

CREATING A WIRED HOME BUSINESS COMMUNITY ON THE CENTRAL COAST

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1 EXECUTIVE SUMMARY

The Central Coast is historically characterised by rapid growth, heavy car dependency and a large number of commuters working outside the region, mainly in Sydney. As a fringe metropolitan area it faces challenges in attracting local employment yet has been less favourably treated than areas such as Sydney's western suburbs, Newcastle and Wollongong. Regional unemployment is higher than the metropolitan average and there are fewer highly paid professional and executive residents.

Metropolitan planners envisage a steady increase in the Central Coast population to 2026 whereas Gosford City Council want to cap growth at 2011 levels. Any proposed re-zoning of land at Terrigal for residential use therefore has the potential to be opposed by Council. Unlike lower density housing schemes characteristic of the post-war period, many developers of master planned home business communities, such as at Parkside, pay particular attention to encouraging working from home to reduce commuting by car and achieve greater environmental sustainability. The key to plans for Parkside are to form a wired home business park whose 'hard' component will be fast broadband connectivity, tailored office accommodation and facilities for support services. Equally important are the 'soft' elements aiming to build neighbourhood cohesiveness through a lively community intranet, increase civic participation, strengthen links to local retailers and reward good environmental performance.

This Report highlights through case studies, mainly from the US and Australia, factors which could contribute towards a wired community being successful. Several earlier projects have aimed to reduce a 'digital divide' between the information rich and information poor and Parkside could help if the proposed intranet infrastructure is broadened beyond the immediate housing area. There is some evidence that wiring a neighbourhood will improve social cohesion, although only in areas where there are modest social and economic challenges in the first place. Property developer led wired communities have been successfully established in the US and recently in Australia though they are quite a recent phenomenon and the results have not been fully researched. Most are in the form of joint ventures with telecommunications suppliers, cable TV companies, universities and local councils. Of the two main technology suppliers, Cisco have been pushing home automation whilst Nortel see fibre cabling as a way of encouraging working from home to reduce road congestion.

Building a wired community at Terrigal gives the chance to minimise economic problems such as road congestion and maximise employment opportunities for local people. Whilst the proposal is for a small property project, certainly compared to the size of wired communities in the US, it represents one of the few sites remaining for development in the Gosford City local government area. A conventional scheme would provide little or no additional employment and it is likely that most residents would commute to Sydney. Serious promotion of working from home should moderate the marginal increase in vehicle journeys in a region dominated by the car. Around three quarters of Central Coast employees drive to work and at least a quarter commute out of the area each day. Congestion on the F3 and its feeder road system is likely to increase as the regional population rises unless working from home can be encouraged and new jobs created on the urban fringe.

There is potential not only have a good mix between commuters, full time home workers and occasional home workers in a Central Coast wired community but also to improve employment prospects in the region. Beyond encouraging teleworking, one way to bring more employment to the Gosford area would be to establish a small business incubation unit which would help to nurture modest scale businesses at their early stage of growth by providing shared business services, lower cost premises and business advice. This approach has been used successfully in the US, is being pioneered in Sydney by a joint venture between Sutherland Shire council, TAFE New South Wales and the University of Wollongong and has been successfully adopted at the Ourimbah Campus of the University of Newcastle by The Central Coast Regional Development Commission. Those attracted to Parkside are likely to include in their number entrepreneurs and small business owners attracted to the central business support unit that will allow them to employ more local people which could reduce above average unemployment levels in the Central Coast. The new residents will increase the under-represented higher income earners in the region, and more of their spending will take place locally rather than in the centre of Sydney.

The proposed on-going involvement of the University of Sydney's Planning Research Centre would best be managed in conjunction with the 'Central Coast Campus' which is a partnership between the Central Coast Community College, TAFE NSW Hunter College and the University of Newcastle. Sydney University could focus on issues of urban planning with the Gosford Campus's Faculty of Information & Communications Technology assisting with technology advice and establishing a community intranet. The involvement of academic institutions in the Parkside project will have multiple benefits: increasing the technology skill base in the Central Coast; involving more people from the local community in the scheme; providing real life experience for students at Australia's oldest and largest planning school; the provision of feedback which will allow the Parkside scheme to change with technology and community needs and finally positive publicity for the property developer and local council who will be seen as pioneers in using technology to achieve sustainable housing outcomes.

Whilst it is not the purpose of this Report to comment in detail on Crighton Properties' specific proposals for Parkside they follow many aspects of wired community best practice from around the world. The scheme also conforms closely with the environmental aims of Gosford City council as set out in their 2001 and 2002 strategies. Economic and environmental sustainability is not guaranteed by providing high speed internet connections to a housing estate. However, the combination of a carefully targeted development catering for home business together with strong partnerships between the developer, the local council and academic institutions will improve the chances of successful outcomes not only for those living in the new houses at Parkside, but for those of the wider neighbouring community.

2 BACKGROUND

2.1 Introduction

Crighton Properties are seeking permission from Gosford City Council to develop a residential estate known as 'Parkside' at Kings Road Terrigal on the Central Coast. The scheme proposes to establish a wired community, and this Report researches similar projects undertaken around the world and considers what lessons can be learned.

The term 'wired community' describes the use of cable connections to link together existing or new housing units to provide fast Internet access. A short term benefit from a wired community is to allow greater opportunity to work from home and a reduction in commuting by car. In the medium term additional entertainment and inter-active services may be provided through the cable and there are opportunities for home automation. The provision of local environmental information could encourage responsible use of natural resources.

By the development of a 'community intranet', that is a series of restricted access web sites which connect members of a housing estate with each and with local service providers, it should be possible to engender greater neighbourhood integration. Benefits from working from home and reduced commuting by car are discussed in sections 5.3 and 5.4 of this Report. A wired community, therefore, has the potential to increase social, economic and environmental sustainability.

2.2 Acknowledgements

The author acknowledges the financial assistance of Crighton Properties to enable the preparation of this Report. Advice has been sought from Professor Edward Blakely, Chair of Urban and Regional Planning at the University of Sydney and a key figure in the preparation of the Sydney Metropolitan Strategy. Meetings have been held with:

- ❑ Geoffrey Cox and Peter Childs: Crighton Properties.
- ❑ Matthew Crozier: Crozier CGS Pty Ltd.
- ❑ Bridget Horne and Karen Minto: Premier's Department of New South Wales, Gosford.
- ❑ Michael Polowytsch and Tony Sampson: New South Wales Department of State and Regional Planning, Hunter & Central Coast Region.

The views and analysis in this Report are those of the author. He may be contacted by e-mail at tonygilmour@yahoo.com or by telephone on (02) 9357 3427.

2.3 Note on Sources

It is acknowledged that, the topics covered in this Report are under-researched, there are no established intellectual frameworks and only few relevant case studies are available. As a consequence more reliance than normal has had to be placed on newspaper reports, Internet sites, press releases and personal interviews. Accordingly, these sources need to be interpreted with caution. With a lack of solid academic research on wired communities, and in an area where technology changes quickly, the following sources have been useful:

(a) *Newspaper articles and trade magazines*

These highlight the pioneering projects around the world, most of which are in the US. Other countries where information has been found are Canada, the UK, the Netherlands, Dubai and Australia. Outside the US the focus has been less on the commercial development of wired communities by property development companies and more on bridging the 'digital divide' by improving Internet access to disadvantaged groups in society.

(b) *Information supplied by the main telecommunications providers*

The main companies, all from the US, are Cisco Systems Inc, Nortel Networks Inc and to a lesser extent Verizon Communications Inc. These organisations have useful websites containing product information and press releases.¹ Often the contents of the press releases are copied directly into local newspaper reports and hence there is little opportunity to determine the validity of the companies' statements. The websites do, however, contain much up-to-date technical data in addition to furthering the concept of commercially viable wired communities.

(c) *The Internet*

Over 90% of research documents have been obtained from websites with much data available in the form of down-loadable pdf documents. Some wired communities have their own websites which give an idea of how an intranet site for a Central Coast scheme could look.² Other websites have been developed by property developers and indicate how the features of a wired community could be used as a marketing tool.³ The Boulder community in the United States has a site showing up-to-date water and other environmental data, an idea being considered at Terrigal.⁴

¹ Web site of Cisco Systems Inc (US): www.cisco.com, Web site of Nortel Networks (US): www.nortelnetworks.com and Web site of Verizon Communications Inc (US): www.verizon.com (all consulted 12th April 2005).

² See for example Web site of the Blacksburg Electronic Village (US): www.bev.net (consulted 12th April 2005).

³ Web site of Hillwood (US Property Developer): www.hillwood.com (consulted 12th April 2005).

⁴ Web site of the Boulder Area Sustainability Information Network (US): www.bcn.boulder.co.us/basin (consulted 12th April 2005).

(d) *Urban Land Institute*

A good source of research and opinions is the Washington DC based Urban Land Institute, founded in 1936, which boasts 22,000 members in 80 countries. This is an independent not-for-profit research organisation funded by property companies which uses commercial consultants and academics to produce their reports. They have an interest in sustainability, wired communities, reducing car journeys and promoting water conservation. The majority of literature can be obtained from their website for free.⁵ However, many of their reports are press releases of conferences rather than detailed conference papers.

(e) *Academic Writing*

Methodologically sound research projects have been produced in the fields of urban planning, sociology, social geography and anthropology. These are discussed in section 3 of this Report.

2.4 The Author

In 2005 Tony Gilmour was appointed Research Policy Manager of the Planning Research Centre, coinciding with the start of a PhD programme at the University of Sydney. His research is focusing on the impact of the choice of financing techniques by governments on the achievability of greater affordability in the public and private housing markets. Working closely with Professor Edward Blakely, his objectives are to use academic research to assist in building communities which can achieve social, political, environmental and economic sustainability.

Tony has combined a career working for international Investment Banks with full-time postgraduate study. Up to 2002 Tony held the role of Associate Director at N M Rothschild & Sons working with the Managing Director on global strategic planning and performance management. He was previously Financial Controller of Rothschild's A\$30 billion UK Treasury and Banking divisions, and latterly Compliance Manager of the Australian businesses based in Sydney.

In the academic world, Tony gained a BA (Hons) in history from the University of Cambridge in 1983 followed by an MA in 1987. He still holds the record for the highest marks obtained in the Professional Banking Exams since the Institute's foundation in the nineteenth century. In 1991 he gained top place on the MBA course at the University of Manchester following a secondment to the University of California at Berkeley. Now living in Australia, Tony gained an MA (Hons) in Architectural history at the University of Sydney in 2004. He has lectured at the University of Sydney on Heritage Conservation, Urban Planning and was co-presenter of a summer school course on 'Innovative Financing of Infrastructure in Sydney'.

⁵ Web site of the Urban Land Institute: www.uli.org (consulted 12th April 2005).

3 ANALYTICAL FRAMEWORK

This section assesses the academic literature as it relates to the development of wired communities. In terms of urban planning it places the concept within the broader conceptual framework of master planned communities and smarter growth of fringe urban areas by adopting some principles from new urbanist theory. Specific attention is paid to two features promoted by Crighton Properties at Terrigal: the reduction in commuting by car and the encouragement of working from home.

3.1 Master Planned Communities

Within the planning profession there has been a reaction against uncoordinated suburban sprawl which was the dominant paradigm of the second half of the twentieth century. This had led to increased support for 'master planned communities' which, whilst basically low density residential housing estates, take into account wider issues such as transport and community infrastructure.

In the US master planned communities on a large scale of up to 100,000 residents are being developed, and are popular with local councils as public facilities are often paid for by the property developer, and with residents who buy a particular 'lifestyle' not just a house. Their marketing literature pictures a particular mode of life appealing to a specific demographic. In their community orientation they adopt some of the social utopianism present in garden suburbs and company towns in the nineteenth century.⁶ To the extent that the wired communities adopt a distinctive branding they are more likely to attract a homogenous group of residents who, it may be assumed, have a greater chance of becoming a community of likeminded people.

Master planned communities adopt some of the basic urban design ideas and building styles of 'new urbanism', a planning movement which supports higher density housing around existing transport and other infrastructure. New urbanism developed from an interest in sustainability which has been a growing area of research since the late 1980s and aims, in the context of urban planning, to achieve a balance between the built and the natural environment.⁷ In 1993 the Congress for New Urbanism in the US proposed curtailing urban sprawl, building socially mixed neighbourhoods, resisting edge cities and creating safe environments for pedestrians. In the same year Peter Calthorpe advocated an integration of urban design with environmental sustainability.

In general master planned communities tend to be on 'greenfield sites' (not previously developed) and at lower housing densities whilst new urban communities are often on 'brownfield sites' (land converted from industrial to residential use) at significantly

⁶ Venkatesh, Chen and Gonzalez (2003). 'A study of Southern California wired community: where technology meets social utopianism. Paper presented at the Human-Computer International 10th International Conference. June 22nd-27th 2003. Crete, Greece.' p.3.

⁷ See, for example: Nijkamp and Perrels (1994). 'Sustainable cities in Europe: a comparative analysis of urban energy-environmental policies'. p.4.

higher housing densities.⁸ Both share the need for greater mixed use between residential, work and community facilities and hence a breakdown of the strict zoning policies popular from the 1960s.⁹ Pattern Books and Design Codes are widely used to serve as practical guides to how a development should look in terms of style and materials: the level of detail can vary from the highly prescriptive, such as controlling the architectural features of houses in Celebration Florida, to more general where idealised building layouts are shown.

Several inner-city Sydney developments such as Pymont and Waterloo have been planned using new urban principles. However, to date there has been no coordinated approach and many Councils and individuals resist such developments.¹⁰ There is a view, as yet unsubstantiated by academic research, that suburban values and the primacy of the quarter acre block are more strongly embedded in Australia than the US or UK.¹¹ Moves to a metropolitan planning strategy in Sydney are discussed below in section 5.2 but the early indications are that the residential growth over the next 30 years will balance greenfield and brownfield housing schemes. The 2004 Ministerial Directions Paper states, rather than leaving open for discussion, that the balance between greenfield and brownfield sites will remain at the same ratio (30%/70%) over the next 15-20 years as over the past 20 years.¹² However, developments in new release areas in Sydney's north west and south west corridors will not be approved unless they satisfy sustainable criteria which are described loosely as the provision of local employment, affordable housing and accessibility to public transport.

Wired communities are best understood as one dimension of the broader concept of a master planned community with developers considering the building of community infrastructure alongside the laying of cables and the construction of houses in order to provide a desired lifestyle. In most recent schemes from the US described in section 4.1 below the two terms are virtually synonymous with the house design reflecting of the IT infrastructure, for example providing a separate entrance to a home office to change the way that people work and live. Crighton Properties proposals for Parkside can therefore be seen as much as a move towards master planning a community rather than just being a technology driven idea.

⁸ New urbanism in general, and the use of brownfield sites in particular has been heavily promoted by the UK Government where a target has been set for 60% of houses to be built on brownfield sites or by conversion of existing units by 2008. Web site of the Deputy Prime Minister: www.odpm.gov.uk (consulted 19th April 2005).

⁹ Carmona, Heath, Oc and Tiesdell (2003). 'Public places, urban spaces'. p.11.

¹⁰ Bounds (1993). 'Property values and popular politics: resistance to urban consolidation in inner Sydney'. *Australian Planner*. 31(1). p.14.

¹¹ Graus (1995). 'Ye olde New Urbanism'. *Australian Architecture*. 85(6). p.73.

¹² New South Wales Ministry of Infrastructure Planning and Natural Resources (2004). 'Sydney Metropolitan Strategy - Ministerial Directions Paper'. p.11. 'Greenfield' is defined, narrowly, as buildings not constructed in established areas. If a development took place on open land adjacent to an existing settlement that would not count as 'greenfield'. Many other countries, particularly Britain, define greenfield sites as pieces of land that do not currently have buildings on them.

3.2 Smart Growth on the Urban Fringe

'Smart growth' is a general term originally coined in the US and is a way of encouraging all new developments, whether on greenfield or brownfield sites, to adopt principles of economic and environmental sustainability.¹³ Information technology may be adopted, not as an end in itself but where the ultimate goal is the promotion of economic growth, higher quality of life, participation in civic activities and conservation of natural resources.¹⁴

The City of Gosford can be classified as an urban fringe area, one that has relatively strong local identity but is still tied strongly to the economic hub of a major city, Sydney. Urban fringe communities face pressure for population growth as migration from the inner city continues, and transportation can become gridlocked as many workers commute into the regional centre. The urban fringes of American and Australian cities share many similar characteristics and 'smart growth' principles can be applied to both. The Urban Land Institute in the US has identified ideal characteristics of master planned communities in urban fringe areas, detailed in Figure 1 below. They attempt to balance conservation and development needs, and allay the fears of many living in neighbouring housing who may oppose further development on the grounds that their quality of life will be diminished by further development:

- More conservation of open space.
- More preservation of environmental attributes.
- More preservation of the community's character and heritage.
- More opportunities for a variety of housing types and prices.
- A wider mix of uses including office, shopping and recreational space.
- A greater overall sense of community among the residents.

Figure 1: Master planned communities¹⁵

The general objectives outlined in Figure 1 can be achieved with or without the provision of fast broadband connections. Supporters of wired communities would argue that the benefit advantages from technology provision are that a greater sense of community and identity can be achieved by using local intranets. For the local government area as a whole, however, the availability of fast broadband technology can have an effect on its competitiveness in the greater metropolitan region. Businesses are choosing to locate in areas where there is a high quality of life as this

¹³ Urban Land Institute (US) (2004). 'Press Release: Taking smart growth to the fringe: Urban Land Institute outlines ten principles for building better in the suburbs'. p.1.

¹⁴ Eger (1998). 'Smart communities'. p.2.

¹⁵ Urban Land Institute (US) (2003). 'Press Release: Growing better in greenfields: Urban Land institute look at master-planned communities, role in efficient fringe development'. p.1.

helps to attract and retain skilled staff, but both companies and potential residents expect the same level of technology that they would have access to in the city.¹⁶

Evidence from the US suggests that the fringe urban areas, building on principles of smart growth, can stand shoulder to shoulder with their larger neighbours. In 2000 the World Teleport Association in Washington DC named LaGrange, a town with a population of 27,000 and located near Atlanta, as 'Intelligent City of the Year' for providing high speed access to homes and businesses. LaGrange beat off competition from Chicago, New York, London and Toronto, and took the title from the previous year's holder: Singapore. The local authority funded provision of the main telecommunications infrastructure with the regional cable TV company offering each resident free Internet access. In Glasgow, Kentucky (population 14,000) the council provided broadband connection in partnership with the local electricity utility company. The council in Ashland, Oregon (population 18,500) installed high speed connections to households and businesses to enable the region to remain competitive with better connected areas in neighbouring California.¹⁷

To achieve smart growth in fringe urban areas the Urban Land Institute at a congress in 2004 suggested five defining principles:

- | |
|--|
| <ul style="list-style-type: none"> - <i>Improve education</i>
Advise public officials, environmental groups, developers, financiers and the general public of the benefits of smart growth. - <i>Establish strong partnerships</i>
Build on-going links between the public and private sectors. - <i>Transportation infrastructure is crucial</i>
Objections to suburban sprawl are linked to traffic congestion, transport difficulties and air quality issues. Multiple transportation options should be provided and they should be well connected to each other. - <i>Regionalism and regional vision are key</i>
Establish a vision for the entire region as today's fringe areas will become tomorrow's urban in-fill. - <i>Role of the private sector is implementation</i>
Whilst the private sector should take a lead in implementation, it is for the public sector to provide incentives for smart growth |
|--|

Figure 2: Smart growth in fringe areas¹⁸

¹⁶ In a knowledge based economy many key workers now value quality of life more highly than in the past. Urban Land Institute (US) (2001). 'Press Release: Smart growth, smart companies, smart workers: Urban Land institute conference looks at the impact of the new economy'. p.1.

¹⁷ Johnson (2001). 'Small town fiber'. p.1.

¹⁸ Adapted from Wilbur, Ed. (2004). Report of the Urban Land Institute (US) and Joseph C. Canizaro Public Officials' Forum on 'Smart growth on the fringe'. p.7. The Conference was attended by a mix of public officials, consultants and property developers.

The above model, developed from a mainly US perspective, has some useful applications within Australia. In particular it points to the benefits of the public and private sectors working closely together to achieve desired objectives such as economic, social and environmental sustainability. There is some evidence that the idea is being addressed in the Central Coast with a 2002 regional strategy plan calling for 'smart growth settlement patterns and housing choice'.¹⁹

3.3 Digital Divides

Government policies and academic research have often concentrated on the existence of a 'digital divide', that is the differential adoption of Internet technology based on social, economic, ethnic or spatial hierarchies. In particular there has been a fear that access to digital technology may increase existing inequalities, creating as it were a digital underclass of those who are 'information poor'.²⁰ Problems associated with residential location, even within a metropolitan area, can therefore be exacerbated by the growth of a digital divide. Australia has often been characterised by commentators as exhibiting a digital divide between well provided urban areas and disadvantaged urban fringe and rural areas where Internet access may not be available, or may be of poor quality.²¹ However qualitative research has generally found that 'factors other than geography, particularly income, education, employment and age are the most important causes of different levels of take-up of the Internet and online services amongst Australians'.²²

In the Sydney Metropolitan Region analysis has focused on the 2001 Census which for the first time asked about usage of computers at home and use of the Internet at home, at work or elsewhere. Chris Gibson from the University of New South Wales, writing in 2003, noted that Australia's digital divide was as much based on class as location.²³ Many fringe urban local government areas such as the Blue Mountains and Sutherland had relatively high usage of computers, comparable to inner-city areas such as Mosman or North Sydney. The percentage of residents of Gosford City using a computer at home in the 2001 census was 44.4%, just ahead of the New South Wales average of 43.6% but well behind the best performing council areas of Ku-ring-gai (64.4%), Baulkham Hills (58.6%) and Hornsby (58.5%).²⁴ Gibson noted that there

¹⁹ Planning New South Wales, Gosford City Council and Wyong Shire Council (2002). 'Shaping the Central Coast - Draft Action Plan version 2'. p.8.

²⁰ See for example Graham and Marvin (2001). 'Splintering urbanism: networked infrastructures, technological mobilities and the urban condition'. pp.376-377.

²¹ Baum, Van Gellecum and Yigitcanlar (2004). 'Wired communities in the city: Sydney, Australia'. Australian Geographical Studies. 42(2). p.177.

²² Given (2001). 'Enduring divisions'. Telecommunications Journal of Australia. 51(1). p.20.

²³ Gibson (2003). 'Digital divides in New South Wales: a research note on socio-spatial inequality using 2001 Census data on computer and Internet technology'. Australian Geographer. 34(2). p.239.

²⁴ Australian Bureau of Statistics 2001 Census of Population and Housing. City of Gosford. Table B15. Available at Web site of the Australian Bureau of Statistics: www.abs.gov.au. Methodology based on Gibson (2003). 'Digital divides in New South Wales: a research note on socio-spatial inequality using 2001 Census data on computer and Internet technology'. Australian Geographer. 34(2). Table 4, p.247.

were spatial aspects to the digital divide, within a particular regions there may be enclaves of highly connected individuals and firms immediately adjacent to many people who had no, or only basic, Internet access. Hence there was no clear pattern of a spatial divide in New South Wales between a well-connected inner core and a periphery of poorly connected outer suburbs and rural areas.

Baum and others in 2004 supplemented Gibson's work and analysed Internet usage in the Sydney Statistical Division at sub-local government area detail. Their complex methodology identified seven relatively homogenous clusters of households, analysed by household structure, socio-economic status and ethnicity.²⁵ These were then mapped against computer and Internet usage. Parts of Gosford have not only a home computer usage lower than the average for Sydney as a whole, but are in the lowest possible of the seven clusters. Other areas with similar characteristics include parts of the Hawkesbury, the Blue Mountains and Sutherland.²⁶

To characterise Gosford City, computer usage is average for New South Wales but relatively low for the Sydney Metropolitan Region. It contains within the local government area a pattern that characterised by some neighbourhoods with high computer usage immediately adjacent to those with very low usage. This is a pattern seen throughout the region, is not specific to Gosford and probably reflects significant variations in socio-economic status between Gosford's neighbourhoods. However, the areas where computer usage are low in Gosford suffer from amongst the lowest technology provision in the entire Sydney Metropolitan Region.

With the development of a wired community at Terrigal it is likely that excellent computer access would be provided to a segment of Gosford's population who probably already enjoy high quality Internet provision. The challenge is whether the provision for other residents in the local government area could be improved, for example by using the Terrigal scheme as a prototype for what could happen in other poorly wired neighbourhoods, or using the community intranet to link with households beyond the immediate area of the new housing development. Wider community benefits are more likely to be achieved if the developer works closely in partnership with the Council, or with residents in nearby housing estates.

3.4 Technology and People

The relationship between technology and the building of community interaction and social cohesion has been a feature of writing since the mid nineteenth century. The advent of the Internet, and the joining of adjacent houses into wired neighbourhoods has prompted further research. A key question is whether the Internet increases social isolation with individuals spending hours alone in front of the computer screen, or whether it can act as a catalyst for building both virtual and real communities. The

²⁵ Their general conclusion was that whilst there is a strong connection between socio-economic status and computer ownership, the associations with family status and ethnicity are less clear.

²⁶ Baum, Van Gellecum and Yigitcanlar (2004). 'Wired communities in the city: Sydney, Australia'. *Australian Geographical Studies*. 42(2). p.186.

optimists conclude that technology can be used to rebuild and renew a sense of place, factors that have often been overlooked in the growth of suburban sprawl.²⁷ Certainly it is a paradox that the more that people live and work in cyberspace, the more important become the areas where people physically interact. This is one of the reasons why those in the knowledge based industries often migrate to areas with a higher quality of living and good local facilities.

Hampton and Wellman observed a suburban wired community outside Toronto in 1998 and concluded that the 'Internet supports a variety of social ties, weak and strong, instrumental, social and affiliative. Relationships ... are sustained through a combination of on- and off- line interactions'.²⁸ These relationships were often strongest within the local neighbourhood, the Internet serving as an initial contact point leading to face-to-face meetings at events such as barbecues. In contrast the wiring of high rise public housing units in Atherton Gardens, Melbourne described below in section 4.2 has made little difference to community interaction although there have been some other benefits.²⁹ These units house a heterogeneous mix of individuals with a variety of social and economic problems, and residents had little input into the decision by the Council of where they should be housed.

Research on the impact of Internet technology on community formation has therefore produced mixed messages. In a location where residents have a similar demographic background and have chosen to buy a carefully positioned 'lifestyle', and where their economic and educational background makes them likely to be heavy users of the Internet, wiring a community is likely to assist building neighbourhood cohesiveness. The scheme at Terrigal is therefore more similar to the Toronto, not to the Melbourne example. However, only by carefully tailoring a community intranet are benefits likely to be gained – provision of fibre optic cables alone will make little difference.

3.5 Employment without Commuting

There is a long tradition of self employed professionals and small business owners using the home as their place of work. They have been joined over the last decade by companies who have used the availability of fast internet access to allow employees to undertake many tasks at home that would have traditionally been carried out in an office. Many terms are used to describe this new form of work, including 'telecommuting' and 'home working', though this Report uses 'teleworking'. Typical jobs which have seen a growth of teleworking in the last decade are salespeople, managers, professionals, support personnel, computer programmers, web page designers, data entry clerks and telephone support staff.

²⁷ Eger (1998). 'Smart communities'. p.1.

²⁸ Hampton and Wellman (1999). 'Netville online and offline. Surveying a wired suburb'. *The American Behavioral Scientist*. 43(3).p.489.

²⁹ See below section 4.2. Also Meredyth, Ewing and Thomas (2004). 'Neighbourhood renewal and government by community'. *International Journal of Cultural Policy*. 10(1). p.9.

By way of example of a company promoting teleworking, Nortel Networks are a good case study as they started as early as 1994. Just under half their employees work remotely, either from home, whilst travelling or in a company office other than their own. Approximately one third of employees work from home either some or all of the time. The company estimate that for every teleworker they can reduce their office infrastructure costs by US\$9,000 per person. Generally they still provide 'drop in desks' at a local office where teleworkers can work from time to time, but there is not a need for one desk per employee. Nortel Networks sell products that allow teleworkers a single telephone number, fax and voice mail system such that customers will not be aware of from where the teleworker is based. They claim that the technology can reduce the cost of long distance telephone calls by 30-35%, that their teleworkers have shown a 15-20% increase in productivity and that employee job satisfaction is up by 11%.³⁰

A division in teleworking can be drawn between higher paid 'executive' employment and what has been termed 'pink collar' jobs which are typically lower paid and often undertaken by women who have children.³¹ Management practices have diverged between the two groups with the 'executive' staff normally given more autonomy that they would experience in an office and the 'pink collar' staff more closely monitored and controlled. Yet another group of teleworkers is emerging: senior staff who still have an office but work for a portion of their time from home, or when away on business. This has led Manuel Castells, one of the leading international writers on the impact of information technology to see not 'an end of the office, but the diversification of working sites for a large fraction of the population, and particularly for its most dynamic, professional sector'.³²

The uptake of teleworking has been below the expectations of futurologists who from the 1980s predicted it could rise to over half of all employees. Surveys have shown that whilst in theory it would be possible for 50% of work to be undertaken from home, the actual take-up is only a couple of per cent in developed countries. In the United States the figure has been estimated at 5% by a trade body, the International Telework Association, but in that category would be employees who worked as little as one day per month from home.³³ Lack of consensus as to an appropriate definition of teleworking makes comparisons between surveys difficult and therefore reliance has to be placed on more general and qualitative information sources.³⁴

³⁰ Nortel Networks (2004). 'Case study: Nortel Networks - technology that makes mobility synonymous with productivity'. p.4. and Nortel Networks (2000). 'How can a government protect the environment and improve working conditions for disabled employees without overspending?' p.2. Note that these statistics have been supplied by Nortel Networks and are not capable of any independent verification.

³¹ Wellman, Salaff, Dimitrova, Garton, Gulia and Haythornthwaite (1996). 'Computer networks as social networks: collaborative work, telework and virtual community'. *Annual Review Sociology*. 22(1). pp.228-230. The latter type of jobs have also been targeted at people with physical disabilities.

³² Castells (2000). 'The rise of the network society'. p.426.

³³ Cooper and Kurland (2002). 'Telecommuting, professional isolation and employee development in public and private organizations'. *Journal of Organisational Behaviour*. (23). p.511.

³⁴ Castells (2000). 'The rise of the network society'. p.425.

The Australian census has been used to derive figures for the number of people in the Central Coast region of New South Wales who work from home. Unfortunately the category is quite broad and does not allow identification of teleworkers compared to the self-employed and others. However, on the 2001 census day 4.4% of employed persons in Wyong Shire and 5.2% in Gosford City worked at home. In Wyong Shire between 1996 and 2001 the absolute number of people working at home increased by 1,503 although the proportion of those working at home remained constant. In Gosford City employees working at home declined by 855 with a slight decrease in the proportion of home workers.³⁵ Working from home is only a minor employment category in the Central Coast and is on a steady or a slightly declining trend.

Across the Metropolitan Sydney area and New South Wales as a whole the proportion of home workers is somewhat lower than in Gosford City at 4.1%. In the period between 1996 and 2001 the total number of home workers increased in Metropolitan Sydney from 69,442 to 81,247, an increase of 14.6%. The job titles in the category were 'professionals/associate professionals' (40%) followed by 'clerical and service workers' (31%), 'managers and administrators' (15%) and 'tradespersons and related workers' (6%). In terms of sectors, property and business services showed the greatest growth in the five years to 2001 of 70% per annum. Most Sydney teleworkers live in the eastern suburbs and the northern beaches.³⁶

Barriers to greater teleworking include lack of enthusiasm from employers, but also from employees who fear social isolation. Cooper and others studied the link between telecommuting and isolation and concluded that it is a greater problem in the private than the public sector, and that teleworkers are still able from home to maintain work and social networks. Hence the fears of many employees about teleworking may not be substantiated by the reality.³⁷ In a more comprehensive study in 2003 based on a sample size of 32,000 respondents in 27 European counties, researchers from the University of Cambridge found that teleworkers could not be characterised as socially isolated: they had a higher participation in voluntary, political and trade union activities than those office based.³⁸

To encourage teleworking, attention needs to be given to the physical layout of houses. An example of encouraging home working by design is the Mapleshade Residences in Dallas where there is both a centrally located business centre for use by the residents together with an area in each house for a computer. Although this scheme was for an apartment block rather than a low density greenfield development,

³⁵ Wyong Shire Council, Gosford City Council, The University of Newcastle and Central Coast Health (2004). 'Central Coast: regional profile and social atlas 2004'. p.257.

³⁶ SGS Economics and Planning on behalf of the Department of Infrastructure Planning and Natural Resources (NSW) (2004). 'Sydney's economic geography, trends and drivers'. pp.54-58.

³⁷ Cooper and Kurland (2002). 'Telecommuting, professional isolation and employee development in public and private organizations'. *Journal of Organisational Behaviour*.(23). p.526.

³⁸ Kamerade and Burchell (2003). 'Teleworking and participation in the community: are we becoming an autistic society? Paper for presentation at the European Science Foundation Exploratory Workshop 'Income, Interactions and Subjective Well-being' 25th-26th September 2003'. p.1.

similar principles should apply.³⁹ Design features supportive of teleworking have been summarised in Figure 3 below:

- Construction of a dedicated working space in the home, possibly with a separate business entrance and car driveway. Working space at the front of the house with living areas behind (or vice versa). Some schemes, where space permits, have a separate building to locate the home office.⁴⁰
- Local availability of, and contacts with, professional service providers: lawyers, bankers, accountants, graphic designers, web page experts.
- Provision of site to meet clients away from the home. Board room with dedicated facilities such as projector for PowerPoint presentations.
- Shared secretarial and administrative support services.
- Local copying, printing and document binding facilities.
- Social space to meet other home based workers.
- Child day care, dry cleaning facilities, sandwich shops etc.
- Higher quality of open space such as parks and well designed streetscapes as longer periods will be spent in the same area.

Figure 3: Working from home logistic and design guidelines⁴¹

Little is known about the demographic profile of teleworkers, and as there are so many diverse groups that can be included in this category it is probably impossible to give more than a general impression. A wired community at Terrigal is likely to appeal to the self employed, to 'executive' rather than 'pink collar' staff, and to senior employees who want to reduce the but not eliminate the time they spend in their principal office. Property prices in the area are such that new residents will need to be in the higher socio-economic bracket, though some family partners may undertake 'pink collar' work if they have child minding responsibilities.

3.6 Transport Sustainability⁴²

Land use and transport need to be more closely coordinated, especially in outer-metropolitan areas which is where the majority of future housing development is likely to take place. In traditional greenfield housing developments public transport tends to be under used, car pooling ineffective and walking to local destinations often

³⁹ Horan (2000). 'Making the connection broadband'. p.2.

⁴⁰ Baruch (2000). 'Teleworking: benefits and pitfalls as perceived by professionals and managers'. New Technology, Work and Employment. 15(1). p.44. This survey of UK teleworkers suggested that have a clearly defined work space away from the rest of the house was crucial to making teleworking a success by allowing individuals to perceive a separation between their work and the rest of their lives.

⁴¹ Adapted from Blais (1998). 'Getting wired'. p.2.

⁴² Specific transport issues relating to the Central Coast are discussed in section 5.4 below.

problematic. The challenge for planners is how to apply new urbanist principles on smart transport to lower density residential housing estates, and these can be from reducing longer distance commuting (macro level) as well as minimising the number of local journeys undertaken by car (micro level):

(a) *Macro level transport*

The growth of longer distance commuting by car to work since the 1960s has been encouraged by the ability of people to lower their cost of living by purchasing houses in areas with significantly lower prices than the central city. Research from the US suggests that whilst housing costs are the largest component of family expenditure (33%), transportation costs (19%) are second and of a similar magnitude to food and clothing combined.⁴³ In Australian cities the rise in fuel prices, the growth of road/bridge tolls and the increase in property prices in fringe metropolitan areas suggest that locational economics may be changing. Householders may be less willing to commute by car, both because of the higher cost as well as the perception that non-work time is valuable and could be better spent than sitting in cars for long periods of time.⁴⁴

Reduced commuting within the wider metropolitan area could be achieved by more closely locating housing and employment and by encouraging the growth in teleworking described in section 3.5 above. Many households in metropolitan fringe areas have two or more cars and if one of the vehicles is not needed for commuting every working day then the householders may be able to manage with just one vehicle, leading to a major downward step in traffic congestion as well as lower transportation costs for residents. Reduced commuting by car can lead to greater interaction between people which is important to promote family life and sustain social and community networks.⁴⁵

(b) *Micro level transport*

The reduction of local car journeys is often overlooked in favour of (a) above although it is likely to have a major impact on reducing the number of kilometers travelled by car. Use of the Internet by residents for services such as banking, video on demand and obtaining council information may prevent the need for a journey by any means of transport. For other journeys, in fringe metropolitan areas walking is the most common alternative, although a distant second, to driving.⁴⁶ To encourage journeys by foot, planners must establish attractive local destinations (shops, cafes, sports facilities, schools) and a safe and accessible network of paths. Shared facilities should be clustered together which allows production economies and a wider catchment area than a single housing

⁴³ Urban Land Institute (US) (2003). 'Press Release: We know it: smart growth helps lower consumer location costs for housing, transport, Urban Land Institute shows'. p.1.

⁴⁴ Urban Land Institute (US) (2000). 'Press Release: Linking environmental quality, economic viability and community liveability is focus of Urban Land institutes Smart Growth Conference'. p.1.

⁴⁵ Flood and Barbato (2005). 'Off to work: commuting in Australia'. [p.ix](#).

⁴⁶ Urban Land Institute (US) (2002). 'Press Release: The shortest distance between here and there is . uh, well. Urban Land Institute looks at transportation options for outlying areas '. p.1.

estate.⁴⁷ Paths should be designed to facilitate walking and cycling not just for exercise, but to gain access to a destination which although only a short distance away would normally be accessed by car.⁴⁸

Ideally a master planned community should offer residents a selection of transportation options: driving, cycling, walking, public transport. By giving more choices for people's 'live-work-play' arrangements it is likely that the use of car transportation for long distance commuting or short distance errands will diminish.⁴⁹ These communities are therefore able to function more as 'suburban villages'. However, despite the scope for considerable improvements from the present, the car is likely to remain the dominant mode of transport in fringe metropolitan areas.

⁴⁷ Riddell (2004). 'Sustainable urban planning'. p.119.

⁴⁸ Urban Land Institute (US) (2003). 'Press Release: Building places for people not cars: Urban Land Institute assesses challenges, potential of walkable communities'. p.1.

⁴⁹ Urban Land Institute (US) (2004). 'Press Release: Because today's fringe is tomorrow's infill, Urban Land Institute seeks more efficient land use at the urban fringe'. p.1.

4 WIRED COMMUNITY CASE STUDIES

This section summarises desk research on a number of pioneering wired communities and aims to describe a number of differing approaches in selected countries. Australian coverage is more comprehensive although there have only been a small number of wired community initiatives to date.

4.1 US Examples

The majority of projects in the US are commercially promoted private housing schemes which adopt broadband connectivity and a local intranet as a part of creating a master planned community. Other initiatives are driven by telecommunication suppliers, pro-active local authorities or universities.

(a) *Blacksburg, Virginia, 1992+*

Blacksburg 'electronic village' is often considered the earliest, highest profile and most researched wired community. The scheme was promoted and initially funded by Virginia Tech, a research university, in 1992 and has grown from a closed university network into a more broadly based community intranet. Partners in managing the scheme are now Virginia Tech, the local telecommunications company (Verizon Communications, previously Bell Atlantic Virginia) and the Blacksburg city council.⁵⁰ The university has had a continuing role in monitoring the success of the project, and in tailoring the scheme to meet changing technologies and user requirements.

Connected residents can readily obtain information on local health care provision, clubs and societies, community news and there is an active discussion forum for development changes which may impact upon residents.⁵¹ Usage of the Internet has been boosted by a comprehensive training, education and outreach programme and there is assistance for local businesses to launch their own web pages. Services which were initially provided free are now charged for although income covers only 40% of expenditure with the remainder of the cost covered by university and local government support.

It was estimated that as early as 1996 over 17,000 community members out of a total population of 36,000 had access to the services of the 'village'. At this date over a quarter of local businesses had a presence on the intranet with this figure

⁵⁰ Hampton and Wellman (2000) 'Examining community in the digital neighbourhood: early results from Canada's wired suburb', in Ishida and Isbister 'Digital cities' p.1.

⁵¹ Web site of the Blacksburg Electronic Village (US): www.bev.net (consulted 12th April 2005). There are over 150 community groups with a presence on the 'electronic village'.

rising rapidly to two thirds by 2002.⁵² It was claimed in 2002 that at 60%, the residents of Blacksburg had the highest per capita access to broadband, at home or at work, in the world.⁵³ The existence of the 'electronic village' is said to have increased interaction amongst the residents of the town and boosted Blacksburg's economic growth.⁵⁴

(b) *Heritage, Texas, 2000+*

Of a more comparable size to the proposed scheme at Terrigal is a site at Heritage, Fort Worth where initially 610 units are being built.⁵⁵ Launched in 2000, the project is promoted by property development company Hillwood using technology from UStec. As with most wired community proposals in the United States the main emphasis is on enhanced quality of life through a master planned community.⁵⁶ There is a neighbourhood intranet offering links to local stores and community groups and there is a ten acre neighbourhood centre where people can socialise, use the sports facilities (access for residents only), go shopping or attend a medical centre. Cycle and pedestrian pathways link the estate to encourage local transport and minimise short journeys by car. Some reductions in commuting are likely as Heritage is located close to the employment centre of Alliance, Texas.

Continuity of management within the development is secured by the 'Heritage Homeowners Association' which is a non-profit company that enforces design and architectural controls through clauses in property leases. Relatively modest rates of US\$264 are collected from each homeowner to pay for maintenance of common areas and the community facilities

(c) *Playa Vista, California, 2001+*

Playa Vista, located west of Los Angeles, is a project covering 1,100 acres to build 13,000 wired homes (estimated final population of 30,000) of which 3,200 dwellings will be in the first phase. It is being constructed on a partially brownfield site previously occupied by factories of the Hughes Aircraft Company.⁵⁷ Half the land area will be devoted to open public space and the developers will pay for the restoration of natural habitat wetlands and a wildlife preserve. In addition the master planned development will include six million

⁵² Carroll and Rosson (1996). 'Developing the Blacksburg electronic village'. Association for Computing Machinery. Communications of the ACM. 39(12). p.70. Figures for business access in 2002 are from the Sewell article quoted below.

⁵³ Sewell (2002). 'A true online community'. Telephony. 242(22). p.94.

⁵⁴ Government of Canada (2000). 'Smart community profiles: Blacksburg, Virginia - Blacksburg Electronic Village'. (consulted 19th April 2005).

⁵⁵ 'Istec to wire Hillwood residential community'. The Fort Worth Business Press (US) February 15th 2000. p.1. The final scheme will comprise 2,700 residential units.

⁵⁶ Web site of Hillwood (US Property Developer): www.hillwood.com (consulted 19th April 2005).

⁵⁷ Keefe 'Living the high-tech life; Cisco plans community of internet-wired homes'. Austin American Statesman (US) 27th July 2000.

square feet of office and retail space, and a new media and technology centre. Each new office building, shop or kiosk will have broadband access.

The design of the scheme at Playa Vista was strongly influenced directed by Cisco, and Whirlpool Corporation who are their preferred partner for home automation.⁵⁸ Cisco launched a 'Connected Communities' programme in 2001 to make it easier for building developers to incorporate home automation services into their new housing schemes.⁵⁹ Whirlpool are developing Internet connected devices such as fridges which order provisions when stocks run low and ovens which can have their temperature adjusted from anywhere in the house. Each room in dwellings at Playa Vista will have four plug-in sockets which can be used for high speed internet, cable television, telephone, music and other services. The fridge door will have a 'Web tablet' on which messages can be written, replacing hand written notes.

Cisco estimate that their 'Residential Gateway' home automation product will retail for US\$500 although this is in addition to the extra wiring which for a new home at Playa Vista which should cost US\$1,000. For conversion of older dwellings the cost of wiring can range from US\$1,500 to US\$100,000 depending on the features supplied and the condition of the property.⁶⁰

(d) *Rio Mesa, California, 2001+*

Cisco's main competitor, Nortel Networks, has launched an 'e-village' on a 15,000 acre site at Rio Mesa on the outskirts of Fresno, California.⁶¹ This involves construction of 30,000 homes (500 in the first phase) housing up to 110,000 people. Prices start from a relatively modest US\$110,000 and community facilities will include two golf courses, schools which incorporate 'community learning centres', a shopping complex and a 300 room hotel. Involved in this project are the California State University at Fresno, utility companies, a property developer and the Californian Transportation Department. The scheme is described by the promoters as being a 'true partnership' between Nortel Networks and the property developer as they will work together on designing, building, marketing and the subsequent management of the project. The technology used is fibre optic cable with a download connection speed of 10 Mbps (megabits per second).

⁵⁸ 'Playa Vista selects Whirlpool Corporation to support integrated home solutions for wired community; Whirlpool provides internet-enabled appliances and services'. Press Release by Business Wire.

⁵⁹ Cisco Systems (2001). 'News release: Cisco announces program to connect with homebuilders. Cisco's Connected Communities program helps developers integrate the internet lifestyle into master planned communities'.

⁶⁰ Wong 'Cisco to wire homes with networking technology'. News.com (US) 26th July 2000. Available at <http://news.com.com>.

⁶¹ In the rivalry between US telecommunications giants Cisco and Nortel Networks, wired communities are a major area of competition. Ames 'Wired communities new front in Cisco-Nortel battle'. Ibid.14th February 2001. Available at <http://news.com.com>.

Unlike many US schemes, Rio Mesa is supportive of teleworking with the reduction in car commuting as the main environmental aspect of the project. Nortel Networks claim the 'planned, high performance Internet village for telecommuters [as] expected to be one of the world's largest and most sophisticated Master Planned Communities'.⁶² The involvement of the Californian Transport Department is significant at Rio Mesa and separates it from other examples of US master planned wired communities by an active involvement of developers with public transport planners.

In part the tailoring to high-technology teleworking is a factor of the development's location relative to nearby Silicon Valley, and their properties will be significantly cheaper than those in the Valley itself.⁶³ Not only will Nortel Networks install their equipment in the development – they will market the properties to its own employees, many of whom are themselves teleworkers. This has prompted one commentator to describe Rio Mesa as a twenty first century version of a company town.⁶⁴

4.2 Australian Examples

There has been a significant involvement of Federal, State and to a lesser extent local government in Australian schemes. As in the UK there is a political concern about access of disadvantaged groups to the Internet overlaid with the problematic progress of the full privatisation of Telstra which some fear will disadvantage regional areas.

(a) *Atherton Gardens, Melbourne, 1999+*

As a low-income high-rise public housing estate, Atherton Gardens in Melbourne's Fitzroy district is the site for a scheme which tries to reduce the digital divide discussed in section 3.3 above. The 'Reach for the Clouds' project (later renamed e-ACE) is a joint venture between a not-for-profit Internet service provider, community groups, the local council, State agencies and private companies. The 800 residents in the four 20 storey tower blocks became eligible for free re-conditioned computers after completing a ten hour training course.⁶⁵ Low cost access to the Internet was made available from 2002 and by February 2003 over 380 computers had been distributed.⁶⁶

⁶² Nortel Networks (2001). 'Press Release: Nortel Networks teams to create high-performance internet village in California'.

⁶³ Nortel Networks (2001?). 'The Rio Mesa e-village takes shape'. Nortel Networks state that 20% of their own workforce are telecommuters.

⁶⁴ Kistner 'The company town: 2002'. Network World Fusion (US) March 5th 2001. p.2.

⁶⁵ Meredith (2003). 'Wired communities: neighbourhoods, networks and communities of interest. Paper prepared for 'Building the e-nation'. A Social Science Symposium, April 2003, Sydney'. p.4.

⁶⁶ Ewing, Hayward, Hopkins and Thomas (2003). 'The new social policy and the digital age: a case study of a wired high rise public housing estate'. Just Policy. 29. p.45.

Atherton Gardens houses a high proportion of residents with social and economic challenges, mostly recent overseas immigrants from a wide variety of countries.⁶⁷ To this extent there was no existing community, only a series of smaller racial and familial groupings. Issues of ethnicity, social exclusion, employment and access to the Internet are hard to disaggregate. The initial research findings are that in an area facing as many challenges as Atherton Gardens, increasing people's access to the Internet has more impact on employment and education than on building a community ethos. Many residents of the estate continue to have a deep distrust of their neighbours, despite the provision of technology. There is willingness amongst some to use a computer, but few move forward and participate in neighbourhood activities.⁶⁸

Similar problems have been found in the UK where the 'Wired up Communities' scheme between 2000 and 2003 was promoted by the Department for Education and Skills and funded to the extent of £10 million.⁶⁹ Aiming to give members of disadvantaged communities access to high speed Internet, there were seven pilot schemes. Their success varied and several failed financially when their private sector technology supplier went out of business. They were all behind schedule in part due to the difficulty of establishing partnerships between community groups and the private sector.⁷⁰ It is not clear whether the scheme achieved its educational goals, and even less the aim of greater social inclusion.

(b) *iHOME, Sydney, 2000*

Cisco Systems, Lend Lease, AAPT and the New South Wales Department of Information Technology developed an Internet-enabled home at Jacksons Landing, Sydney in 2000.⁷¹ This small pilot scheme remained open for six months and was a way of Cisco promoting its concept of home automation in Australia in parallel to the larger scheme at Playa Vista, California. The house was fitted with plasma TV screens, an audio system in each room, videoconferencing facilities, a multi media editing facility, Internet linked domestic appliances and a centrally controlled security and lighting system.

All the home automation devices were controlled from the resident's personal Internet site which allowed many household functions to be controlled from anywhere in the world. For example, doors could be unlocked and blinds opened and closed from a remote location.

⁶⁷ The community web pages are available in English, Vietnamese and Chinese. Web site of Atherton Community Enterprise: www.atherton.org.au (consulted 19th April 2005).

⁶⁸ Ewing (2003). 'Virtual renewal: can a network build community?' Paper prepared for 'Building the e-nation'. A Social Science Symposium, April 2003, Sydney'. p.12.

⁶⁹ Web site of the Wired up Communities Scheme (UK): www.dfes.gov.uk/wired (consulted 20th April 2005).

⁷⁰ See Meredyth, Ewing and Thomas (2004). 'Neighbourhood renewal and government by community'. *International Journal of Cultural Policy*. 10(1). p.87. and Devins, Darlow, Petrie and Burdden (2003). 'Connecting communities to the internet: evaluation of the wired up communities programme'. p.viii.

⁷¹ Cisco Systems (2000). 'News release: Cisco leads development of internet access homes in Australia. Teams with Lend Lease Development Jacksons landing; NSW Department of Information Technology and Management; AAPT; Creston; Soundcorp; Len Wallis Audio & Clipsal Integrated Systems'.

(c) *Ballarat, Victoria, 2002+*

The former goldfield Victorian city of Ballarat is being re-positioned as a 'connected community' by installing optic fibre cables to existing homes and businesses. This A\$14 million project initiated in 2002 combines the form of urban and social regeneration tried in high rise public housing units in Atherton Gardens, Melbourne, with the community Intranet developed in Blacksburg, Virginia.⁷² Established as a private limited company (cBallarat), partners are local businesses including those housed at the Ballarat Technology Park, Ballarat City Council, Cisco Systems and the University of Ballarat.⁷³

The Ballarat scheme has been described by the local paper as 'the first time a project of this magnitude has been trialled in Australia' and a 'high-tech coup'.⁷⁴ For a city as large as 80,000 inhabitants it is an ambitious project, and will have a significance both nationally and internationally. As it was only launched in July 2004 it is too early to monitor the results.

(d) *National Broadband Strategy, 2003*

The Commonwealth Government in 2002 accepted all 39 recommendations of the Independent Regional Telecommunications Inquiry on the provision of services to regional, remote and rural Australia. This was conducted against a background of fears over service provision for non-metropolitan areas if Telstra was fully privatised. Three findings of the Inquiry are detailed below:

- *Finding 6.1*

Access to higher bandwidth services is becoming vital for the economic and social development of regional, rural and remote Australia.

- *Finding 6.3*

The Government has provided support, through a variety of policy and program initiatives, to improve access to higher bandwidth services in regional, rural and remote areas.

- *Finding 6.4*

The major impediment to regional, rural and remote Australians having equitable access to higher bandwidth services is the higher prices that users in some areas pay for these services.

Figure 4: Australia's Independent Regional Telecommunications Inquiry⁷⁵

⁷² City of Ballarat (2004). 'ICT2010 Strategy: Ballarat the connected community'.

⁷³ cBallarat (2004). 'Media Release: world-class optical fibre-to-the-premises, Collaborative Optical Leading Testbed (COLT) to be launched by Minister Brumby'.

⁷⁴ Best 'High-tech coup'. The Courier, Ballarat 26th July 2002. p.1.

⁷⁵ Web site of the Australian Department of Communications: www.dcita.gov.au (consulted 19th April 2005).

This Inquiry led to the establishment of a National Broadband Strategy to coordinate investment across all levels of government. A 'demand aggregation strategy' was initiated to make a viable business case for enhanced telecommunications infrastructure in areas that would not otherwise justify broadband connections. A final initiative is described in the next section.

(e) *Higher Bandwidth Incentive Scheme, 2004*

The Australian Government initiated this A\$107.8 million project to act as a subsidy to developers to provide faster broadband connections to areas in urban fringe and rural Australia. Internet Service Providers in selected areas, including that of the Aurora Estate in Melbourne described below, are entitled to a rebate of A\$1,500 per house connected to bring prices to the consumer down to those paid in urban areas.⁷⁶ Unfortunately consumers in Gosford City are not eligible for the scheme as they are part of the Sydney Metropolitan Region.

(f) *Brookwater Estate, Queensland, 2004+*

Telstra's pilot scheme for fibre cabling to residential housing was launched at Brookwater Estate in Greater Springfield, 26 kilometers from the centre of Brisbane, in April 2004. Greater Springfield is described as Australia's largest master planned community, at 2,860 hectares, and is projected to grow from a current population of 7,000 in 1992 to over 60,000 residents by 2012. Built around a lake and golf course designed by Greg Norman, the scheme covers housing, employment, the 'Australian Centre for LifeLong Learning' and a regional shopping centre.⁷⁷ The developers are investing A\$500,000 in research funding of education software and on-line learning at the campus of the University of South Queensland being built at Greater Springfield.⁷⁸

The Brookwater Estate project is a commercial joint venture between telecommunications companies (Telstra and Alcatel), the master plan developer (Springfield Land Corporation, a public-private partnership) and property developers (Medallist Developments, a consortium between Macquarie Bank and golfer Greg Norman). There will be 280 houses wired for free by Telstra at Brookwater together with a further 65 at a smaller scheme at Emerald Lakes on the Gold Coast. If the trial is successful Telstra propose to adopt the infrastructure as standard for new greenfield and multi-unit developments within the next four years. The main services to be provided are a fast broadband connection, telephony, television, the remote reading of electricity meters and eventually video on demand.

⁷⁶ Web site of the Higher Bandwidth Incentive Scheme operated by the Australian Government's Department of Communications Information Technology and the Arts: www.telinfo.gov.au/HiBIS%20page.htm (consulted 12th April 2005).

⁷⁷ Web site of Greater Springfield (Australia): www.springfield.net.au (consulted 4th May 2005).

⁷⁸ MacDermott 'Housing estate puts fibre in its communication diet'. Financial Review (Australia) 22nd July 2004. p.1.

The only other similar fibre optic wiring schemes for residential areas in Australia area are at Canberra where TransACT Communications are providing 'fibre to the kerb', and Bright Telecommunications in Perth supplying 200,000 homes. Unlike the proposals at Brookwater Estate and Terrigal these projects are focussed on supplying cabling rather than consciously trying to create a wired community with broader neighbourhood cohesion.

(g) *Aurora Estate, Melbourne, 2005+*

The Victorian Urban Development Authority, VicUrban, is proposing to supply an optical fibre cable network to the Aurora housing estate at Epping North, 20 kilometers north of Melbourne.⁷⁹ This is the largest subdivision of new land in the State of Victoria, and the development will feature close attention to environmental sustainability: two water pipes will arrive at each home, one supplying clean drinking water and the other re-use water for irrigating the garden. When completed in ten years, 8,000 homes covering 668 hectares will be wired for an anticipated population of 25,000. The scheme has features of both a highly controlled master planned community and a 'transit orientated development' around a commuter railway line.

The local council, the City of Whittlesea, initiated in 2003 a 'Wired Development Project' which used their planning powers to encourage fast broadband access in all new housing estates.⁸⁰ Council guidelines have been produced to ensure standardisation between different private sector developers to achieve economies of scale and attract telecommunications providers. Earlier schemes initiated by Whittlesea transferred ownership of the telecommunications conduits to the council upon completion but this will not be the case for the Aurora Estate, except for certain feeder conduits.

The tender document for the Aurora Estate issued in January 2005 calls for a partnership between the private and public sectors for cable installation and provision of communication services. This follows publication of a report by KPMG which identified that subsidies would be necessary to make the scheme viable, and these would need to be from both State and the developer.

4.3 Service Provision

This section summarises typical services supplied to consumers in a wired community. It is useful to separate between the 'hard' component such as the physical telecommunications and information infrastructure, and the 'soft' component of online services, information supply and community based schemes.⁸¹ The following services have been, or are proposed to be, offered:

⁷⁹ VicUrban (2005). 'Aurora fibre to the home: request for tender. Contract no 3664. 28th January 2005'. p.2.

⁸⁰ Web site of the City of Whittlesea (Australia): www.whittlesea.vic.gov.au (consulted 12th April 2005).

⁸¹ Blais (1998). 'Getting wired'. p.1.

(a) *Broadband Internet access*

This is a basic feature that is common to all wired communities and is used for the high speed transmission of data. Faster speeds are increasingly allowing the receipt of voice and video signals in addition to Internet web pages and e-mail. Additional bandwidth capacity allows the transfer of large data or image files which are necessary for many teleworkers.

Many of the new private sector wired community schemes offer a speed of 10 or 15 Mbps. Note, however, there is often a different downstream/download and upstream/upload speed with the former being faster and normally quoted as the headline figure. As an example, in January 2005 Verizon in the US announced that there would be three tiers available for consumers: 5 Mbps/2 Mbps (downstream/upstream) for basic residential use; 15 Mbps/2 Mbps for heavy residential use and 30 Mbps/5 Mbps for high usage teleworkers.⁸²

(b) *Entertainment*

Recent developments in this fast moving area include digital television, video on demand, DVD feed to any television screen in the house, on-line music downloads and more accessible video conferencing. Video or DVD recorders could be set remotely to record programmes. Smart homes could also allow family members to play computer games from different rooms in the house.⁸³

(c) *Alarm systems*

Details of breaches of home security can be sent direct to the alarm companies' offices: the company will subsequently telephone the resident and if the correct personal number is not given the police will be called.⁸⁴ The same could happen for fire detection system. In a wired community selected neighbours, a caretaker and/or the emergency services could be alerted.

(d) *Close circuit television.*

Pictures showing visitors to the house or the neighbourhood in general could be viewed on a television or computer monitor of residents, or from a central site. This is a feature currently provided in many apartment blocks but seldom on lower density housing developments and gives the possibility of providing security levels perceived from gated communities without spatial exclusion.

⁸² Verizon Communications (2005). 'Press Release: Verizon's new high-fiber 'diet' fir 13 Long Island communities: blazing-fast data, crystal clear voice and video capability'. p.2.

⁸³ Wardell (2001). 'Home tech, high touch: a North Carolina development sells the softer side of technology'. Builder, Washington DC. 24(9). p.174.

⁸⁴ Anderson (2001). 'Smarter security systems'. p1.

Other practical applications of close circuit television are to allow parents to monitor their children in a day care centre, or in the family swimming pool.⁸⁵

(e) *Intranet links to local retailers*

The earliest example of this is said to date from 1995 when a local grocery store in the small town of Blacksburg, Virginia offered a remote shopping service.⁸⁶ A community home page can be created which will bring together all the local services providers and assist in creating awareness of what can be provided locally without the need to visit an out-of-town shopping centre or the regional city. Linking to community retailers makes it more likely that they will be able to compete with the range of goods and services offered on-line by national or international companies.⁸⁷ Local businesses should be able to foster longer term relationships with nearby residents and special offers can be tailored to groups living in the immediate locale of the retail unit.

(f) *Monitoring environmental data*

A community intranet could allow residents to monitor environmental issues in their neighbourhood. In the town of Boulder, Colorado the residents can find out the flow of water in the local river compared against historic levels, air quality and the strength of the sun.⁸⁸ The 'Boulder Area Sustainability Information Network' (BASIN) is a joint venture between the US Environmental Protection Agency, the City of Boulder and local water companies. BASIN's web site also provides information on current environmental issues and suggests ways that water could be conserved.

Moving beyond general local environmental data, IT systems could be developed to link household water meters to an intranet so that individuals could see their personal water consumption, and relating this to how much they pay for water services. By providing both information and an financial incentive there is a strong chance that water consumption can be reduced. This type of scheme is being proposed at Terrigal together with a community waste water treatment and reticulation facility which will be used by householders for toilet flushing and laundry purposes.

Environmental feedback is important as car dependent lower density housing developments place a strain on water supply systems in the same way that they cause problems with the existing transport infrastructure. In California, State law requires that for new housing estates with over 500 dwellings the developer must obtain certification that there is sufficient water available for the next

⁸⁵ Patrizio 'Keeping up with the e-Joneses'. Wired News (US) 9th February 2001. p1.

⁸⁶ See section 4.1 below. Quoted in Carroll, Rosson, Cohill and Schorger (1995). 'Building a history of the Blacksburg Electronic Village'. p.2.

⁸⁷ Gibson (2003). 'Digital divides in New South Wales: a research note on socio-spatial inequality using 2001 Census data on computer and Internet technology'. Australian Geographer. 34(2). p.240.

⁸⁸ Web site of the Boulder Area Sustainability Information Network (US): www.bcn.boulder.co.us/basin (consulted 19th April 2005).

twenty years.⁸⁹ Restrictions in New South Wales may be increased in the medium term as water supplies are at record low levels.

(g) Home automation

By linking devices such as heating/cooling, lighting, entertainment or even sprinkler systems to a computer it is possible to control them remotely over the Internet. This creates what is often known as a 'smart home'. American telecommunications company Cisco Systems has been at the forefront of developments in this area, see above for examples from Playa Vista, California and Jacksons Landing, Sydney.

(h) Community activities

A local intranet can establish a community bulletin board for checking the availability of and booking sports or medical facilities, joining a wine tasting society, obtaining babysitters, meeting other parents with children of pre-school age or placing advertisements for items to be bought or sold.⁹⁰ In some schemes such as at Centennial, Indianapolis new residents complete a profile of their leisure interests and are automatically alerted to like minded neighbours.⁹¹ Strong links can be built with local schools where more information could be made available over a secure intranet than on the World Wide Web. Issues of interest to the community such as new road proposals or the closure of a bank branch could be discussed on an intranet based local group.

4.4 Case Study Implications

The principal wired community examples from the US are structured in the form of a close collaboration between commercial property developers and telecommunications companies such as telephone service providers, cable TV operators or computer software and hardware businesses. In some situations the partnership will also include local universities, utility companies, local councils and regional planning bodies. In general they are on a larger scale than proposed at Terrigal although implementation tends to start with a manageably size scheme of a few hundred properties. Wiring of houses for the Internet is normally combined with 'soft applications' such as the establishment of a community Intranet, the development of shared facilities and a move towards being able to control electrical appliances through the Internet.

⁸⁹ Urban Land Institute (US) (2002). 'Press Release: Water, water, not everywhere. Urban Land Institute examines connections between land use and water use'. p.1.

⁹⁰ Venkatesh, Chen and Gonzalez (2003). 'A study of Southern California wired community: where technology meets social utopianism. Paper presented at the Human-Computer International 10th International Conference. June 22nd-27th 2003. Crete, Greece.' p.3.

⁹¹ Walkup 'Wired communities: making the connection'. Wireless Design & Development, US November 2001. p.54.

Joint ventures with telecommunications companies appear attractive, but there are pitfalls as technology changes quickly as does the financial fortunes of many businesses in the sector. Care must be taken in selecting partners, writing contracts, estimating likely costs and the appropriate sharing of risk. Contracts should contain a clear service level agreement as this will allow a smoother transition to another service provider in the case of the telecommunications company having financial difficulties.⁹² Property companies need to have an on-going role in the management of the scheme, working closely with representatives of householders.

Many of the case studies detailed in this section are pilot projects and there is little data on which to judge their success. In the US and occasionally in Australia, involvement of large telecommunication partners as joint venture partners has often allowed provision of infrastructure at below market cost. The Urban Land Institute in the US considers that having advanced broadband facilities increases the desirability of a particular housing scheme although technology remains just one of many factors influencing the buying decision along with house design, community facilities and quality of the surrounding neighbourhood.⁹³ It is not clear whether purchasers would be willing to pay more than a modest premium for the provision of an information technology infrastructure which many have now come to view as standard in new properties.⁹⁴ As Pamela Blais, a Toronto based planning consultant has noted: 'when IT infrastructure is universally available, the competitive edge associated with it, if any, will come more from developing useful community-based applications and services. Providing high-quality, easy-to-use, locally orientated online services and information could provide a competitive edge in the coming era when virtually every community is a telecommunity [i.e. a wired community].'⁹⁵

The case studies show a polarisation between schemes aimed at up-market residential housing estates which are financed by property developers and public sector projects. The latter are often promoted by local councils to maintain the competitiveness of communities in relative decline, and in the US, the UK and Australia are funded by national monies made available specifically for this purpose.⁹⁶ Involvement of local councils can have a positive impact on ensuring that developers continue to support economically and environmentally sustainable objectives even when the final plot of land has been sold. In addition some councils such as Blacksburg in Virginia and the City of Whittlesea in Melbourne have publicised their support for wired community schemes as a selling feature to encourage businesses to invest in their area by positioning their local government area as being high-tech and progressive.

⁹² Harr 'Future proofing properties'. pp.1-2.

⁹³ This has been supported by research in the US on the wired community of Ladera Ranch, California. Venkatesh, Chen and Gonzalez (2003). 'A study of Southern California wired community: where technology meets social utopianism. Paper presented at the Human-Computer International 10th International Conference. June 22nd-27th 2003. Crete, Greece.' p.3.

⁹⁴ Oppel 'New homes are now wired for a lot more than lights'. The New York Times 26th May 2000. p.1.

⁹⁵ Blais (1998). 'Getting wired'. pp.2-3.

⁹⁶ 'Wired communities growing at high end, small town extremes of housing market'. Telecommunications Reports 15th October 2002. p.1. The US scheme for funding broadband deployment to settlements of under 20,000 is under the Farm Security and Rural Investment Act of 2002.

4.5 Further Research

Unfortunately whilst there is considerable fanfare when new wired community schemes are launched, there is little subsequent review to discover whether they have achieved their economic or environmental objectives. Exceptions to the lack of research are where there has been an on-going involvement from a university to monitor the success of the project: the Blacksburg Electronic Village in Virginia (section 4.1 above) and Melbourne's Atherton Gardens scheme (section 4.2 above).

Case study analysis is needed on a scheme which is commercially developed rather than publicly funded, and the proposed on-going involvement of the University of Sydney's Planning Research Centre with the Terrigal wired community could fill a vital research requirement. The involvement of the University of Sydney would be best managed in conjunction with the 'Central Coast Campus' which is a partnership between the Central Coast Community College, TAFE NSW Hunter College and the University of Newcastle. Sydney University could focus on issues of urban planning with the Gosford Campus's Faculty of Information & Communications Technology assisting with technology advice and establishing a community intranet.⁹⁷

The involvement of academic institutions in the Terrigal project will have multiple benefits: increasing the technology skill base in the Central Coast; involving more people from the local community in the scheme; providing real life experience for students at Australia's oldest and largest planning school; the provision of feedback which will allow the Terrigal scheme to change with technology and community needs and finally positive publicity for the property developer and local council who will be seen as pioneers in using technology to achieve more sustainable housing outcomes.

⁹⁷ See Web site of the Central Coast Campus: www.ccc.newcastle.edu.au

5 CENTRAL COAST PLANNING ISSUES

To examine the regional context of the Central Coast a number of publications have been produced by the New South Wales Government, Gosford City Council and others. The environmental policies of both these organisations has gone through a series of recent changes, and the regional situation will only become clear with the publication of the Sydney Metropolitan Strategy.

5.1 Metropolitan Context

In May 2004 a Ministerial Directions Paper was issued by Craig Knowles, New South Wales's Minister for Planning and Infrastructure.⁹⁸ This acted as a discussion document at the Sydney Futures Forum held in May 2004, and attended by invited representatives. Following community and professional consultation a new Sydney Metropolitan Strategy will be issued to cover growth in the region over the next 30 years later in 2005. Professor Edward Blakely of the University of Sydney is chairman of the panel advising on managing Sydney's growth.

The general direction of the Metropolitan Strategy is the need to accommodate the growth of Sydney's population which is estimated to be increasing by up to one thousand individuals per week. Migration, coupled with changing demographics which suggest smaller household sizes, will result in the need for a substantial increase in the number of dwellings. It is proposed that sub-regions within the Sydney Metropolitan Region will be identified and major centres for each selected where there is a transport node, local employment opportunities and major health and education complexes. The need is to create centres which act as economic hubs, not dormitories of the central business district which house car commuters.⁹⁹

Initial suggestions are that environmental sustainability will be a major focus of the Metropolitan Strategy. In future buildings should 'meet greatly improved standards for resource consumption'.¹⁰⁰ Practical steps have already been taken as the New South Wales Government has launched a 'building sustainability index' (BASIX), a web-based planning tool which assess the performance of residential developments against sustainability indices. From July 2004 new housing must use 40% less potable water and produce 25% less greenhouse gas emissions than average homes of the same type.¹⁰¹ BASIX is seen by many environmentalists as an excellent first step.

⁹⁸ New South Wales Ministry of Infrastructure Planning and Natural Resources (2004). 'Sydney Metropolitan Strategy - Ministerial Directions Paper'.

⁹⁹ Blakely (2003). 'Suburbs as new competitive communities; a paradigm for the future'. Australian Planner. 40(4). p.46.

¹⁰⁰ New South Wales Ministry of Infrastructure Planning and Natural Resources (2004). 'Sydney Metropolitan Strategy - Ministerial Directions Paper'. p.28.

¹⁰¹ Web site of BASIX: New South Wales Department of Infrastructure Planning and Natural Resources: www.basix.nsw.gov.au (consulted 19th April 2005). Regulations come into effect in Gosford in July 2005.

What is not clear from the initial discussions on the Metropolitan Strategy is precisely where the population growth will take place. Emphasis has been placed on greenfield growth corridors west of Sydney and brownfield urban in-fill, but what pressures from regional planners will be placed on fringe urban areas which are in neither of these categories? It would be politically challenging and difficult in practice for the State Government to place quotas on the population growth of each local government area, yet this might eventually prove necessary as many councils have anti-growth policies which are population with their existing residents.

5.2 Central Coast Profile

In an area approximately 70 kilometers north of the centre of Sydney, the Central Coast Region of New South Wales includes the two local government areas of Gosford City and Wyong Shire. The region stretches from the Hawkesbury River in the south to the shores of Lake Macquarie in the north and is bordered by the Pacific Ocean to the east and State forests to the west. Through the region runs the main north/south railway and freeway, the F3, between Sydney and Newcastle. Good transport links are both an advantage for Gosford and Wyong as well as being a problem in that they encourage commuting and consequently are becoming congested.

The estimated resident population of the region in 2003 is just over 300,000 with 160,000 based in the City of Gosford local government area and approximately 95% of the population along a coastal strip mostly east of the F3. Population growth between 1991 and 2001 on the Central Coast (23.5%) has been substantially higher than in the Sydney Statistical Division (13.1%) and New South Wales (12%).¹⁰² From a holiday and retirement area, the Central Coast has moved to being a fringe metropolitan settlement with many smaller villages integrated into a conurbation.

Gosford is the ninth largest local government area in New South Wales by population and one of the largest geographically. Due to limitations of the amount of land available for residential development, average annual growth rates for Gosford have slowed from 2.2% pa during 1991-1996 to 1.2% pa for 1996-2001. It has been estimated that these rates have continued to decline since the last census to 0.9% in 2001-2002 and 0.3% in 2002-2003.¹⁰³ The New South Wales Department of Infrastructure, Planning and Natural Resources has estimated that by 2026 approximately 384,000 people will live on the Central Coast: a 30% increase or an additional 88,000 individuals. Fastest growth will be in Wyong Shire which by 2014 will over-take Gosford City in population. Gosford City is forecast to grow by 630 people each year, equivalent to a 10% increase over the 25 year life of the Metropolitan Strategy but much lower than the 54% growth predicted in Wyong.¹⁰⁴

¹⁰² Wyong Shire Council, Gosford City Council, The University of Newcastle and Central Coast Health (2004). 'Central Coast: regional profile and social atlas 2004'. p.29, pp.35-36 and p.39.

¹⁰³ Ibid. p.40.

¹⁰⁴ Ibid. p.45.

5.3 Employment

One of the impacts of the projected population growth of 30% on the Central Coast during the period of the Sydney Metropolitan Strategy is the need to generate local employment. It has been forecast that the number of new jobs required for the region is 42,600 between 2001 and 2021 of which 35,000 will be needed for Wyong Shire and 7,600 for Gosford City residents.¹⁰⁵ Not only are more jobs needed but the regional economic base needs to be broadened to provide a greater range of job opportunities for the unemployed and those commuting outside the Central Coast.

There have been some minor moves by the State Government to promote the region to employers. A 'Minister for the Central Coast' has been appointed and a booklet produced advertising the business benefits of relocation to the area.¹⁰⁶ The Ourimbah Campus of the University of Newcastle hosts a successful business incubator that will be complimentary to home office opportunities offered at Parkside offering temporary opportunities for businesses to grow in the area before permanent premises can be found. However, there remains a perception that the region has been less successful than competitors such as western Sydney, Newcastle and Wollongong in lobbying State politicians to provide funding for economic development, State-wide advertising and help with establishing new businesses. The Hunter and Illawarra regions have special A\$10m 'Advantage Funds' established in 1997 and 1999 respectively.¹⁰⁷

Despite appearances of prosperity, there are employment challenges faced by the Central Coast. From the 2001 Census, the unemployment rate for the Gosford City was 7.4%, higher than the figure of 6.1% for the wider Sydney area. The Central Coast is significantly under-represented by households in the highest income bracket of those earning over A\$2,000 per week (5.6%) compared to New South Wales (10.2%) and the Sydney Statistical District (13.8%). This is also shown in the statistic that in 2001 only 22% of employees living on the Central Coast were classified as managers, administrators or professionals compared to 30.1% in the Sydney Statistical Division, where 30.1% and 28.5% in New South Wales.¹⁰⁸

For a wired community at Terrigal the challenge will be to minimise economic problems and maximise employment opportunities. Whilst the proposal is for a small property project, certainly compared to the size of wired communities in the US, it represents one of the few sites remaining for development in the Gosford City local government area. A conventional scheme would not provide any additional employment and it is likely that most residents would commute to Sydney. Serious promotion of teleworking should moderate the marginal increase in car journeys

¹⁰⁵ Ibid. p.238.

¹⁰⁶ New South Wales Department of State and Regional Development (2005). 'The Central Coast: a better business environment'.

¹⁰⁷ New South Wales Department of State and Regional Development (2004). 'Strong regions, strong future; regional development in NSW'. p.9.

¹⁰⁸ Wyong Shire Council, Gosford City Council, The University of Newcastle and Central Coast Health (2004). 'Central Coast: regional profile and social atlas 2004'. p.220, p.227 and p.243.

whilst encouraging business owners and entrepreneurs to the area. The new residents will increase the under-represented higher income earners and when their businesses start to grow it is possible that local people could be employed in a support role which would reduce above average unemployment levels.

Beyond encouraging teleworking, one way to bring more employment to the Gosford area would be to establish a small business incubation unit which would help to nurture modest scale businesses at their early stage of growth by providing shared business services, lower cost premises and business advice. These have been used in the US where there has been a need to generate local employment: Zone Ventures was founded in 1998 in Los Angeles to revive poorer neighbourhoods with a mixture of public money and private advice.¹⁰⁹ In Australia, Sutherland Shire council, TAFE New South Wales and the University of Wollongong have set up a A\$5 million joint venture establishing a business incubator for small and medium sized enterprises in premises located at a TAFE campus at Loftus.¹¹⁰ A similar scheme, partnering with the local council and the University of Sydney, would be possible in Terrigal although the scale would be smaller as it would need to be based in what is predominantly a residential area.

Provision of fast broadband access in Terrigal and a business incubator will not necessarily lead to the migration of high technology workers and companies to the area. Promotion of sites for technology companies by the Hunter & Central Coast office of the New South Wales Department of State and Regional Planning have had only modest success at Mount Penang Parklands. Research on Sydney's North Ryde has found limitations in perceived wisdom as to the workings of a 'technopole', that is a concentration of technological innovation which creates synergistic improvements in scientific and economic productivity. North Ryde can be characterised as a concentration of generic business space rather than a technopole with companies rarely involved in research and development and have few links - other than informal ones such as the hiring of facilities - with the adjacent Macquarie University.¹¹¹

North Ryde is as an example of the suburbanisation of economic activity, a move away from an urban model whereby economic activity is concentrated in the central district business district surrounded by dormitory suburban housing. The move of employment opportunities to an area such as Gosford, to reduce commuting by car and rail to Sydney, would have clear environmental benefits.

5.4 Commuting

Journey to Work information has been derived from the Australian Bureau of Statistics Census data using information supplied by the Transport Data Centre to code

¹⁰⁹ Tseny, Steins and Chavan (2000). 'Closing the divide'. p.2. The proximity to more established technology firms in Silicon Valley, availability of venture capital funds and adjacency to the University of California were factors in the success of this scheme.

¹¹⁰ TAFE Link New South Wales (2004). 'Height of success: nurturing businesses in south Sydney'. p.1

¹¹¹ Freestone (1996). 'The making of an Australian technoburb'. Australian Geographical Studies. 34(1). pp.26-27.

workplace locations. In 2001, of those employees living on the Central Coast: 64.1% worked in the region, 25.2% worked outside the region and 10.7% worked in a location not specified. Of those working outside the Central Coast 90% travelled south to the Sydney region and 10% north to the Hunter region which includes Newcastle. Of the Sydney commuters the most popular destinations are the central business district of 'Inner Sydney' (26.6%), 'Central Northern Sydney' (24.9%), 'Lower Northern Sydney' (23.7%), 'Central Western Sydney' (7.7%), the 'Northern Beaches' (4.1%) with the remainder working in the southern and western suburbs.¹¹²

For employees living on the Central Coast the car is the dominant mode of transport with 79% of workers travelled to work by car (71% as a driver plus 8% as a passenger) on census day in 2001. Car usage is slightly higher for those living in Wyong Shire (84%) than Gosford City (76%). All these figures are noticeably higher than the averages for the Sydney Greater Metropolitan Region (72%). Central Coast households have a higher dependency on car ownership with only 11.1% not having access to a motor vehicle compared to 13.1% in the Sydney Statistical District. In June 2003 Gosford City had 109,119 residents with a driver's licence, representing over 81% of the population aged 15 years or older. On the Central Coast travel by car increased from 74.2% of total journeys in 1991 to 78.7% in 2001: there has been a decline in the proportion of trips by public transport over this period with bus usage down 1.1% and train usage down by 1.4%.¹¹³

The train is the second most popular mode of transport used to travel to work by employees living on the Central Coast with rail users living in Gosford City (16%) ahead of the Greater Metropolitan Region average (14%) which would be expected from a commuter area.¹¹⁴ There are said to be 2,900 commuters using Gosford railway station on an average working day between 6.30am and 9.00am and the State Government in 2002 funded an increase of 350 parking spaces at the station, bringing the total to 1,100. However the focus from the State remains on the private motor vehicle: of the transport initiatives described in a 2002 booklet: A\$41 million were on rail, A\$15 million on buses, A\$5 million on cycleways but over A\$400 million on the F3 freeway and link roads in the Central Coast area.¹¹⁵

The above statistics confirm the fears of many in the Central Coast that the region's transport is dominated by the car and that recent trends are for the situation to become even more polarised. Around three quarters of employees drive to work and at least a quarter commute out of the area each day. Congestion on the F3 and its feeder road system are likely to increase as the regional population increases unless teleworking

¹¹² Wyong Shire Council, Gosford City Council, The University of Newcastle and Central Coast Health (2004). 'Central Coast: regional profile and social atlas 2004'. p.248.

¹¹³ Ibid. pp.260 and p.266.

¹¹⁴ Ibid. pp.257-258.

¹¹⁵ New South Wales Government (2002). 'Connecting the Central Coast: the Central Coast transport action plan'. p.4 and *passim*.

can be encouraged and employment opportunities created locally.¹¹⁶ This is why the proposals for a wired community at Terrigal are interesting, and worthy of support.

5.5 Gosford Council's Policies

The State Government appears to be focused on economic growth – particularly population, employment and housing: the Minister for Infrastructure, Planning and Natural Resources announced in 2004 that ‘keeping Sydney competitive is one of the core values of the Metropolitan Strategy’.¹¹⁷ Gosford City Council are seeking to minimise further development: in 2001 their vision was stated as ‘an excellent quality of life based upon minimum population growth, ecologically sustainable development, the provision of effective services and the creation of new employment opportunities’.¹¹⁸ Whilst the State projects that the population of Gosford City will rise to 177,000 by 2026 the council resolved in May 2003 to cap the population at 169,000 which is the level it should reach by 2011.¹¹⁹

It is not clear how the impasse described above will be resolved or whether it will lead to an open conflict between the different levels of government. Gosford City is unlikely to be alone in seeking more modest growth levels yet the State may push to centralise more planning powers. Whilst it is not the purpose of this Report to comment in detail on Creighton Properties’ specific proposals for Terrigal they follow many aspects of wired community best practice from around the world. The proposals conform closely with the environmental aims of Gosford City council as set out in their 2001 and 2002 strategies.¹²⁰ If a council such as Gosford City is seen to be supporting a wired community scheme at Terrigal - which appears to be a genuine attempt to improve environmental sustainability - then there is more chance that the State could give room for negotiation over the total increase in population expected in the local government area.

¹¹⁶ For problems with congestion see Planning New South Wales, Gosford City Council and Wyong Shire Council (2002). 'Shaping the Central Coast - Draft Action Plan version 2'. Chapter 6.

¹¹⁷ Knowles (2004). 'News Release: Sydney a magnet for employment growth'. p.1.

¹¹⁸ Gosford City Council (2001). 'State of environment supplementary report. Council's vision for Gosford city'. p.1.

¹¹⁹ Wyong Shire Council, Gosford City Council, The University of Newcastle and Central Coast Health (2004). 'Central Coast: regional profile and social atlas 2004'. p.45.

¹²⁰ See Gosford City Council (2001). 'State of environment supplementary report. Council's vision for Gosford city'. and Planning New South Wales, Gosford City Council and Wyong Shire Council (2002). 'Shaping the Central Coast - Draft Action Plan version 2'. passim.

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