



Hawkesbury City Council

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Residential Strategy

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HAWKESBURY RESIDENTIAL STRATEGY

Prepared for Hawkesbury City Council
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Hawkesbury LGA is located on the northwestern edge of the Sydney Metropolitan Region and is characterised by its natural setting, national parks and townships. The LGA is located in the Hawkesbury River valley and contains approximately 2,800 square kilometres of land. Two thirds of the LGA is located in National Parks, including, Wollemi National Park, Parr State Conservation Area, Cattai and Scheyville National Parks Yengo National Parks and Blue Mountains National Park. Significant areas of the LGA are also utilised for rural land uses.

Historically, Hawkesbury LGA has developed independent of the Sydney Metropolitan region with small townships developing south of the Hawkesbury River. However since the 1970s the metropolitan region has sprawled and now sits along the LGA's boundaries. Hawkesbury LGA is now recognised in the Sydney Metropolitan Strategy and has a role in the long-term development of the metropolitan region.

Challenges for the future planning within Hawkesbury LGA include:

- _The need to accommodate an approximate 5,000 additional dwellings by 2031, primarily within the existing urban areas as prescribed in the Department of Planning's North West Subregional Strategy;
- _Preserving the unique and high quality natural environment of the LGA;
- _Accommodating a changing population, which presents new demands in terms of housing, services and access;
- _On-going development pressures to expand into natural and rural areas, as well as new development both in and around existing centres; and
- _Physical constraints – flood, native vegetation and bushfire risk.

The purpose of the Hawkesbury Residential Strategy 2009 ('the Strategy') is to guide future residential development within the LGA over the next 30 years and ensure future residential development is sustainable and meets the needs of the Hawkesbury population.

The Hawkesbury Residential Strategy 2009 provides a sustainable planning framework to ensure equity in access to a range of services and facilities, to encourage increased diversity in housing stock and to promote a range of lifestyle areas. The Strategy provides a philosophy for localised growth and development, based on a sustainability checklist, as well as an overall strategy for the entire LGA.

Implementing Council's Vision

The key directions established in the Hawkesbury Community Strategic Plan 2010-2030, have guided the Residential Strategy:

Looking after people and place

A community in which the area's character is preserved and lifestyle choices are provided with sustainable, planned, well serviced development, within strongly connected, safe and friendly neighbourhoods.

Caring for our environment

A community dedicated to minimising its environmental footprint, enjoying a clean river and an environment that is nurtured, healthy, protected and provides opportunities for its sustainable use.

Linking the Hawkesbury

A community which is provided with facilities and services efficiently linked by well maintained roads and accessible and integrated transport and communication systems which also connect surrounding regions.

Supporting Business and Local Jobs

New and existing industries, which provide opportunities for a range of local employment and training options, complemented by thriving town centres.

Shaping our future together

An independent, strong and engaged community, with a respected leadership, which provides for the future needs of its people in a sustainable and financially responsible manner.

1.1 Community Survey Directions

Council has consulted with residents on many occasions regarding the future direction of the Hawkesbury LGA. In 2007, Council conducted a survey of local residents to inform the Community Strategic Plan. This Draft Hawkesbury Residential Strategy 2009 is guided by the relevant findings of the Community Survey, primarily the identified criteria to:

- _Maintain the rural character and atmosphere of the Hawkesbury;
- _Achieve balanced growth;
- _Provide housing choice;
- _Develop strong town centres, and,
- _Encourage better public transport.

1.2 Guiding Documents

A high-level literature review has guided and informed the Hawkesbury Residential Strategy. Key documents reviewed include:

- _Sydney Metropolitan Strategy- City of Cities: A Plan for Sydney's Future 2005;
- _Draft North West Subregional Strategy;
- _Draft Hawkesbury City Residential Strategy 1997;
- _Hawkesbury Employment Lands Strategy 2008;
- _Hawkesbury Community Strategic Plan 2010-2030; and
- _Community Survey Results 2007.

1.3 Document Structure

As outlined in the Hawkesbury Residential Strategy Project Brief, the purpose of this study is to "develop a planning framework for residential precincts to provide for a range of housing types and locations to satisfy demographic demands within the Hawkesbury region to at least the year 2031". This has been achieved through the implementation of the Centres Development Model (refer Chapter 2) which guides the location of future housing in a sustainable manner which meets social, economic and environmental outcomes. This Strategy provides a strategic direction on the location of future housing, however additional detailed studies and structure planning will be required to confirm the actual location of future housing.

The key components of this document are:

- _Introduction and overview (Chapter 1);
- _Outline of the background and context to this Strategy and establishes the overarching framework (Chapter 2);
- _Analysis of existing population, housing market and affordability trends (Chapter 3);
- _A review of key physical, environmental and social issues impacting the entire LGA (Chapter 4);
- _Analysis of opportunities and constraints across the LGA to identify future investigation sites which may be suitable to accommodate future urban development (Chapter 5); and
- _The Sustainable Development Framework that establishes a model to guide the location of future housing and the provision of ancillary services and facilities to support the future population. This chapter includes strategies and actions to address LGA wide issues (Chapter 6).



2.1_Hawkesbury Residential Development Model

The Hawkesbury Residential Strategy uses a model to guide the location of future urban development, which considers environmental sustainability, the need to strengthen existing communities, and responds to the needs of the future population. The following provides an overview of the key issues and considerations, which have assisted with the development of the Centre Development Model.

The purpose of this Residential Strategy is to confirm the strategic direction of future residential growth within Hawkesbury LGA and to ensure it is developed in a sustainable manner that meets social, economic and environmental outcomes.

2.2_Residential Development in Hawkesbury LGA

Hawkesbury LGA is a unique area benefited by its natural setting and strong association with the environment. The character and environmental settings of the Hawkesbury is one of the defining elements that attract residents to the LGA and the community has set a strong direction through the 2007 Community Survey that the existing rural character and atmosphere must be maintained.

However, due to its location on the north-western edge of the Sydney metropolitan region, the LGA has long faced a range of development pressures. In the late 1970's and the early 1990's there was significant urban development within the LGA spurred by strong population growth. There has also been ongoing pressure of sprawling urban development, with the expansion of the Sydney Metropolitan Area just to the south of the LGA and more recently the development of the North West Growth Centre that includes the eastern reaches of the LGA.

2.3_Future Dwelling Target

The Sydney Metropolitan Strategy (2005) estimates that Sydney's population will grow by around 1.1 million people by 2031. The Metropolitan Strategy estimates that Sydney will need an additional 640,000 new dwellings by 2031 to take into account factors such as an ageing population and decrease in household sizes. The Metropolitan Strategy seeks to provide between 30-40% of new housing in new land release areas and 60-70% in existing established areas, close to transport and services.

Implementation of the Sydney Metropolitan Strategy has been through a series of sub-regional plans designed to guide local land-use planning through to 2031. Hawkesbury LGA is included in the North-West Subregion, which also includes The Hills, Blacktown, Blue Mountains and Penrith.

The North West Subregion covers the largest land area, 5,240 square kilometres, of all the regions within the Sydney metropolitan area, accommodating a population of over 760,000 people. The Draft North West Subregional Strategy 2007 has established dwelling targets for each of the LGAs to assist with achieving the additional 140,000 dwellings required in the region to meet demand through to 2031.

Hawkesbury LGA has a dwelling target of 5,000 additional dwellings.

The purpose of this Residential Strategy is to identify population trends and projections in line with subregional targets and to identify appropriate means to accommodate future dwelling needs. This Residential Strategy will review the dwelling target and establish a framework to ensure that these additional dwellings are supported by the required services, facilities and infrastructure.

2.4_Restricted Development Capacity

Previous planning strategies by Hawkesbury City Council have investigated opportunities to accommodate additional residential development within the LGA. The 1997 Residential Strategy (draft) recognised that urban growth was severely limited by elements within the Hawkesbury LGA natural environment, such as state and national parks, high value agricultural lands, flooding issues along the Hawkesbury River and limited development capacity within the existing centres. The 1997 Strategy found that there was capacity only for an additional 550 dwellings within areas zoned for residential uses and identified the expansion of some existing areas to cater for short-term additional growth.

The 1997 Residential Strategy identified possible development areas building on the existing settlements. However, it has since been recognised that some of these areas are not serviced and are not programmed to be serviced, severely limiting the supply of residential land within the LGA. Some of these areas have developed and others have been deemed too constrained due to limited infrastructure and natural constraints.

Development within Hawkesbury LGA is further constrained by the need to retain agricultural land to maintain a long term food supply within proximity to the metropolitan region. Hawkesbury LGA is part of the Sydney Basin which is a fertile agricultural area which produces two thirds of NSW's vegetable production by weight (SGS 2008). The Basin is strategically significant in providing food to the Sydney region and benefited by its proximity to this market, securing areas for food production within proximity to this market will become more significant as the cost of transportation increases. As such, future urban development should be balanced with securing long-term food production areas within Hawkesbury LGA and within the Sydney Basin.

2.5_ Meeting the Needs for Future Residential Development

The Hawkesbury Residential Strategy 2009 builds on the 1997 Draft Residential Strategy approach and also is guided by the direction established in the Draft North West Regional Strategy, and focuses on a centres based approach:

The dwelling target for Hawkesbury LGA assumes that growth will occur within the capacity of the existing LEP; and north of the Hawkesbury River. This would need to be associated with existing local centres. (p82)

As such, centres and existing urban areas are the focus of investigation when accommodating future housing needs in this Strategy. Locating new growth in existing areas is a sustainable approach to manage residential development and can assist in creating sustainable communities.

In ensuring that future development within the LGA is sustainable and meets the directions of the Hawkesbury Community Strategic Plan 2010-2030, the following best practice examples have been considered.

2.6_ Sustainable Communities

The NSW Department of Local Government (2006) has identified the core components of a sustainable community to include:

- _ *Social cohesion:* a socially mixed community where neighbourhoods are characterised by diversity of income, age, culture and housing tenure etc and there are opportunities to move freely through life's cycle without the need to relocate.
 - _ *Functional economy:* diverse employment opportunities exist which underpin a quality of life matched with community prosperity expectations.
 - _ *Robust environment:* ecologically balanced with impacts from human activity capable of being accommodated without degradation, and,
 - _ *Sound infrastructure:* facilities and services are matched to community needs.
- The key components of a sustainable community will be addressed through the Residential Strategy.

2.7_ Sustainable Development

The US Green Building Council, the Congress for New Urbanism and US National Resources Defence Council have developed Leadership in Energy and Environmental Design (LEED) standards and rating systems to encourage sustainable development in buildings and neighbourhood development. These standards embrace elements of the LEED economic and social indicators, with the key indicators used in the LEED rating system for neighbourhood development including:

- _ Smart location and linkage which seeks to ensure future housing is developed in close proximity to transport and key services and facilities, while being cognisant of natural and resource constraints and limitations and conservation areas;
- _ Neighbourhood pattern and design which seeks to create compact involved communities with a diversity of housing types (including affordable housing), public and active spaces and transit facilities within walking distance of a diversity of uses.
- _ Neighbourhood patterns should encourage walkable streets, universal accessibility and community involvement, and
- _ Green construction and technology which seeks to create certified green buildings which are efficient in their water and energy use, that reuse and recycle and better manage waste, lighting and heating.

The LEED Neighbourhood Development rating system provides a range of criteria for development to meet to achieve sustainable neighbourhood status. The focus of this system and model is to rate individual developments against the criteria to give it a star rating, as per the Green Building Council rating system.

The LEED Neighbourhood Development rating system and criteria will be incorporated into the Residential Strategy.

2.8_ Core Philosophy for Hawkesbury LGA

The core philosophy of the Hawkesbury Residential Strategy considers the above models of sustainable development and communities as well as the key issues raised in the Community Survey 2007 and Council's Hawkesbury Community Strategic Plan 2010-2030.

The core philosophy seeks to provide sustainable development within the LGA which minimises its environmental impact, preserves existing character and lifestyle choices, promotes social interaction and is economically viable. The Hawkesbury Residential Strategy will seek to:

- _Achieve balanced growth which provides additional housing whilst preserving environmental and agricultural areas;
- _Provide housing choice which meets the needs of a changing population;
- _Maximise the effective use of existing hard and soft infrastructure;
- _Build on existing urban areas;
- _Develop strong centres with high quality public domains, increased local employment opportunities and improved services;
- _Provide accessible health, education, legal, recreational, cultural and community development services;
- _Provide regional/local employment opportunities to support Sydney's role in the global economy;
- _Provide accessible transport options for efficient and sustainable travel between homes, jobs, services and recreation;
- _Ensure utilities, transport and communication are provided in timely and efficient way;
- _Avoid land use conflicts, and risk to human health and life;
- _Natural resource limits are not exceeded/environmental footprint minimised, and

_Protect and enhance biodiversity, air quality, heritage, and waterway health.

2.9_Centre Development Model

To ensure future residential development meets the core philosophy, future residential development will be encouraged to focus on existing centres and in some urban corridors linking Windsor and Bligh Park to utilise existing services and facilities, access existing public transport, utilises existing infrastructure and minimises demand for new infrastructure. This approach importantly minimises the sprawl of urban development on to sensitive environmental or agricultural areas.

This approach builds on the direction set by the Sydney Metropolitan Strategy (2005) to locate 60-70% of future housing within the existing urban areas. Centres are the priority location for such growth as they are benefited by existing retail, commercial, community and transport infrastructure services. It will also intensify the development criteria established in the 1997 Residential Strategy (draft).

In line with the Draft North West Subregional Strategy 2007, the Hawkesbury Residential Strategy 2009 identifies a number of strategic centres within the LGA to be the focus of future residential activity and the priority locations for community services, retail and commercial services, employment and transport nodes.

For each centre type, the hierarchy clearly nominates the character and level of service provision in terms of numbers of dwellings, types of retail and employment, infrastructure requirements, public transport provision and level of community service as shown in Figure 2.1.

This hierarchy provides a checklist and indicators to ensure each centre provides the required level of services in line with the needs of the individual centre.

2.10_Strategy for Rural Village Development

The Hawkesbury Residential Development Model focuses on future residential development in urban areas and key centres. However, the importance of maintaining the viability of existing rural villages is recognised. As such, the Hawkesbury Residential Strategy has developed a strategy for rural residential development.

Future development in rural villages should be of low density and large lot dwellings, which focus on proximity to centres and services and facilities. Rural village

development should also minimise impacts on agricultural land, protect scenic landscape and natural areas, and occur within servicing limits or constraints.

The following outlines each of the key elements for each centre type:

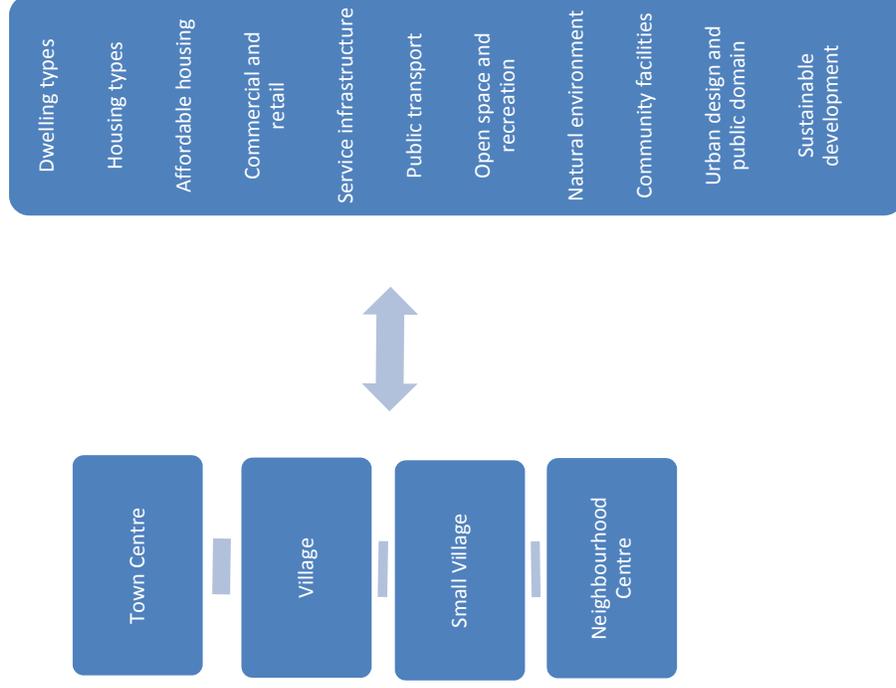


Figure 2.1: Centres and Key Sustainability Elements

3.1_ Current Population Profile

A review of current and projected population characteristics and trends informs the development of the Hawkesbury Residential Strategy and paints a picture of who we are planning for.

This section reviews the most current population and demographics data for Hawkesbury LGA to develop a detailed understanding of the current population and recent demographic trends.

Information is from the 1996, 2001 and 2006 Enumerated Census of Population and Housing produced by the Australian Bureau of Statistics as well as the Hawkesbury City Council Community ID (ID Profile). Comparisons are made between Western Sydney Regional Organisation of Council (WSROC) and the Sydney Statistical Division (SD).

3.1.1_ Population Growth

Hawkesbury LGA experienced significant development during the post-war period and also during the 1970s and 1980s. Between 1976 and 1981 the population increased by almost 10,000 people.

The population continued to increase during the 1990s, becoming stable in the late 1990s at approximately 60,000 people. Between 2001 and 2006 Hawkesbury LGA experienced a negative growth rate with a decline of 152 people (refer Table 3.1). Whilst the population growth rate has declined, the rate of household formation and therefore demand for housing has remained high throughout the past decade. The population of Hawkesbury LGA in 2006 was 60,921 persons.

3.1.2_ Age Structure

Hawkesbury LGA accommodates an increasingly ageing population with increases in the proportion of people aged 50 and over from 1996 (19%) to 2006 (26%). There have also been losses in younger age groups such as those aged 0-11 (21% in 1996 down to 18% in 2006) and also those aged 25-34 (17% in 1996 down to 13% in 2006).

Table 3.1 Age Structure of Hawkesbury LGA 1996-2006

	1996		2006		Change
	Number	%	Number	%	
0-11	12,033	21	10,944	18	-1,089
12-24	11,259	20	12,252	20	993
25-34	9,624	17	7,644	13	-1,980
35-49	13,418	23	14,021	23	603
50+	10,780	19	15,865	26	5,085

Source: Hawkesbury Community ID (ID Profile) Accessed 28/05/09

3.1.3_ Household Income

Household income is analysed through quartiles to remove the impact of wage level fluctuations and inflation changes over time. The quartiles are calculated on the distribution of household incomes in the Sydney SD.

Based on a comparison to the Sydney SD income quartiles, incomes in Hawkesbury are generally in the 'medium lowest' and 'medium highest' income groups. This trend was consistent between 1996 and 2006.

3.1.4_ SEIFA Index

The SEIFA index of Disadvantage 2006, is an index based on values such as low income, low educational attainment, high unemployment, jobs in relatively unskilled occupations and variables that reflect disadvantage rather than measure specific aspects of disadvantage (e.g. Indigenous and separated/divorced). Based on Local Government Areas in the Sydney SD, Hawkesbury LGA is 22nd with a SEIFA index of 1,033.

The WSROC region is eleventh in the index of LGA areas. Higher values indicate lower disadvantage in an area with respect to the criteria listed above. This means that Hawkesbury LGA is considerably less disadvantaged than the WSROC region.

3.1.5 Employment Characteristics

During 2006, the dominant industries in Hawkesbury LGA workforce were retail trade (14%); manufacturing (12%), construction (12%), property and business services (8%) and education (8%).

The high percentages of people in education reflect the significant numbers of schools in the LGA and the presence of the University of Western Sydney Richmond Campus. There were also a high percentage of those in Government Administration and Defence (7%) which can be attributed to the RAAF Base in Richmond. It also suggests that people are working locally within the Hawkesbury LGA.

3.1.6 Car Ownership

In Hawkesbury LGA in 2006 86.3% of the households owned at least one car compared with 81.5% in the WSROC Region. Percentage of people with no cars in Hawkesbury (5.6%) was also considerably lower than that in the WSROC region (11%)

The largest changes in the household car ownership in Hawkesbury LGA between 1996 and 2006 were an increase in owners of 3 vehicles or more (15.7% compared to 21.6%).

Implications for the Hawkesbury Residential Strategy

The following summarises the key implications arising from the review of Hawkesbury LGA's existing population profile and recent trends.

- _The population of Hawkesbury LGA is generally stable with a minor loss of 152 people between 2001 and 2006. However, there has been significant changes to the age structure, with an additional 5,000 people now aged 50 compared to 2001. This may generate substantial additional demand for services and facilities for older people as well as influencing housing types.
- _There has been some loss in population of those in the younger age groups (0-34years) which again may have impacts on housing, facilities and services for these groups.
- _The household income quartiles indicates increased relative income-earning capabilities across time as there are more people occupying the higher income groups. This wealth is reflected in the SEIFA index where Hawkesbury is 22nd with 1033, slightly less disadvantaged than Sydney. It indicates that the area has few families of low income and few people with little training and in unskilled occupations.
- _Car dependency is high in Hawkesbury LGA with 86.3% of the households owning at least one car.
- _Maintain and build on local employment that meets resident skill sets.

3.2_Current Housing Profile

The following outlines the current housing profile of Hawkesbury LGA taking into account the types of households, types of dwellings and also the impact of housing affordability on the LGA.

3.2.1 Household Structure

The most significant trend in household groups between 1996 and 2006 has been the proportional decrease of 'couple with children' household group. As shown in Table 3.2, this group represented 45% of household groups in 1996 and dropped to 39% by 2006, in total there was a loss of 331 'couple with children' households in this period.

Most other housing groups have had small gains during this period, the most notable being the additional 807 'lone person' households and 667 additional 'couple with no children' households.

Table 3.2: Household Types of Hawkesbury LGA 1996-2006

Household Type	1996 (No.)	1996(%)	2006 (No.)	2006(%)
Couples with children	8,531	45%	8,200	39%
Couple no children	4,431	23%	5,098	24%
One parent family	2,112	11%	2,512	12%
Other households	493	3%	670	5%
Group households	590	3%	515	2%
Lone person	3,094	16%	3,901	17%
Total Households	19,251	100%	21,262	100%

Source: Hawkesbury Community ID (ID Profile) Accessed 28/05/09

3.2.2 Dwelling Types

Hawkesbury LGA accommodated 21,142 dwellings in 2006. At this time, the majority of households in Hawkesbury LGA occupied a separate house (85.5%), while lower proportions occupied medium density dwellings (11.9%) and high density dwellings (0.2%).

Between 1996 and 2006, there were 2,147 additional dwellings within Hawkesbury LGA. The largest changes in the type of dwellings occupied by households in Hawkesbury LGA between 1996 and 2006 were for those occupying medium density housing (+523), separate house (+1874 dwellings) and other (+247 dwellings).

Table 3.3: Hawkesbury LGA Occupied Dwelling Types 1996 and 2006

Dwelling Type	1996 (No.)	1996 (%)	2006 (No.)	2006 (%)
Detached dwellings	16,246	85.5%	18,120	85.7%
Villas, town houses, semi-detached	1,990	10.5%	2,513	11.9%
Flats, home units, apartments	44	0.2%	40	0.2%
Other dwellings	715	3.8%	468	2.2%
Total Dwellings	18,995	100%	21,142	100%

Source: Hawkesbury Community ID (ID Profile) Accessed 28/05/09

3.2.3_Housing affordability

Housing affordability refers to the ability of individual households to secure housing which is appropriate to their needs and income. Once housing costs exceed the household's means to pay, housing stress is experienced by that household. Households paying more than 30% of the household income on housing costs are generally considered to be in housing stress.

Measurements of housing affordability are generally restricted to lower income groups, as those with higher incomes are generally viewed to have some degree of choice in the location, type and cost of their housing. The NSW Centre of Affordable Housing have numerically defined these very low to moderate incomes, which are incomes up to 120% of the median household income may experience housing affordability issues depending on their circumstances (Centre for Affordable Housing 2008). The Strategy adopts these measurements.

Two indicators have been used to determine the affordability of housing within Hawkesbury LGA and to determine how many households are impacted by affordability issues:

- _Stock of affordable housing, and
- _Housing Stress for both mortgage and rental markets.

Each of these indicators have been used to analyse households most vulnerable to housing affordability, being very low, low and moderate income households. The following outlines the distribution of these income groups, based on the Sydney SD median household income of \$1,154 per week (2006 ABS Census):

- _Very low household income (0-50% of median) at \$0-\$577 per week.
- _Low household income (50-80% of median) at \$578-\$923 per week.
- _Moderate household income (80-120% of median) at \$924-\$1,384 per week.

Stock of Affordable Housing

The NSW Centre for Affordable Housing provides data identifying the proportion of rental and purchase housing stock that is considered affordable in the Hawkesbury LGA with comparisons against Sydney SD and Outer Western Sydney SSD.

Hawkesbury LGA Rental Housing Market

The Hawkesbury LGA rental market is more affordable than the Sydney SD for very low, low and moderate income earners but comparable to the Outer Western Sydney SSD rental market (refer Table 3.4). In 2009, 82% of moderate income households, 40% of low income households and 11% of very low income households could afford rental properties within the LGA. There was a slight decrease in affordability of rental properties for all income groups between 2007 and 2009.

Table 3.4 Proportion of rental housing stock that is affordable

	Very Affordable Rental Stock	Very Low Income 2007	Very Low Income 2009	Low Income 2007	Low Income 2009	Moderate Income 2007	Moderate Income 2009
Hawkesbury LGA	16%	11%	11%	65%	40%	91%	82%
Outer Western Sydney SSD	22%	12%	12%	69%	46%	88%	86%
Sydney SD	11%	5%	5%	35%	19%	69%	56%

Source: Centre for Affordable Housing, 2009, Accessed 15/09/2009

Hawkesbury LGA Purchase Housing Market

Purchase housing stock in the Hawkesbury LGA is more affordable than that of the Sydney SD but less affordable than purchase stock in the Outer Western Sydney SSD. In 2009, 57% of moderate income households, 7% of low income households and 1% of very low income households could afford purchase properties within the LGA. Between 2007 and 2009 the affordability of purchase housing stock in the Hawkesbury LGA increased, meaning more households had the ability to enter the purchase housing market.

Table 3.5: Proportion of purchase housing stock that is affordable

% of Affordable Rental Stock	Very Low Income 2007	Very Low Income 2009	Low Income 2007	Low Income 2009	Moderate Income 2007	Moderate Income 2009
Hawkesbury LGA	0%	1%	2%	7%	12%	57%
Outer Western Sydney SSD	0%	1%	3%	11%	24%	70%
Sydney SD	0%	0%	2%	7%	13%	38%

Source: Centre for Affordable Housing, 2009, Accessed 15/09/2009

Housing Stress

Households paying more than 30% of their income on housing costs (either rental or mortgage) are considered to be in housing stress. The following identifies the number of households within Hawkesbury LGA facing housing stress, with comparisons made to the Outer Western Sydney SSD and Sydney SD. Data is sourced from the NSW Centre for Affordable Housing.

In 2009, 51% of very low, low and moderate households within the Hawkesbury LGA were in housing stress, this means that 3,531 of such households were paying more than 30% of their income on rent or mortgage repayments. The proportion of very low, low and moderate households in Hawkesbury LGA impacted by housing stress is comparable to that of the Outer Western Sydney SSD (49%) and Sydney SD (59%).

Table 3.6: Number of Households in Rental and mortgage stress in Hawkesbury LGA

	Rental Stress	Mortgage Stress	Housing Stress	% of very low, low and moderate income in housing stress
Hawkesbury LGA	1,271	2,260	3,531	51%
Outer Western Sydney SSD	7,478	10,728	18,206	49%
Sydney SD	124,586	117,029	241,615	59%

Source: Centre for Affordable Housing, 2009, Accessed 15/09/2009

Implications for the Hawkesbury Residential Strategy

The following summarises the key implications arising from the review of Hawkesbury LGA's existing housing profile and recent trends.

- _ While population between 2000-2006 declined by 152, there was actually an increase in number of dwellings (+2,147 dwellings) and in the number of households (+2,011 households). This shows that household sizes are decreasing which may be linked to an ageing population or change in preferences.
- _ Household structure in Hawkesbury LGA has changed with a decline in the number of couples with children and increase in couples with no children and lone person households. These trends are common in an ageing population and reinforce the need to provide a range of dwelling types.
- _ Most new dwellings in Hawkesbury LGA have been detached dwellings with a significant amount of medium density (villas/townhouses) also being constructed.
- _ Housing in Hawkesbury LGA is slightly more affordable for both renters and purchasers when compared to the Sydney SD. However, housing remains unaffordable for very low, low and moderate incomes with 51% of these groups being impacted by housing stress.

3.3_Population Projections to 2031

An understanding of future population projections is central to enabling the appropriate and timely provision of a range of housing types. A review of the future growth scenarios of Hawkesbury LGA is based on population projections to 2031 included in the *Draft Hawkesbury Futures: Infrastructure Requirements 2006-2036* (updated to include 2006 census data) and Census Applications, 2009 data.

According to the Sydney Metropolitan Strategy (2005), Sydney will require almost 640,000 additional dwellings over the next 25 years just to cater for the housing demands of the existing population and taking into account factors such as an ageing population and shrinking household sizes. Within the North West Subregion, which includes Baulkham Hills, Blacktown, Blue Mountains, and Penrith LGAs, it is envisaged that there will be a need for an additional 140,000 new dwellings. Of this, Hawkesbury LGA will provide an additional 5,000 dwellings by 2030.

3.3.1_Population Trends to 2031

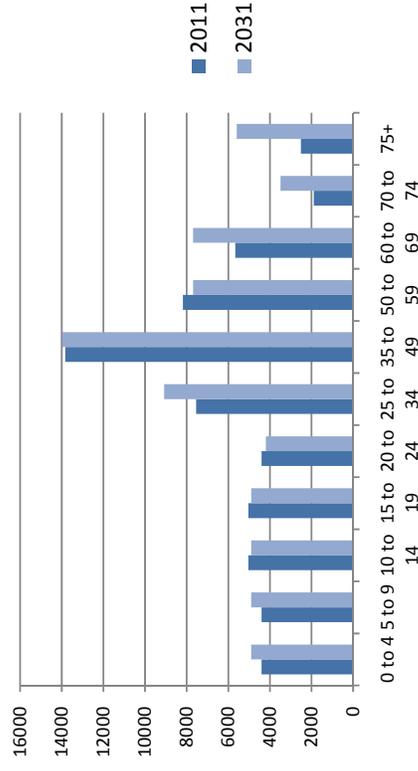
The population of Hawkesbury LGA is anticipated to increase from 60,639 people in 2006 to 69,898 by 2031. This is an increase of 9,013 people over a thirty year period, or additional 300 people per year.

3.3.2_Population Projections by Age

- The age structure of the population is anticipated to change in the following ways:
 - The 0-24 age group will be relatively stable with a total gain of 497 people, but small losses in the 10-24 age groups
 - There will also be minimal growth in the 24-59 age group with an additional 1198.
 - The 24-35 age group will be the basis of the majority of this growth.
 - Significant increases in those aged 60+. This group is expected to increase by 6,713 people by 2031. This will have significant impact on housing needs, services and facilities within the LGA.

These changes are illustrated in Figure 3.1 below.

Figure 3.1 Age Structure Change, 2011-2031



Source: Census Applications 2009

3.3.3_Household Type Estimates

The *Draft Hawkesbury Futures: Infrastructure Requirements 2006-2036* (updated to include 2006 census data) includes estimates on the types of households in Hawkesbury up to 2030. This data is important for estimating changes in dwelling demand and will help understand future housing mix.

Table 3.7: Hawkesbury LGA Household Types 2006 and 2031

Household Type	2006	2031
Couples with children	38%	28%
Couple no children	27%	35%
One parent family	12%	11%
Other households	2%	3%
Group households	2%	2%
Lone person	18%	22%
Total Households	100%	100%

Source: Census Applications (Hawkesbury Futures: Infrastructure Requirements 2006-2031)
 * Variations in household types are a result of updated census data for projections.

Table 3.7 shows that there will be significant restructuring in household types within the LGA, with a proportional decline in 'couple with children' households (-10%) and increases in the smaller household types, particularly 'couple with no children' (+8%) and 'lone person' households (+4%). Similar trends have been observed across the Sydney metropolitan region and have been linked to an ageing population and a decline in average household size.

These trends have significant implications on future housing requirements. A decline in the number of larger household types (ie 'couples with children' households) may reduce demand for more traditional low density family homes. Whereas the increased number of smaller household types (ie 'couple with no children' and 'lone person' households) may increase demand for smaller dwelling types.

3.3.4_Dwelling Type Estimates

Dwelling types have been analysed to understand the demand for different dwelling types between 2006 and 2031.

Table 3.8: Hawkesbury LGA Dwelling Types 2006 & 2031

Dwelling Type	2006 (No.)	2006 (%)	2031 (No.)	2031 (%)
Detached dwellings	17,853	84%	18,633	69%
Villas, town houses, semi-detached	2,248	11%	7,485	28%
Flats, home units, apartments	911	4%	940	3%
Other dwellings	170	1%	55	0%
Total Dwellings	21,181	100%	27,113	100%

Source: Census Applications (Hawkesbury Futures: Infrastructure Requirements 2006-2031)
 * Variations in dwelling numbers are a result of updated census data for projections.

As shown in Table 3.8, the demand for various dwelling types will change significantly between 2006 and 2031. Most notable is the significant increase in demand for villas, town houses and semi detached dwellings and reduced demand for detached dwellings. These trends are consummate with decline in the larger household types and increase in smaller household types discussed in Section 3.2.1.

3.3.5 Dwelling Requirements to 2031

Table 3.9 identifies the projected dwelling mix of the new dwellings to 2031. This data was provided by Census Applications and has calculated the projections of dwelling types from an assessment of past trends and recent development activity. This analysis gives direction on the types of dwellings that should be planned for up to 2031.

The projections show an estimated demand for an additional 5,932 dwellings which is slightly higher than the dwelling target set in the North Western Subregional Strategy. It is understood that the Department of Planning adopted a conservative dwelling target given the high level of environmental constraints within Hawkesbury LGA. The Residential Strategy is designed to be suitably flexible to provide 5,000-6,000 dwellings with the final number of dwellings being shaped by market demand and more detailed environmental capacity analysis.

Of the additional 5,000-6,000 dwellings, it is anticipated that 810 will be low density dwellings, 5,237 will be medium density and 29 will be high density.

Table 3.9: Hawkesbury LGA Dwelling Types 2006 & 2031

	Low Density	Medium Density	High Density	Other	Total
2006	17,853	2,248	911	170	21,181
2031	18,663	7,485	940	55	27,113
Change	+810	+5,237	+29	-115	+5,932
% of New Dwellings	14%	88%	1%	-2%	100%
	10-15	70-80	1-5	n/a	

Source: Census Applications (Hawkesbury Futures: Infrastructure Requirements 2006-2031)

Low density: detached houses

Medium density: villas, town houses, semi-detached

High density: flats, home units, apartments

3.3.6 Accommodating Future Needs

The Dwelling Target for Hawkesbury LGA has been revised to 5,000-6,000 additional dwellings by 2031 to take into account the revised 2006 Census population estimates discussed in Section 3.3.4. The Strategy will seek to achieve the higher dwelling estimate however; more detailed land capacity analysis may revise the dwelling target.

In line with the Sydney Metropolitan Strategy, 70% of future residential development will be infill development that is located within existing urban areas and utilise existing services and infrastructure. Only 30% of future residential development will be greenfield development. The Residential Strategy distributes the future dwelling target of 6,000 dwellings accordingly:

- _ 4,200 dwellings to be located in existing urban areas;
- _ 1,800 dwellings to be located in greenfield areas;

The dwelling targets for both the Greenfield and existing urban areas can be broken down further by density type (refer Figure 3.2). This is important so that the additional dwelling stock meets the needs of the Hawkesbury LGA through to 2031 and is based on the estimates for each dwelling type in Table 3.10.

It is assumed that there will be no additional low density development within existing urban areas (except for replacement of existing stock) and existing urban areas will be the focus of future medium and high density development. Greenfield areas will take on the small allocation of future low density development. The low density dwelling allocation is considered to address both future low density detached dwelling needs and rural residential dwelling needs. 55% of dwellings in Greenfield areas will be medium density contributing to the dwelling mix across the LGA.

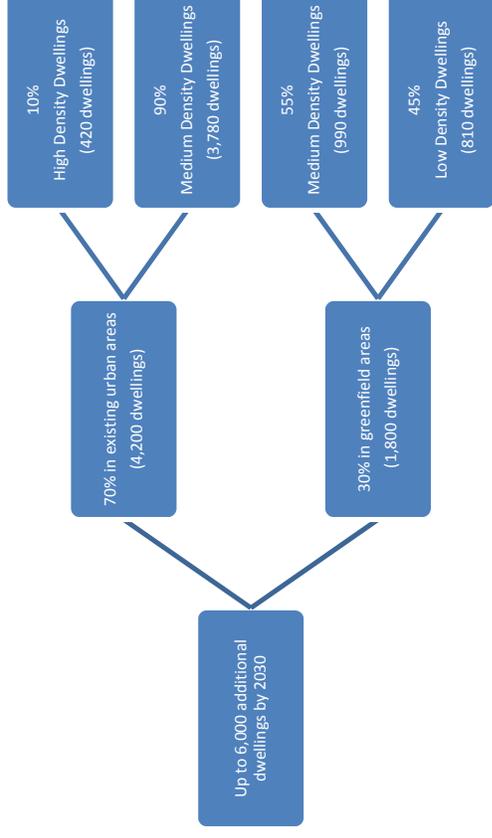


Figure 3.2 Hawkesbury Residential Strategy Dwelling Model

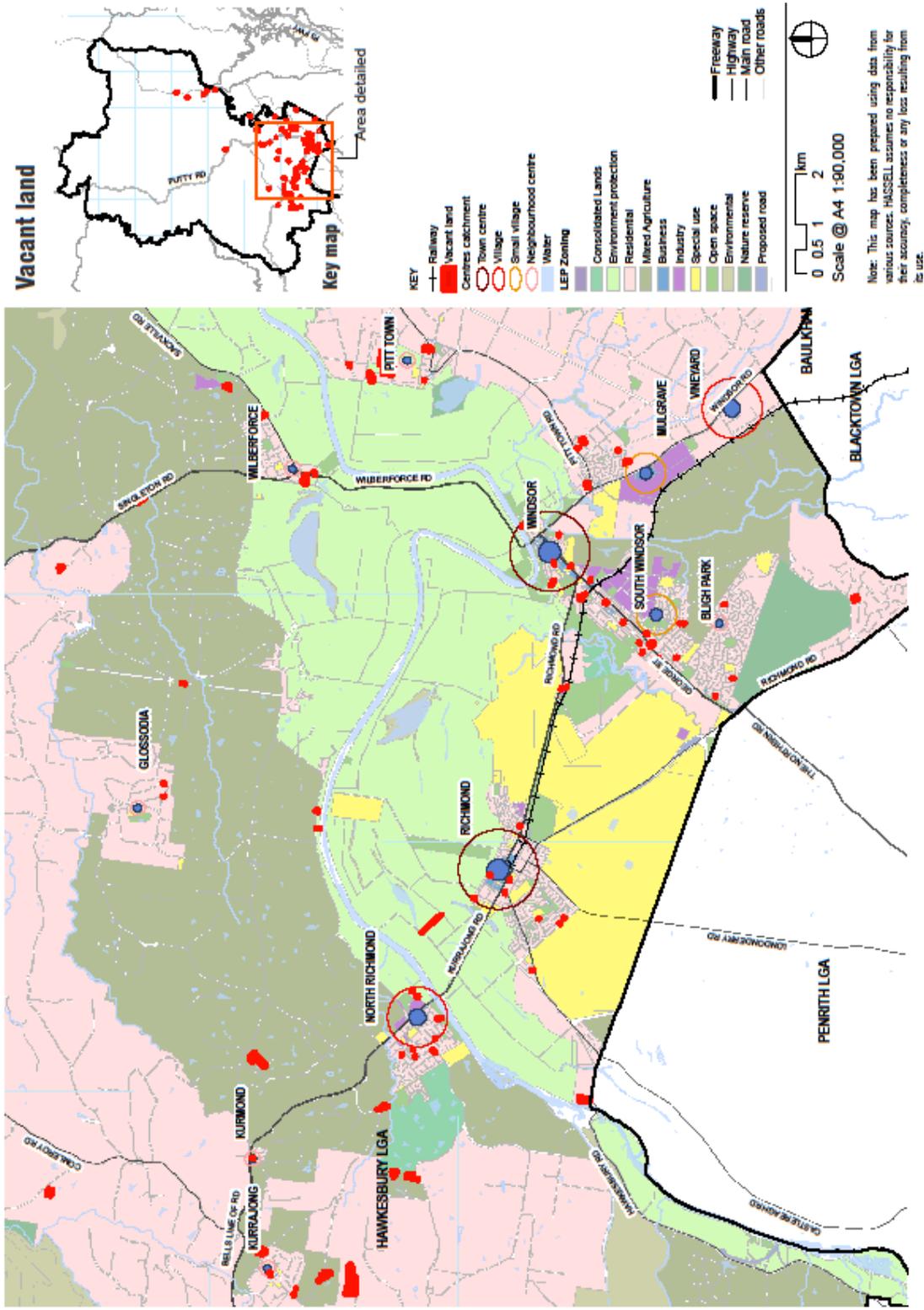


Figure 3.3 Existing Lot Supply in Hawkesbury LGA

3.3.7 Analysis of Existing Capacity

In line with the direction to locate 70% of future dwellings within existing urban areas, vacant lots within existing centres should be a priority location for future dwellings. Council's data on existing lot supply indicates that as of October 2009 there were approximately 168 vacant lots within areas currently zoned for Housing, Rural Housing and Multi Unit Housing (Refer Figure 3.3). These lots will contribute to future dwelling supply, potentially providing medium and high density dwellings.

When considering future greenfield development, it is noted that the North West Growth Centre extends to within the southern boundary of the LGA, however the planning and development of this area will be overseen by the Growth Centres Commission as part of a co-ordinated planning approach to the growth centre. This entire Growth Centre will generate approximately 60,000 dwellings over the next 30 years. However, the North West Subregion Strategy state that this will be in addition to the individual dwelling targets assigned to each LGA.

As such, the majority of additional dwellings will come through increasing densities within existing urban areas and through new, but limited, greenfield locations. The following sections of the Strategy review the key issues, opportunities and constraints to assist with accommodating 60,000 future dwellings and ensuring dwellings have access to a range of services and facilities.

3.3.8 Role of Rural Residential Development

Rural residential developments have historically been a popular lifestyle choice within Hawkesbury LGA. However, rural residential development has a number of issues associated with it including:

- _ Impacts on road networks;
- _ Servicing and infrastructure;
- _ Access to facilities and services;
- _ Access to transport and services;
- _ Maintaining the rural landscape; and
- _ Impacts on existing agricultural operations.

Whilst this Strategy acknowledges rural residential dwellings are a part of the Hawkesbury residential fabric, rural residential dwellings will play a lesser role in accommodating the future population. As such, future rural development should be low density and large lot residential dwellings. Future rural residential development, that is large lot residential dwellings, will be required to:

- _ Be able to have onsite sewerage disposal;
- _ Cluster around or on the periphery of villages;
- _ Cluster around villages with services that meet existing neighbourhood criteria services as a minimum; and
- _ Address environmental constraints and have minimal impact on the environment.

3.4_Summary

The following provides a summary of the key issues arising from the analysis of population and housing trends within Hawkesbury LGA and their implications on future development within the LGA.

3.4.1_Population Growth and Projections

Population growth within Hawkesbury LGA has been relatively stable since 2001. However population growth rates are projected to increase through to 2031 with an increase 9,013 people, bring the population to 69,898. This additional population growth will increase demand for new housing and also services and facilities.

3.4.2_Ageing Population

Whilst population growth has been stable, there have been significant changes to the age structure of the local population, in particular, growth of age groups 60+ and losses in younger age groups. By 2031 nearly a quarter of the population will be above 60, compared to only 16% projected in 2011.

Growth in the older age groups may generate additional demand for services and facilities for older people. It will also have an impact on the dwelling types within the LGA as older people generally require smaller housing formats, dwellings at ground level and dwellings fitted with accessible features.

3.4.3_Housing Affordability

Hawkesbury LGA provides an affordable housing option, when compared to the Sydney SD. However for some very low, low and moderate income households affordability remains an issue with 51% of these groups being impacted by housing stress.

3.4.4_Future Dwelling Target and Mix

To meet future housing needs, Hawkesbury LGA will need to accommodate 5,000-6,000 additional dwellings by 2031. The majority of future dwellings (70%) will be located in existing urban areas where there is good access to existing services, facilities and infrastructure. The remaining 30% of future dwellings will be located in Greenfield areas on the fringe of existing urban areas.

3.4.5_Providing Greater Dwelling Diversity

Improved dwelling diversity is required to meet the future needs of the Hawkesbury LGA population. Trends have shown that the population is ageing and household sizes are shrinking, which in the medium to long term is likely to result in demand for an additional 5,000 medium density dwellings (approximately 75% of future dwellings will need to be medium density to meet future dwelling needs).

Low density dwellings will continue to be the primary dwelling type in the LGA, however it is anticipated that demand for new low density dwellings will be limited to less than 1000 dwellings.

Demand for high density dwellings is not anticipated to be large, however they may play a role in affordable housing, housing for older people and in general improving overall dwelling choice.

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Background research and mapping have identified a range of key issues that will influence the future sustainable development of housing in Hawkesbury LGA. These issues include:

- _ Natural Environment;
- _ Centres and Employment;
- _ Transport;
- _ Open Space and Recreation;
- _ Community Services and Facilities;
- _ Utilities Infrastructure;
- _ Heritage and Character; and
- _ Sustainable Development.

An overview of these issues and their implications (constraints and opportunities) on the Residential Strategy is provided in the following section. The development opportunities for Hawkesbury LGA in response to these issues are assessed through an opportunity and constraints analysis, discussed in Chapter 5.

Maps are presented throughout the chapter showing the location of the issues discussed. The maps focus on the southern part of the LGA as this is where 94% of the population is located and where, as will be discussed, the potential to develop is highest.

Natural Environment

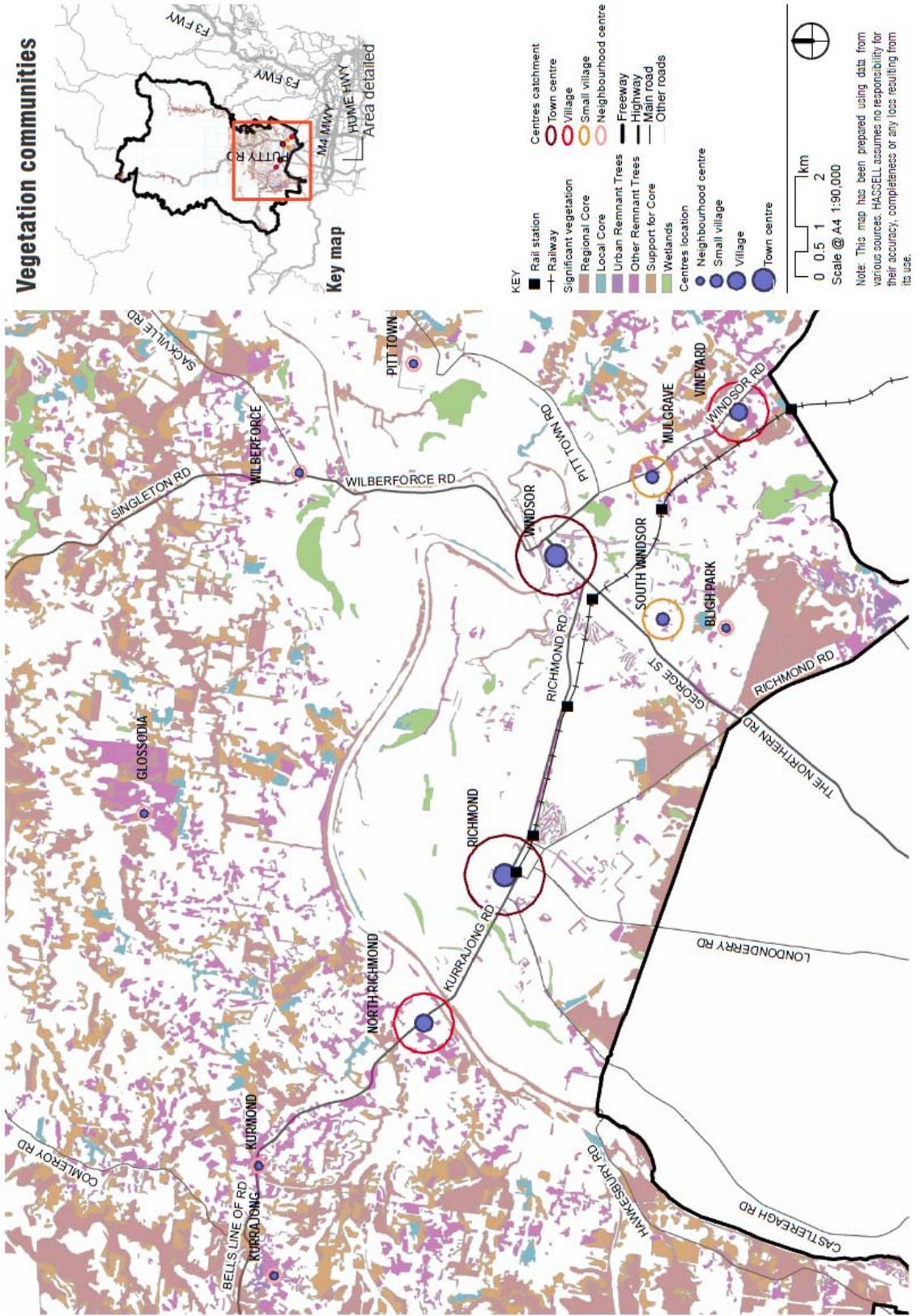


Figure 4.1: Hawkesbury Residential Strategy Vegetation Communities

(Source: Hawkesbury City Council GIS, October 2009)

Natural Environment

4.1_Natural Environment

Hawkesbury LGA is unique in the Sydney Metropolitan context, with its character being strongly influenced by the natural environment and rural qualities that make up its diverse landscape. Hawkesbury LGA is centred on the upper reaches of the Hawkesbury River.

The key elements shaping the Hawkesbury LGA natural environment include its:

- Biodiversity and Vegetation;
- Bushfire Prone Areas;
- Slope;
- Acid Sulphate Soils,
- Flooding;
- Wetlands; and
- Agricultural Land.

4.1.1 Biodiversity and Vegetation

Two thirds of the LGA is located in National Parks, including, Wollemi National Park, Parr State Conservation Area, Cattai and Scheyville National Parks Yengo National Parks and Blue Mountains National Park. This provides a total of approximately 1,930 square kilometres of national park areas within the LGA. Hawkesbury LGA also includes a part of the Greater Blue Mountains World Heritage Area to the west containing a wide and balanced representation of eucalypt habitats as well as localised swamps, wetlands, and grassland.

The Hawkesbury LGA comprises a range of vegetation communities that contribute to the biodiversity in the LGA, as shown in Figure 4.1. The location of these communities corresponds with the extensive areas within national parks, state forests and nature reserves. The vegetation communities identified (and shown in Table 4.1) contribute to the biodiversity in the LGA as well as the landscape character of the LGA. As such these areas are not considered suitable for extensive future urban development.

Table 4.1: Vegetation Community Values

CSA Value	Priority Order	Classification
W, C1, C2, C3, C4	1	W = Wetlands C1-C3 = Regional Core C4 = Local Core
URT, O1, O2, O3	2	URT = Urban Remnant Trees O1-O3 = Other Remnant Vegetation
S1, S2	3	S1-S2 = Support for Core

Implications for the Hawkesbury Residential Strategy

- Vegetation communities contribute to the biodiversity, character and landscape setting of the Hawkesbury LGA and are therefore not suitable for urban development.
- Future urban development to occur in areas where there are limited impacts on significant vegetation communities.
- Future urban development in the Greater Blue Mountains World Heritage Area or in National Parks, State Forests, State Conservation Areas, Recreation Areas or nature reserves is inappropriate.

Natural Environment

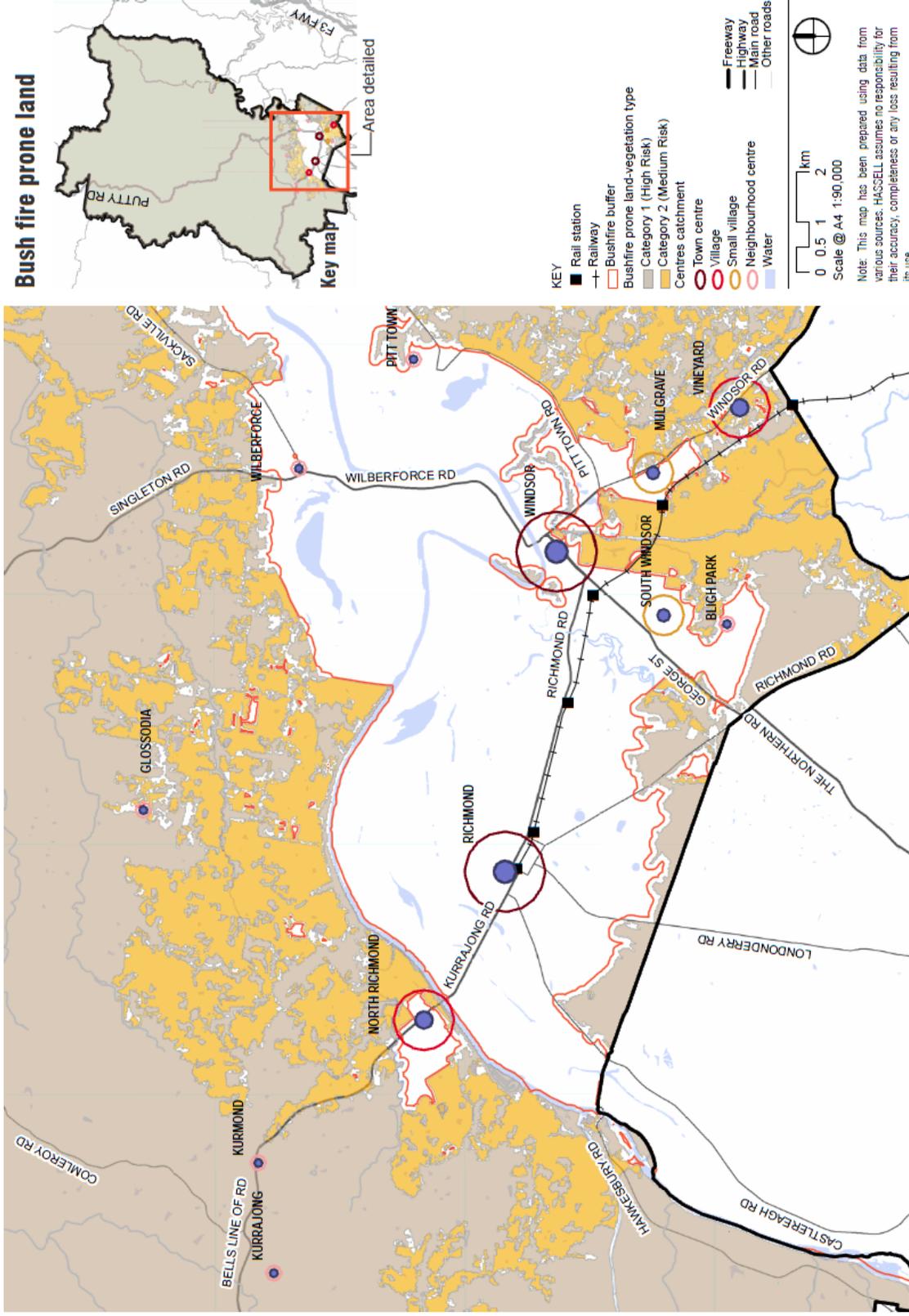


Figure 4.2: Hawkesbury Residential Strategy Bushfire Category 1 and 2 Areas (Source: Hawkesbury City Council GIS, October 2009)

Natural Environment

4.1.2_Bushfire Prone Areas

Hawkesbury LGA contains significant areas of bushland which are important for biodiversity and also prone to bushfire. It is recognised that these areas provide strong landscape character and rural settings, however given the high risk of bushfire, these areas are generally not appropriate for intensive residential development.

The extent of bushfire risk is identified and categorised to determine where urban development may be appropriate with minimal risk of bushfire, subject to meeting the requirements of the NSW Rural Fire Service *Planning for Bush Fire Protection*, (Version 3), June 2006.

As a result of the high number of national park areas, Figure 4.2 shows that:

- _ The vast majority of the Hawkesbury LGA is categorised as Category 1 high risk and not suitable for future extensive urban development;
- _ The main urban areas, including the town centres of Windsor and Richmond, have been cleared of classified vegetation for the existing development and therefore are not subject to bushfire legislation; and
- _ Category 2 vegetation is found surrounding the outskirts of Wilberforce, North Richmond, Bligh Park and Vineyard.

Development in these areas must comply with the requirements of Planning for Bushfire Protection, prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and may include further bushfire investigations.

Implications for the Hawkesbury Residential Strategy

- _ Large areas of the LGA are at high risk of bushfire and therefore not suitable for future urban development.
- _ Some areas in proximity to Wilberforce, North Richmond and Vineyard are at risk of bushfire, which may make them unsuitable for residential development.
- _ Detailed site specific studies should be carried out on areas identified as being within a vegetation category before urban development can occur.
- _ Future urban and other development is subject to meeting the requirements of the NSW Rural Fire Service Planning for Bushfire Protection (Version 3), June 2006.

Natural Environment

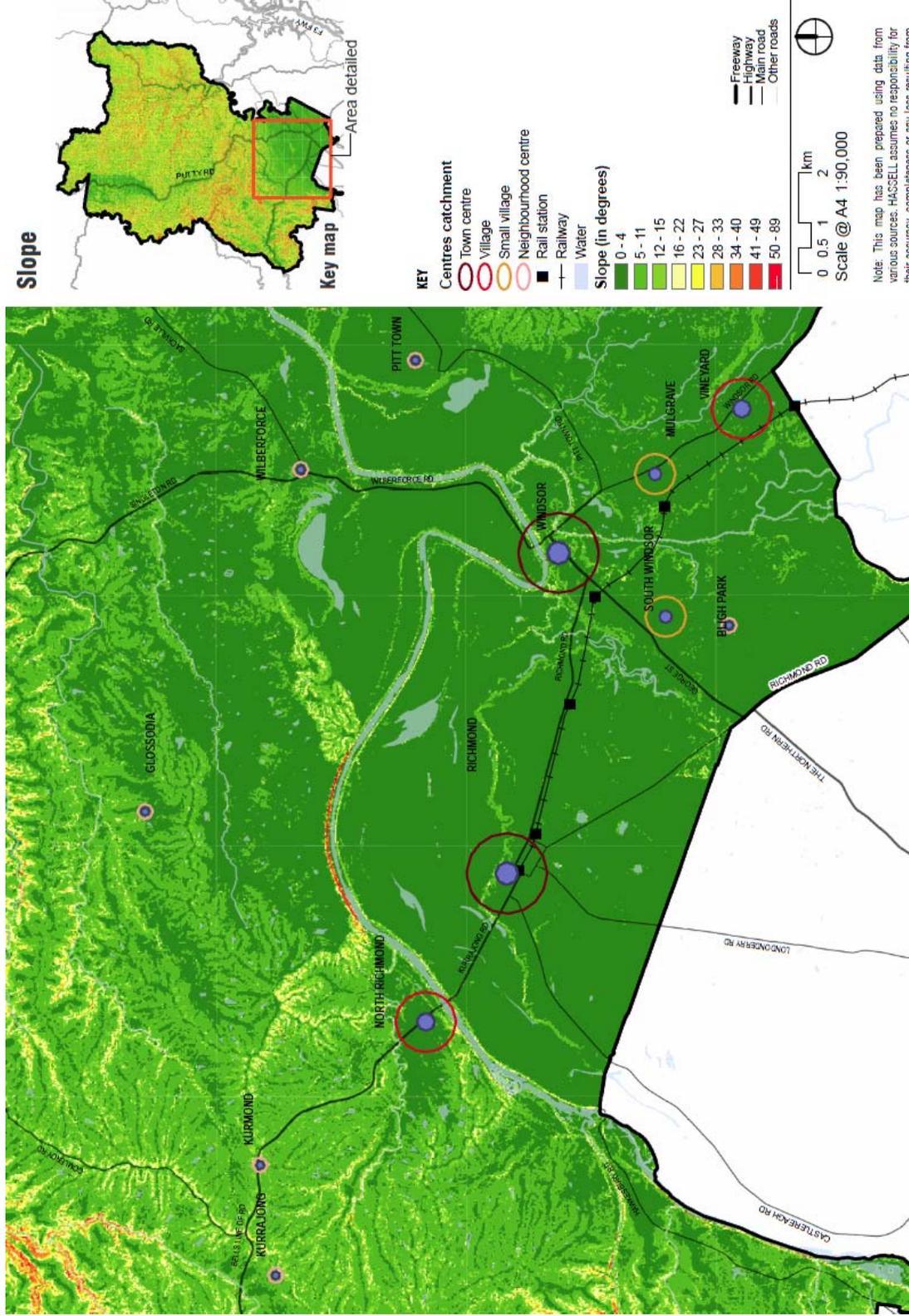
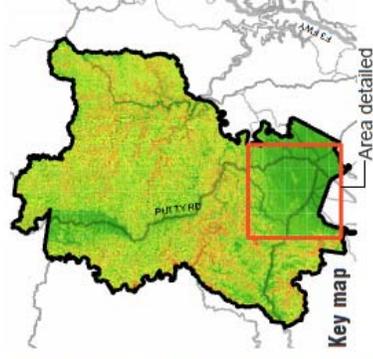


Figure 4.3: Hawkesbury Residential Strategy Slope

(Source: Hawkesbury City Council GIS, October 2009)

Slope



Natural Environment

4.1.3_Slope

The terrain of Hawkesbury LGA is influenced by the Blue Mountains and Great Dividing Range to the north west as well as some of Sydney's significant river systems associated with the Hawkesbury Nepean Catchment.

The topography varies widely throughout the Hawkesbury LGA from slopes of less than 1:20 (5% slope) increasing to 1:8 (12.5% slope), with the majority of the current urban areas predominantly located on areas below 15 degree slope (1:6.5 slope). These slopes are often associated with the river and creek systems in the north of the LGA, as shown in Figure 4.3.

The Draft Residential Strategy 1997 Sustainable Development Threshold stated that a slope of 15% is generally considered to be the upper limit for urban development. Beyond this, soil erosion becomes an increasingly difficult problem to manage and may even expose development to landslip and mass movement hazards.

It is important to acknowledge that the *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* states that access pathways should be no more than 1:14. Mindful of the ageing population of Hawkesbury future residential development areas should be aware of this restriction.

Implications for the Hawkesbury Residential Strategy

- _ Slope is a constraint on residential development within the LGA.
- _ Future urban development in areas with a slope of 15% or more is not considered appropriate.
- _ Future urban development must address slope stability and associated issues such as soil erosion.

Natural Environment

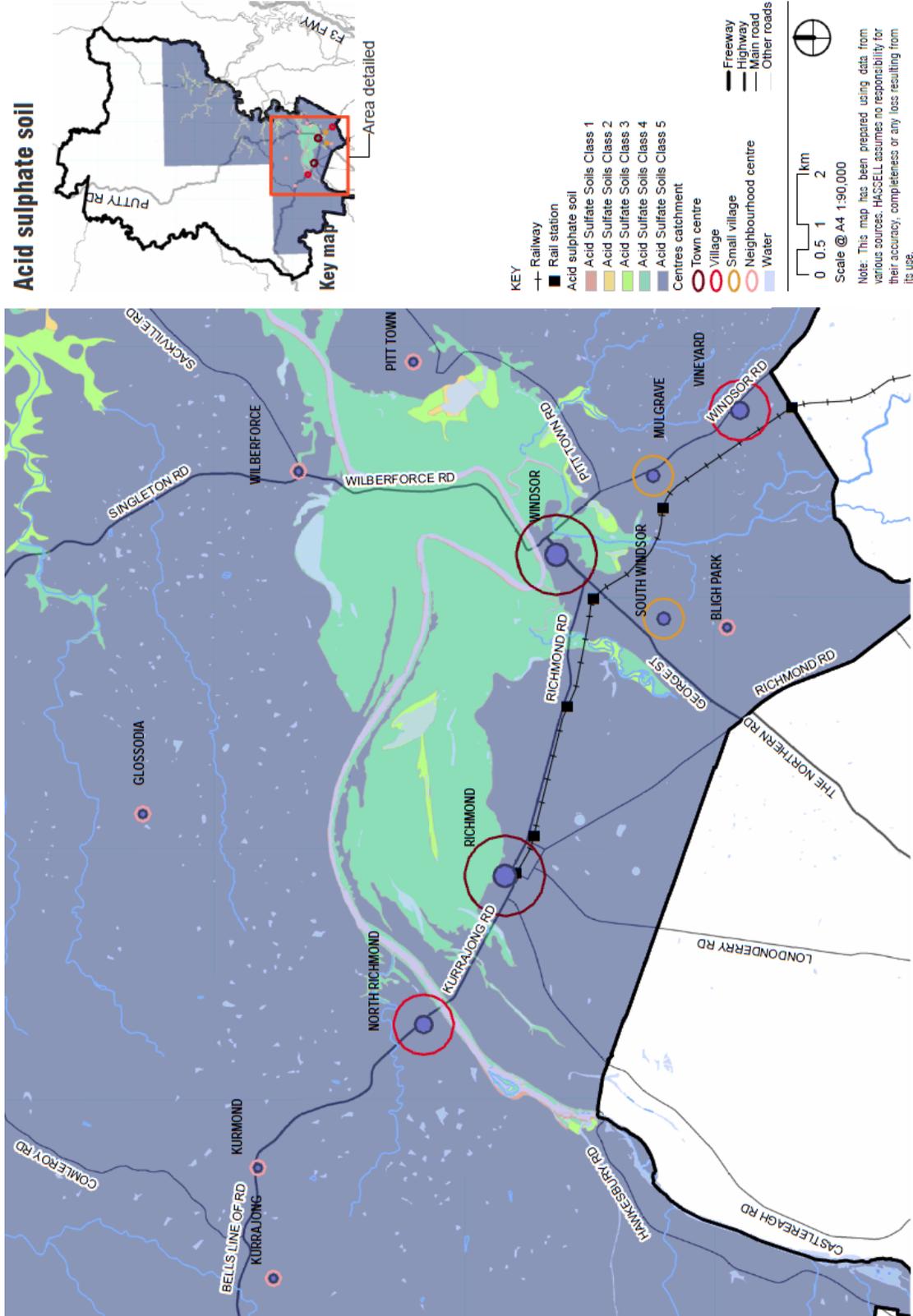


Figure 4.4: Hawkesbury Residential Strategy Acid Sulphate Soils

(Source: Hawkesbury City Council GIS, October 2009)

Natural Environment

4.1.4_Acid Sulphate Soils

Acid sulphate soils are sediments and soils containing iron sulphates that are usually found in low-lying parts of coastal floodplains, rivers and creeks. As the LGA comprises an extensive river system, acid sulphate soils are common throughout the area, which, depending on their classification, can be a constraint to development.

The extent of acid sulphate soils in the Hawkesbury LGA is portrayed in Figure 4.4 and described in Table 4.2. These soils are categorised from being Class 1 where any development is constrained, to Class 5 where development is less constrained. Soils in other categories have varying levels of constraints associated with future development.

Table 4.2: Acid Sulphate Soil Classifications

Class of land	Works
1	Any work
2	Works below the natural ground surface
3	Works by which the watertable is likely to be lowered Works beyond 1 metre below the natural ground surface
4	Works by which the watertable is likely to be lowered beyond 1 metre below natural ground surface
5	Works beyond 2 metres below the natural ground surface metres below natural ground surface Works within 500 metres of adjacent Class 1, 2, 3 or 4 land which are likely to lower the watertable below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land

Hawkesbury Local Environmental Plan 1989

Development on land identified in the table is required to seek consent for works proposed.

As shown in Figure 4.4, there is a significant amount of land identified as containing Class 5 acid sulphate soils. Class 4 is found along the rivers and creeks namely the Hawkesbury River running through Windsor. This includes Clarendon and Pitt Town but also affecting the agricultural land to the north of Richmond. Class 3 acid sulphate soils are found in small isolated areas close to urban centres but also in the rural northern creeks where Class 2 acid sulphate soils are also present.

Appropriate planning and management of development on acid sulphate soils is required. While the maps do not describe the severity of acid sulphate soils in an area, they provide an initial indication that acid sulphate soils could be present on land. Further investigation and management of acid sulphate soils should be carried out in one or two stages:

- A preliminary assessment; and
- An Acid Sulphate Soils management plan.

Implications for the Hawkesbury Residential Strategy

- Large areas of the LGA, particularly around existing townships are impacted by acid sulphate soils.
- Location of future urban development should be cognisant of acid sulphate soil classifications.
- Site specific studies should be carried out on areas identified as subject to an Acid Sulphate Soil Classification before urban development is approved.
- Appropriate construction methods must be used for urban development in areas identified as at risk of acid sulphate soils, in line with Hawkesbury Local Environmental Plan 1989.

Natural Environment

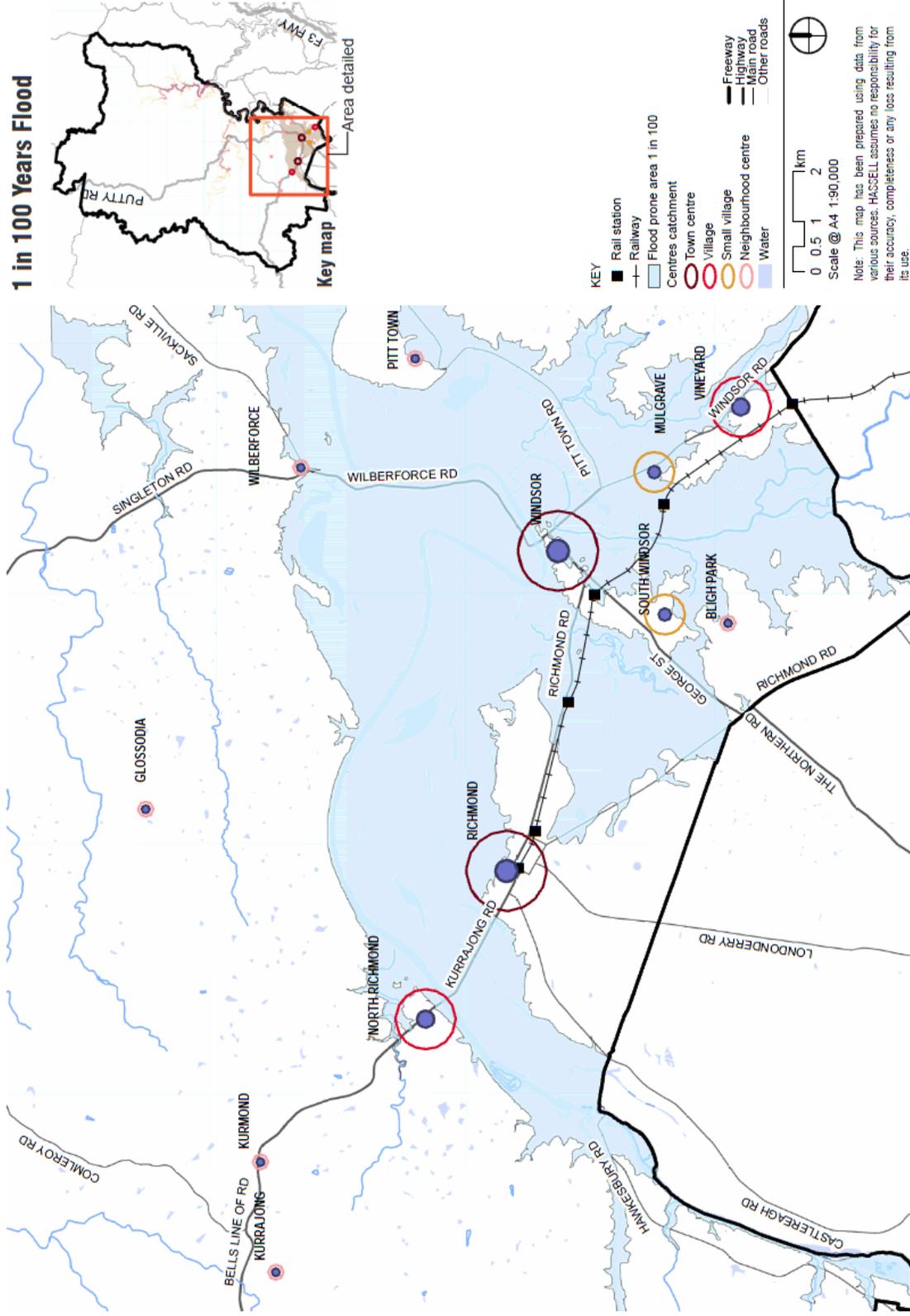


Figure 4.5: Hawkesbury Residential Strategy 1 in 100 Year Flood

(Source: Hawkesbury City Council GIS, October 2009)

Natural Environment

4.1.5_Flooding

The Hawkesbury LGA is dominated by several river systems associated with the Hawkesbury– Nepean Catchment and the sub catchments of:

- _ Hawkesbury River;
- _ Cattai Creek;
- _ South Creek;
- _ MacDonald River
- _ Grose River; and
- _ Colo River.

As Figure 4.5 shows, the majority of the urban area of Hawkesbury LGA is prone to at least 1:100 year flooding, making flooding a significant issue in both established and undeveloped areas and effectively divides the LGA into north and south of the Hawkesbury River. Flooding is particularly prevalent in the south eastern area around North Richmond, Richmond, Windsor, South Windsor, Blight Park, Wilberforce and Pitt Town areas, South Windsor and Bligh Park.

The North West Subregional Strategy identifies that the areas north of the Hawkesbury River are predominantly above the Probable Maximum Flood level and are therefore more suitable for future urban development.

The North West Subregional Strategy states that future housing growth in Hawkesbury LGA is substantially constrained by the capacity within the evacuation network. The growth potential in Windsor and Richmond is restricted by high flooding occurrence.

The Subregional Strategy also notes that strong partnerships should be sought with Hawkesbury– Nepean Catchment Management Authority and the North West councils to:

- _ Ensure aims and objectives of Catchment Action Plans are considered in the future management and planning of LGA;
- _ Coordinate a regional approach to riverine values and wetlands, including identifying priority areas for management;
- _ Undertake stream mapping to enable councils to develop planning controls to protect regionally significant riparian corridors; and
- _ Undertake broad-scale stream mapping at a strategic level to determine the significance of riparian lands and their management requirements in areas that are potentially being developed or redeveloped.

Council recognised in their Draft Residential Strategy 1997, that new development is to avoid high risk flood prone areas and wetlands. Council's Floodplan Risk Management

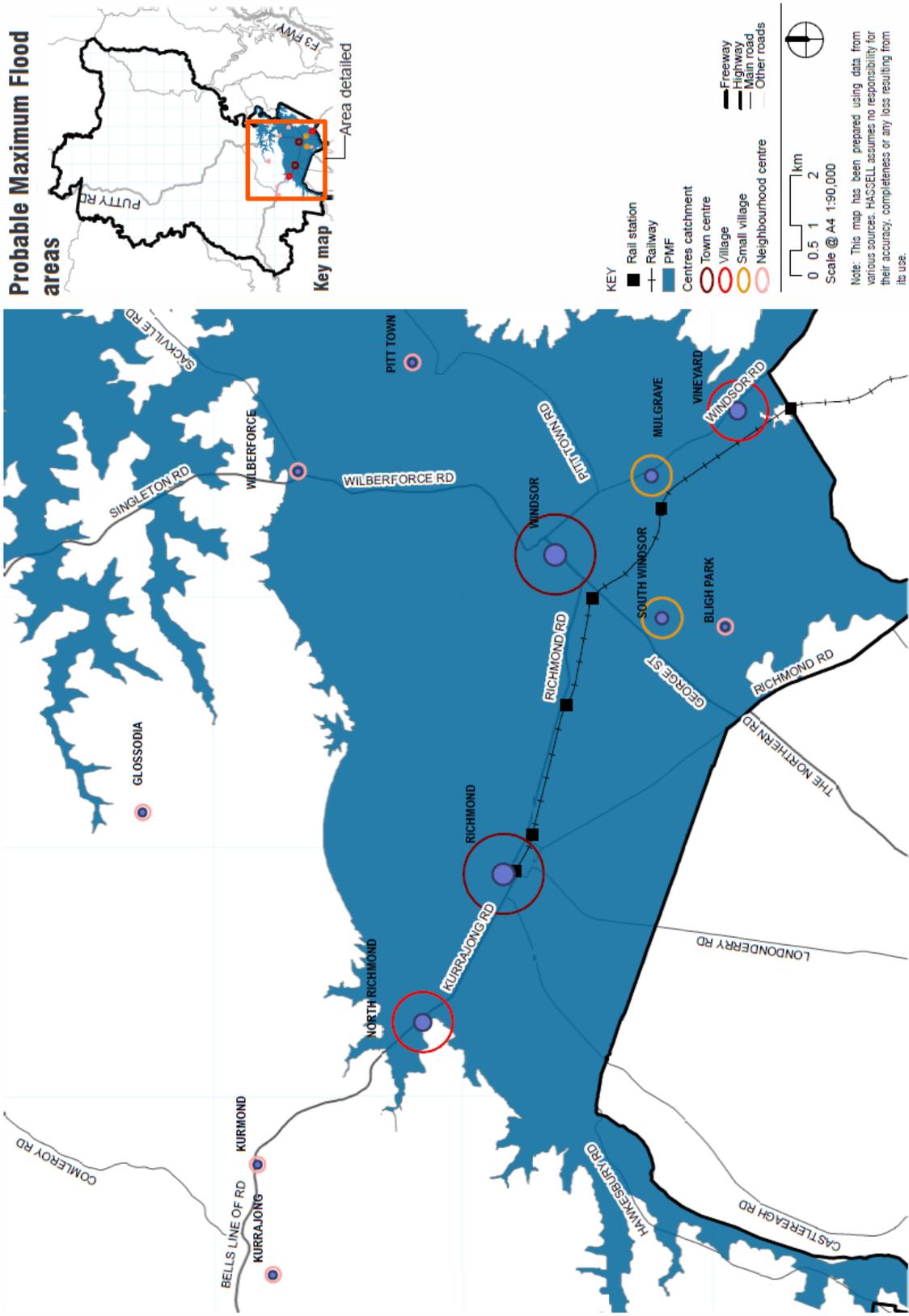
Advisory Committee is also planning to produce a Flood Risk Management Study and Plan for the LGA in the near future.

It is increasingly important that the impacts of climate change are considered in development and for Hawkesbury LGA the increased risk of flooding is a fundamental issue. The principle of climate change and ecologically sustainable development is evolving to a point where, in the future, it would be a mandatory legal consideration for Council in development decisions. A recent case in the Land and Environment Court (Walker v Minister for Planning [2007] NSWLEC 741) found that the Minister was obliged to consider whether the risk of coastal flooding from climate change was relevant to the development before the application was determined.

Implications for the Hawkesbury Residential Strategy

- _ Flooding is a significant issue within Hawkesbury LGA and future urban development must avoid high risk flood prone areas.
- _ Flood Risk Management Plan should be prepared for all new urban development occurring in flood prone areas.
- _ Appropriate construction methods must be used for existing urban development in areas identified as at risk of flooding.
- _ The impacts of climate change and increased flooding on future development must be considered in future development.
- _ Infill development is dependant on flood evacuation upgrading.

Natural Environment



(Source: Hawkesbury City Council GIS, October 2009)

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Natural Environment

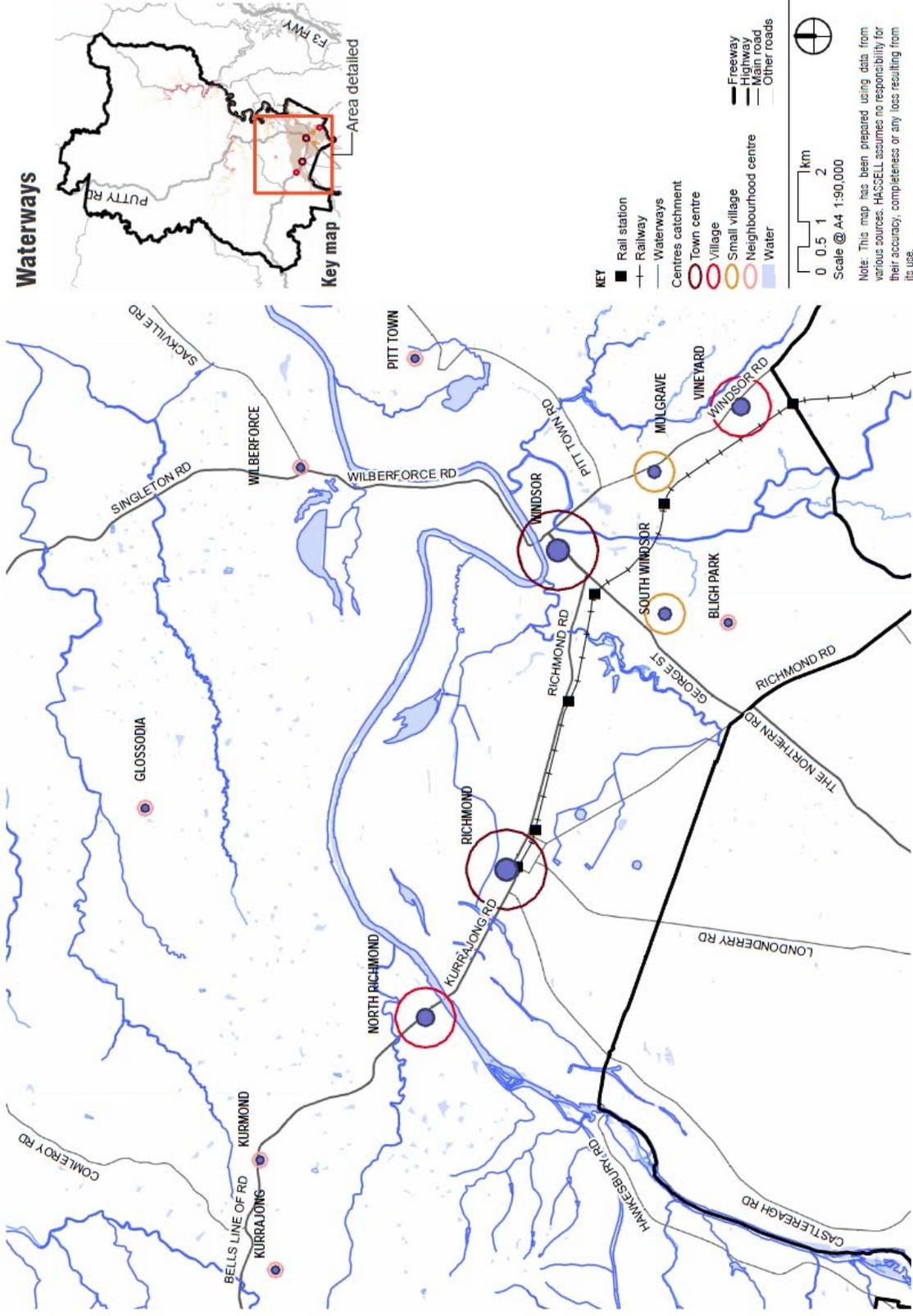


Figure 4.7: Hawkesbury Residential Strategy Waterways

(Source: Hawkesbury City Council GIS, October 2009)

Natural Environment

4.1.6_Wetlands

Wetlands include important and productive plant communities and bird habitats and play a significant role as flood storage areas. There are a number of wetlands within the Hawkesbury LGA and several of these are protected by *Sydney Regional Environmental Plan No. 20 - Hawkesbury Nepean River 1997*.

The North West Subregional Strategy recommends that Council coordinate a regional approach to riverine values and wetlands, including identifying priority areas for management.

As identified in the Draft Residential Strategy 1997 Sustainable Development, threshold and wetlands should be protected in the environmental and economic interests of the catchment by ensuring that any potentially harmful development is carefully considered before approval for development is given.

Implications for the Hawkesbury Residential Strategy

- _ There is a need to continue to protect wetlands within the Hawkesbury LGA.
- _ Future urban development in wetland areas should be avoided.
- _ Hawkesbury City Council to work with other LGAs within the region to develop an approach to riverine values and wetlands, including identifying priority areas for management.

4.1.7_Agricultural and Rural Land

Hawkesbury LGA also has an extensive amount of agricultural land which provides a significant resource to the LGA and the Sydney Metropolitan Region. Rural landscapes contribute to the pastoral industry as well as the rural character of the LGA. Protection of these productive and landscape areas is essential to maintain a significant economic resource in terms of primary production as well as tourism.

As identified in the Sydney Metropolitan Strategy, agriculture in the Sydney region represents up to 12 percent of NSW's total agricultural production and contributes \$1 billion to the Sydney economy. The market proximity a suitable climate are the major reasons why agriculture is in the fringe of Sydney. Agriculture provides for a large proportion of the fresh affordable food that is consumed in Sydney (<http://www.ruralplanning.com.au/ruralplanning/>).

The external benefits of a proximate and accessible food supply (future cost savings from reduced need to transport food) are increasingly important in considering the merits of urban development versus protecting agricultural production. Consequently there will be a need for food to be produced as close as possible to population

concentrations. Agricultural and rural industries in the Hawkesbury, which already plays a significant economic contributor, will therefore be increasingly important and in demand.

As identified in the Hawkesbury Employment Lands Strategy 2008, Hawkesbury contains 16 percent of vegetable and other crop establishments in the Sydney Basin (ABS, 2006). There has also been international demand for the Hawkesbury Harvest Farm Gate Trail and its products. As food security becomes a more pressing issue and demand increases, management of Hawkesbury's agricultural lands will gain in importance. This will require forward planning to assess the scale and nature of land that would become more valuable for food production for the Sydney Basin in the future.

Challenges for agriculture include water sources for irrigation and availability of agricultural land in future as competition from other rural and ancillary uses demands high quality agricultural locations. As such, urban development in proximity to agricultural land needs to be buffered to avoid impacts on future residents of agricultural uses, such as noise, odour, hours of operation and pesticides. While agricultural land needs to be buffered from urban land uses to minimise impacts such as run off, loss of viable holdings and loss of production potential.

Implications for the Hawkesbury Residential Strategy

- _ Agriculture is important to the local and regional economy and should not be impacted by future urban development.
- _ Urban development in rural and agricultural areas should avoid conflicts between uses and maintain economic and tourism resources for the LGA.
- _ Future urban development on prime agricultural land should be clearly assessed for its benefits before approval.
- _ Land auditing and an assessment of the scale and nature of land food production is required.

Centres and Employment

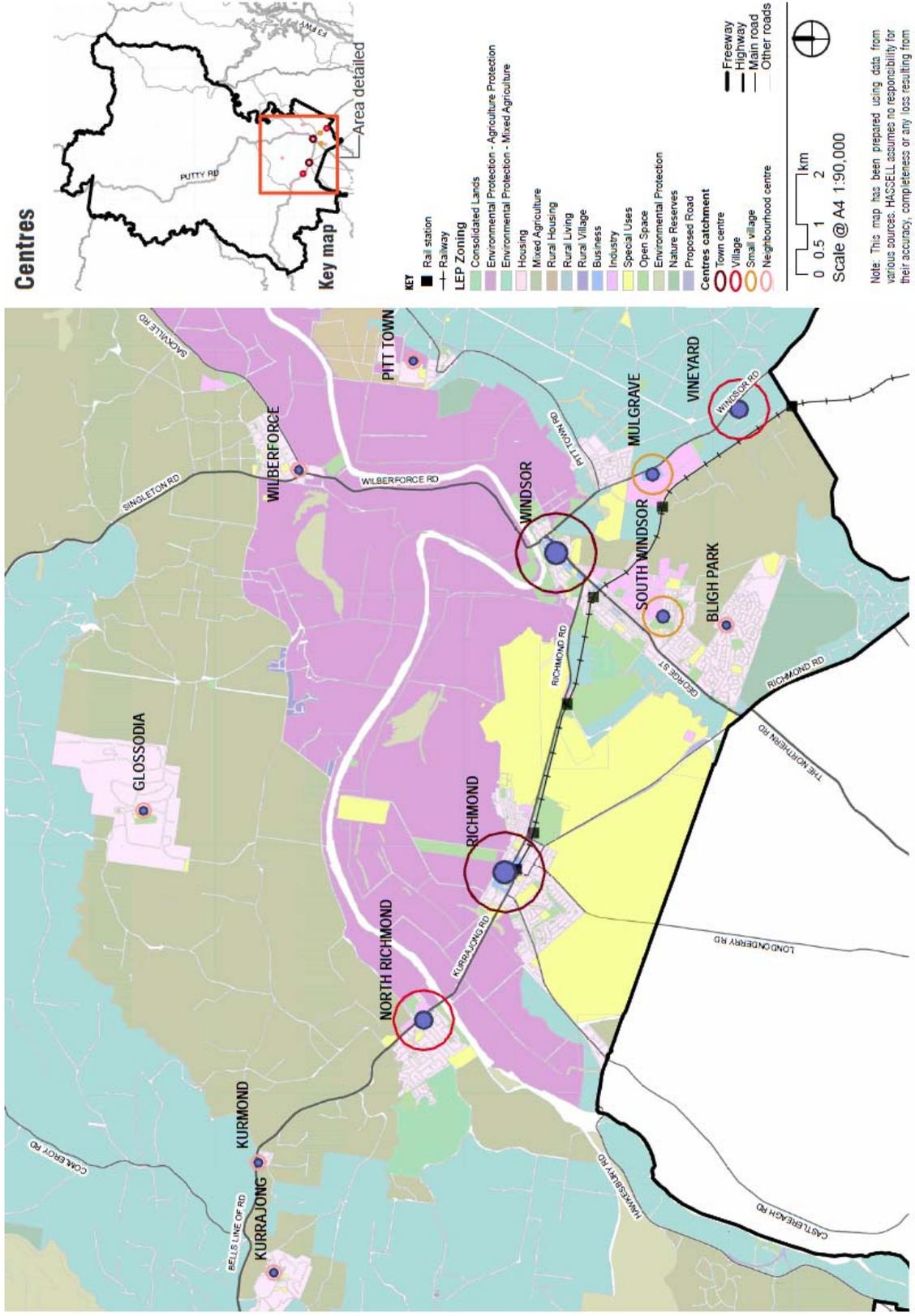


Figure 4.8: Hawkesbury Residential Strategy Centres Map

(Source: Hawkesbury City Council GIS, October 2009)

Centres and Employment

4.2_Centres and Employment

4.2.1_Key Centres

The Hawkesbury LGA contains a range of centres that service the area as shown on Figure 4.8. While Council does not have a centres hierarchy, this Residential Strategy has adopted the North West Sub Region Centres and Corridors Hierarchy. This has been used to identify the following hierarchy for the key centres in the Hawkesbury LGA shown in Table 4.3:

Table 4.3: Key Centres Hierarchy

Town Centres:	Neighbourhood Centres
Richmond	Bligh Park
Windsor	Kurmond
Villages	Kurrajong
North Richmond	Clarendon
Vineyard*	
South Windsor*	
Small Villages	
Mulgrave/McGraths Hill	
Glossodia	
Wilberforce	
Pitt Town	

*Vineyard is not identified in the North West Sub Region Centres but has been identified as a potential village using the North West Subregional Strategy dwelling numbers for 2031.

*South Windsor currently has residential areas within and beyond its catchment that suggest it could function as a village.

The Draft North West Subregional Strategy Centre Classifications is shown in Table 4.4. The centres classification gives an indication as to what the function of the centre was at the time of preparing the strategy and is not intended to be a set classification to limit the growth or expansion of these centres, and may be modified slightly as long as it is part of a sustainable strategy for the LGA. It is noted that Vineyard has been identified as a village by 2031 due to its projected population and location on the railway line and its position in the North West Growth Centre. It is recommended that the role and function of centres be revised at each review of the Residential Strategy.

The major centres of Richmond and Windsor are the primary retail and commercial centres for Hawkesbury LGA. Windsor provides the historic, civic and health focus for

the LGA while Richmond provides significant educational and defence uses and associated employment.

The village of North Richmond and small villages of South Windsor and Mulgrave are located just outside these main centres and provide a range of smaller scale retail, educational, commercial and community services. South Windsor also provides for industrial land uses. Neighbourhood centres provide local retail and commercial services and in some instances provide local educational and community facilities.

Implications for the Hawkesbury Residential Strategy

- Hawkesbury LGA has a hierarchy of centres which includes town centres, villages, small villages and neighbourhood centres. The established centres hierarchy defined in the Subregional Strategy is supported however; the local centres hierarchy that defines the role and function of all centres on the LGA is required to be investigated.
- The State Government’s position of consolidating growth is recognised and identifies centres as the focus of future urban development.
- Future urban development is to locate within existing or proposed centres where a range of services and facilities are currently available or are planned to be available by 2031.
- “Out of centre” development is generally discouraged unless it can be justified satisfactorily using the sustainable development framework.

Centres and Employment

Table 4.4: Draft North West Subregional Strategy Centre Classifications for Town Centres, Villages, Small Villages and Neighbourhood Centres

Centre Type	Catchment	Description	EXISTING HIERARCHY	2031 HAWKESBURY LGA*
Town Centre	800m	Town Centres have one or two supermarkets, community facilities, medical centre, schools, etc. Contains between 4,500 and 9,500 dwellings. Usually a residential origin than employment destination.	Richmond Windsor	Richmond Windsor
Village	600m	A strip of shops and surrounding residential area within a 5 to 10 minute walk contains a small supermarket, hairdresser, take-away food shops. Contains between 2,100 and 5,500 dwellings.	North Richmond Vineyard	North Richmond Vineyard South Windsor
Small Village	400m	A small strip of shops and adjacent to residential area within a 5 to 10 minute walk. Contains between 800 and 2,700 dwellings.	South Windsor Mulgrave/McGrath Hill***	Mulgrave/McGrath Hill Pitt Town Glossodia Wilberforce
Neighbourhood Centre	150m	One or a small cluster of shops and services. Contains between 150 and 900 dwellings.	Bligh Park Kurmond Kurrajong Glossodia** Wilberforce** Pitt Town**	Bligh Park Kurmond Kurrajong Glossodia Clarendon
Rural town, village or neighbourhood centre	As above	Located in rural zones outside metropolitan urban areas with similar roles to towns, villages and neighbourhoods but rural in character with a wider driving catchment.		

*As proposed by the Hawkesbury Residential Strategy 2009.

** It is considered that these centres are currently Small Villages not Neighbourhood Centres and based on their current population size should be able to grow to the upper limit of the Small Village category by 2031.

*** Mulgrave is predominantly employment lands and has a lesser role in accommodating residential growth.

Centres and Employment

4.2.2_Employment Sectors

The North West Sub Region Strategy identified that the Hawkesbury LGA has capacity to provide an additional 3,000 jobs by 2031. This will increase local employment from 24,000 jobs in 2001 to 27,000 jobs in 2031. Currently within the LGA, employment is focused on key sectors such as:

- _ Education – University of Western Sydney (UWS) Hawkesbury Campus and the Richmond College TAFE;
- _ Defence – Richmond Air Base;
- _ Industrial – Large land holdings provide for local and more regional/ industrial uses;
- _ Agricultural and Pastoral – river floodplains have extensive market gardens, while the more undulating terrain accommodates a range of grazing, pastoral and horse related industries; and
- _ Commercial and Retail – within the key centres.
- _ Tourism and other “out of centre” employment as identified for further investigation in Hawkesbury Employment Strategy.

Existing vacant industrial areas are predominantly unserved, with threshold costs and/or poor access to key transport routes limiting development. In commercial / business areas existing lot configurations, heritage and existing development constrains the potential for renewal and reinvestment.

The following employment areas and their intended industry type in Hawkesbury LGA correlate with the key centres that are identified for potential employment development by the Hawkesbury Employment Lands Strategy 2008:

- _ **Mulgrave/Vineyard** (Manufacturing Light/ Manufacturing Heavy/Urban) The industrial area is land zoned 3(b) Special Business occupied by a range of fast food restaurants and an automotive sales business.
- _ **North Richmond** (Local Industry, Utilities/Urban Services) This is an industrial area with a number of small pockets of industrial land comprising light industry and smaller industrial strata units supporting local service providers. Two industrial precincts adjoin residential land, a school and community centre.
- _ **Richmond** (Local Industry, Utilities/Urban Services) This industrial area falls within two precincts, the largest of which is located at the eastern edge of the Richmond Town Centre around 300 m from the East Richmond Station on the Richmond branch of the Western Line. To the west is the Richmond RAAF Base and to the south the Richmond Golf Course.
- _ **Windsor/South Windsor** (Manufacturing–Light, Manufacturing–Heavy, Urban Services) This industrial area is the largest within Hawkesbury LGA. It supports a broad mix of industrial uses and adjoins the residential area of Windsor. The recently completed Windsor Flood Evacuation Route passes through this industrial area.

- _ **Wilberforce** (Utilities/Urban Services, Local Industry) The area adjoins rural lands and open space to the south and is not serviced by reticulated sewer. There are also a number of local service providers within the area.

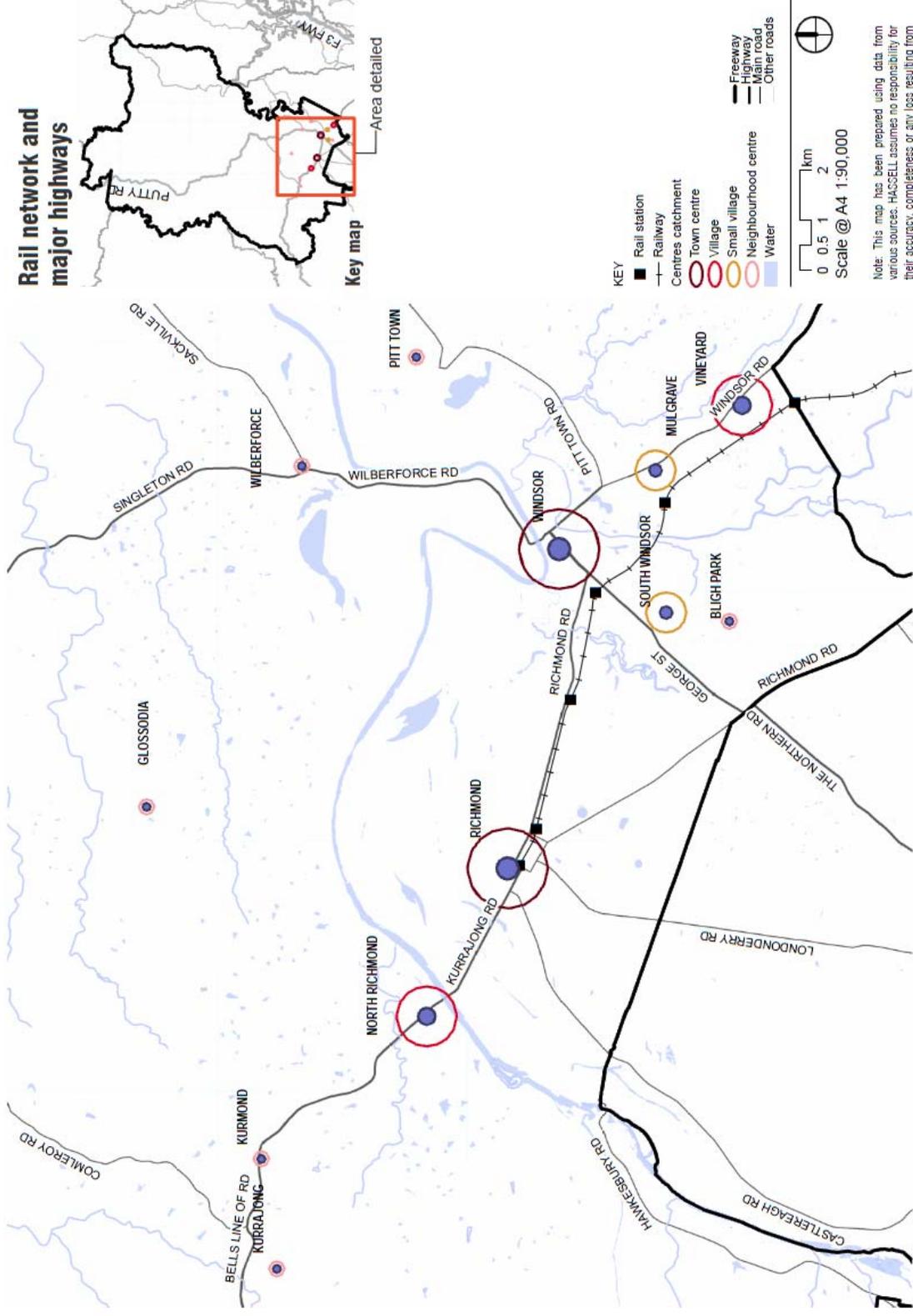
The Employment Lands Strategy 2008 also identifies the following gateway areas which should be investigated for development and design treatments.

- _ George Street and Blacktown Road
- _ Windsor Road, Mulgrave
- _ Bells Line of Road, North Richmond
- _ Land on western side of George Street, South Windsor.

Implications for the Hawkesbury Residential Strategy

- _ Hawkesbury LGA has a high level of job self containment with local employment sectors in education, industry, agriculture, commerce and retail and this should be maintained or improved.
- _ The North West Sub Regional Strategy seeks to increase local employment by 3000 jobs by 2031.
- _ The Hawkesbury Employment Lands Strategy (December 2008) also identifies Mulgrave and Clarendon as having potential to accommodate future employment growth.
- _ Key sectors and potential employment areas identified in the Employment Lands Strategy 2008 are to be promoted to ensure employment assets are utilised.

Transport



(Source: Hawkesbury City Council GIS, October 2009)

Figure 4.9: Hawkesbury LGA Residential Strategy: Transport Networks Services

Transport

4.3_Transport

Hawkesbury LGA is serviced by a range of transport options including train, bus and private vehicles. Figure 4.9 identifies the key transport infrastructure in the LGA.

4.3.1_Train services

Train services are an important feature of the LGA as they provide facilities for the community to reach employment destinations and other centres within and outside the area. Hawkesbury LGA is located on the Western Railway Line to Richmond, and is within easy commuter distance to employment nodes located within the Hawkesbury as well as those located elsewhere, within the Sydney region at Parramatta and Blacktown.

Hawkesbury LGA is serviced by the following CityRail stations on the Western Line:

- _ Vineyard;
- _ Mulgrave;
- _ Windsor;
- _ Clarendon;
- _ East Richmond; and
- _ Richmond.

The line terminates at Richmond but provides access south east into Sydney CBD and also joins the Blue Mountains Line heading west at Blacktown. Services between Richmond and Blacktown operate at only a moderate frequency with a half-hourly service for all stops during peak hour and an hourly service for all stops during off-peak times.

4.3.2_Road Infrastructure

Key roads providing access to Hawkesbury LGA include:

- _ Windsor Rd connecting with Westlink M2 at Baulkham Hills and towards Parramatta and the Sydney LGA to the south east; and
- _ Richmond Rd/ The Northern Rd providing a north south link into Windsor.

Other public roads include:

- _ Londonderry Rd and Castlereagh Rd both leading to Penrith in the South;
- _ Wilberforce Rd leading to Parr State Conservation Area to the north;
- _ Pitt Town Rd leading to Hornsby in the south east;
- _ Blacktown Rd leading Blacktown and Parramatta in the south east; and
- _ Bells line of Rd leading to Lithgow and the Blue Mountains to the North West.

Hawkesbury City Council's Community Strategic Plan identified the need to link the LGA more effectively with the surrounding areas. The following have been identified:

- _ A community provided with facilities and services efficiently linked by well maintained roads;

- _ Accessible and integrated transport and communication;
- _ Connect surrounding regions;
- _ To enable these visions, the integration of a transport network and development of a hierarchy of roads will need to be facilitated; and
- _ Road infrastructure was also identified in the Hawkesbury City Council Community survey results where improving local roads was rated the most important for both rural and urban residents.

Existing road capacity issues should be addressed in consultation with the Roads and Traffic Authority prior to or as part of the development for any development within the Hawkesbury LGA.

Transport

4.3.3_Bus Services

Like train services, bus services provide links to main centres and employment areas and are an important facility for communities and also tourists visiting the area.

Most suburbs within the southern section of Hawkesbury LGA are serviced by bus routes provided by:

- _ West Bus
- _ Hawkesbury Valley bus company Route 661: (weekdays and Saturdays)
- _ Riverstone - McGraths Hill – Windsor
- _ Route 662: (weekdays only)
- _ Oakville - Maraylya – Riverstone
- _ Route 663/4: (weekdays and Saturdays)
- _ Route 663: Wisemans Ferry - Pitt Town - Oakville - Windsor
- _ Route 664: Maraylya - Oakville – Windsor
- _ School Services
- _ Busabout

NSW Transport and Infrastructure (formally the Ministry of Transport) proposed changes to bus routes (portrayed in Figure 4.10) which include Hawkesbury LGA and the proposed changes came into effect in October 2009. These include the following routes which between centres:

- _ 682 Richmond to Berambing via Bells Line of Rd and Kurrajong;
- _ 680 Richmond to Bowen Mountain via Grose Wold and Grose Vale;
- _ 678 Richmond to Penrith via Agnes Bank, Castlereagh and Cranebrook;
- _ 677 Richmond to Penrith via Londonderry Rd and the Northern Rd;
- _ 676 South Windsor Loop;
- _ 675 Richmond, Windsor, Bligh Park Loop;
- _ 674 Windsor to Mt Druitt;
- _ 673 Windsor to Penrith via Llandilo and Cranebrook;
- _ 661 Windsor to Reiverstone via McGraths Hills, Vineyard & Darkville;
- _ 663 Windsor to Wiesmans Ferry via Pitt Town; and
- _ 662 Riverstone to Oakville via Maraylya.
- _ 669 Windsor to Sackville Wilberforce;
- _ 668 Windsor to Richmond via Glossodia;
- _ 608 Windsor to Rouse Hill via Windsor Rd;

4.3.4_Car Use

Due to limited public transport services and the expansive area that is the Hawkesbury LGA there is significant reliance on the private motor car for transport. In 2006 86.3% of the households owned at least one car compared with 81.5% in the WSROC Region. The percentage of people with no cars in Hawkesbury (5.6%) is considerably lower than that in the WSROC region (11%).

The road networks are described in Section 4.3.2 of this report. However due to the rural nature of much of the LGA, residents are required to travel on the major regional and arterial road networks to access services and facilities resulting in potential conflicts between residential and heavy vehicle traffic.

4.3.5_Cycleways

There are dedicated local cycle routes within the Hawkesbury LGA, as shown in Figure 4.11. The cycle routes follow the existing road networks and run along open space networks, providing key links through local residential areas. The majority of the cycle networks are on-street. There are proposed extensions to the existing cycle routes through Kurmond and Vineyard as well as an off-street cycleway extending from Windsor, along Windsor Road to the M2.

The Draft North West Subregional Plan promotes an increase in the number of cycleways, in conjunction with walking routes, to promote cycling as an alternative and legitimate form of transport to cars. Cycleways should therefore not just be used within urban areas for recreational purposes but also to connect centres.

Transport

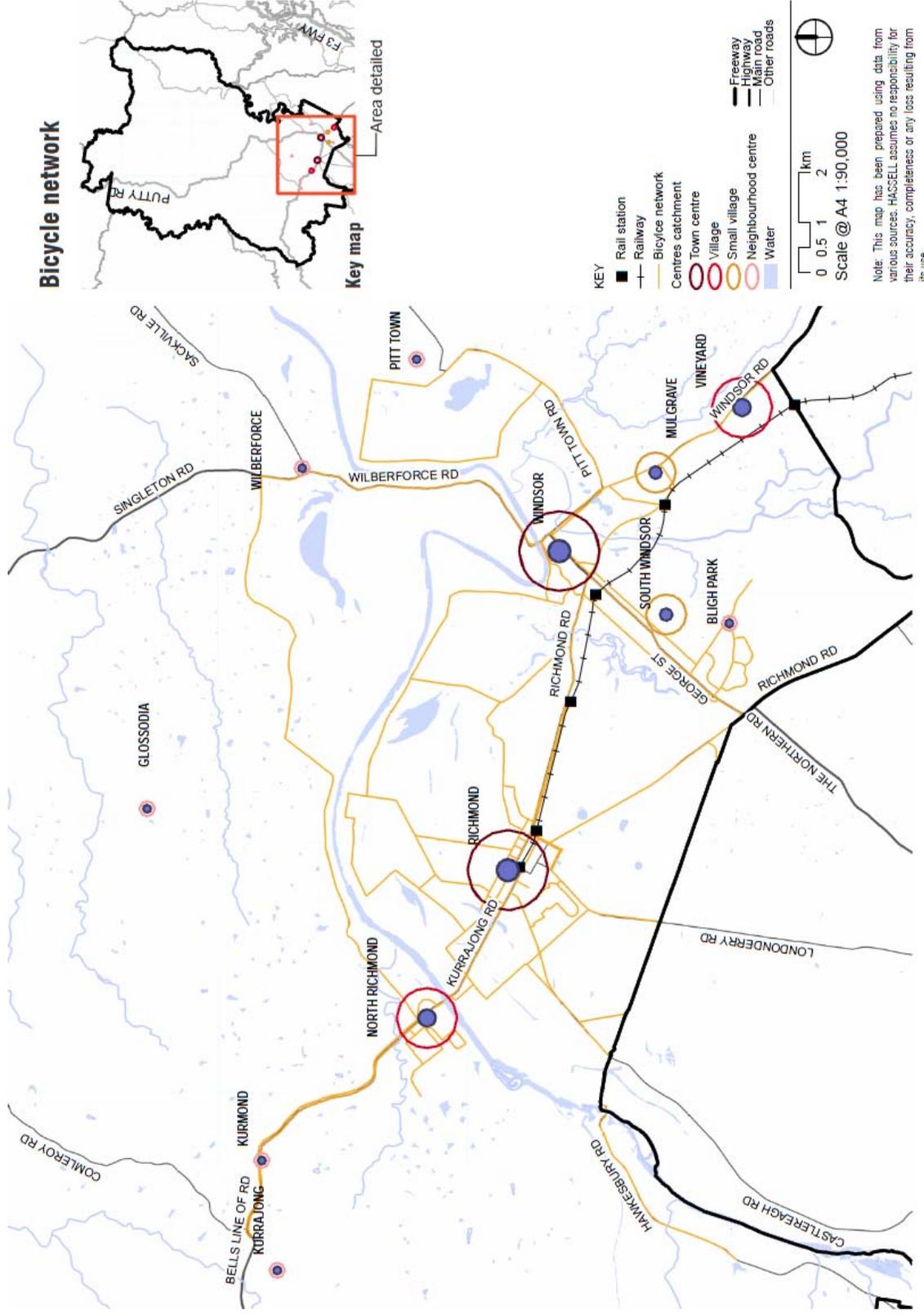


Figure 4.11: Hawkesbury Residential Strategy Cycle Networks

(Source: Hawkesbury City Council Cycle ways map, October 2009)

Transport

4.3.6 Pedestrian Facilities

Recently Council has commenced work on developing a new Mobility Plan for the Hawkesbury LGA. The plan will consist of not only a new bicycle network, but a new Pedestrian Access and Mobility Plan. The comprehensive plan will assist in the development of pedestrian policies and facilities. The needs of people who require special access will also be considered.

In Hawkesbury City Council's Community Survey Results 2007 footpaths were identified as a high priority area for services.

Additionally, the *Sydney Metropolitan Strategy- City of Cities: A Plan for Sydney's Future 2005* identified the need for easier walking access from nearby areas to shops and facilities to improve the health problems of local residents and reduce the use of cars for short trips while making centres more accessible.

Implications for the Hawkesbury Residential Strategy

- Existing road capacity issues should be addressed in consultation with the Roads and Traffic Authority prior to or as part of the development for any development within the Hawkesbury LGA.
- Future urban development is to concentrate in proximity to CityRail Train Stations within the Hawkesbury LGA
- Future urban development is to locate in proximity to areas which are linked into the existing train network and provide services to outlying centres
- Future urban development should be serviced by adequate road networks with links to key centres.
- Future urban development is to concentrate in proximity to regular and reliable bus networks and services.
- Regular and reliable bus services should be in place to key destinations and further transport links.
- Future urban development is to focus on existing and proposed centres to encourage greater access and therefore use of public transport options as well as proximity to services and facilities.
- Cycle links to other centres and key destinations should be considered
- Extending cycleways should be considered to connect expanding centres as a result of increased dwelling densities
- Increased access and usage of paths should be encouraged.
- Future urban development should provide universally accessible pedestrian facilities.

Open Space and Recreation

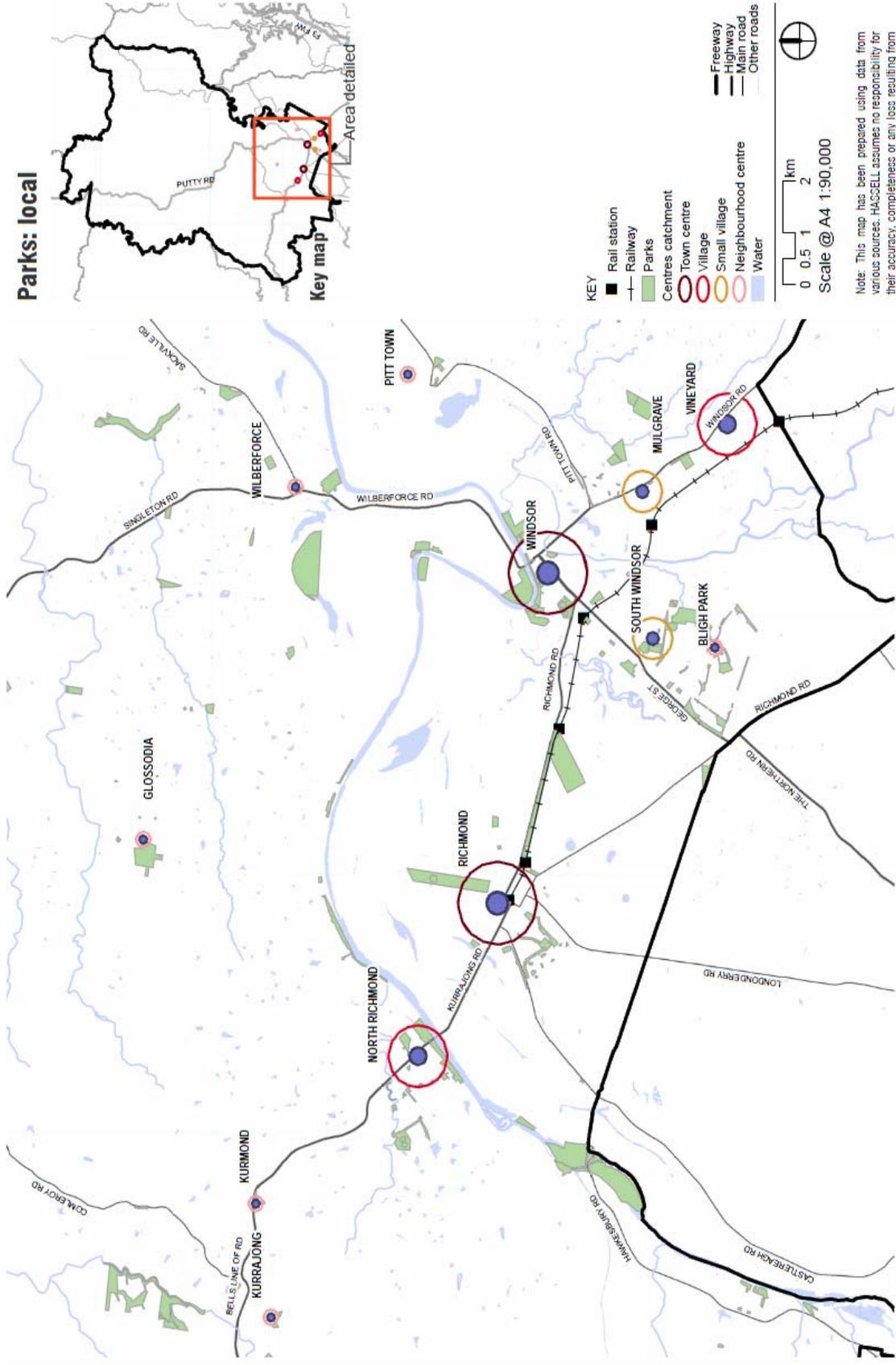


Figure 4.12: Hawkesbury Residential Strategy Local Open Space

(Source: Hawkesbury City Council GIS, October 2009)

Open Space and Recreation

4.4_ Open Space and Recreation

4.4.1_Distribution of Open Space

As shown in Figure 4.12, the majority of open space within the Hawkesbury LGA is associated with the natural landscape areas within National Parks, State Forests, recreation and nature reserves and conservation areas. Of the almost 2,800 square kilometres of land within the Hawkesbury LGA, 71% is located within National Parks, Nature Reserves and Recreational Areas.

Open space areas provide a range of recreation opportunities for residents and tourists to the Hawkesbury. Within the LGA there are approximately 200 parks and 23 ovals.

While some of these areas provide for recreational use, some areas contain sensitive bushland and habitat and are relatively remote from the urban centres, and as such, they provide limited resources for everyday passive and active recreational use.

In order to use the available park space to its full potential, Council is currently undertaking a playground replacement program to upgrade existing sites and improve the amenities for the community.

Hawkesbury City Council has also received funding for Wilberforce Park, Stage 1.

Implications for the Hawkesbury Residential Strategy

- _ Open space is a significant asset for Hawkesbury LGA that contribute to character and amenity of the LGA.
- _ Existing park and recreation areas are to be maintained.
- _ To promote healthy communities, future urban development should be located close to a range of existing or proposed passive and active public open spaces where possible.

Open Space and Recreation

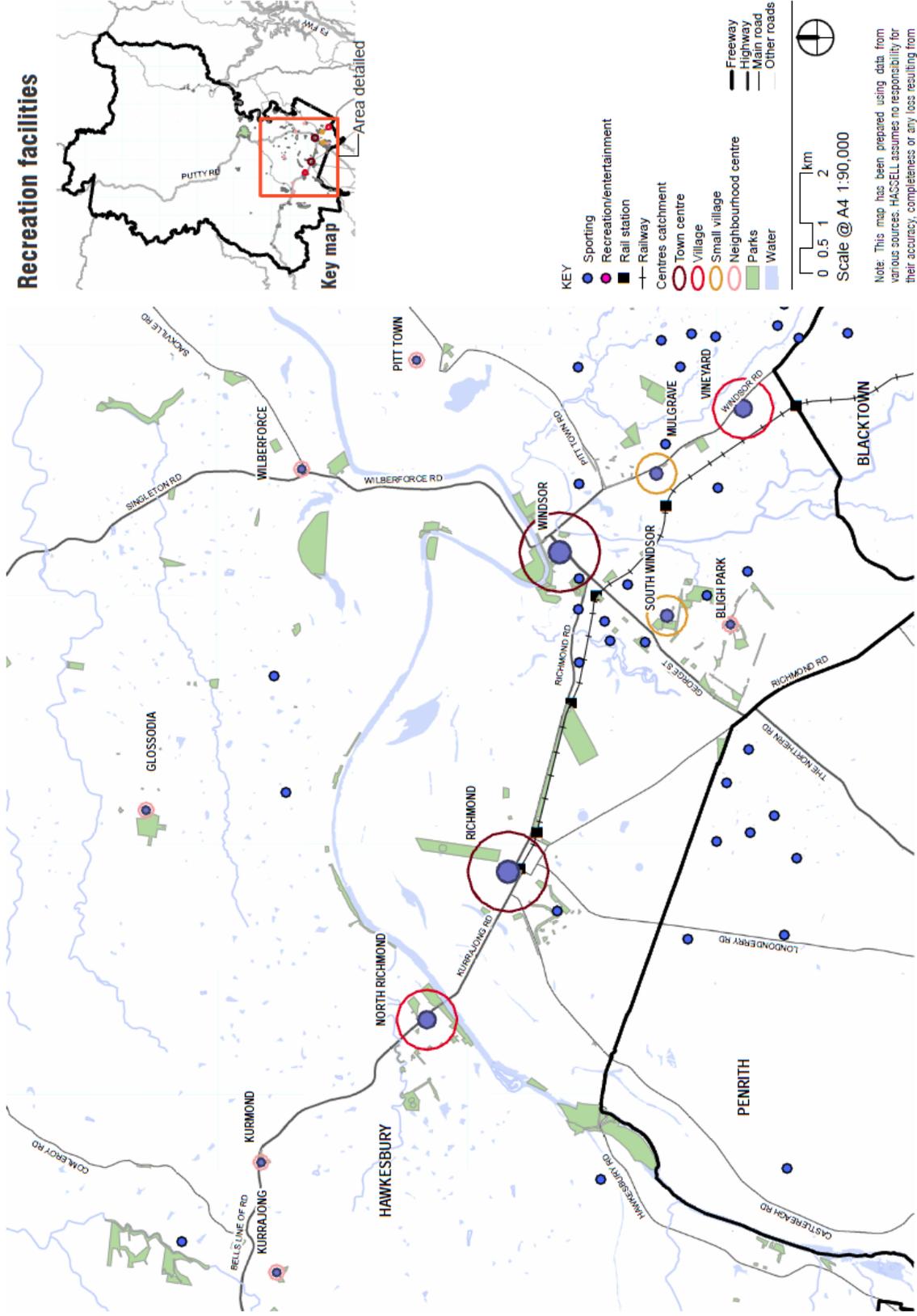


Figure 4.13: Hawkesbury Residential Strategy Recreation Facilities

(Source: HASSELL GIS, October 2009)

Open Space and Recreation

4.4.2 Recreation Facilities

Recreational facilities are a valuable resource for residents and tourists. Streams and water courses associated with the Hawkesbury Nepean River Catchment form part of the public open space and recreation system within or around the edges of urban development. They hold high recreational value and attract people from both inside and out of the LGA. The natural vegetation and fauna and geological features are also part of the recreational experience.

In addition to the natural recreation facilities and resources within Hawkesbury LGA, there is a range of formal recreation facilities. Figure 4.13 identifies the numerous recreational facilities provided near or within the LGA. These include:

- _ Swimming centres;
- _ Clubs (including bowling clubs);
- _ Community centres;
- _ Golf courses;
- _ Conference centres; and
- _ Art schools.

Within the Hawkesbury LGA, there are approximately 15 tennis courts, 37 playing fields, four golf courses, and two swimming pools including an indoor aquatic centre.

As Figure 4.13 shows, the majority of these are located in urban areas surrounding existing centres such as Windsor and Richmond. They are located close to the main road infrastructure namely Richmond Road and Putty Road.

Table 4.5 identifies indicative benchmarks for open space and recreation facilities and applies these benchmarks to the Hawkesbury LGA to identify current and future potential levels of provision. These benchmarks are a guide only and more detailed investigations are required to ascertain better the condition, use and demand on recreational facilities.

This table indicates that the LGA provides a strong level of open space and recreational facilities for existing residents.

Future residential numbers are anticipated to increase marginally and therefore suggests future residents will have adequate provision of open space and recreation. Detailed investigations on these areas, the level of service, and the appropriateness of facilities for future population is required.

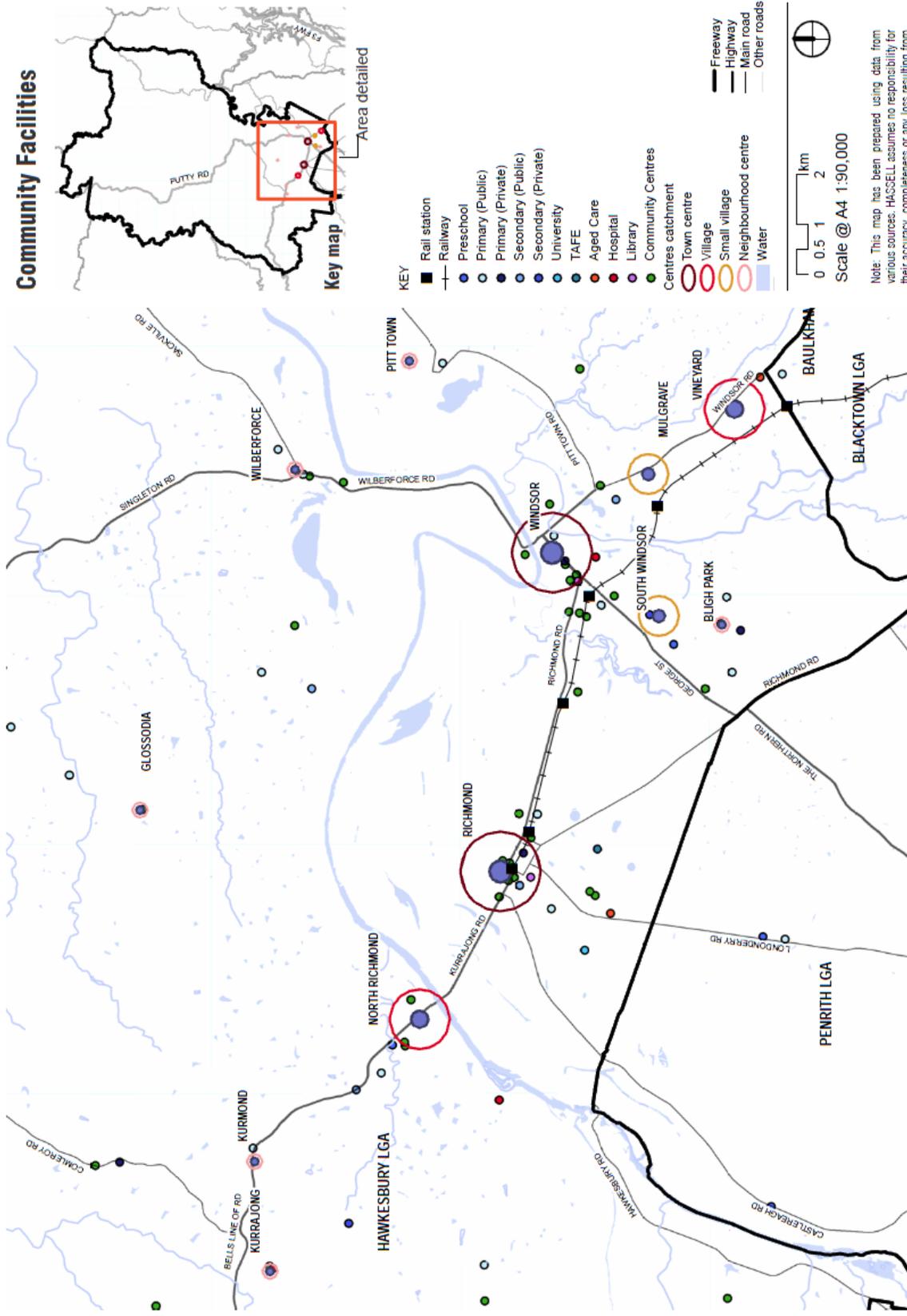
Table 4.5: Recreational Facilities Infrastructure Provision

Infrastructure	Benchmark Service Provision (Indicative Only)	2009 Facilities	Current Provision	Anticipated future demand 2031
Open Space and Recreation				
Regional Park (20ha+)	LGA Catchment	1		
District Park (3-10ha)	1 per 25,000-50,000 residents		2	2
Local Park (1-4ha)	1 per 3,000-5,000 residents		15	17
Neighbourhood Park	1 per 1,000-2,000 residents	60	41	47
Sporting Open Space (2ha)	2ha per 1,000 residents	37		

Implications for the Hawkesbury Residential Strategy

- _ Centres should provide a level of recreational facilities which meet the needs of the local community.
- _ Future urban development should maximise the use of existing recreation assets.
- _ Open space and recreation facilities provide high amenity to residential areas. Future urban development is to focus on areas with open space and recreational facilities.
- _ Detailed investigations of the level of service, and the appropriateness of facilities for future population is required.

Community Services and Facilities



Community Facilities



Figure 4.14: Hawkesbury Residential Strategy Community Facilities

(Source: Hawkesbury City Council GIS, October 2009)

Community Services and Facilities

4.5 Community Services and facilities

Hawkesbury LGA currently contains a large range of community facilities including community centres, schools and tertiary institutions and facilities for young and older people. These facilities, identified in Figure 4.14, are primarily located in the southern part of the Hawkesbury LGA which aligns with the key population centres where the majority of the Hawkesbury LGA population (94%) live. The remaining 6% of the population live in the more rural and remote parts of the LGA with limited access to facilities and services. It is worth noting that there are numerous mobile community services to cater for the more remote populations.

A high level review of the existing community facility provision has been undertaken against indicative benchmarks, provided in Table 4.7 to determine how the number of the existing community facilities may meet existing and future community needs. The community service review identified that the Hawkesbury LGA currently provides:

- _ 18 Community centres and halls;
- _ 1 community health centre in Windsor; and
- _ 2 Council Libraries (Central Library in Windsor and Branch Library in Richmond)

Youth services in the Hawkesbury LGA include:

- _ 2 mobile youth centres (Colo Wilderness Mobile Resource Unit and Forgotten Valley Mobile Resource Unit);
- _ A youth information service;
- _ A Youth Transport Service; and
- _ Youth centres and services in Glossodia, Bligh Park and North Richmond

Community facilities specifically for older people and people with a disability are provided by both Council and not for profit organisations and include:

- _ 2 respite day centre (Richmond and Windsor);
- _ Support & Resource Centres (Windsor);
- _ Retirement villages; and
- _ Nursing homes;

Hawkesbury LGA contains a variety of education establishments including:

- _ 9 public preschools;
- _ 6 community or Council operated long day care centres;
- _ 18 privately operated long day care centres;
- _ 2 mobile preschools (for remote and more isolated regions of the Hawkesbury);
- _ 35 public primary schools;
- _ 9 other primary schools (independent, religious, private, etc);
- _ 6 public high schools; and
- _ 5 other secondary schools (independent, religious, private, etc).

In addition, Hawkesbury LGA provides:

- _ 1 occasional care centre; and
- _ 5 before and after school facilities.

The LGA also offers a range of tertiary education opportunities including the University of Western Sydney Hawkesbury Campus, Richmond College of TAFE and a regional community college.

Community Services and Facilities

Table 4.6: Community Infrastructure Provision

Infrastructure	Benchmark Service Provision (Indicative Only)	2009 facilities/places /beds	Current Demand 2006	Anticipated Future Demand 2031	Capacity to Meet Future Demand
Community Centre					
Local (Small)	1 facility per 5,000-10,000 residents	19	8	9	✓
Neighbourhood/District (large)	1 facility per 30,000 residents		2	3	✓
Education					
Preschool	1 facility per 5,000-10,000 residents	9	8	9	✓
Primary School (Public)	1 facility per 2,000-2,500 dwellings	35 facility	27 facility	31 facility	✓
Primary School (Private)	1 facility per 20,000 residents	9 facility	3 facility	4 facility	✓
Secondary School (Public)	1 facility per 6,000-7,000 dwellings	6 facility	12 facility	14 facility	X
Secondary School (Private)	1 facility per 35,000 residents	5 facility	2 facility	2 facility	✓
Local TAFE	1 facility per 30,00-50,000 residents	2 facility	2 facility	2 facility	✓
University	1 facility per 220,000	1 facility	0	0	✓
Health					
Public Hospital	2-3 beds per 1,000 residents	-	183 beds	210 beds	X
Private Hospital	1-2 beds per 1,000 residents	127~	122 beds	140 beds	X
Neighbourhood Community Health Centre	1 per 10,000 residents		6	7	
Child Care and Youth					
Long Day Centre	1 place per 10 children aged 0-4 years	24 centres	429 places	459 places	✓
Family Day Care (home base)	1 place per 200 children aged 0-5 years*		22 places	23 places	X
Occasional Care	1 place per 100 children aged 0-5 years*	1 centre	43 places	46 places	✓
Outside of School Hours (OOSH)	1 place per 80 children aged 5-12 years*	5 centres	83 places	89 places	✓
Vacation Care	1 place per 75 children aged 5-12 years*	6 centres	87 places	95 places	✓
Youth Centre	1 facility per 20,000 residents	4 centres	3 centres	4 centres	✓
Aged Care Facilities					
Residential High Care Beds	44 beds per 1,000 residents over 70 years		175 beds	196 beds	X
Residential Low Care Beds	44 beds per 1,000 residents over 70 years		175 beds	196 beds	X
Community Care Spaces	25 beds per 1,000 over 70 years		100 beds	111 beds	X
Libraries					
Branch Library	1 facility per 20,000-30,000	2	2	3	X

~This is a Private Hospital, however, it does have the facilities for Public Health Care.

*Figures not fully consistent with service provision standards due to data availability. Population projection data only available for groups 0-4 years and 5-11 years

Community Services and Facilities

4.5.1_Community Needs Analysis

The future community facility needs for the Hawkesbury LGA in 2031 can in part be determined by a review of the future community and social infrastructure needs against a range of indicative benchmarks. In addition to utilising benchmarks there is a need to undertake consultation with key service providers and the wider community to more accurately determine future community facility needs. Benchmarks have been used as a high level tool to determine a level of service provision to meet population needs. These benchmarks do not identify the level or quality of service provision. The Residential Strategy has relied on these benchmarks purely to ascertain if levels of service provision are being met however further investigations are required to more accurately determine Hawkesbury LGA's community facility needs to 2031.

4.5.2_Service and Infrastructure Requirements

Table 4.7 outlines the current on-ground provision of community facilities in the LGA plus benchmark standards for the provision of community facilities based on the population from the 2006 ABS Census Data (60,921 persons) and a population growth of approximately 9,000 by 2031.

As previously noted, Hawkesbury LGA is anticipated to have a steady incline in population growth. There are substantial shifts in the age structure, with particular growth in older age groups, which will lead to an increase in demand for more specialised types of services such as aged care and support. It is recommended that a more detailed Community Needs Analysis be undertaken and updated every 5 years in line with ABS Census releases and Council's LEP review.

It can be noted from Table 4.7 that currently the on-ground provision of services is generally meeting that required for the current population. Given the steady incline in population growth, it is anticipated that there may be a marginal increase in the demand for the number of facilities and services, however the type and service delivery models is subject to further review, particularly in consideration of key target groups.

4.5.3_Facilities for Older People to 2031

Traditionally the Hawkesbury LGA has accommodated young families and therefore has had limited services for older people or people with a disability. With the ageing population there is a need to ensure that service provision is reviewed and demands are met in a timely manner. Future provision of services for older people needs to ensure that these services are well located in key centres, in proximity to a range of wider transport, commercial and community services and facilities.

4.5.4_Health Facilities to 2031

Hawkesbury LGA currently contains a private hospital which provides 127 beds (Hawkesbury District Health Service), and provides public health services with the Sydney West Area Health Service. Whilst this analysis does not take into account hospital beds outside of the LGA boundary, based on the benchmark service provision

there is evident an under supply of both public and private hospital beds to meet both the current and future requirements.

4.5.5_Child Care and Youth Facilities to 2031

Hawkesbury LGA has significant numbers of childcare and educational facilities and services, which appear to meet the current levels of demand, as identified in the benchmarks.

There is a wide range of services for young people provided in the Hawkesbury, reflecting the young nature of the population, which also appears to meet current and future needs.

More detailed analysis and research is required to ascertain whether the services currently available are adequately servicing the population. Analysis would also need to consider the appropriateness of the location of services and facilities based on where future growth and development may occur, such as that in Vineyard, associated with the North West Growth Centre area.

4.5.6_Libraries to 2031

There are currently 2 libraries provided in the LGA as illustrated in Table 4.7. Based on the benchmark provision of 1 per 20,000-30,000 residents, there is a potential demand for 2 libraries in 2006, and 3 libraries for 2031 (one additional library).

4.5.7_Social Considerations

Key social trends currently influencing the Hawkesbury population include:

- _ An ageing population;
- _ Declining household size with increasing lone person households; and
- _ Loss of young people.

Overall, the Hawkesbury LGA appears to rate well against the community facility benchmarks, however the current provision of community services and facilities have been based on past demands and needs. The Hawkesbury Residential Strategy provides an opportunity to identify future population trends, needs and locations to better plan for future community facility provision.

Implications for the Hawkesbury Residential Strategy

- _ As the focus of community facilities in the Hawkesbury is in the southern parts of the LGA future urban development should focus where there is a strong provision of community facilities.
- _ Future provision of all community facilities is to be encouraged to locate in town centres, villages, small villages and neighbourhood centres.
- _ Community facilities and services should be accessible by all residents of the LGA in future urban development.

Community Services and Facilities

- _ Community service planning needs to review population growth and encourage collocation of services and facilities in key centres of the LGA.
- _ The ageing of the population may result in increased demand on services for older people and people with a disability.
- _ Education and childcare facilities are to be accessible to all residents of the LGA in future urban development, particularly in areas with families with children.

Utilities Infrastructure

4.6 Utilities Infrastructure

4.6.1 Sewerage

Providing adequate sewerage is one of the main issues in terms of infrastructure for Hawkesbury LGA. Reticulated sewerage is currently available to the following areas: North Richmond, Richmond, Windsor, South Windsor and Bligh Park, McGraths Hill, Windsor Downs and Pitt Town.

Treatment plants are located at North Richmond, Richmond (both of which are operated by Sydney Water) South Windsor and McGraths Hill (owned and operated by Hawkesbury City Council).

There is also treatment plants located at Blaxlands Ridge servicing pump out facilities in rural areas during flood emergencies, RAAF base at Richmond, and small local plants at Wilberforce and Scheyville.

Currently there are three common systems of sewage treatment, storage and disposal being used in the three towns area.

- Septic tank plus on-site soil absorption.
- Septic tank and road tanker pump-out.
- Aeration plus on-site irrigation.

4.6.2 Electricity

Integral Energy serves all of the Hawkesbury area and connections to residential properties are carried out on application. It is noted that some outer lying rural areas of Hawkesbury LGA may have no lines or have very old lines which may need additional supply.

Solar power has been an option for houses in the LGA where it has been too expensive to connect to the power grid such as at Kurrajong Hills.

4.6.3 Telecommunications

Telstra has provided network modernisation for most of Hawkesbury City Council area and the (0245) area has recently been digitised. In addition to local and international calls, a variety of additional telecommunication services are available. Some of the on-line facilities are not yet available to all areas, but Telstra is systematically providing them on request.

Implications for the Hawkesbury Residential Strategy

- Investigations are required to determine the ability of all existing utilities infrastructure.
- Investigations are required to determine the capacity of infrastructure to meet the needs of future urban development.
- Infrastructure to meet the capacity of new urban growth.
- Sewage options should be explored for future dwelling demand.
- Urban development in town centres to be limited to areas serviced by reticulated sewerage.
- Urban development in villages, small villages and neighbourhood centres where no reticulated sewer system is available to be limited to areas capable for onsite disposal.
- Major infrastructure and evacuation route upgrades to be considered for further growth.

Utilities Infrastructure

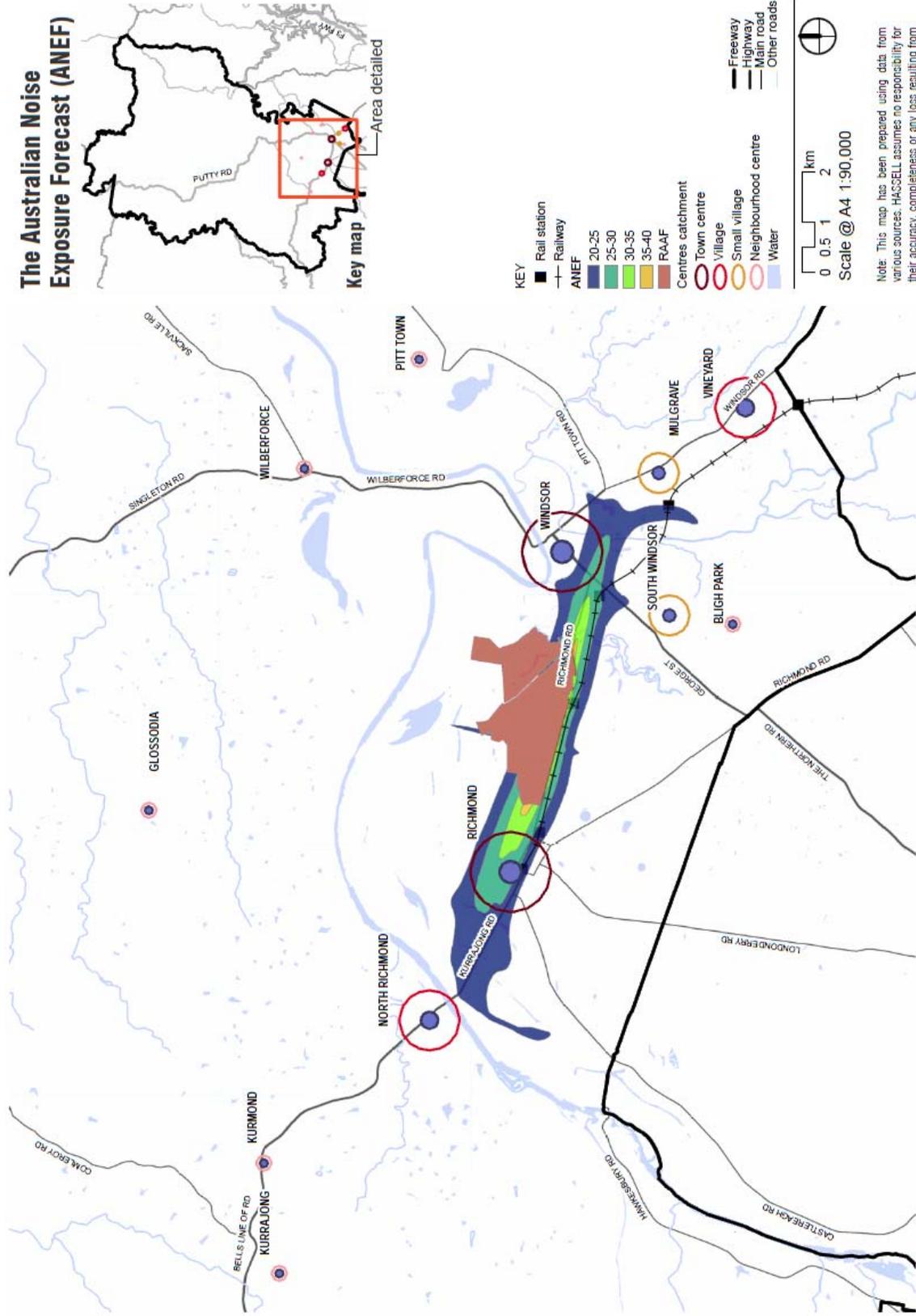


Figure 4.15: Hawkesbury Residential Strategy ANEF

(Source: Hawkesbury City Council GIS, October 2009)

Utilities Infrastructure

4.6.4_Noise exposure

The RAAF Base at Richmond is a vital and integral part of the Hawkesbury LGA in terms of its social and economic contributions to the area. This area has therefore been excluded from consideration for future urban development. The noise generated by aircraft associated with the RAAF also restricts development in the surrounding areas due to excessive noise exposure.

Table 4.7: ANEF Classifications

Building Type	ANEF zone of site		
	Acceptable	Conditional	Unacceptable
House, home unit, flat, caravan park	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF
Hotel, motel, hostel	Less than 25 ANEF	25-30 ANEF	Greater than 30 ANEF
School, university	Less than 20 ANEF	20-25 ANEF	Greater than 25 ANEF
Hospital, nursing home	Less than 20 ANEF	20-25 ANEF	Greater than 25 ANEF
Public building	Less than 20 ANEF	20-30 ANEF	Greater than 30 ANEF
Commercial building	Less than 25 ANEF	25-35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30-40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

Australian Standard – AS2021+2000 Acoustic Aircraft Noise Intrusion – Building siting and construction

The Australian Standard 2021-2000 gives the above listing for acceptable ANEF levels against development. The table identifies residential development is to be located in a less than 20 ANEF zone.

As Figure 4.15 identifies, the area immediately surrounding Richmond from approximately McGraths Hill to North Richmond is affected by air craft noise exposure forecast (ANEF) ranging from 20-35 and therefore not suitable for future urban development.

Implications for the Hawkesbury Residential Strategy

- Urban development should occur in areas with noise exposure contour less than 20.
- The Australian Standard criteria should be adopted as a measure of appropriate noise zones for future development.
- Development in areas with noise exposure contour between 20-25 will require special noise assessment and mitigation measures.
- Development in area above 25+ANEF is considered unacceptable.

Heritage and Character

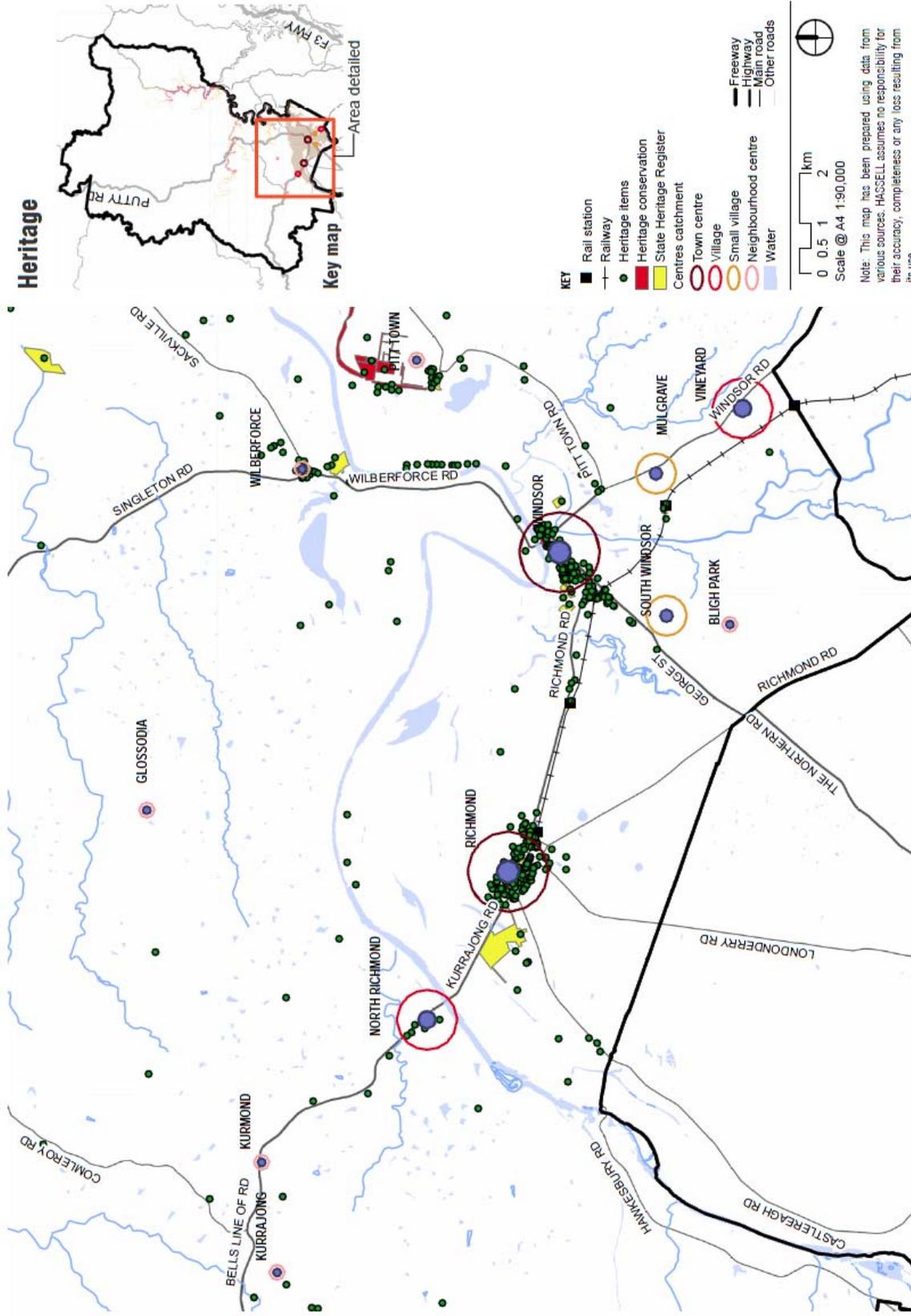


Figure 4.16: Hawkesbury Residential Strategy Heritage (Source: Hawkesbury City Council GIS, October 2009)

Heritage and Character

4.7_Heritage and Character

The Hawkesbury LGA is an area rich with heritage character, with over 500 items being identified as places of local heritage significance. The character of Hawkesbury has been influenced by its indigenous, European and natural heritage. The future character of the Hawkesbury LGA will need to build on these significant and unique elements that will contribute to this character and seek to create high quality urban development in both public spaces and urban design.

4.7.1_Indigenous Heritage

The Darug People comprised the largest group of Aboriginal people in the Sydney region, extending from the Coast to the Blue Mountains. The Darug People of the Hawkesbury, the Marramarr Clan, subsided around the rich and diverse Hawkesbury River, known as the Deerubbin.

The Hawkesbury River played a significant role in the Darug People's day to day subsistence and ceremonies, as such there are:

- _ 193 known indigenous heritage sites; and
- _ 4000 potential sites within the Hawkesbury LGA.

4.7.2_European Heritage

The Hawkesbury was originally explored and settled to provide a food source for the Sydney colony. Cr Rex Stubbs, Mayor of Hawkesbury City Council 2000 and President of The Hawkesbury Historical Society prepared a history of the Hawkesbury (undated), which stated:

Governor Phillip first explored the Hawkesbury River by boat in July 1789 reaching as far as an area now known as Yarramundi Falls at the junction of the Grose and Nepean Rivers. He planted crops on Richmond Hill before returning to Sydney.

Governor Phillip returned to the Hawkesbury by foot in April 1791. He was accompanied by Captain Watkin Tench who recorded in his journal the first meeting in the Hawkesbury between Europeans and the Darug people. The party met and stayed overnight with Gombereee, Yellomundi and Deeimba at Bardenarang Creek. Tench's accounts shows the beginnings of understanding between the two peoples but also just how little was actually known about Aboriginal culture.

Settlement of the Hawkesbury by Europeans first occurred in January 1794 when twenty two families were granted farms on Pitt Town Bottoms, then known as Bardenarang

European settlers first came to the Hawkesbury River in 1788 and shortly after began to establish farms to feed the Sydney colony.

The Hawkesbury LGA is considered to be one of the oldest European settlement areas in Australia. During the latter half of 1810, Governor Macquarie made a tour of the colony surrounding Sydney, taking in the Hawkesbury Nepean Rivers. During this tour Macquarie named the five towns of Richmond, Castlereagh, Pitt Town, Wilberforce and Windsor. With the exception of Castlereagh, these towns are all found within the Hawkesbury LGA.

They are now referred to as the five Macquarie towns and are settlements he laid out on higher ground after serious flooding of the district's plains.

Governor Macquarie had a profound influence on the development and landscape of the City of Hawkesbury. Therefore, the Hawkesbury LGA contains a character that is dominated by the legacy of early colonial times. The heritage significance not only refers to the built form, but also the adjoining farmlands. It is vital that developments in and around the identified Macquarie Towns adhere to development controls (<http://www.hawkesburyhistory.org.au/> accessed 11/09/09)

Figure 4.16 shows that the majority of local heritage items are located within these Macquarie Towns, particularly Richmond and Windsor. State heritage items are located in Wilberforce, Richmond and Windsor.

Being within existing settlements, new development will most likely occur in proximity to heritage items. This should not be seen as a constraint, as heritage items contribute to the character of the area. However, any design near a heritage item should be treated sensitively. Controls are enforced to protect heritage items. New developments should be designed to minimise visual impact on the surrounding heritage.

Hawkesbury City Council has identified the following European heritage items situated within the LGA:

- _ 530 Local Sites;
- _ 44 State Sites;
- _ 139 on register of the National Estate; and
- _ 1 listed place on Commonwealth heritage list.

4.7.3_Natural Heritage

As identified in Section 4.1.1, the Blue Mountains World Heritage Area provides a significant natural heritage resource to the Hawkesbury LGA.

Rural lands within the subregion also attract visitors and tourists to the areas. A farm gate trail through Hornsby, Baulkham Hills and Hawkesbury LGA is promoted by

Heritage and Character

Hawkesbury Harvest, a community based organisation established to promote rural industries in the Hawkesbury LGA.

The rural character of Hawkesbury is seen as attractive to visitors and the local community. Best practice guidelines and performance standards have been implemented to protect the rural character of the area.

Implications for the Hawkesbury Residential Strategy

- _ Design proximate to heritage items should be treated sensitively in new development.
- _ Urban development in close proximity to heritage items should be assessed for its impact on the heritage environment.

Sustainable Development

4.8_Sustainable Development

Hawkesbury City Council is committed to sustainable development and has key aims to minimise the environmental footprint of future development, protecting and enhancing biodiversity, and ensuring future development is sustainable (*Hawkesbury Community Strategic Plan 2010-2030*). The Residential Strategy is central to achieving these aims, as outlined below.

4.8.1_Enhance Biodiversity

Sustainable development should protect existing flora and fauna assets and minimise new development within existing environmentally sensitive areas. The Sydney Metropolitan Strategy 2005 has adopted a consolidated form for future urban growth, which promotes locating additional growth within existing urban areas. This therefore minimises new development in natural and conservation areas.

4.8.2_Preserve High Quality Agricultural Land

The Draft Hawkesbury City Residential Strategy 1997 identified the need to preserve prime agricultural land from urban development. Agricultural lands are also a key part of the local and regional economy (Draft North West Subregional Strategy). The State Government policy direction of containment of urban growth assists in preserving agricultural land and is upheld by this Strategy.

4.8.3_Environmentally Responsive Design

The Hawkesbury Community Strategic Plan recognises that existing character of the LGA must be preserved by ensuring future development responds to the unique environmental landscape setting of the LGA. It recognises that residents of Hawkesbury LGA have a close relationship with the natural environment and the standard of living in Hawkesbury is benefited by the amenity and healthy lifestyle aspects of living within such a landscape. As such, it is important that the natural aspects of the LGA are preserved and impact on the environment as a whole is minimised, by ensuring future development is environmentally responsive and based on principles of sustainable design.

Improved housing design can also significantly reduce the amount of water and energy consumed by households. Dwelling design can reduce the demand for energy sources through appropriate design and use of alternate energy sources such as solar power. Demand for water can also be reduced through use of rainwater tanks and systems, on site detention and recycling as well as household appliances and fixtures which reduce usage of water.

4.8.4_Urban Design Principles for Future Dwellings

All new dwellings within NSW are required by BASIX to meet a minimum criterion for sustainable design. However, there is an opportunity to encourage dwelling controls in Hawkesbury LGA that go beyond the requirements of BASIX to provide the highest standards of environmentally sustainable design whilst being mindful of cost implications and impacts on housing affordability. Therefore, a higher level than BASIX is strongly encouraged.

Dwelling types have been developed for the Hawkesbury Residential Strategy that are responsive to the environmental and landscape context, demonstrate environmental design principles and reflect the types of housing required to accommodate households in Hawkesbury as identified by the Population and Housing Needs analysis in Chapter 3. The typologies are outlined on the following pages.

Sustainable Development

4.8.5_Urban Design Principles for Rural Residential Lots

Rural residential dwellings have historically been a popular housing option within Hawkesbury LGA. However, rural residential dwellings also utilise large amounts of land and promote a sprawled urban form. Rural residential dwellings also have additional costs with providing services and infrastructure to remote areas. Whilst this Strategy acknowledges rural residential dwellings are a part of the Hawkesbury residential fabric, rural residential dwellings will play a lesser role in accommodating the future population.

Key principles for Rural Residential Lots:

- _ Dwelling should be designed and located on the lot to maximise solar access into living areas of dwelling;
- _ Dwellings should be sited in a manner which preserves existing trees and bushland areas;
- _ Dwellings should be design to respond to the natural topography and reduce the overall amount of disturbance to the site;
- _ Building materials should be responsive to the local microclimate;
- _ Pitched roofs, skillion roofs and eaves should be incorporated to contribute to passive heating and cooling of the dwelling;
- _ Each lot should be independently serviced for energy, water and sewage;
- _ Use of water tanks should be considered;
- _ Rural residential lots should be located on the fringe of centres or existing urban areas; and
- _ Rural residential lots should not be located in areas with high risk to bushfire or flooding.

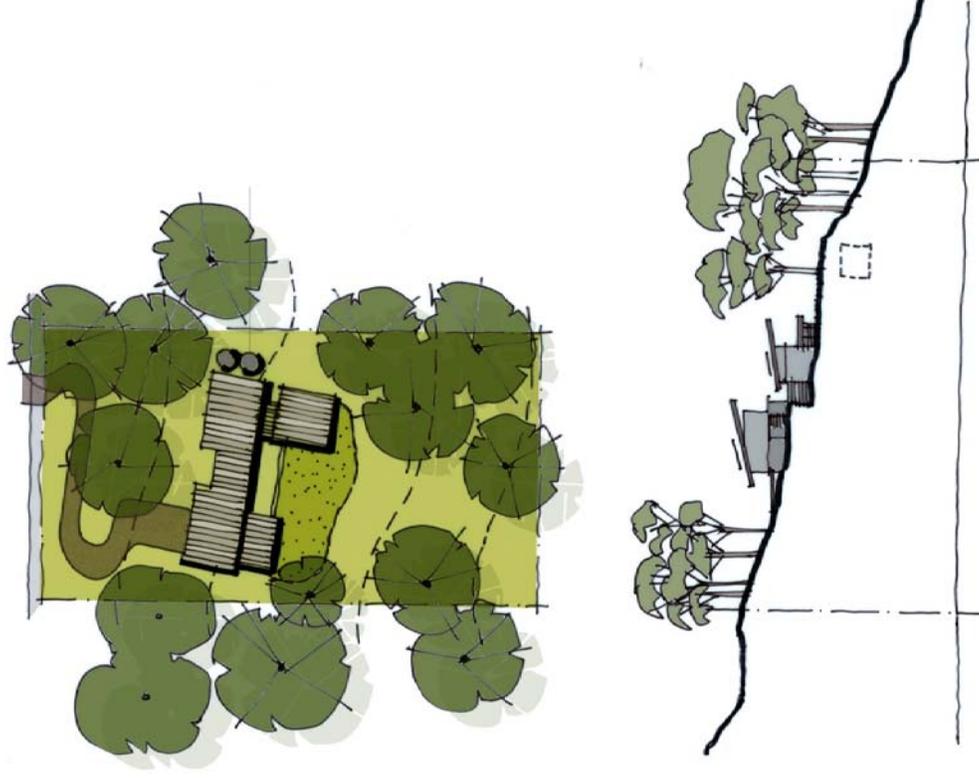


Figure 4.16 Layout of Rural Residential Dwelling responding to topography and slope
Source: HASSELL 2009

Sustainable Development

4.8.6_Urban Design Principles for Low Density Dwellings

The majority of dwelling stock within Hawkesbury LGA is low density, detached dwellings. There is an opportunity to improve both design and sustainability outcomes for future low density dwellings.

Key principles for low density dwellings:

- _ Dwelling should be sited to provide good access to the northern sun and to allow for passive heating and cooling for the main living areas, as shown in Figure 4.17;
- _ Ensure passive solar gains to the rooms which are the most used, such as living areas;
- _ Bedrooms should be located on the side of the building which receives little sunlight;
- _ Layout to allow all breezes to pass through the dwelling and ventilate the main living areas;
- _ Utility, service areas and garages can be located on the western side of a dwelling to act as a buffer to the afternoon sun;
- _ Open space should be located on the north or northeastern elevations to maximise solar access to the dwelling;
- _ Minimise site coverage to allow stormwater to infiltrate naturally into the ground and reduce increased overflow;
- _ Dwellings should be designed to respond to the natural topography and reduce the overall amount of disturbance to the site;
- _ Building materials should be responsive to the local microclimate; and
- _ Pitched roofs, skillion roofs and eaves should be incorporated to contribute to passive heating and cooling of the dwelling.
- _ Subdivision controls should encourage/require lot design/layouts that provide that allotment layout that will facilitate more sustainable dwelling design/siting.

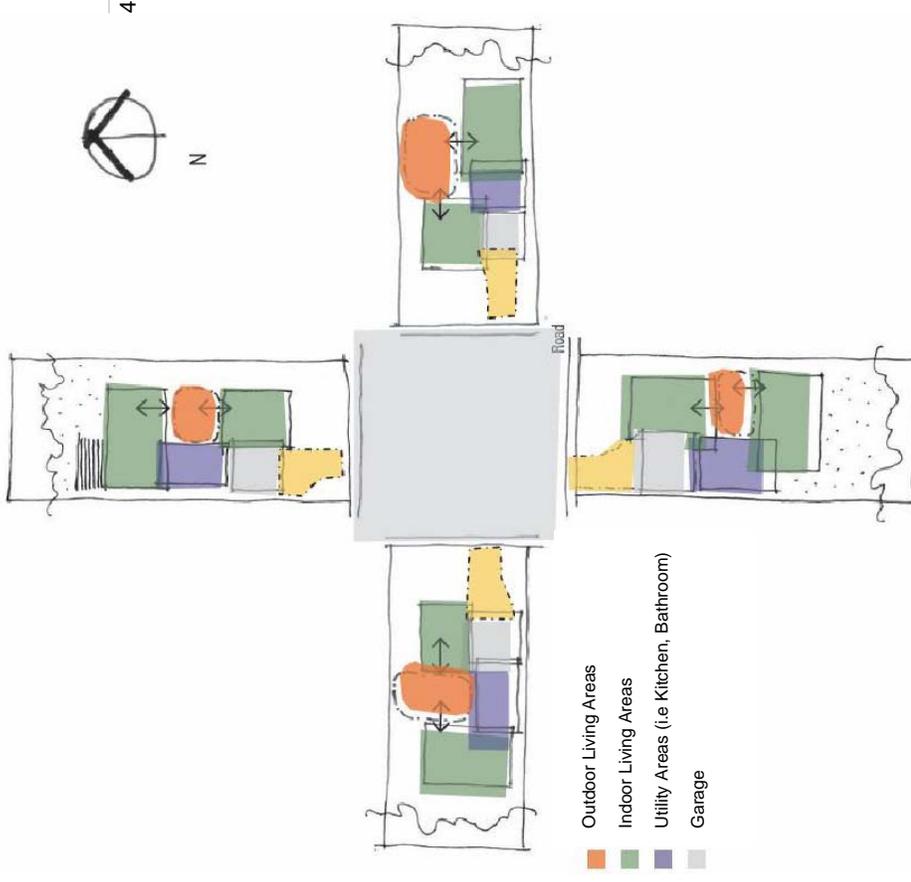


Figure 4.17 Dwelling Layouts for Solar Access
Source: HASSELL 2009

Sustainable Development

4.8.7_Urban Design Principles for Medium Density Dwellings

Medium density dwellings are playing an ever increasing role in the urban areas of the Hawkesbury LGA. They provide an important smaller housing format suited to the increasing number of smaller households such as couples without children and lone person households. Medium density dwellings should also provide housing options for older people and therefore it is important that they are designed to be accessible and a single level.

Key principles for medium density dwellings:

- _ Dwellings should be arranged on the lot to maximise solar access to main living areas of dwellings;
- _ Open space should be located on the north or northeastern elevations to maximise solar access to the dwelling;
- _ Dwellings should be designed to minimise overshadowing and loss of privacy to neighbouring dwellings;
- _ Setbacks and heights of medium density dwellings should respect existing patterns within the street;
- _ 'Gun barrel' driveways should be avoided where possible;
- _ Integrate garages, parking and access into the overall building design;
- _ Utilise CPTED (Crime Prevention Through Environmental Design) Principles for all communal areas;
- _ Ensure all dwellings implement principles of Accessible Design;
- _ Minimise site coverage to allow stormwater to infiltrate naturally into the ground and reduce increased overflow;
- _ Dwellings should be designed to respond to the natural topography and reduce the overall amount of disturbance to the site;
- _ Building materials should be responsive to the local microclimate; and
- _ Pitched roofs, skillion roofs and eaves should be incorporated to contribute to passive heating and cooling of the dwelling.

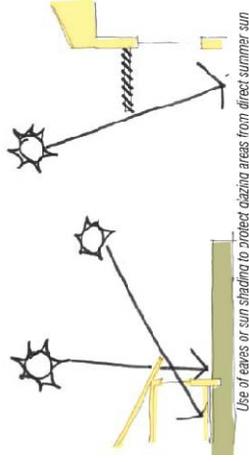


Figure 4.18 Dwelling Layouts for Solar Access

4.8.8_Urban Design Principles for High Density Dwellings

High Density Dwellings provide an important housing choice for smaller households and low-maintenance dwellings. However, the location and design of high density dwellings must respect the existing rural character of the Hawkesbury LGA. It is considered that there is limited demand for such dwellings and that they should generally be 3-6 storeys, in keeping with the surrounding urban character.

Key principles for high density dwellings:

- _ Buildings should be designed and located on the lot to maximise solar access into living areas of dwellings;
- _ Ensure the building fronts and addresses the street;
- _ Building should be highly articulated and have a defined base, middle and top sections;
- _ Heights and setbacks of high density dwellings should respect existing patterns within the street;
- _ Building should be designed to minimise overshadowing and loss of privacy to neighbouring dwellings;
- _ All high density dwellings to be constructed in accordance with SEPP 65;
- _ Provide a mix of dwelling sizes within a single building to provide housing choice.
- _ Utilise CPTED Crime Prevention Through Environmental Design) principles for all communal areas;
- _ Ensure all dwellings implement principles of Accessible Design;
- _ Minimise site coverage to allow stormwater to infiltrate naturally into the ground and reduce increased overflow;
- _ Dwellings should be designed to respond to the natural topography and reduce the overall amount of disturbance to the site;
- _ Building materials should be responsive to the local microclimate; and
- _ Pitched roofs, skillion roofs and eaves should be incorporated to contribute to passive heating and cooling of the dwelling.

Summary of Key Issues

4.9_Summary of Key Issues

The following provides a summary of background research and mapping of the key issues influencing the future sustainable development of housing in Hawkesbury LGA and their implications (constraints and opportunities) on the Residential Strategy.

4.9.1_Natural Environment Biodiversity and vegetation

Two thirds of the LGA is located in National Parks providing a total of approximately 1,930 square kilometres. These comprise a range of vegetation communities that contribute to the biodiversity in the LGA and are therefore not suitable for urban development. Future urban development should occur in areas where there are limited impacts on significant vegetation communities away, from national parks and State Conservation Areas.

Flooding

The Hawkesbury LGA is dominated by several river systems with the majority of the urban area of Hawkesbury LGA prone to at least 1:100 year flooding. Flooding is prevalent in areas around the North Richmond, Richmond, Windsor, Wilberforce and Pitt Town areas. Future urban development must avoid high risk flood prone areas and appropriate construction methods must be used. Development must also be mindful of increasing potential for flooding as a result of climate change.

Bushfire

Hawkesbury LGA contains significant areas of bushland which are prone to bushfire. The vast majority of the LGA is categorised as vegetation Category 1 - High Risk except for the urban areas which have been cleared of classified vegetation. Further investigation should be carried out on areas identified before urban development can occur.

Terrain

Hawkesbury LGA is influenced by the Blue Mountains and Great Dividing Range to the north west as well as some of Sydney's significant river systems. As a result, the topography varies widely from slopes of less than 1:20 (5% slope), increasing to 1:8 (12.5% slope). Future urban development must occur in areas with a slope of less than 15% (1:6.5) and must address slope stability and soil erosion.

Acid Sulphate Soils

Due to the extensive river system found throughout the LGA, acid sulphate soils are common and can be a constraint to development. There is significant amount of land identified as containing Class 5 acid sulphate soils with Class 4 found along the rivers

and creeks. Class 3 acid sulphate soils are found in small isolated areas in the urban areas. Future urban development should be cognisant of acid sulphate soil classifications.

Wetlands

There are a number of wetlands within the Hawkesbury LGA including important and productive plant communities and bird habitats and therefore future urban development in wetland areas should be avoided. Hawkesbury City Council are to identify priority areas for management.

Agriculture and Rural Land

Hawkesbury LGA has an extensive amount of agricultural land which should be protected to maintain a significant economic resource. Future urban development on prime agricultural land should be restricted with any property clearly assessed in detail, with conflicts between urban development in rural and agricultural areas avoided. Agriculture in The Hawkesbury is already a significant economic contributor and will be increasingly important and in demand as transport costs rise.

4.9.2_Centres and Employment

Hawkesbury LGA contains a range of centres that service the LGA. The major centres of Richmond and Windsor are the primary retail and commercial centres with the village of North Richmond and small villages of South Windsor and Mulgrave located just outside these main centres. The established centres hierarchy defined in the Sydney Metropolitan Strategy is supported and future urban development should be located within existing or proposed centres.

Employment within the LGA is focussed on key sectors such as education, defence, industrial, agricultural and pastoral and commercial and retail within the key centres. Future urban development is to locate within existing or proposed centres to maximise collocation with employment sectors within the LGA.

4.9.3_Transport

Due to limited connectivity of public transport services, there is significant reliance on the private motor car for transport. Key roads providing access to Hawkesbury LGA include Windsor Road and Richmond Road. However, the LGA is located on the Western Railway Line to Richmond and is within easy commuter distance to employment nodes. Regular and reliable bus services should also be in place to key destinations and further transport links.

Adequate road networks with links to key centres and services and facilities is also important for future development.

Summary of Key Issues

4.9.4_Open space and recreation

Hawkesbury has a number of natural and formal recreation facilities. The majority of these are located in urban areas surrounding existing centres such as Windsor and Richmond. Future urban development should focus on areas with open space and recreational facilities and centres should provide a level of recreational facilities, which meet the needs of the local community.

4.9.5_Community services and facilities

Hawkesbury LGA currently contains a large range of community facilities including community centres, schools and tertiary institutions and facilities for young people and older people primarily located in the southern part of the LGA. Currently the LGA rates well against general community facility benchmarks but future provision of all community facilities is to be encouraged to locate in town centres, villages, small villages and neighbourhood centres.

4.9.6_Utilities infrastructure

Providing adequate sewerage is one of the main issues in terms of infrastructure for Hawkesbury LGA. Reticulated sewerage is currently available in North Richmond, Richmond, Windsor, South Windsor and Bligh Park, McGraths Hill, Windsor Downs and Pitt Town. Integral Energy serves all of the Hawkesbury area, however some outer lying rural areas of Hawkesbury LGA may have no electricity lines or have very old lines which may need additional supply. Telstra has provided network modernisation for most of LGA and has recently been digitised

Further investigations are required to determine the ability of all existing utilities infrastructure for future development. Infrastructure to meet the capacity of new urban growth is required with sewage options explored for future dwelling demand.

4.9.7_Noise exposure

Aircraft associated with the RAAF generates noise which restricts development in the surrounding areas due to excessive noise exposure. Areas immediately surrounding Richmond from approximately McGraths Hill to North Richmond are affected by aircraft noise exposure forecast (ANEF) ranging from 20-35 and therefore development not occur.

4.9.8_Heritage and character

The Hawkesbury LGA is an area rich with character, with over 500 items having been identified as places of local heritage significance and 55 as state significant. Urban development in close proximity to heritage items should be assessed for its impact on the heritage environment with the Urban design of the heritage item treated sensitively

4.9.9_Sustainable Development

Hawkesbury City Council is committed to sustainable development and has key aims to minimise the environmental footprint of future development and this can be done through enhancing biodiversity, preserving high quality agricultural land, providing an environmentally responsive design and urban design principles for future dwellings

Dwelling typologies for urban design principles for low density dwellings, medium density dwellings, high density dwellings and rural residential lots have been developed that reflect the responsive to the environmental and landscape context and demonstrate environmental design principles.

5.1 Introduction

The Key Issues Analysis (Chapter 4) showed that land within Hawkesbury LGA is constrained by a range of factors including conservation areas, bushfire prone land, flooding and lack of infrastructure. The area is also recognised for its high amenity rural and natural setting.

With these constraints and the State Government's direction to provide for more sustainable and consolidated models of urban growth, the Hawkesbury Residential Strategy uses the Sustainable Development Framework to ensure future dwellings are located in close proximity to centres, transport, services and facilities. As identified by the Hawkesbury Residential Dwelling Model (Figure 3.2), 70% of additional dwellings (4,200 dwellings) will be located in existing urban areas where they can access such services and facilities. Only 30% of future development will be located on Greenfield sites preferably located within or adjacent to existing centres.

The Constraints Severity Index (CSI Index) has been used to assist with the identification of future development sites. CSI brings together the different layers of key issue analysis to build a picture of development constraints and opportunities across the LGA. This analysis identifies locations that are not suitable for development, thereby identifying sites that could be further investigated for the possibility to locate the 6,000 dwellings. The analysis reviews both infill and Greenfield opportunities.

It is noted that this is a high-level modelling exercise and is a guide to assist Council in undertaking more site specific detailed investigations and studies. The modelling is based on the data available and using criteria and weightings developed in consultation with Council Officers.

5.2 Constraints Severity Index (CSI)

The concept behind the Constraints Severity Index works on the understanding that environmentally or otherwise constrained land should generally not be used for urban development. The Constraints Severity Index is a GIS tool which can identify locations which are constrained by a range of factors and therefore may not be suitable for urban development.

The Constraints Severity Index works by analysing a series of constraints indicators, it also takes into account opportunity indicators that may support development, it then evaluates the level of constraint in the study area. The locations with lower constraint are given positive values and are earmarked for further investigations.

The tool overlays a weighted index of opportunities and constraints to estimate locations which could be investigated for future urban development:

Opportunities

Opportunities include elements such as:

- _ Proximity to centres
 - _ Availability of services and facilities (ie commercial, retail and community)
 - _ Availability of existing or planned key infrastructure (ie road, transport and sewer)
- Opportunities including their sub-categories have been weighted from +5 being the greatest opportunity to +1 being the least opportunity. Opportunities investigation areas are identified in green tones.

Constraints

Constraints predominately relate to environmental constraints including:

- _ Flooding
- _ Acid sulphate soils
- _ Bushfire prone land and buffers
- _ Significant vegetation communities
- _ Slope
- _ Riparian zones and buffers

Constraints also include impacts associated with existing uses such as Richmond Air Base, heritage items as well as lack of infrastructure.

Constraints, including their sub-categories have been weighted from -5 being the most constrained to -1 being least constrained. Constraints are identified in red tones.

The final part of the assessment overlays the opportunity and constraints mapping into a single map that will show areas with potential for future development.

Table 5.1 outlines the opportunity and constraint indicators that were used for this assessment. The assessment has been limited to available data.

5.2.1_Process

The following process was used to determine the severity of each constraint and opportunity:

1. Identify indicators (including sub-categories) with available spatial data.
2. Assign weighting to each indicator including sub-categories, if any. Opportunities are given a positive value (0 to 5) and constraints are given a negative value (0 to -5).
3. Divide the LGA into a grid of uniformly sized square cells to standardise the spatial unit of analysis. The cells within the grid measure 400m by 400m.
4. Each indicator data set is analysed to identify how much of the criterion measured (by that indicator) falls within each cell. Since the units of indicators vary depending on what is being measured, they are all standardised against the maximum value in any cell on a scale of 0 to 100. This process is repeated for each opportunity and constraint indicator data set.
5. These standardised indicator values are aggregated into a single dataset after taking into account their assigned weights. This provides a picture of the opportunities and constraints combined together.
6. The final output weighs the 'severity' or combined impact of the opportunity or constraint indicators in each grid cell, to identify whether the combined impacts are high or low.
7. A high (positive) index value indicates higher potential, and a low (negative) index value indicates low or no potential for additional residential development. Therefore, cells with higher index values are identified for further investigation for their suitability to accommodate future development.

5.2.2_Calculations

CSI can be calculated as sum of all indicators multiplied by their respective weightings, divided by the respective maximum values and converted to percent, by multiplying the resulting value with 100.

Mathematically it can be represented as:

$$CSI = \sum_{i=1}^{i=n} I_i * \frac{W_i}{I_{max}} * 100$$

Where

CSI= Constraint Severity Index

I_i= ith indicator value (area of land occupied in a cell by the criterion or number of items in a cell)

n= total number of indicators

W_i= weighting of the ith indicator

I_{max}= highest values of the indicator in any cell of the grid

5.3_Opportunity and Constraint Indicators

Table 5.1 outlines the indicators and data used to develop the Opportunity and Constraints severity mapping.

Table 5.1 Opportunity and Constraints Indicators

	Subcategory	Source	Unit	Type	Weighting
CONSTRAINT MAPPING					
Flood prone land	1:100	Council GIS	sqm	Constraint	-5
	Other	Council GS	sqm	Constraint	-3
Bushfire prone land	Vegetation Groups 1	Council GIS	sqm	Constraint	-4
	Vegetation Group 2	Council GIS	sqm	Constraint	-3
	Buffer	Council GIS	sqm	Constraint	-2
ANEF	RAAF	Council GIS	sqm	Constraint	-4
	>20	Council GIS	sqm	Constraint	-4
Acid Sulphate Soils	Class 1&2	Council GIS	sqm	Constraint	-4
	Class 3,4&5	Council GIS	sqm	Constraint	-2
Slope	>15 degrees	Council GIS	sqm	Constraint	-4
	W_C1, C2, C3, C4 (Priority Order 1)	Council GIS	sqm	Constraint	-5
Vegetation/Ecology	URT, O1,O2,O3 (Priority Order 2)	Council GIS	sqm	Constraint	-4
	S1, S2 (Priority Order 3)	Council GIS	sqm	Constraint	-3
	100m buffer along creeks/waterways	HASSELL	sqm	Constraint	-4
Riparian Heritage	State and Local Heritage Items	Council GIS	Item	Constraint	-2
Lack of sewer		Council GIS	sqm	Constraint	-4
OPPORTUNITY MAPPING					
Centre catchment	Town centre	HASSELL	800m buffer	Opportunity	5
	Village	HASSELL	600m buffer	Opportunity	5
	Small Village	HASSELL	400m buffer	Opportunity	5
	Neighbourhood Centre	HASSELL	150m buffer	Opportunity	5
Residential zone		Council GIS	Zone area	Opportunity	5
	Business zone	Council GIS	Zone area	Opportunity	2
Access	Rail Station	Council GIS	1km buffer	Opportunity	5
	Bus Route	Council GIS	400m buffer	Opportunity	4
Local open space	Roads	Council GIS	metres	Opportunity	5
		Council GIS	400m buffer	Opportunity	4
Recreational facilities		Council GIS	400m buffer	Opportunity	4
Community facilities		Council GIS	400m buffer	Opportunity	4
Heritage		Council GIS	Item	Opportunity	2
Sewer		Council GIS	sqm	Opportunity	5

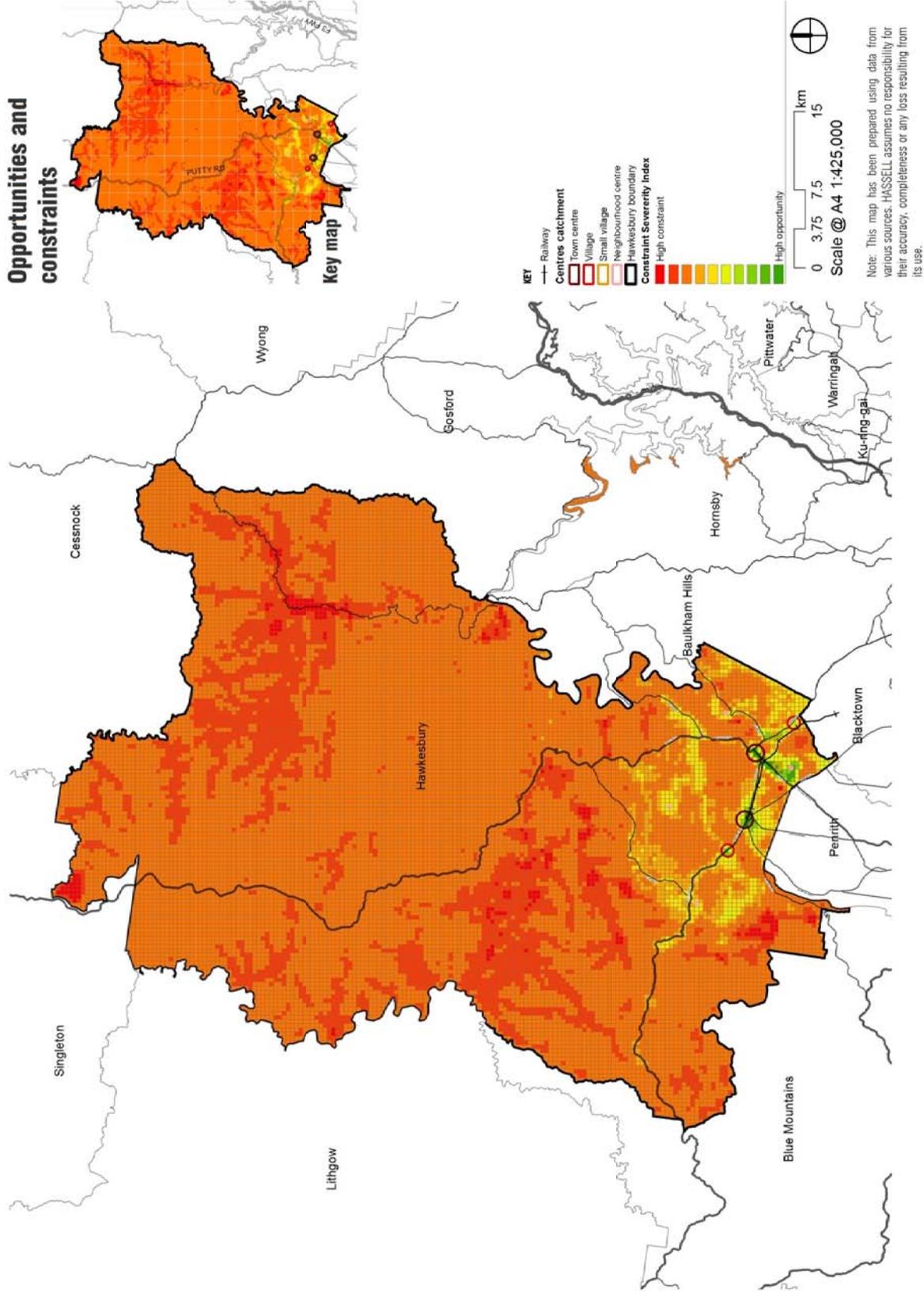


Figure 5.1: Opportunity and Constraints Analysis, Hawkesbury LGA
Source: HASSELL (October, 2009)

5.4_LGA Wide Opportunities and Constraints

Figure 5.1 illustrates the opportunity and constraints severity index for the Hawkesbury LGA. The key findings of this analysis are as follows:

- _The majority of the LGA is classified as 'high constraint' showing the area contains significant implications to future urban development. Future urban development should not be considered in these areas without detailed investigation and analysis of the identified constraints.
- _It is important to note that the Opportunity and Constraints Analysis is a tool to identify areas for future investigation. As it measures opportunities and constraints at a high level, local level investigations may identify other areas appropriate for urban development.
- _The south-eastern part of the LGA has more potential for future urban development with some areas of 'high opportunity', particularly around the centres of Richmond, North Richmond, Windsor and the corridor between Windsor and Bligh Park.
- _Some areas within the south-eastern part of the LGA are "neutral" for future development (shaded yellow/gold) these areas have some constraints but do not contain many of the factors which are considered important to support future urban development such as transport infrastructure and facilities for example. These areas may require investigation and subject to provision of services and elements in Sustainability Index may be suitable for urban development.
- _In general, the Opportunity and Constraints Severity Index analysis for Hawkesbury LGA supports the principles of the Sustainable Development Framework for the LGA, by indicating that centres contain the most opportunity to support additional development.

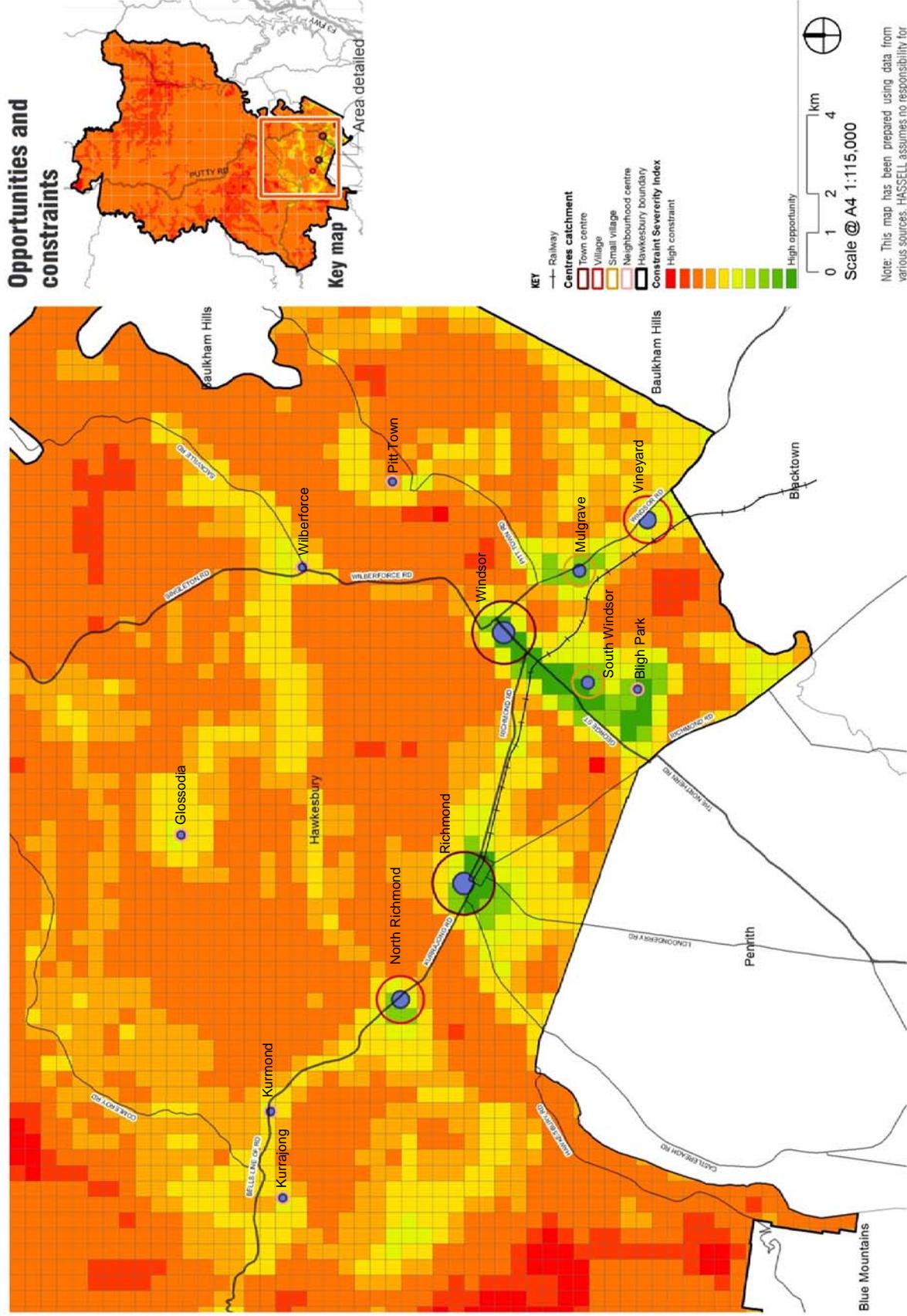


Figure 5.2: Opportunity and Constraints Analysis, Hawkesbury LGA Southern Areas
 Source: HASSELL (October, 2009)

5.5 Southern Areas Opportunities and Constraints

Figure 5.2 is a detail of the opportunity and constraints analysis for the south-eastern areas of the LGA, which is currently the focus of residential development.

The key findings of this analysis is as follows:

- _ The areas with the greatest potential for future development generally align with the location and catchment of the existing centres. Richmond, North Richmond, Windsor, South Windsor and Mulgrave have areas with high opportunity for development.
- _ There is a corridor of high urban development potential between Windsor and Bligh Park. Which may require further investigations to determine extent and capacity of services and facilities.
- _ While there is potential for future urban development in some of the existing smaller centres such as Clarendon, Vineyard, Glossodia, Kurrajong, Wilberforce and Pitt Town. Some of these centres are constrained and others may be lacking the services and facilities to support future growth, particularly sewer services. Investigation into current extent and capacity of services and facilities may identify long term opportunity for these centres.

5.6 Future Investigation Areas

The CSI mapping has identified areas with high opportunity for future development that should be further investigated to determine the area's ability to support additional or new housing development. Future investigation areas have been identified from high level data, which has considered:

- _ Areas with high opportunity for future development
- _ Aerial photos to determine on-ground capacity

Existing centres were the focus of the analysis as the opportunity and constraints analysis identified most opportunity lay in areas within or adjacent to centres. This Residential Strategy implements a centres based strategy and seeks to locate 70% of future growth within existing areas in accordance with the Sydney Metropolitan Strategy. The analysis has reviewed areas within existing centre catchments to identify future investigation areas.

This analysis will also assist Council in locating a small proportion of development (30% of future development) within and adjacent to existing urban areas.

Based on the outcomes of the opportunity and constraints analysis the following areas were the focus of this review:

- _ Richmond
- _ North Richmond
- _ Windsor
- _ Wilberforce
- _ Glossodia

Investigations in Glossodia may need to consider a reduction in extension of residential zone amending some of this zoned land to include large lot residential in recognition of environmental and servicing constraints.

The remaining centres identified in the Residential Strategy that have not been investigated subject to investigation, are considered to be subject to unacceptable impacts for future development in the short-long term. These areas are as follows:

Vineyard - The future planning will be subject to the North West Growth Centre.

Pitt Town- The future development has previously been addressed by the Department of Planning in 2008 as part of a Part 3A Concept Approval, which is considered to supply Pitt Town with an adequate supply of zoned residential land for the duration of the Residential Strategy. Pitt Town has longer term development potential in zoned areas.

Clarendon- Clarendon has been identified in the Employment Land Strategy 2008 for commercial and industrial use. Clarendon also has significant constraints to development such as flooding and inadequate road infrastructure.

Mulgrave/McGraths Hill- This area has been removed from the investigation areas as it is subject to unacceptable flooding and evacuation impact.

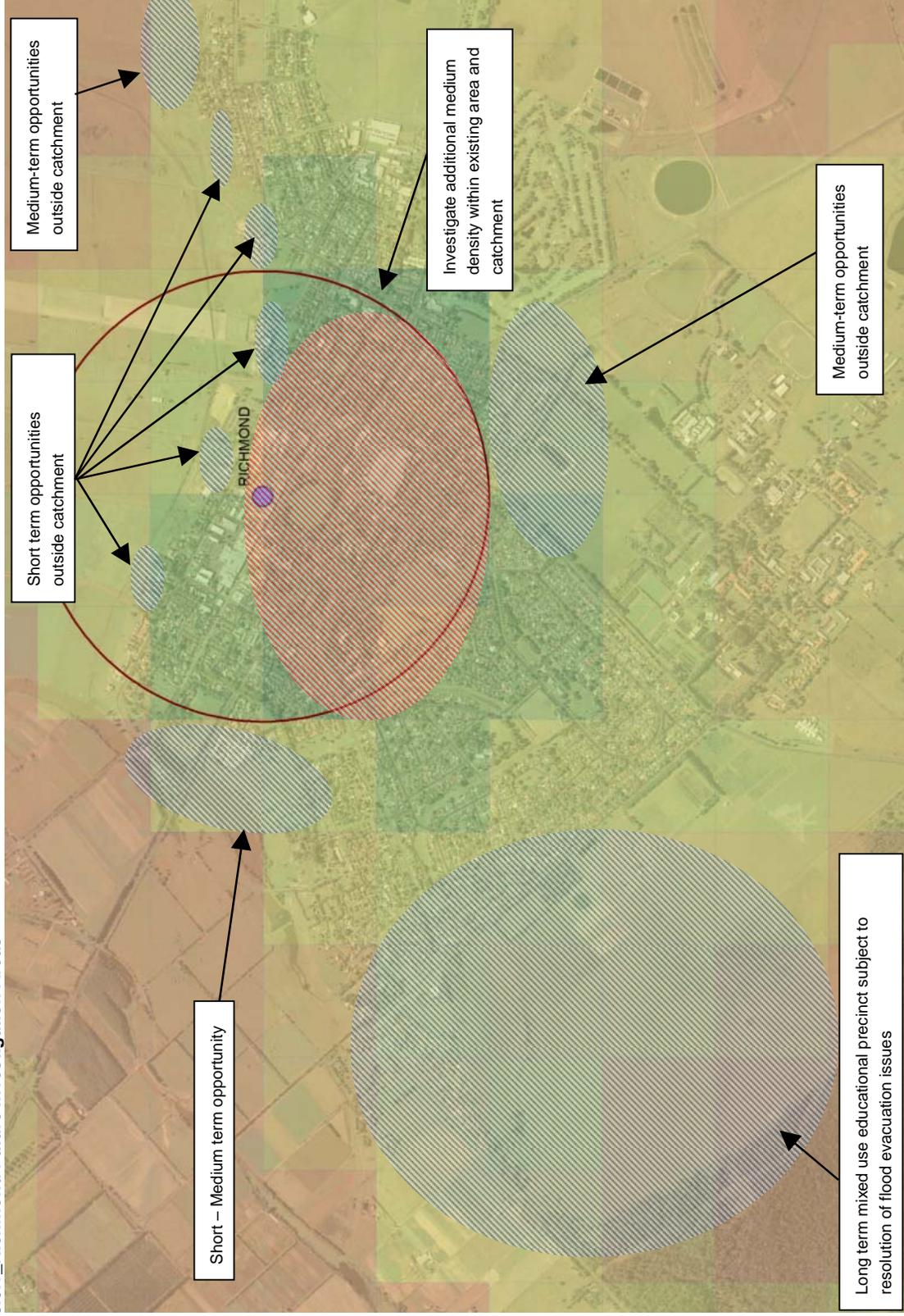
South Windsor- South Windsor has been removed as it is predominantly a service industrial centre. Future investigation should consider the removal of land identified in the current MDP due to unacceptable flooding and servicing.

The CSI mapping has also shown the potential for a corridor between Windsor and Bligh Park. Corridor development can be consistent with the Centres Based planning model as long as all dwellings are within proximity to a centre. This may be achieved by locating additional smaller centres within the corridor to meet the convenience needs of the local population.

Detailed Structure Planning to determine land capacity and ability to meet dwelling targets of the investigation areas has not been undertaken as part of this study and is required to be undertaken in future investigation.

As part of the Future Investigation processes, each centre should be reviewed against the Sustainability Matrix (Refer to Chapter 6) to ensure the centre has sufficient services, infrastructure and facilities to support additional development. Structure Planning of centres will also assist in developing a coherent and comprehensive approach to increasing residential development in suitable investigation areas.

5.6.1_Richmond Future Investigation Areas



Investigations must consider the Sustainability Matrix criteria for a **Town Centre** to ensure the centre has the required level of services and facilities to accommodate future population.

Further Investigations are subject to:

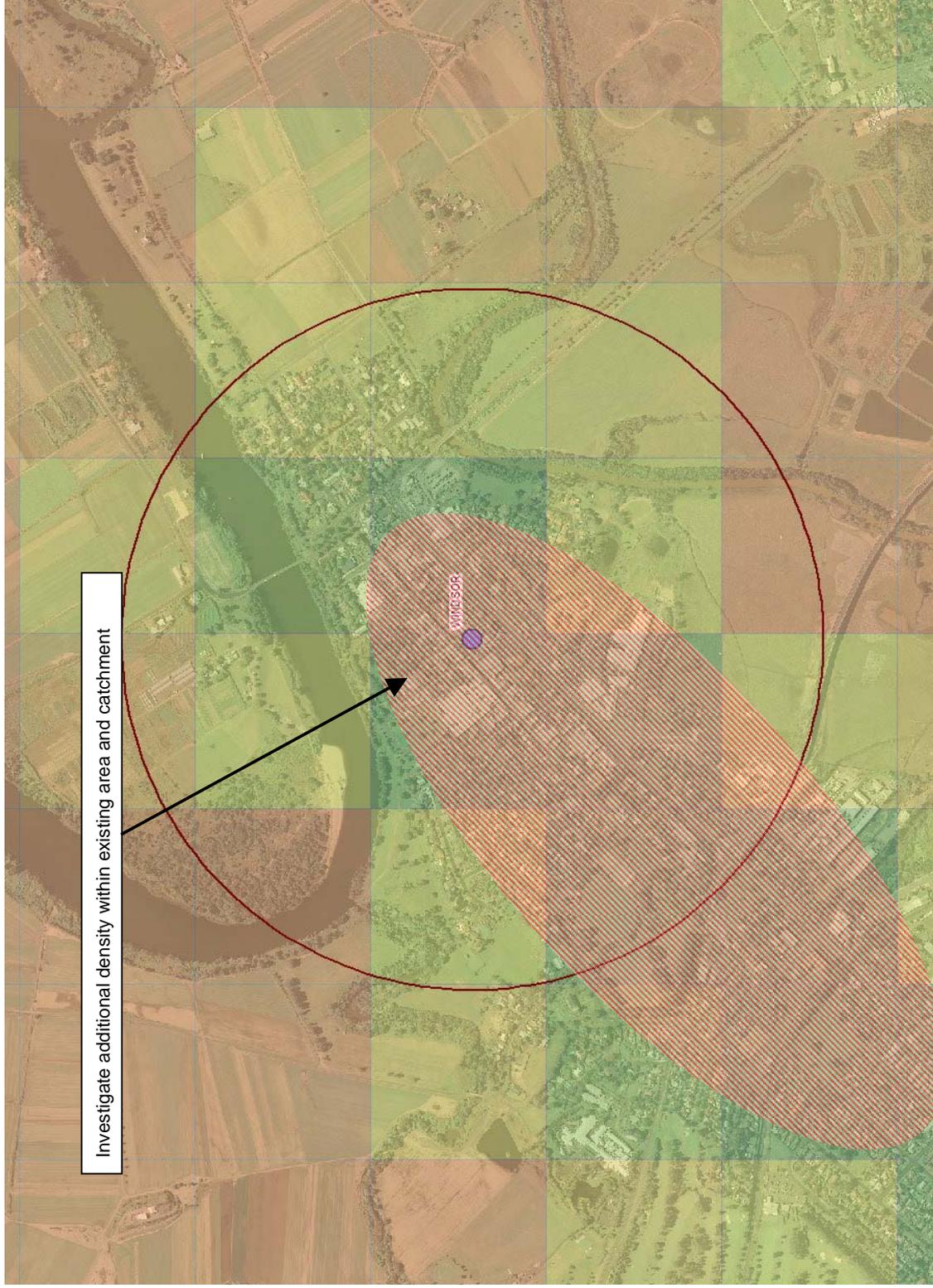
- _ The ability to appropriately service development in a timely manner
- _ Flood evacuation
- _ Detailed structure planning of town centre and investigation areas.

Source: HASSELL (October, 2009)

*Investigation areas identified may extend beyond the time scales of this Residential Study.

*The inclusion of the areas for investigation does not guarantee that the whole of that land can be developed in the future.

5.6.2 Windsor Future Investigation Areas



Investigate additional density within existing area and catchment

Investigations must consider the Sustainability Matrix criteria for a **Town Centre** to ensure the centre has the required level of services and facilities to accommodate future population.

Increased intensity and development of investigation areas are subject to:

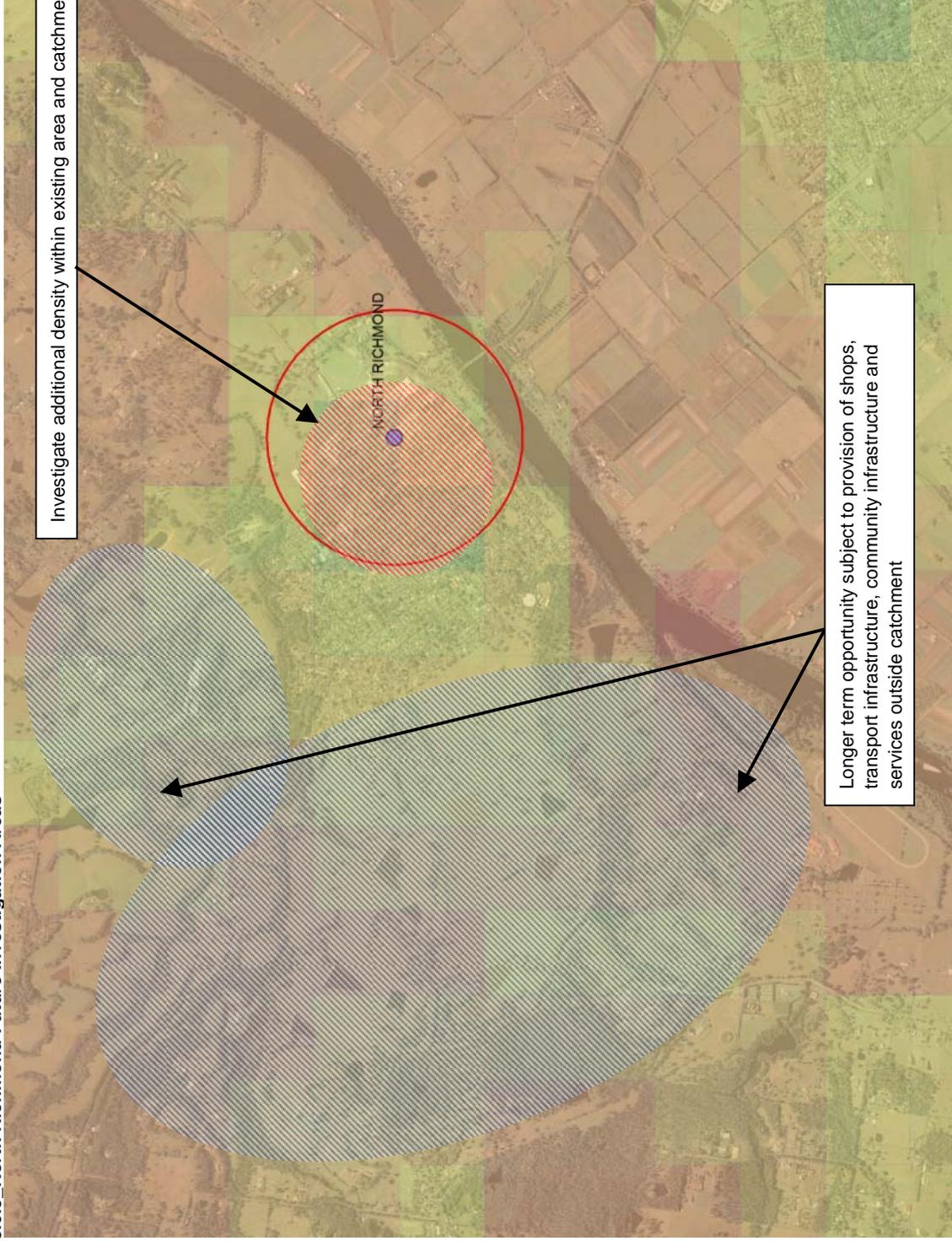
- _Resolution of existing flood evacuation;
- _Timely and appropriate provision of infrastructure; and
- _Detailed structure planning of town centre and investigation areas but only in areas not affected by the 1:100 flood.

Source: HASSELL (October, 2009)

*Investigation areas identified may extend beyond the time scales of this Residential Study.

**The inclusion of the areas for investigation does not guarantee that the whole of that land can be developed in the future.

5.6.3 North Richmond Future Investigation Areas



Source: HASSELL (October, 2009)

*Investigation areas identified may extend beyond the time scales of this Residential Study.

*The inclusion of the areas for investigation does not guarantee that the whole of that land can be developed in the future.

5.6.4 Wilberforce Future Investigation Areas



Investigations must consider the Sustainability Matrix criteria for a **Small Village** to ensure the centre has the required level of services and facilities to accommodate future population.

Increased intensity of development and investigation areas subject to:

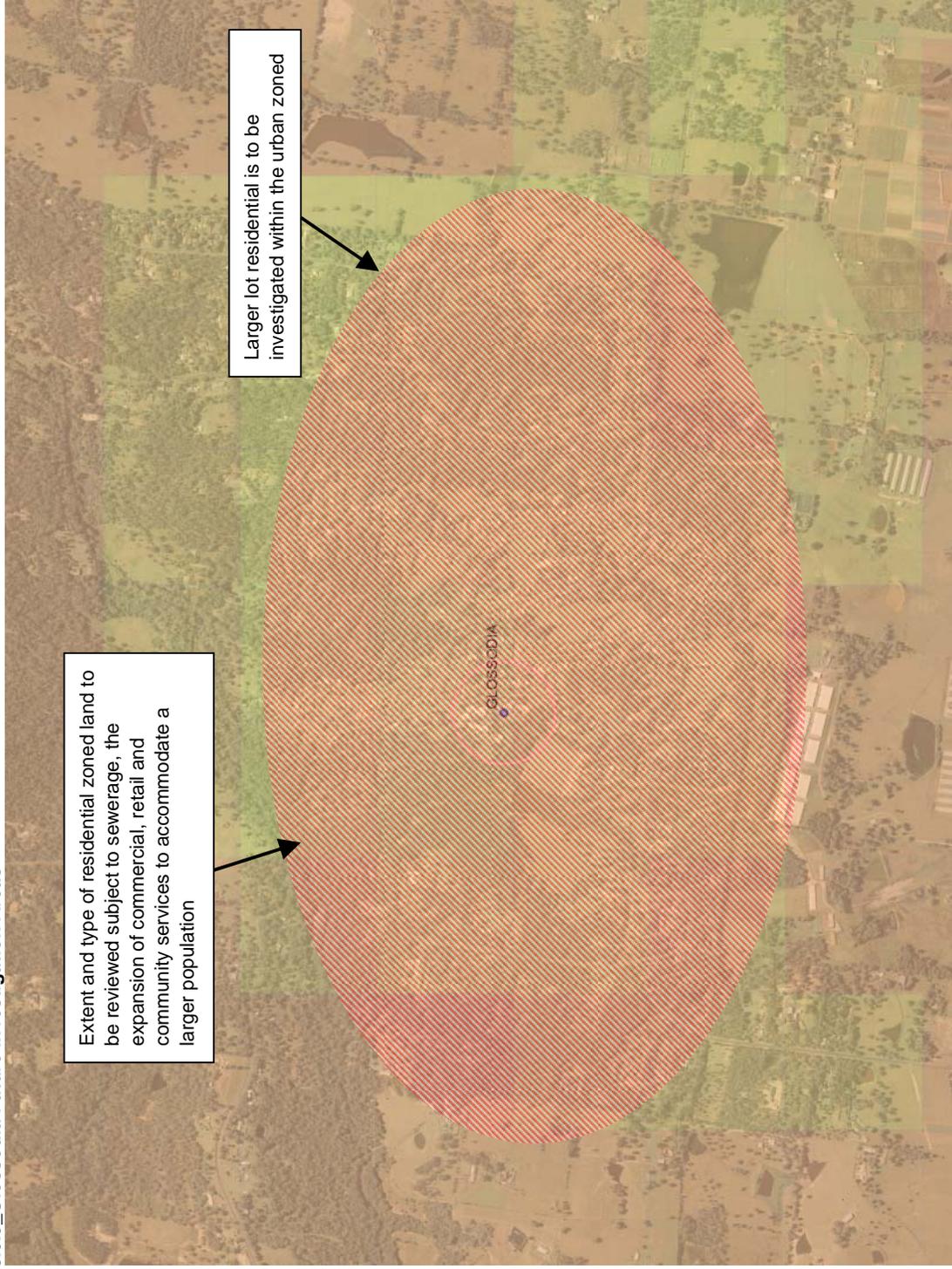
- _Provision of sewerage infrastructure
- _Resolution of flood evacuation
- _Timely provision of infrastructure
- _Detailed structure planning of investigation areas
- _Provision of additional services and facilities

Source: HASSELL (October, 2009)

*Investigation areas identified may extend beyond the time scales of this Residential Study.

*The inclusion of the areas for investigation does not guarantee that the whole of that land can be developed in the future.

5.6.5 Glossodia Future Investigation Areas



Investigations must consider the Sustainability Matrix criteria for a **Neighbourhood Centre** to ensure the centre has the required level of services and facilities to accommodate future population.

Increased intensity of development and investigation areas subject to:

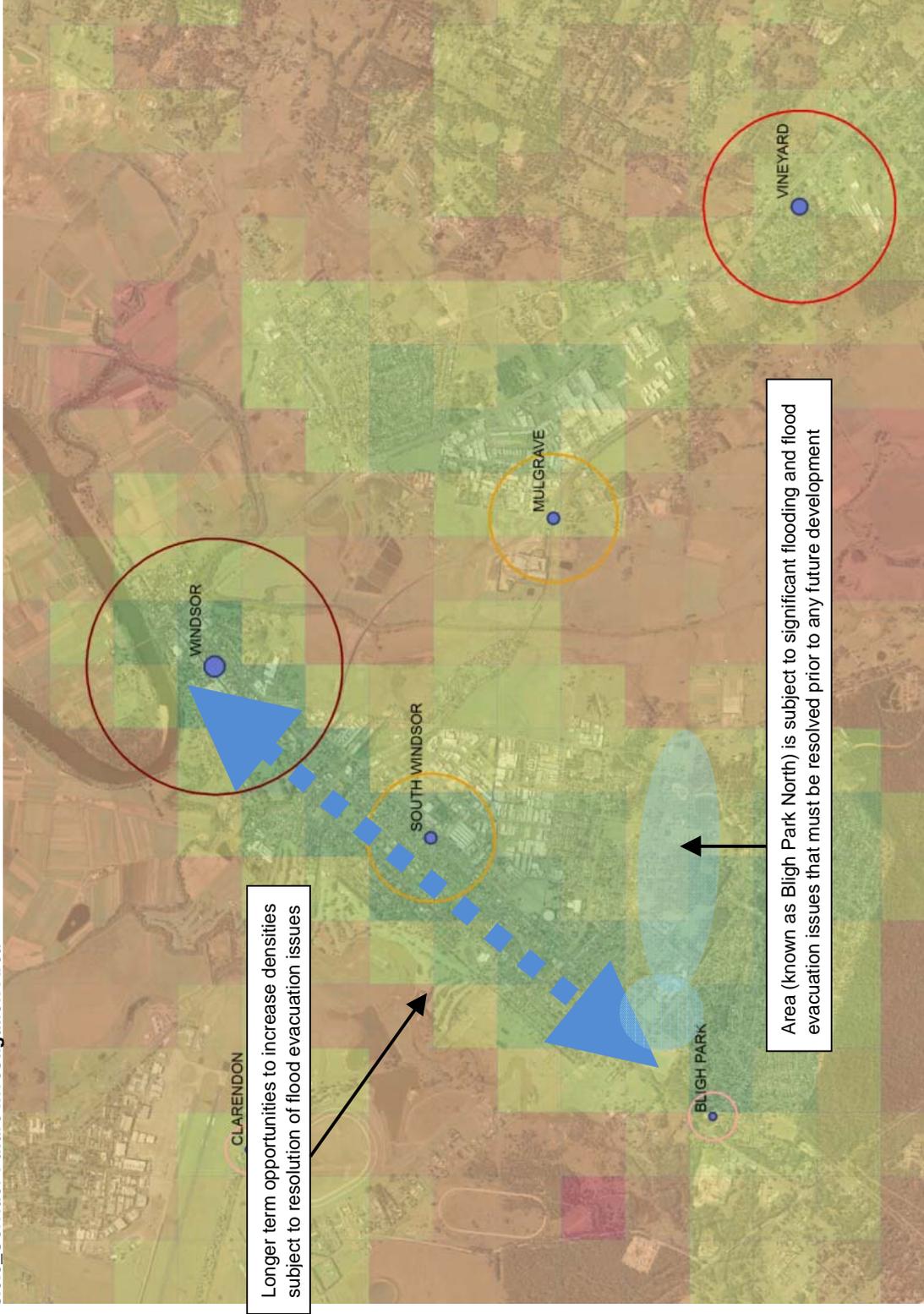
- _ Resolution of transport, access and traffic issues particularly road infrastructure crossing the river
- _ Provision of sewage for increase in density of development
- _ Detailed structure planning to review residential types and distribution
- _ Review of extent of zoning to determine appropriateness of the scale and density of development within the centre

Source: HASSELL (October, 2009)

*Investigation areas identified may extend beyond the time scales of this Residential Study.

*The inclusion of the areas for investigation does not guarantee that the whole of that land can be developed in the future.

5.6.6 Corridor Future Investigation Area



There is an opportunity for a corridor between Windsor and Bligh Park containing a range of densities.

Additional smaller centres within the corridor are to ensure the convenience needs of the local population are met. Increased intensity and development of investigation areas are subject to:

- _ Resolution of existing flood evacuation;
- _ Provision of additional services and facilities
- _ Detailed structure planning of town centre and investigation areas; and
- _ Timely provision of infrastructure.

Source: HASSELL (October, 2009)

*Investigation areas identified may extend beyond the time scales of this Residential Study.

*There are no investigation areas nominated in Vineyard due to the fact that all suitable area in this locality has been included in the North West Growth Centre

*The inclusion of the areas for investigation does not guarantee that the whole of that land can be developed in the future.

6.1_Introduction

The Hawkesbury Residential Strategy 2009 has adopted a centres based planning approach to guide the location of 5,000-6,000 additional dwellings to 2031. The centres based approach builds on the Draft Hawkesbury Residential Strategy 1997 and assists in achieving the Sydney Metropolitan Strategy's objective of locating 60-70% of future dwellings within existing residential areas.

The Sustainable Development Framework identifies centres as the focus of future residential activity and the priority location for community services, retail and commercial services, employment and transport nodes.

The three elements of the Sustainable Development Framework are:

- **Centres Hierarchy** identifies four types of centres within Hawkesbury LGA based on their size, function and role within the hierarchy.
- **Sustainability Matrix** establishes a standard level of services and facilities; defined by the classification of each centre. The Matrix nominates the character and level of service provision in terms of numbers of dwellings, types of retail and employment, infrastructure requirements, public transport provision and level of community service. This Matrix provides a checklist and indicators to ensure each centre provides the required level of services in line with the needs of the individual centre and can be used when considering locating additional development within or adjacent to a centre.

– **Implementation Plan** that outlines key strategies and actions to respond to the broad LGA wide issues identified in Chapter 4. It also includes strategies and actions to assist Council in meeting the standards for centres established in the Sustainability Matrix.

– **Detailed Structure Plans** are the next stage of the Hawkesbury Residential Strategy and will determine the specific location of additional dwellings and subsequent staging. The Sustainability Matrix will guide the structure planning, outlining benchmark service provision needs and the population and dwelling targets for each centre type.

As identified through the Opportunity and Constraints Analysis (Chapter 5) the priority locations for future structure planning are:

High Priority	Richmond North Richmond Windsor
Medium Priority	Wilberforce Glossodia
Low Priority	Bligh Park Clarendon Vineyard* Mulgrave Pitt Town South Windsor

*The timing for Vineyard will be subject to the North West Growth Centre planning.

6.2_Review and Monitoring

The Hawkesbury Residential Strategy should be reviewed every five years to meet State Planning and LEP requirements and to update with ABS Census and population projection data.

The Sustainability Matrix is the key tool for monitoring the implementation and achievement of the Hawkesbury Residential Strategy. In line with the reviews of the LEP and release of ABS Census data, an assessment can be made of each centre against the Sustainability Matrix.

6.3_Centres Hierarchy

The Hawkesbury Residential Strategy uses a Centres Hierarchy to guide the location and density of future housing and to ensure that centres contain the standard provision of services and facilities. Table 6.1 summarises the hierarchy of centres within Hawkesbury LGA, outlines their catchment, role, dwelling range, and identifies the possible future designation of centres within the LGA. Further information on each of the centre is in Section 4.2.

Table 6.1: Summary of Centres Hierarchy for Hawkesbury LGA

Centre Type	Catchment	Description	Hawkesbury LGA Centres
Town Centre	800m	Town Centres have one or two supermarkets, community facilities, medical centre, schools, etc. Contain between 4,500 and 9,500 dwellings. Usually a residential origin than employment destination.	Richmond Windsor
Village	600m	A strip of shops and surrounding residential area within a 5 to 10 minute walk contains a small supermarket, hairdresser, take-away food shops. Contain between 2,100 and 5,500 dwellings.	North Richmond Vineyard* South Windsor*
Small Village	400m	A small strip of shops and adjacent residential area within a 5 to 10 minute walk. Contain between 800 and 2,700 dwellings.	Mulgrave Glossodia* Wilberforce* Pitt Town*
Neighbourhood Centre	150m	One or a small cluster of shops and services. Contain between 150 and 900 dwellings.	Bligh Park Kurmond Kurrajong Clarendon

*Denotes centres which will achieve this status in the long term

6.4_Sustainability Matrix

The Sustainability Matrix establishes a minimum level of services and facilities; defined by the classification of each centre. The Matrix nominates the character and level of service provision in terms of numbers of dwellings, types of retail and employment, infrastructure requirements, public transport provision and level of community service.

The Matrix should be used to assess current service and facility provision of each centre when considering additional development within a centre. It will also inform future infrastructure and facility service provision.

ALL CENTRES	
Sustainability Element	Criteria
Service Infrastructure	<p>Following infrastructure is required for all centres:</p> <ul style="list-style-type: none"> _ Water (drinking/recycled) _ Stormwater _ Sewer _ Energy (electricity/gas) _ Communications (landline, mobile, broadband) _ Road networks with links to key centres _ Resolution of flood evacuation _ Suitable public parking <p>Infrastructure has capacity or can be augmented to cater for future growth and demand</p> <ul style="list-style-type: none"> _ Water: Capacity to develop sustainable water systems to reuse and recycle stormwater runoff and overland flows. _ Sewer: Urban development in town centres and villages to be limited to areas serviced by reticulated sewerage. <p>Urban development in small villages and neighbourhood centres to be limited to areas capable for onsite disposal and/or waste water irrigation.</p> <p>The infrastructure capacity of each centre must be able to support future dwelling projections and provided in a timely and efficient way.</p> <p>Development is located outside of 20+ ANEF noise corridors.</p>
Public Transport and Access	<p>Future urban development:</p> <ul style="list-style-type: none"> _ Promotes high level of public transport to minimise car usage; _ Is concentrated in proximity to City/Rail Train Stations within the Hawkesbury LGA; _ Is concentrated in proximity to regular and reliable bus networks and services; _ Is accessible to transport options for efficient and sustainable travel between homes, jobs, services and recreation <p>Transport infrastructure is available or scheduled to be provided in a timely and efficient way to service future urban development.</p> <p>All centres provide cycle links within each centre and with linkages to other centres and key destinations</p> <p>All centres contain universally accessible pedestrian facilities throughout the centre</p>

ALL CENTRES	
Sustainability Element	Criteria
Housing Types	<p>New dwellings to primarily be located within centre catchments.</p> <p>New dwellings to provide a variety of housing types.</p> <p>Mixed use development to surround commercial core.</p> <p>Provide suitable transition between different dwelling densities.</p>
Affordable Housing	<p>Affordable housing to be integrated into new urban developments.</p> <p>Affordable housing to be located within centre catchment and close to public transport and services.</p> <p>Provision of housing to meet special needs i.e. essential workers, itinerant residents, elderly, cultural groups, etc.</p>
Employment and Centres	<p>All centres to accommodate the retail and commercial service needs of their surrounding residential population, according to their designation.</p> <p>Facilitate renewal of existing centres with the capacity for growth.</p> <p>Maintain or improve the existing level of subregional employment self containment.</p> <p>To permit urban expansion at the perimeter of those towns and villages which can expand economically and without environmental detriment.</p> <p>Meets subregional employment capacity targets.</p> <p>Employment related land is provided in appropriately zoned areas.</p>

Hawkesbury Residential Strategy 2009

ALL CENTRES Sustainability Element	Criteria
Open Space and Recreation	<p>Open space provision linking and contributing to district level open space network</p> <p>All future residents are located in proximity to local and district open space and recreation facilities</p> <p>All centres meet open space and recreation benchmarks according to their catchments and population needs</p>
Natural Environment and Resources	<p>Future development is cognisant of and responsive to natural and environmental constraints including natural areas; water and air quality; flood prone land (less than 1:100); wetlands and riparian zones; acid sulphate soils; steep terrain; bushfire prone land; biodiversity and significant fauna or flora habitat; heritage. Detailed criteria for each constraint is outlined below.</p>
Natural Areas	<ul style="list-style-type: none"> _ No urban development in areas identified for conservation, environmental sensitivity and recreation _ Maintains a high quality natural environment and respects elements of natural environment. _ Protect and enhance biodiversity, air quality, heritage, and waterway health. <p>Maintains or improves areas of regionally significant terrestrial and aquatic biodiversity (as mapped and agreed by DECCW and DPI). This includes regionally significant vegetation communities; critical habitat; threatened species; populations; ecological communities and their habitats.</p>
Water and Air Quality	<p>Maintain or improve existing environmental condition for air quality.</p> <p>Maintain or improve existing environmental condition for water quality and quantity.</p> <p>Future development is consistent with community water quality objectives for recreational water use and river health (DECCW and CMA).</p>
Flood Prone Land	<p>Future urban development:</p> <ul style="list-style-type: none"> _ must avoid high risk flood prone areas, below 1:100 flood level. _ in flood prone or at risk areas is to prepare a Flood Risk Management Plan; _ must demonstrate and undertake appropriate construction methods to be used in areas identified as at risk of flooding; and _ is consistent with catchment and stormwater management planning (CMA and local council).

ALL CENTRES Sustainability Element	Criteria
Wetlands	<p>Future urban development is to be avoided in (or in close proximity to) wetland areas, to continue to protect wetlands in the Hawkesbury LGA.</p> <p>Future urban development to be located outside of riparian zones.</p> <p>Location of future urban development is to be cognisant of acid sulphate soil classifications.</p>
Acid Sulphate Soils	<p>Site specific studies should be carried out on areas identified as subject to an Acid Sulphate Soil and Urban Salinity Classification before urban development is approved.</p> <p>Appropriate construction methods must be used for urban development in areas identified as at risk of acid sulphate soils, in line with Hawkesbury Local Environmental Plan 1989.</p>
Heritage	<p>Future development is cognisant of and responsive to archaeological and cultural heritage.</p> <p>Future urban development to protect areas of Aboriginal cultural heritage value (as agreed by DECCW).</p>
Scenic Landscapes	<p>The existing landscape and its retention form an important consideration for further development of the LGA. Its significance is both local and regional and a considerable asset to tourism and increasingly important to marketing of local products as an adjunct to tourism.</p> <p>Urban development to minimise impacts on view corridors to significant rural and natural landscapes.</p>
Steep Terrain	<p>Urban development to be limited to areas with a slope of 15% or lower.</p> <p>Development on slopes greater than 15% are required to demonstrate there is no impact on soil erosion, subsidence, landslip and mass movements.</p>

Hawkesbury Residential Strategy 2009

ALL CENTRES Sustainability Element	Criteria
Prime Agricultural Land	<p>Prime agricultural land is to be protected.</p> <p>Urban development in rural and agricultural areas should be avoided to minimise conflicts between uses and to maintain economic and tourism resources for the LGA.</p> <p>There is a need to protect the potential for future agricultural productions as circumstances and opportunities change. The protection of agricultural land is also seen as important by the local community for protecting the rural, scenic quality of the Hawkesbury.</p> <p>Future urban development on prime agricultural land needs to demonstrate the rationale for loss of prime agricultural land and loss of economic activity, employment and food source in the LGA and should be clearly assessed for its benefits before approval.</p>
Bushfire Prone Land	<p>Urban development in Category 1 and 2 Bushfire areas is to be avoided.</p> <p>Urban development is subject to meeting the requirements of the NSW Rural Fire Service <i>Planning for Bushfire Protection</i> Version 3, June 2006 guidelines. Detailed site specific studies are to be carried out in areas identified as being within a bushfire vegetation category before urban development can occur.</p>
Special Uses Land	<p>Future urban development is not to impact on the continued use and existence of significant special uses, such as the RAAF Base at Richmond and the University and TAFE College sites.</p> <p>Future urban development avoids impacts on productive resource lands; extractive industries and other mining.</p>
Noise Exposure	<p>Urban development with noise exposure contour of 20 or higher ANEF should not occur.</p> <p>Australian Standard 2021:2001 criteria should be adopted as a measure of appropriate noise zones for future development.</p>
Community Facilities	<p>All centres to provide a level of community facilities and services that are accessible and meet the needs of their local community.</p> <p>Some services and facilities may exist in areas outside of the centres therefore long term planning of future facility provision to create community hubs which seek to collocate and consolidate services and facilities in key nodes.</p>

ALL CENTRES Sustainability Element	Criteria
	<p>Future urban development is to ensure that:</p> <ul style="list-style-type: none"> _ Quality health, education, legal, recreational, cultural and community development and other government services are accessible. _ Adequate community services and facilities exist to meet the needs of the future residents _ Existing community services and facilities have the capacity to service the future development _ Future service provision has been planned and budgeted _ Developer funding for required service upgrade/access is available.
Character and Public Domain	<p>Future urban development is to have little or no impact on items of indigenous, European or Natural heritage</p> <p>Future urban development to be cognisant of the character of surrounding areas.</p> <p>Future urban development to be cognisant of the landscape character and its setting.</p> <p>Future urban development is to focus around or be proximate to active urban space which facilities formal and informal meeting and gathering spaces both during day and night i.e. plaza, square, mall etc</p> <p>Creation of high quality and safe public domain both during day and night.</p>
Sustainable Development	<p>All new housing to be adaptable, and where possible accessible, and embrace principles of sustainable housing design.</p> <p>Define the environmental and infrastructure capacity for each centre and ensure that new development does not exceed the defined capacities.</p> <p>Ensure all development is constructed to the highest environmental standards.</p> <p>Natural resource limits not exceeded/ environmental footprint minimised.</p> <p>Demand for water does not place unacceptable pressure on infrastructure capacity to supply water and on environmental flows.</p> <p>Demand for sewer does not place unacceptable pressure on infrastructure capacity to supply sewer.</p> <p>Demonstrates most efficient/suitable use of land.</p> <p>Demand for energy does not place unacceptable pressure on infrastructure capacity to supply energy; requires demonstration of efficient and sustainable supply solution</p>

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TOWN CENTRE	Richmond Windsor
Dwelling Target	4,500-9,000 dwellings within 800m radius
Housing Types	Medium to high density residential development (say 3-6 storey as per previous section) graduating down to 1-2 storey residential development 25-50 dwellings per hectare Seniors Living/Aged care housing Mixed use - shopping on street
Affordable Housing	Affordable housing integrated into new developments. Priority location for affordable housing, to ensure residents can access a broad range of services available in major centres.
Employment and Centres	Retail and service focus to serve large residential catchment: -Large group of retail services -1-2 supermarkets -Lifestyle/café focus -Medical facilities -Small shopping mall -Some local business and employment -Limited night time activity
Service Infrastructure	Refer to all centres
Public Transport	Public transport interchange for bus and train 18 hr public transport services for rail and bus 10 -15 min frequency in peak and 20-30 min off peak Strong connection to other centres Park and ride facilities
Open Space and Recreation	2 local parks (1-4ha) distributed across local area 6 neighbourhood parks (0.25-2ha) Cycle links to other centres and key destinations Universally accessible pedestrian facilities throughout centre
Natural Environment	Refer all centres

TOWN CENTRE	Richmond Windsor
Community Facilities	1 local community health centre 1 preschool 1 public primary school 1 public secondary schools 1 youth centre 1 branch libraries Child care facilities Aged care facilities
Character and Public Domain	Active urban space which facilities formal and informal meeting and gathering spaces i.e.plaza, square, mall etc High quality and safe public domain during both day and night.
Sustainable Development	All new housing to be adaptable and embrace principles of sustainable housing design

VILLAGE	North Richmond Vineyard* South Windsor*
Dwelling Target	2,100-5,500 dwellings within 600m radius
Housing Types	Low, Medium to high density development (2-6 storey in some areas) From 25 dwellings per hectare Seniors Living/Aged care some density
Affordable Housing	Affordable housing integrated into new developments. Desirable location for affordable housing, to ensure residents can access a broad range of services available in major centres.
Employment and Centres	Cluster of shops for daily shopping with 10-50 shops: -Small supermarket -Strip of shops -Limited services -Limited medical services
Service Infrastructure	Refer to all centres
Public Transport	Bus interchange (more than 1 bus) 14 hr services 10 - 15 min frequency
Open Space and Recreation	1 local park (1-4ha) 3 neighbourhood parks (0.25-2ha) Cycle links to other centres and key destinations Universally accessible pedestrian facilities throughout centre
Natural Environment	Refer all centres
Community Facilities	1 local community health centre 1 preschool 1 public primary school Child care facilities Aged care facilities
Character and Public Domain	Active urban space which facilities formal and informal meeting and gathering spaces i.e. plaza, square, mall etc High quality and safe public domain
Sustainable Development	All new housing to be adaptable and embrace principles of sustainable housing design

*Denotes centres which may achieve this status in the long term outside the scope and time frames of this Strategy.

SMALL VILLAGE	Mulgrave/McGraths Hill Glossodia* Wilberforce*
Dwelling Target	800-2,700 dwellings with 400m radius
Housing Types	Low density housing 2 stories Seniors Living/Aged care housing dependent on location and proximity to services and facilities
Affordable Housing	Affordable housing integrated into new developments.
Employment and Centres	Small cluster of shops for daily shopping 5-30 shops: Convenience Limited specialist shops Limited services Take-away/cafes
Service Infrastructure	Refer all centres
Public Transport	Bus interchange (more than 1 bus) 14 hr services 10 - 15 min frequency
Open Space and Recreation	1 local park (1-4ha) 3 neighbourhood parks (0.25-2ha) Cycle links to other centres and key destinations Universally accessible pedestrian facilities throughout centre
Natural Environment	Refer all centres
Community Facilities	(by benchmarks no facilities required in catchment) 1 small community health centre 1 small community centre 1 preschool Child care facilities Aged care facilities
Character and Public Domain	Active urban space which facilities formal and informal meeting and gathering spaces i.e. plaza, square, mall etc High quality and safe public domain
Sustainable Development	All new housing to be adaptable and embrace principles of sustainable housing design

*Denotes centres which may achieve this status in the long term outside the time frames of this Strategy.

NEIGHBOURHOOD CENTRE	Bligh Park* Kurrajong* Kurmond* Clarendon*
Dwelling Target	150-900 dwellings within 150m radius.
Housing Types	Low density housing Concentrated housing diversity in centre
Affordable Housing	Affordable housing integrated into new developments.
Employment and Centres	Convenience shopping needs of 1-5 shops such as Convenience store, Milkbar -Petrol station -Takeaway
Service Infrastructure	Refer all centres
Public Transport	Bus interchange (more than 1 bus) 14 hr services 10 - 15 min frequency
Open Space and Recreation	Neighbourhood parks for local areas Cycle links to other centres and key destinations Universally accessible pedestrian facilities throughout centre
Natural Environment	Refer all centres
Community Facilities	(by benchmarks no facilities required in catchment) 1 small community health centre 1 small community centre 1 preschool Child care facilities Aged care facilities
Character and Public Domain	High quality and safe public domain Active urban space which facilities formal and informal meeting and gathering spaces
Sustainable Development	All new housing to be adaptable and embrace principles of sustainable housing design

*Denotes centres which may achieve this status in the long term outside the scope and time frames of this Strategy.

6.5 Rural Village Development Criteria

While the majority of future residential development will occur within existing residential areas or in potential green field areas on the periphery of existing urban areas and corridors, it is recognised that there is a need to maintain the ongoing viability of rural villages. Future development within rural villages should be primarily low density and large lot residential dwellings.

Additionally all future low density and large lot residential development in rural villages must:

- _ Be able to have onsite sewerage disposal;
- _ Cluster around or on the periphery of villages;
- _ Cluster around villages with services that meet existing neighbourhood criteria services as a minimum;
- _ Address environmental constraints and with minimal environmental impacts; and
- _ Within the capacity of the rural village.

6.6 Actions and Implementation

The following are a series of issues, criteria, actions and indicators for each of the 10 Sustainability Elements. Each sustainability element has been reviewed in the Key Issues (Chapter 4) and the sustainability criteria above to make a series of actions directly relevant to Hawkesbury LGA.

Each action is categorised under the following action areas of investigation, policy, partnership and planning to assist with the implementation of each strategy.

INVESTIGATION: Research or investigation to assist in future policy and planning direction;

POLICY: Formal Council direction;

PARTNERSHIP: Working with key stakeholders and authorities to provide services, facilities or infrastructure; and

PLANNING: Statutory or strategic planning response.

The number of the issues does not necessarily relate to the numbered criteria or actions as some criteria and actions address multiple issues.

(A) HOUSING TYPES		
ISSUES	CRITERIA	ACTIONS
A1.1 The number of dwellings has increased from 1996-2006 whilst population has decreased demonstrating that household sizes are decreasing.	A2.1 New dwellings to provide a variety of housing types to meet existing and future housing needs of the Hawkesbury LGA, in terms of a range of housing options in smaller dwelling types, the provision of a range of housing types for older people and people with a disability.	A3.1 POLICY Hawkesbury City Council to implement the Residential Strategy and sustainability criteria for centres to ensure that dwellings are in a suitable and appropriate location and type to meet the needs of the current and future population.
A1.2 Population is ageing, with one quarter of the population aged 50 years or over, requiring a range of housing types to suit needs of older people.	A2.2 New dwellings to primarily be located within centre catchments demonstrated to be capable of accommodating future growth.	A3.2 INVESTIGATION: Hawkesbury City Council to undertake structure planning and local environmental studies to determine the capability of investigation areas to accommodate future growth.
A1.3 The majority of existing dwellings (79%) are detached houses, while 41% of households are smaller household types (one person and couples with no children).	A2.3 Mixed use development to surround commercial core.	A3.3 POLICY: Hawkesbury City Council to prepare design guidelines to guide the design and siting of medium and higher density development in the Hawkesbury LGA.
A1.4 By 2031, 50% of households will be smaller household types (one person and couples with no children).	A2.4 Provide suitable transition between different dwelling densities.	A3.4 PLANNING: Hawkesbury City Council to increase medium and higher density zoning in centres identified as capable of accommodating future growth.
A1.5 Population projections and residential targets for Hawkesbury identify the need to accommodate between 5,000 and 6,000 new dwellings by 2031.		
A1.6 Most new dwellings have been detached dwellings (86% with a significant amount of medium density (villas/townhouses) also being constructed (10%). Hawkesbury population is ageing Household structures have changed and reinforced the need to provide a range of dwelling types.		
(B) AFFORDABLE HOUSING		
ISSUES	CRITERIA	ACTIONS
B1.1 Housing remains unaffordable for very low, low and moderate incomes with 51% of these groups being impacted by housing stress.	B2.1 Integrate affordable housing into new urban developments. B2.2 Locate affordable housing within centre catchment and close to public transport and services. B2.3 Provide housing to meet special needs i.e. essential workers, itinerant residents, elderly, cultural groups, etc	B3.1 PLANNING: LEP and DCP controls are to protect the supply of existing affordable housing. B3.1 PARTNERSHIP: Facilitate partnerships with State Government, Community Housing groups and developers to facilitate development of affordable housing.

(C) EMPLOYMENT AND CENTRES	
ISSUES	ACTIONS
<p>C1.1 The centres classification is based on that identified in the North West Sub Regional Plan and considerations developed in the preparation of this Residential Strategy, it requires future local investigation to determine the role and function of centres.</p> <p>C1.2 The Centres classification is recommended as a guide to assist in future planning directions, classifications identified are not intended to limit the growth or expansion of these centres, where capacity for future sustainable growth and development can be demonstrated.</p> <p>C1.2 The State Government Metropolitan Strategy seeks consolidation of growth to be the focus of future urban development, rather than creation of new areas for growth.</p> <p>C1.3 Existing vacant industrial areas are predominantly unserviced, with threshold costs and/or poor access to key transport routes limiting development.</p> <p>C1.4 In commercial / business areas existing lot configurations, heritage and existing development constrains the potential for renewal and reinvestment.</p>	<p>C2.1 Locate future development within existing or proposed centres where a range of services and facilities are currently available or are planned to be available by 2031.</p> <p>C2.2 Future infrastructure programs to be undertaken in key centres, in a timely manner to facilitate anticipated growth and development.</p> <p>C2.3 Urban development is to accommodate retail and commercial services in all centres to meet the needs of their surrounding residential population, according to their designation.</p> <p>C2.4 Facilitate the renewal of existing centres with the capacity for growth.</p> <p>C2.5 Maintain or improve the existing level of subregional employment self containment.</p> <p>C2.6 Urban development to permit expansion at the perimeter of those towns and villages which can expand economically, sustainably, within service areas and without environmental detriment.</p> <p>C2.6 Urban development to meet subregional employment capacity targets</p> <p>C2.7 Provide employment related land in appropriately zoned areas.</p>
<p>C3.1 INVESTIGATION AND PLANNING: Investigate role and function of centres and employment areas to create a formal centres hierarchy and develop strategic directions to guide future form, function of these centres and employment areas.</p> <p>C3.2 INVESTIGATION: Undertake investigation into existing services and facilities in key centres to determine additional services required to meet future population needs.</p> <p>C3.3 INVESTIGATION: Undertake studies into the investigation areas of Richmond, North Richmond and Windsor Station and facilitate renewal of existing centres with capacity for growth.</p> <p>C3.4 INVESTIGATION: Investigate and facilitate the servicing of vacant industrial lands to unlock existing supply in the identified areas.</p> <p>C3.5 PLANNING: Capitalise on strategic assets by considering future of land at Clarendon for office and business development with minor and ancillary retail development.</p> <p>C3.6 INVESTIGATION: Investigate additional industrial land supply to address future employment growth in Mulgrave, South Windsor and North Richmond.</p> <p>C3.7 INVESTIGATION: Investigate the nature of employment activities on non employment zoned lands.</p> <p>C3.8 PLANNING: Support specialised industry sectors of Agriculture and Government, Administration and Defence.</p> <p>C3.9 PLANNING: Identify appropriate development and design treatments for the following gateway areas: _George Street and Blacktown Road _Windsor Road, Mulgrave _Bells Line of Road, North Richmond _Land on western side of George Street, South Windsor.</p>	<p>C3.1 INVESTIGATION AND PLANNING: Investigate role and function of centres and employment areas to create a formal centres hierarchy and develop strategic directions to guide future form, function of these centres and employment areas.</p> <p>C3.2 INVESTIGATION: Undertake investigation into existing services and facilities in key centres to determine additional services required to meet future population needs.</p> <p>C3.3 INVESTIGATION: Undertake studies into the investigation areas of Richmond, North Richmond and Windsor Station and facilitate renewal of existing centres with capacity for growth.</p> <p>C3.4 INVESTIGATION: Investigate and facilitate the servicing of vacant industrial lands to unlock existing supply in the identified areas.</p> <p>C3.5 PLANNING: Capitalise on strategic assets by considering future of land at Clarendon for office and business development with minor and ancillary retail development.</p> <p>C3.6 INVESTIGATION: Investigate additional industrial land supply to address future employment growth in Mulgrave, South Windsor and North Richmond.</p> <p>C3.7 INVESTIGATION: Investigate the nature of employment activities on non employment zoned lands.</p> <p>C3.8 PLANNING: Support specialised industry sectors of Agriculture and Government, Administration and Defence.</p> <p>C3.9 PLANNING: Identify appropriate development and design treatments for the following gateway areas: _George Street and Blacktown Road _Windsor Road, Mulgrave _Bells Line of Road, North Richmond _Land on western side of George Street, South Windsor.</p>

(D) SERVICE INFRASTRUCTURE	
ISSUES	ACTIONS
CRITERIA	ACTIONS
<p>D1 Overall Service Infrastructure</p>	
<p>D1.1.1 Due to the large geographic area of the Hawkesbury LGA, infrastructure is limited in more remote parts of the LGA.</p> <p>D1.1.2 There is a need expand the sewerage service areas to meet current and future residential needs and zoned land within existing urban centres.</p> <p>D1.1.3 Existing electrical supply, particularly in some outer lying rural areas, may have no lines of supply or ageing infrastructure in need of augmentation and upgrade for electricity or have very old lines which may need additional supply.</p> <p>D1.1.4 The capacity of infrastructure to meet future development needs is unknown.</p>	<p>D1.2.1 Infrastructure: Has capacity or can be augmented to cater for future growth and demand</p> <p>D1.2.2 Water: Capacity to develop sustainable water systems to reuse and recycle stormwater runoff and overland flows.</p> <p>D1.2.3 Sewer: Urban development in town centres and villages to be limited to areas serviced by reticulated sewerage.</p> <p>D1.2.4 Urban development in small villages and neighbourhood centres to be limited to areas capable for onsite disposal and/or waste water irrigation.</p> <p>D1.2.5 The infrastructure capacity of each centre must be able to support future dwelling projections and provided in a timely and efficient way.</p> <p>D1.2.6 Telecommunications infrastructure has capacity or can be augmented to meet current and future growth needs.</p> <p>D1.2.7 Urban development of lots less than 4000 square metres to be seweraged.</p>
<p>D2 Special Uses Land:</p> <p>D2.1.1 Special uses land accounts for a large amount of the LGA, particularly in Richmond, and is not suitable for future residential development.</p>	<p>D2.3.1 PLANNING: LEP and DCP to protect special uses land and prevent future development in these areas or adjacent to these areas that may compromise changing use and function of special uses land.</p>
<p>D3 Noise Exposure:</p> <p>D3.1.1 The noise generated by aircraft associated with the RAAF restricts development in the surrounding areas due to excessive noise exposure.</p> <p>D3.1.2 The area immediately surrounding Richmond is affected by air craft noise exposure forecast (ANEF) ranging from 20-35 and not suitable for future urban development.</p>	<p>D3.3.1 PLANNING: The Australian Standard 2021:2001 should be adopted as a measure of appropriate noise zones for future development.</p>

(E) TRANSPORT AND ACCESS	
ISSUES	CRITERIA
ISSUES	ACTIONS
<p>E1.1 Infrastructure and improving local roads and linkages within the LGA has been highlighted as the most important areas for improvement in the Community Strategic Plan.</p> <p>E1.2 Improved services and facilities such as transport and retail are required to develop employment lands and meet community's needs for residential areas.</p> <p>E1.3 Certain employment precincts lack road and service infrastructure.</p> <p>E1.4 There is significant reliance on the private motor car for transport.</p> <p>E1.5 Due to the size of the Hawkesbury LGA, there is limited public transport services throughout the LGA, however even in urban areas, public transport services, particularly bus services are limited.</p> <p>E1.6 Public transport services are not a viable or affordable option for the community.</p> <p>E1.7 There is a need to link the LGA more effectively with the surrounding areas as identified by the Community Strategic plan.</p> <p>E1.8 Vacant land in industrial areas is often unserviced, with threshold costs limiting development, or has poor access to key transport routes.</p> <p>E1.9 The key centres in the southern area are linked by a local bicycle network, which is predominantly on street linkages. There is a need to ensure that bicycle networks have sufficient separation from road network to provide safe linkages. Additional bicycle routes are sought for recreation and commuter use.</p> <p>E 1.10 Pedestrian facilities are limited outside the larger centres, there is a need to provide pedestrian facilities, such as footpaths in all urban areas, linking residential areas with transport, services and facilities.</p> <p>E1.11 The existing road networks do not meet current evacuation needs</p>	<p>E2.1 Upgrade road transport infrastructure to facilitate economic development and enhanced access within the Hawkesbury LGA.</p> <p>E2.2 Promote high level of public transport to minimise car usage.</p> <p>E2.3 Urban development to be accessible to transport options for efficient and sustainable travel between homes, jobs, services and recreation:</p> <ul style="list-style-type: none"> – In proximity to CityRail Train Stations. – In proximity to regular and reliable bus networks and services. <p>E2.4 Frequency and servicing of public transport services to be upgraded to meet current and future community needs.</p> <p>E2.5 Bicycle networks to be expanded to facilitate recreation and commuter use in a safe environment.</p> <p>E 2.6 Pedestrian footpaths are provided in all urban areas and centres.</p> <p>E2.7 Flood evacuation networks to be upgraded to meet future development requirements.</p>
	<p>E3.1 AUDIT AND INVESTIGATION: Review current provision and levels of public transport servicing to determine if the services meet current levels of demand and if modal split or co-ordination of services is being achieved in an efficient manner. Undertake investigations to upgrade service delivery to meet current and future needs.</p> <p>E3.2 PLANNING: Capitalise on underutilised transport infrastructure and lobby for improved servicing including proposed new bus routes.</p> <p>E3.3 PLANNING: Facilitate integration of a transport network and develop a hierarchy of roads. Existing road capacity issues should be addressed in consultation with the Roads and Traffic Authority prior to or as part of the development for any development within the Hawkesbury LGA.</p> <p>E3.4 PARTNERSHIP: Lobby State Government to work in partnership to improve transport networks, public transport services and frequency to seek to achieve sustainable matrix targets by 2031.</p> <p>E3.5 PARTNERSHIP: Establish partnership with neighbouring Councils and transport providers to enhance services (delivery and frequency) in the LGA.</p> <p>E3.6 INVESTIGATION: Undertake detailed investigations on centres, the level of service, and the appropriateness of facilities for future population.</p> <p>E3.7 PLANNING: Encourage more sustainable transport, expanding bicycle and pedestrian networks, providing more transport options</p> <p>E3.7 PLANNING: Provide safe cycle links within each centre and with linkages to other centres and key destinations.</p> <p>E3.8 PLANNING: Provide universally accessible pedestrian facilities throughout all centres.</p> <p>E3.9 PLANNING: Urban development subject to resolution of the flood evacuation issues.</p>

(F) OPEN SPACE AND RECREATION	
ISSUES	CRITERIA
ISSUES	ACTIONS
<p>F1.1 Hawkesbury LGA has significant open space and recreation resources in its natural areas, national parks and reserves, however many of these areas are remote from urban areas or are not accessible due to terrain or environmental sensitivity.</p> <p>F1.2 Some recreational areas contain sensitive bushland and habitat and provide limited resources for everyday passive and active recreational use.</p> <p>F1.3 Footpaths were identified as a high priority area for services in the Community Survey Results 2007.</p>	<p>F2.1 Provide open space linking and contributing to district level open space network.</p> <p>F2.2 Urban development to be located in proximity to local and district open space and recreation facilities.</p> <p>F2.3 All centres to meet open space and recreation benchmarks according to their catchments and population needs.</p> <p>F3.1 PLANNING: Complete playground replacement program, to upgrade existing sites and improve the amenities for the community.</p> <p>F3.2 INVESTIGATION: Detailed investigations on development areas, the level of service and the appropriateness of facilities for future population is required.</p> <p>F3.3 INVESTIGATION AND AUDIT: Review existing recreation infrastructure provision within the LGA and determine use, condition and maintenance, demand (current and projected) and suitability.</p>

(G) NATURAL ENVIRONMENT AND RESOURCES	
ISSUES	CRITERIA
	ACTIONS
<p>G1 Natural Areas and Vegetation:</p> <p>G1.1.1 Two thirds of the LGA is located in National Parks, reserves, etc and therefore not suitable for development.</p> <p>G1.1.2 The Hawkesbury LGA comprises a range of vegetation communities which are susceptible to damage by development.</p>	<p>G1.2.1 No urban development in areas identified for conservation, environmental sensitivity and recreation.</p> <p>G1.2.2 Maintain a high quality natural environment and respect elements of natural environment.</p> <p>G1.2.3 Protect and enhance biodiversity, air quality, heritage, and waterway health.</p> <p>G1.2.3 Future urban development to occur in areas where there is limited impacts on significant vegetation communities.</p>
<p>G2 Bushfire Prone Land:</p> <p>G2.1.1 The vast majority of the Hawkesbury LGA is categorised as Category 1 at high risk for bushfires and not suitable for future extensive urban development.</p> <p>G2.1.2 Category 2 vegetation is found surrounding the outskirts of Wilberforce, North Richmond, Bligh Park and Vineyard and development in these areas potentially poses a moderate risk.</p>	<p>G2.2.1 Urban development in Category 1 and 2 Bushfire areas is to be avoided.</p> <p>G2.2.2 Urban development in Category 1 or 2 Bushfire Areas is subject to meeting the requirements of the NSW Rural Fire Service Planning for Bushfire Protection" Version 3, June 2006 guidelines.</p>
<p>G3 Slope and Terrain:</p> <p>G3.1.1 The topography varies widely from slopes of less than 1:20, increasing to 1:8 with construction and access difficult in steeper areas.</p> <p>G3.1.2 A slope of 15% is generally considered to be the upper limit for urban development.</p>	<p>G3.3.1 INVESTIGATION: Identify if future urban development investigation areas are subject to slope constraints</p> <p>G3.3.2 PLANNING: LEP/DCP Controls to specify maximum slope permissible for urban development and other forms of development.</p>

G5 Flood Prone Land:

- G5.1.1** The urban area is prone to at least 1:100 year flooding, making flooding a significant issue.
- G5.1.2** Flooding is particularly prevalent in the South Eastern area around the North Richmond, Richmond, Windsor, Wilberforce and Pitt Town areas.
- G5.2.1** Existing and future urban development to avoid high risk flood prone areas, below 1:100 floodline.
- G5.2.2** Prepare a Flood Risk Management Plan in flood prone areas.
- G5.2.3** Demonstrate and undertake appropriate construction methods to be used in areas identified as at risk of flooding.
- G5.2.4** Be consistent with catchment and stormwater management planning (CMA and local council).
- G5.3.1** Investigate and identify all floodprone land, prepare a Flood Risk Management Plan in flood prone areas. Address existing urban areas subject to flooding.
- G5.3.2 PLANNING:** Provide information on appropriate construction methods to be used in areas identified at risk of flooding.
- G5.3.2 PARTNERSHIP:** Form partnerships with Hawkesbury– Nepean Catchment Management Authorities and the North West councils to:
- Ensure aims and objectives of Catchment Action Plans are considered in the future management and planning of LGA.
 - Coordinate a regional approach to riverine values and wetlands, including identifying priority areas for management.
 - Undertake stream mapping to enable councils to develop planning controls to protect regionally significant riparian corridors.
 - Undertake broad–scale stream mapping at a strategic level to determine the significance of riparian lands and their management requirements in areas that are potentially being developed or redeveloped.

G6 Water and Air Quality:

- G6.1.1** Navigability, safety and usability of waterways and stabilisation of river banks requires improvement.
- G6.1.2** High priority areas for services identified in the Community Survey Results 2007 were stormwater management and reuse.
- G6.1.3** Improving air quality was identified as high importance and low satisfaction in the Community Survey Results 2007.
- G6.2.1** Maintain or improve existing environmental condition for air quality.
- G6.2.2** Maintain or improve existing environmental condition for water quality and quantity.
- G6.2.3** Development to be consistent with community water quality objectives for recreational water use and river health (DECCW and CMA).
- G6.2.4** Potentially harmful development should be carefully considered before approval.
- G2.3.1 PLANNING:** Implement actions in the Water and Energy Action Plans.
- G2.3.2 PLANNING:** Achieve and exceed State Government standards for recycling and reduction of waste water.
- G2.3.3 PLANNING:** Comply with State Government Water Sharing Plan.
- G2.3.4 PLANNING:** Undertake broad–scale stream mapping at a strategic level to determine the significance of riparian lands and their management requirements in areas that are potentially being developed or redeveloped.

G7 Wetlands:

G7.1.1 Wetlands should be protected in the environmental and economic interests of the catchment.
G7.1.2 There are a number of wetlands protected by Sydney Regional Environmental Plan No. 20 - Hawkesbury Nepean River 2007.

G7.2.1 Development is to avoid wetland areas.
G7.2.2 Future urban development to be located outside of riparian zones.

G7.3.1 INVESTIGATION AND PLANNING: Identify riparian zones, prepare LEP/DCP to limit development within riparian zones within the LGA.
G7.3.2 PARTNERSHIP: Work with other LGAs within the region to develop an approach to riverine values and wetlands, including identifying priority areas for management.

G8 Scenic Landscapes, steep land:

G8.1.1 The existing landscape and its retention form an important consideration for further development of the LGA.
G8.1.2 The significant of scenic landscapes is both local and regional and a considerable asset to tourism and needs to be protected accordingly.

G8.2.1 Urban development to minimise impacts on view corridors to LEP and DCP to protect scenic views significant rural and natural landscapes.

G9 Prime agricultural land:

G9.1.1 There is an extensive amount of agricultural land which provides a significant resource to the LGA and the Sydney Metropolitan Region which requires protecting.
G9.1.2 Protection of rural landscapes as productive and landscape areas are essential to maintain a significant economic resource in terms of primary production as well as tourism in the LGA.

G9.2.1 Prime agricultural land is to be protected.
G9.2.2 Urban development in rural and agricultural areas should be avoided to minimise conflicts between uses and to maintain economic and tourism resources for the LGA.
G9.2.3 Protect the potential for future agricultural productions as circumstances and opportunities change.
G9.2.4 Future urban development on prime agricultural land needs to demonstrate the rationale for loss of prime agricultural land and loss of economic activity, employment and food source in the LGA and should be clearly assessed for its benefits before approval

G9.3.1 PLANNING: Maintain agriculture as a viable industry.
G9.3.2 PLANNING: LEP and DCP to protect existing high quality agricultural lands from urban expansion

(H) COMMUNITY FACILITIES	ISSUES	CRITERIA	ACTIONS
<p>H1.1 Hawkesbury LGA is well provided with community facilities servicing the majority of the population, however, 6% of the population live in the more rural and remote parts of the LGA, with limited access to facilities and services</p>	<p>H2.1 Focus future urban development in centres where the majority of community services and facilities are located.</p>	<p>H3.1 AUDIT AND INVESTIGATION: Undertake audit of existing community facilities to determine capacity to meet current and future needs, capacity for growth, future needs, etc.</p>	<p>H3.2 PLANNING: Seek to ensure all community facilities are accessible.</p>
<p>H1.2 There are substantial shifts in the age structure, with particular growth in older age groups requiring access to community facilities.</p>	<p>H2.2 All centres are to provide a level of community facilities and services that are accessible and meet the needs of their local community.</p> <p>H2.3 Quality health, education, legal, recreational, cultural and community development and other government services are accessible.</p> <p>H2.4 Adequate community services and facilities exist to meet the needs of the current and future residents</p>	<p>H3.3 INFRASTRUCTURE: Some services and facilities may exist in areas outside of the centres therefore long term planning of future facility provision to create community hubs which seek to collocate and consolidate services and facilities in key nodes.</p>	<p>H3.4 PLANNING: Undertake consultation with key service providers and the wider community to more accurately determine future community facility needs.</p> <p>H3.5 PLANNING: More detailed Community Needs Analysis be undertaken and updated every 5 years in line with ABS Census releases and Council's LEP review.</p>

(I) HERITAGE AND CHARACTER	
ISSUES	ACTIONS
<p>11 Heritage</p> <p>11.1.1 New development will most likely occur in proximity to 11.2.1 Future development is cognisant of and responsive to 11.3.1 INVESTIGATION: Undertake investigations and heritage items. archaeological and cultural heritage.</p> <p>11.1.2 Hawkesbury LGA has significant cultural and indigenous heritage which needs to be acknowledged, recorded and protected. Aboriginal cultural heritage value (as agreed by DECCW).</p> <p>11.2.3 Urban design of the heritage item should be treated sensitively in new development.</p> <p>11.2.4 Urban development in close proximity to heritage items should be assessed for its impact on the heritage environment in line with Hawkesbury Local Environmental Plan 1989.</p>	<p>11.3.2 PLANNING: Develop plans to enhance the character and identity of towns and villages and conserve and promote heritage.</p>
<p>12 Character</p> <p>12.1.1 There are significant and unique elements which contribute to the character of the LGA that future character will need to build on.</p>	<p>12.3.1 PLANNING: Integrate sustainable practices into Council plans and policies.</p> <p>12.3.2 PLANNING: Undertake public domain plans to guide the development of the public domain to ensure the individual character of each centre is retained and enhanced.</p>
<p>12.2.1 Future urban development is to have little or no impact on items of indigenous, European or Natural heritage</p> <p>12.2.2 Be cognisant of the character of surrounding areas.</p> <p>12.2.3 Be cognisant of the landscape character and its setting.</p> <p>12.2.4 Focus around or be proximate to active urban space which facilities formal and informal meeting and gathering spaces both during day and night i.e. plaza, square, mall etc.</p> <p>12.2.5 Development should create high quality and safe public domain both during day and night.</p>	

(J) SUSTAINABLE DEVELOPMENT		
ISSUES	CRITERIA	ACTIONS
J1.1 New development will need to respond to the unique environmental landscape setting of the LGA.	<p>J2.1 All new housing is to be adaptable, and where possible accessible, and embrace principles of sustainable housing design.</p> <p>J2.2 All development is to ensure that it is constructed to the highest environmental standards.</p> <p>J2.3 Natural resource limits must not be exceeded and environmental footprint minimised.</p> <p>J2.4 Demand for water must not place unacceptable pressure on infrastructure capacity to supply water and on environmental flows.</p> <p>J2.5 Demand for sewer must not place unacceptable pressure on infrastructure capacity to supply sewer.</p> <p>J2.6 Development must demonstrate the most efficient and suitable use of land.</p> <p>J2.7 Demand for energy must not place unacceptable pressure on infrastructure capacity to supply energy; requires demonstration of efficient and sustainable supply solution</p>	<p>J3.1 INVESTIGATION: Define the environmental and infrastructure capacity for each centre and ensure that new development does not exceed the defined capacities.</p> <p>J3.2 PLANNING: LEP and DCP controls require sustainable built form to maximise solar access, cross ventilation and minimise waste.</p>