



Herring Road Urban Activation Precinct

Planning Report Volume 2: Appendices

June 2014

Herring Road Urban Activation Precinct

Appendix A - Statement of intended effect

Statement of intended effect

Proposed amendment to the Ryde Local Environmental Plan 2014

It is proposed to rezone the Herring Road Urban Activation Precinct by way of a State Environmental Planning Policy (“the proposed SEPP”) that amends the *Ryde Local Environmental Plan 2014* (the Ryde LEP).

The proposed SEPP will establish land use zones, maximum height for buildings, maximum floor space ratio and minimum allotment size for the lands known as the Herring Road Precinct.

It is also proposed to transfer the Macquarie University site out of Schedule 3 of the *State Environmental Planning Policy (Major Development) 2005* and into Council’s LEP.

The proposed rezoning is supported by a detailed planning report, supporting specialist studies on utilities and community infrastructure, traffic impact assessment, economic feasibility and community engagement and 3D visualisation of the precinct.

The Department seeks to rezone the majority of the land within the precinct to the B4 Mixed Use zone which will allow for a range of land uses to transform the precinct into an active place for living, working and learning. It will also allow landowners flexibility to respond to changes in demand and market conditions over time. Specifically, sites to be rezoned include:

- The majority of the Macquarie University Campus to be rezoned from SP2 Education Establishments to B4 Mixed Use will allow the university more flexibility in the way it accommodates a mix of academic, commercial and ancillary services within the campus.
- 80 Waterloo Road and 101 Waterloo Road / 16 Byfield Street are currently zoned B3 Commercial Core. It is proposed to rationalise these zone boundaries and consolidate the B3 zones into the B4 Mixed use zone. A minor adjustment to the Herring Road precinct boundary is proposed to facilitate a more coordinated design and development outcome.
- A small triangular strip of vacant land at the Talavera and Christie Road intersection is proposed to be rezoned from RE1 Public Recreation to B4 Mixed Use, to be consistent with the surrounding zoning.

The Department also seeks to:

- Establish permitted and prohibited land uses within the B4 Mixed Use and E1 Public Recreation zones across the Precinct;
- Insert clauses and a map relating to minimum allotment sizes for development; and
- Prepare a map for land reservation acquisition for the local open space within the precinct.

1. Objectives or intended outcomes

The Ryde LEP is the principal local environmental planning instrument that regulates development in City of Ryde. The majority of the land in the Precinct is currently zoned B4 Mixed Use under the LEP, although there are areas zoned B3 Commercial Core, B7 Business Park, RE 1 Public Recreation and SP2 Infrastructure.

The proposed instrument will amend the Ryde LEPs Instrument and planning maps. The Instrument will establish objectives for development, specify permissible and prohibited uses, and will establish new development control provisions, including principal development standards for future urban development within the Precinct.

The proposed planning instrument will allow for the redevelopment of the Herring Road Precinct for a mix of residential, commercial, education, retail and community uses. The proposed instrument will:

- Encourage a mix of land uses to transform the precinct into an active place for living, learning and working;

- Create a quality high density urban community that utilises excellent transport infrastructure and access to job markets, educational facilities, retail, local services and recreational assets;
- Increase building heights and densities to improve housing supply and choice;
- Transform Herring Road into an active street, with wider pavements, new landscaping and new places to meet;
- Plan for better connected and finer-grained streets and pedestrian / cycle and networks to provide safer, more convenient and pleasant access; and
- Create opportunities for new and improved parks, spaces, playgrounds and community facilities.

The proposal encourages redevelopment for medium to high density housing that could achieve up to 5,400 new dwellings by 2031.

2. Explanation of provisions

This section provides an explanation of the proposed zoning and development controls to be introduced into the Ryde LEP by the proposed instrument. Terms used in this description have the same meaning as in the *Environmental Planning and Assessment Act 1979* ('EP&A Act') and the *Standard Instrument Local Environmental Plan*.

2.1 Land use table and zones

A mix of land uses is needed to create and sustain busy streets, active spaces, successful businesses, well used facilities and lively places. To cater for residential population growth and the demand increases for businesses and other uses over time, land use controls will need to be flexible enough to allow change. The 'B4 Mixed Use' zone proposes a mix of land uses and activities for the Herring Road precinct.

The future commercial, retail, residential, entertainment, medical, community and education uses attracted to Herring Road shall build on the existing local attractors of Macquarie University, the Macquarie Shopping Centre and Macquarie Business Park and good transport accessibility in the form of the bus interchange and the Macquarie University Train Station.

Quality public spaces will provide gathering places for residents, workers, students and visitors to meet. Recreation and environmental conservation areas along Shrimptons Creek, Kikkiya Creek and in the university will continue to provide a mix of active and passive recreation opportunities for residents, workers and students.

Draft Zoning Maps, Height of Building Maps, Floor Space Ratio Maps, Minimum Allotment Size Maps and Land Reservation Acquisition Maps for the precinct are attached to this Statement of Intended Effect to illustrate the changes under the proposed SEPP.

Zone	Proposed Change to the Ryde LEP
B4 Mixed Use	Inclusion of the following uses that are permitted with consent: <ul style="list-style-type: none"> • car parks • high technology industry • light industry • signage • water recycling facilities • water treatment facilities

2.2 Principal development controls

The proposed instrument will introduce amended principal development standards for heights of buildings, floor space ratio and minimum allotment size into Ryde LEP.

2.3.1 Heights of Buildings

The proposed building height controls for the Herring Road precinct seeks to:

- define the precinct's key activity streets of Herring Road and Waterloo Road with taller buildings;
- focus the highest buildings of between 90m and 120m in areas closest to the train station;
- enable precinct gateway sites to act as secondary opportunities for building height with buildings of up to 65m and 90m in height; and
- add definition and legibility to the Herring Road precinct as part of Macquarie Park.

2.3.2 Floor Space Ratio Controls

The proposed floor space ratio (FSR) controls for the Herring Road precinct complement the proposed building height controls.

- The proposed FSRs represent a balance between optimising access to transport infrastructure, facilitating financially viable development and achieving quality built form;
- FSRs of 3.5 to 4.5:1 are proposed for site in close proximity to and with good access to Macquarie University Train Station and in locations that can facilitate taller, gateway buildings;
- FSRs for strata titled properties range between 3.0:1 and 4.5:1, depending upon location and subdivision pattern (minimum lot size controls also apply); and
- FSRs on sites adjacent to Epping Road and along Herring Road range between 2.5:1 and 2.9:1.

- *2.3.3 Minimum lot size*

Minimum lot sizes have been identified for some of the smaller allotments to ensure new development has sufficient amenity to cater for the increase in density. These controls apply to the strata building precinct located east of Herring Road.

Site amalgamation to a minimum lot size of 1,800sqm is proposed. The site amalgamation control is to ensure that future renewal and redevelopment:

- can facilitate good design with appropriate building footprints and built form;
- has lot sizes and dimensions that are appropriate for scale and character of precinct renewal proposals;
- responds to the existing and proposed future character of the area, its subdivision pattern and street structure; and
- respects and minimises impact on the privacy and amenity of neighbouring properties.



Ryde Local Environmental Plan 2014

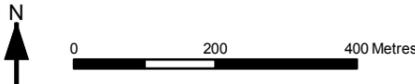
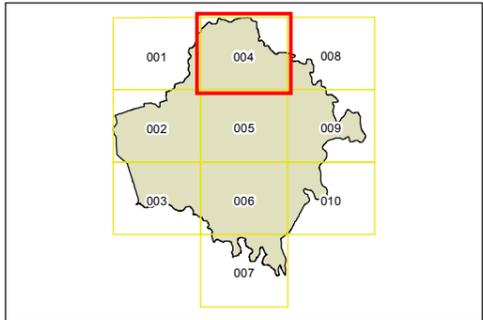
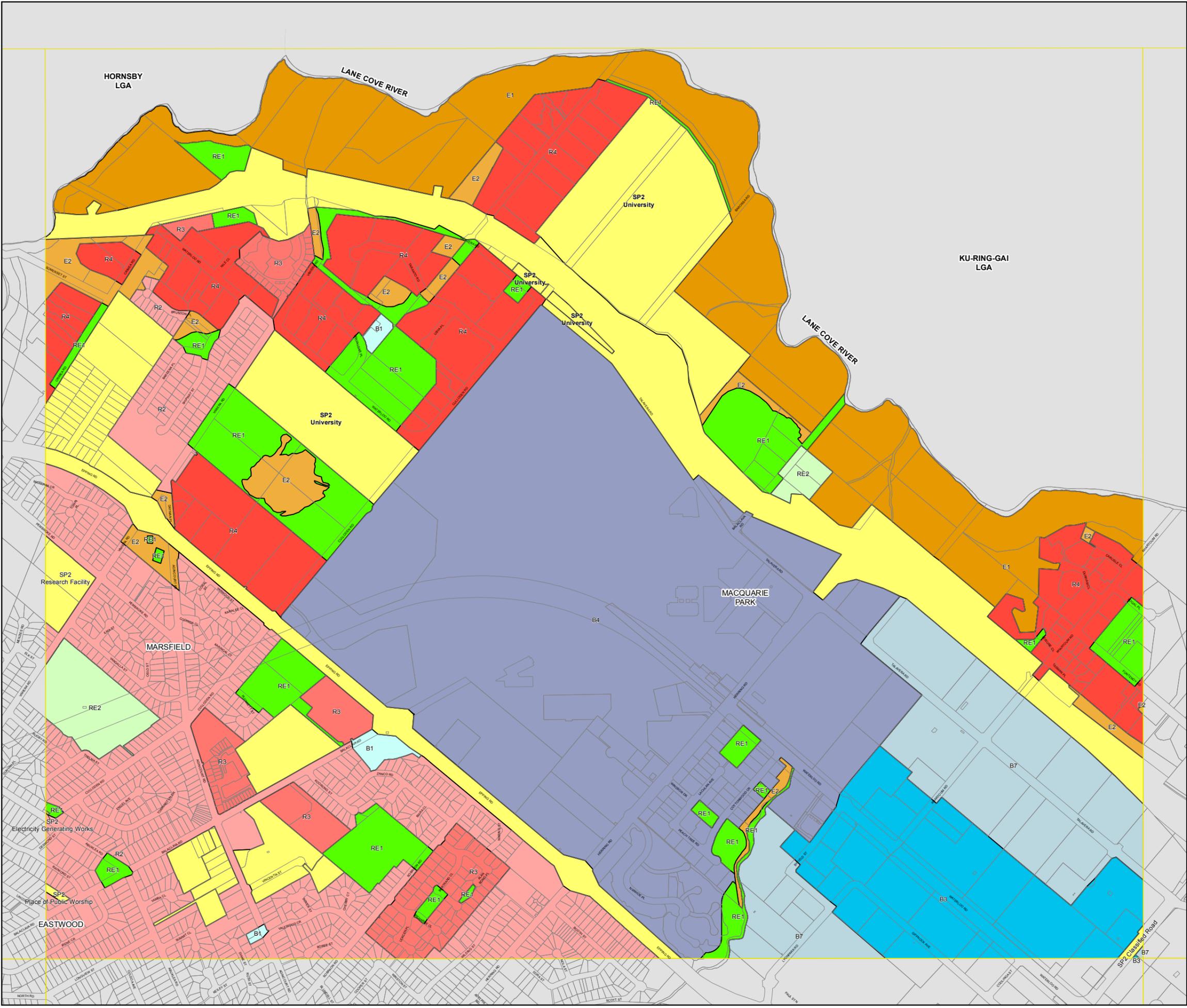
Land Zoning Map - Sheet LZN_004

Zone

- B1 Neighbourhood Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- B7 Business Park
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- IN2 Light Industrial
- IN4 Working Waterfront
- R1 General Residential
- R2 Low Density Residential
- R3 Medium Density Residential
- R4 High Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- SP1 Special Activities
- SP2 Infrastructure
- DM Deferred matters

Cadastre

- Cadastre 27/03/2014 © City of Ryde



Projection: GDA 1994
MGA Zone 56
Scale: 1:10,000 @ A3

Map identification number: 6700_COM_LZN_004_010_20140407



Ryde Local Environmental Plan 2014

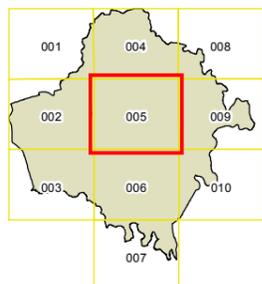
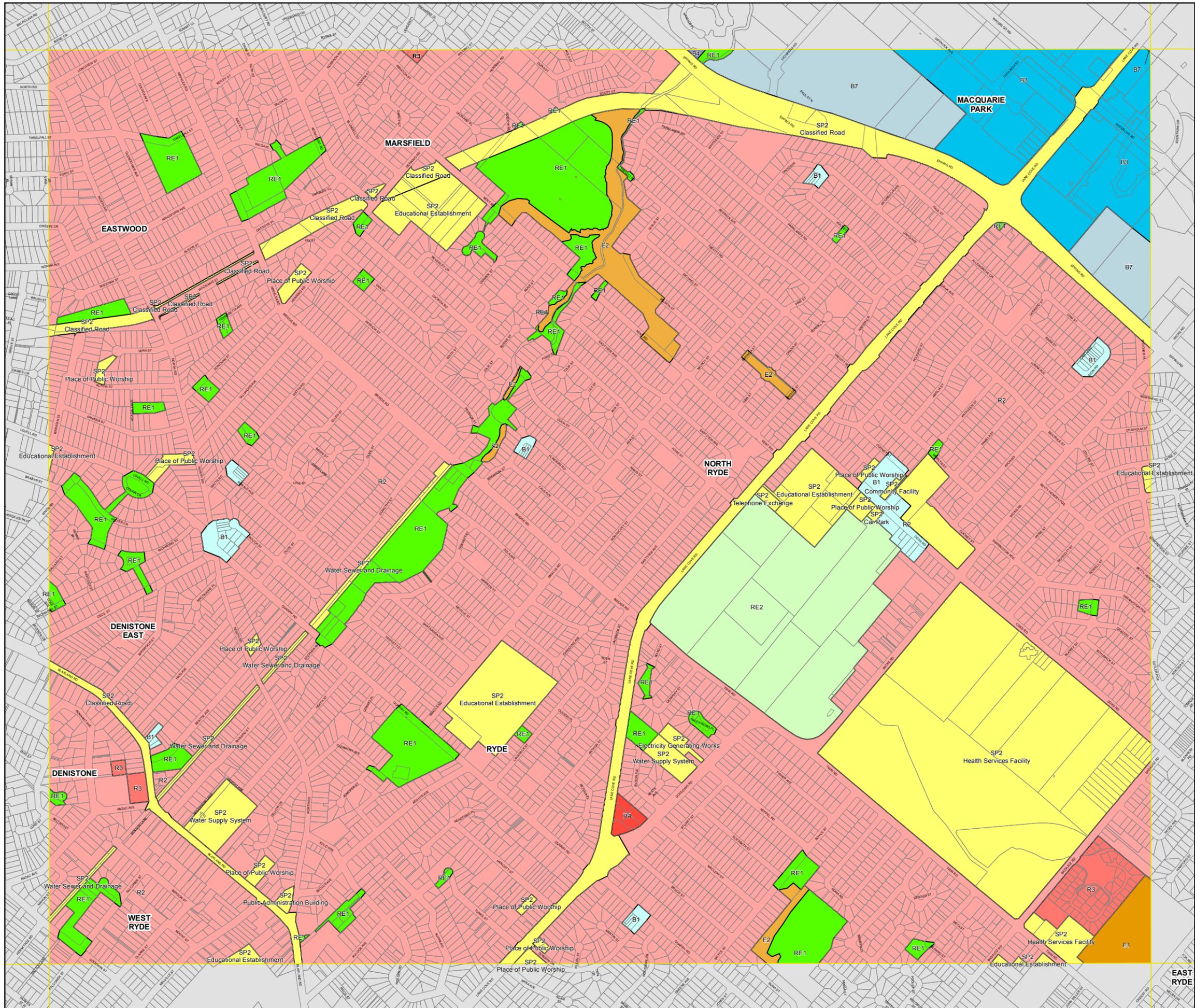
Land Zoning Map - Sheet LZN_005

Zone

- B1 Neighbourhood Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- B7 Business Park
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- IN2 Light Industrial
- IN4 Working Waterfront
- R1 General Residential
- R2 Low Density Residential
- R3 Medium Density Residential
- R4 High Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- SP1 Special Activities
- SP2 Infrastructure
- DM Deferred matters

Cadastre

Cadastre 27/03/2014 © City of Ryde



Projection: GDA 1994
MGA Zone 56
Scale: 1:10,000 @ A3

Map identification number: 6700_COM_LZN_005_010_20140407



Ryde Local Environmental Plan 2014

Height of Buildings Map - Sheet HOB_004

Maximum Building Height (m)

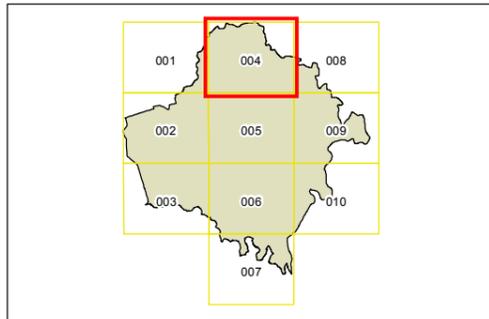
J	9.5	T1	26
K	10	T2	27.5
L	11.5	U1	30
M1	12	U2	30.5
M2	12.5	U3	33
N1	13	U4	33.5
N2	14	V	37
O1	15	W	44.5
O2	15.5	X	45
O3	16	Z	57
P	18.5	AA1	65
Q	19	AA2	75
R1	21.5	AB1	90
R2	22	AB2	92
S1	23	AB3	99
S2	24	AC	120

Maximum Building Height (RL)

7
14.6
18
24
25
33
39
47.75
91
105

Cadastre

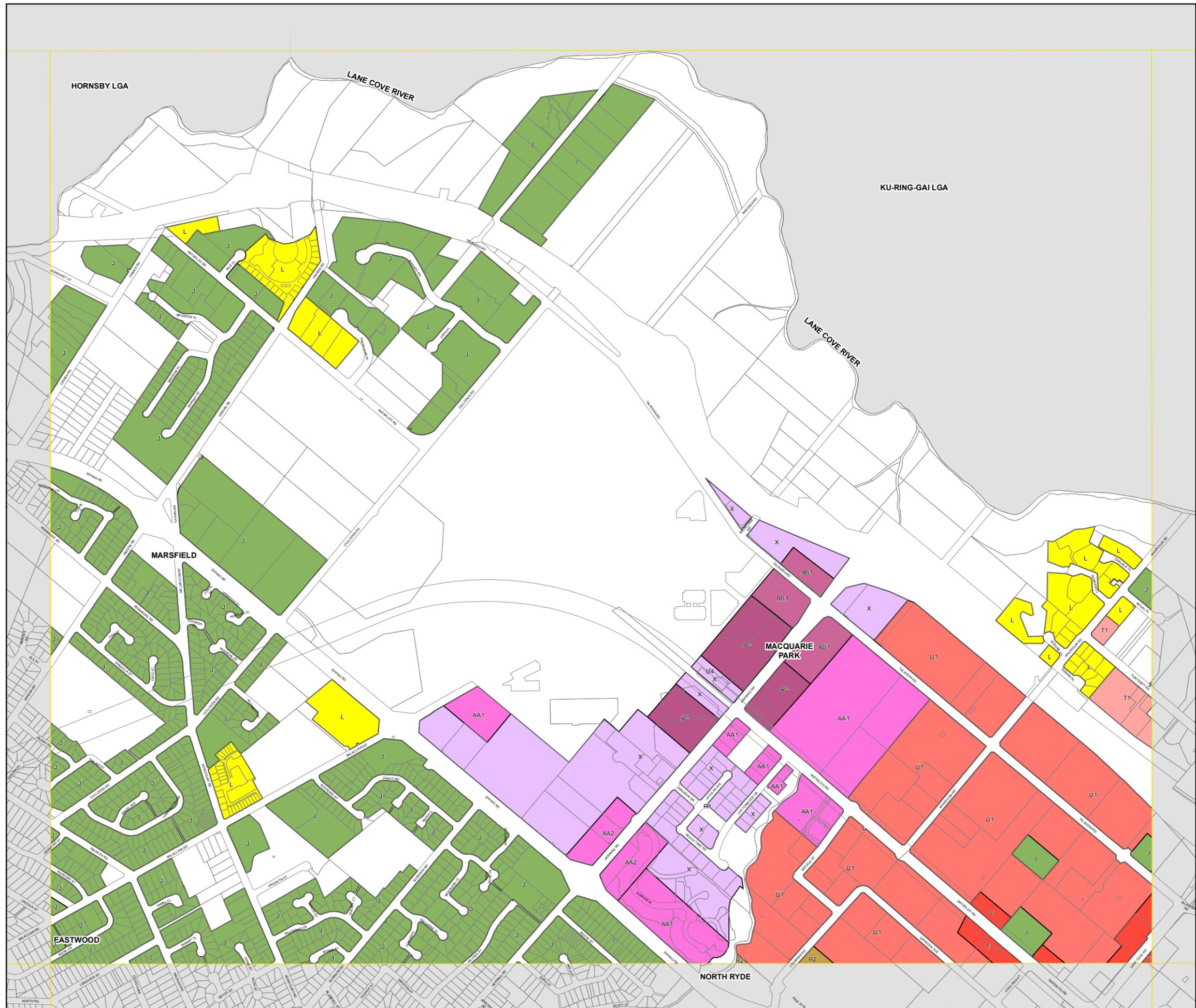
Cadastre 27/03/2014 © City of Ryde



Projection: GDA 1994
MGA Zone 56

Scale: 1:10,000 @ A3

Map identification number: 6700_COM_HOB_004_010_20140407





Ryde Local Environmental Plan 2014

Height of Buildings Map - Sheet HOB_005

Maximum Building Height (m)

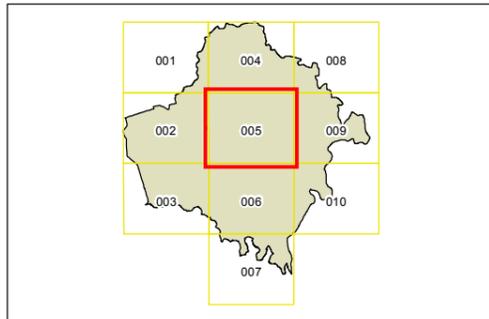
J	9.5	T1	26
K	10	T2	27.5
L	11.5	U1	30
M1	12	U2	30.5
M2	12.5	U3	33
N1	13	U4	33.5
N2	14	V	37
O1	15	W	44.5
O2	15.5	X	45
O3	16	Z	57
P	18.5	AA1	65
Q	19	AA2	75
R1	21.5	AB1	90
R2	22	AB2	92
S1	23	AB3	99
S2	24	AC	120

Maximum Building Height (RL)

7
14.6
18
24
25
33
39
47.75
91
105

Cadastre

Cadastre 27/03/2014 © City of Ryde

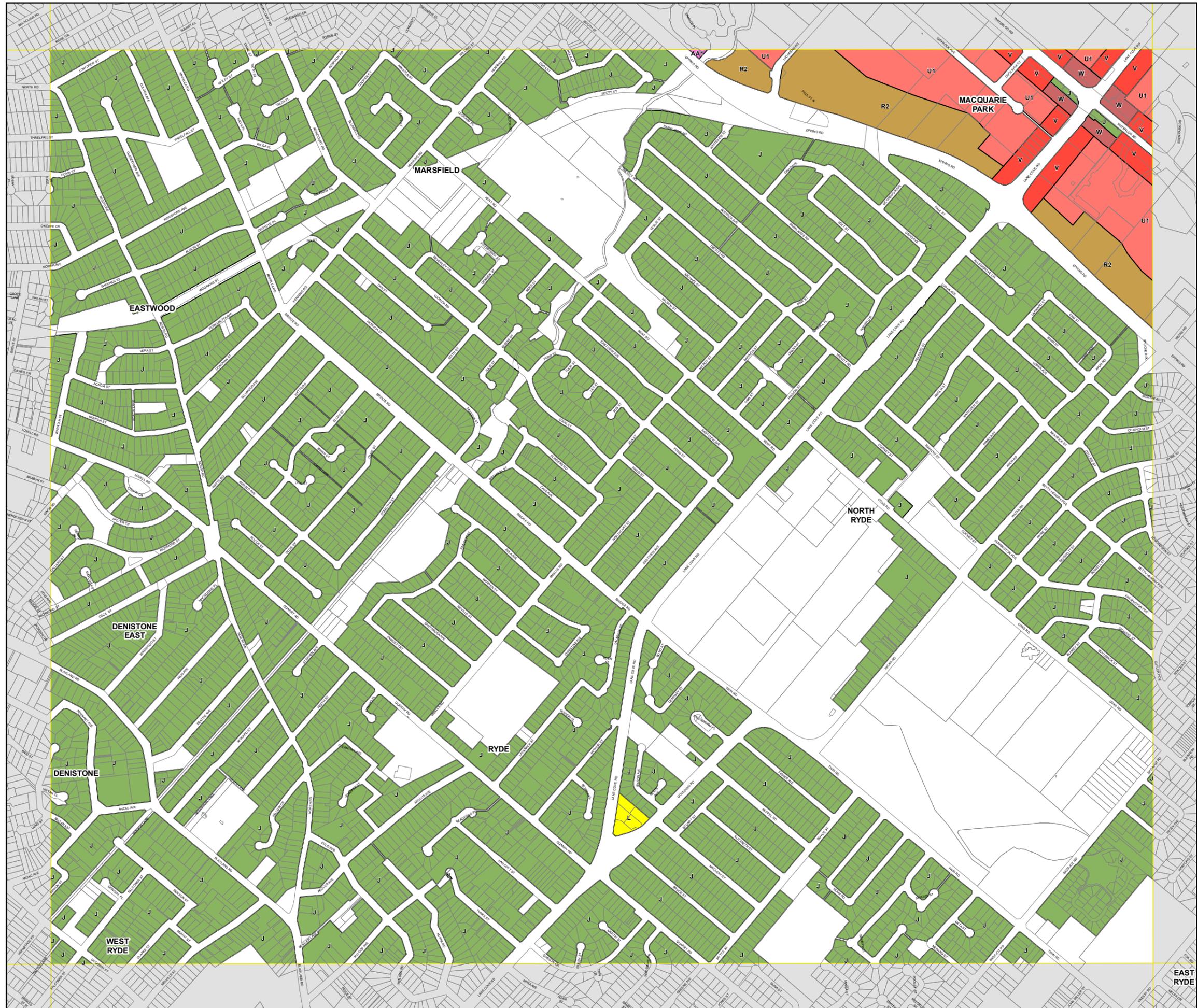


0 200 400 Metres

Scale: 1:10,000 @ A3

Projection: GDA 1994
MGA Zone 56

Map identification number: 6700_COM_FSR_005_010_20140407



EAST RYDE

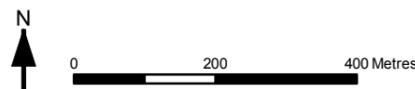
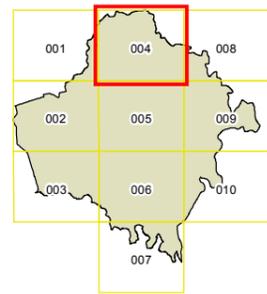
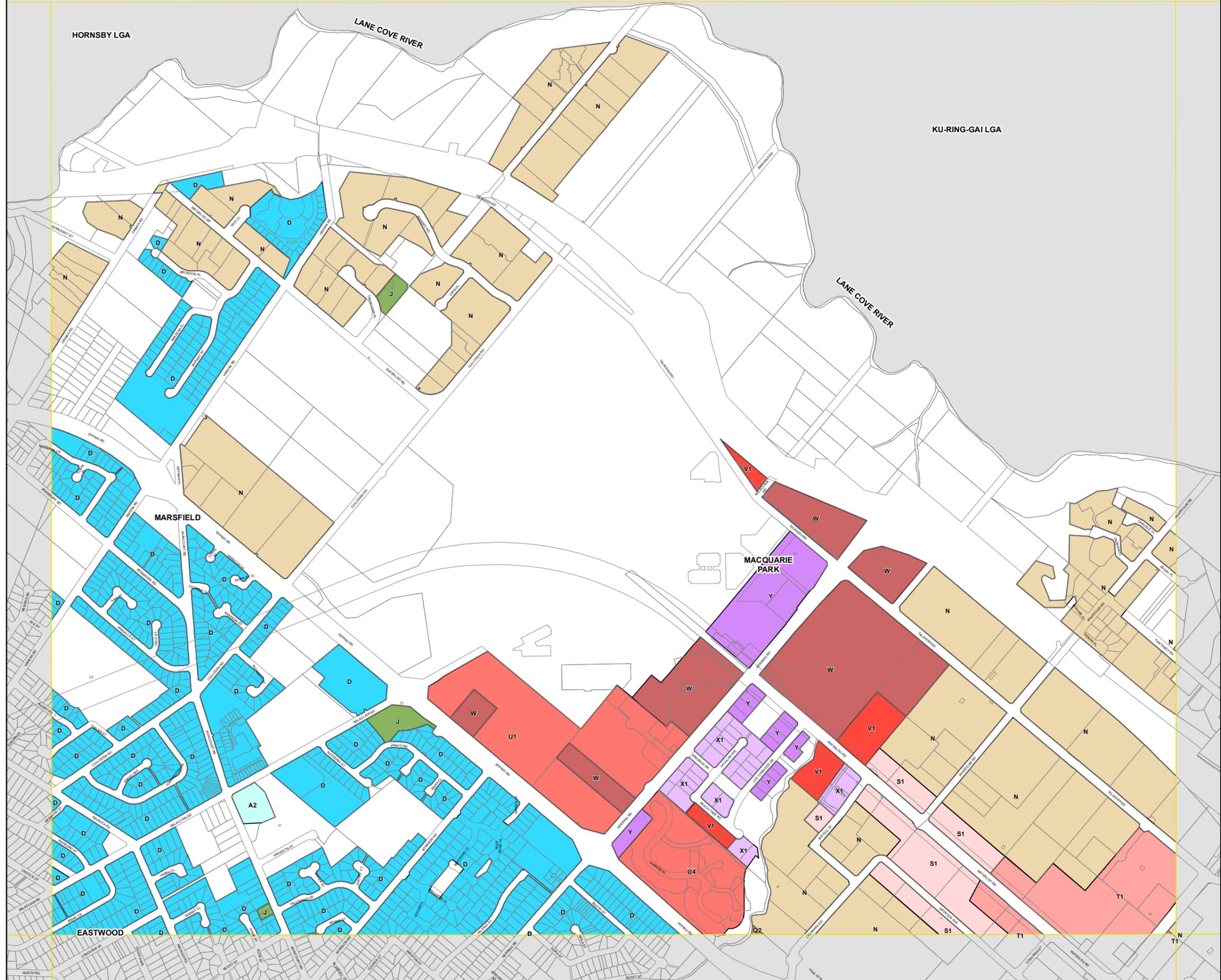
Floor Space Ratio Map - Sheet FSR_004

Maximum Floor Space Ratio (n:1)

A1	0.00	T1	2.00
A2	0.30	T2	2.20
A3	0.33	T3	2.30
D	0.50	U1	2.50
G	0.65	U2	2.60
I	0.75	U3	2.70
J	0.80	U4	2.90
K	0.88	V1	3.00
N	1.00	V2	3.20
O	1.10	W	3.50
P1	1.20	X1	4.00
P2	1.25	X2	4.30
Q1	1.30	X3	4.37
Q2	1.39	Y	4.50
S1	1.50	Z	5.00
S2	1.80		

Cadastre

 Cadastre 27/03/2014 © City of Ryde



Projection: GDA 1994
MGA Zone 56
Scale: 1:10,000 @ A3



Ryde Local Environmental Plan 2014

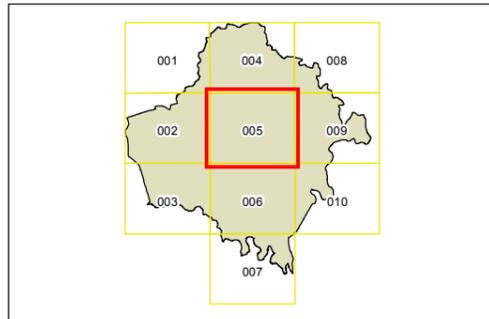
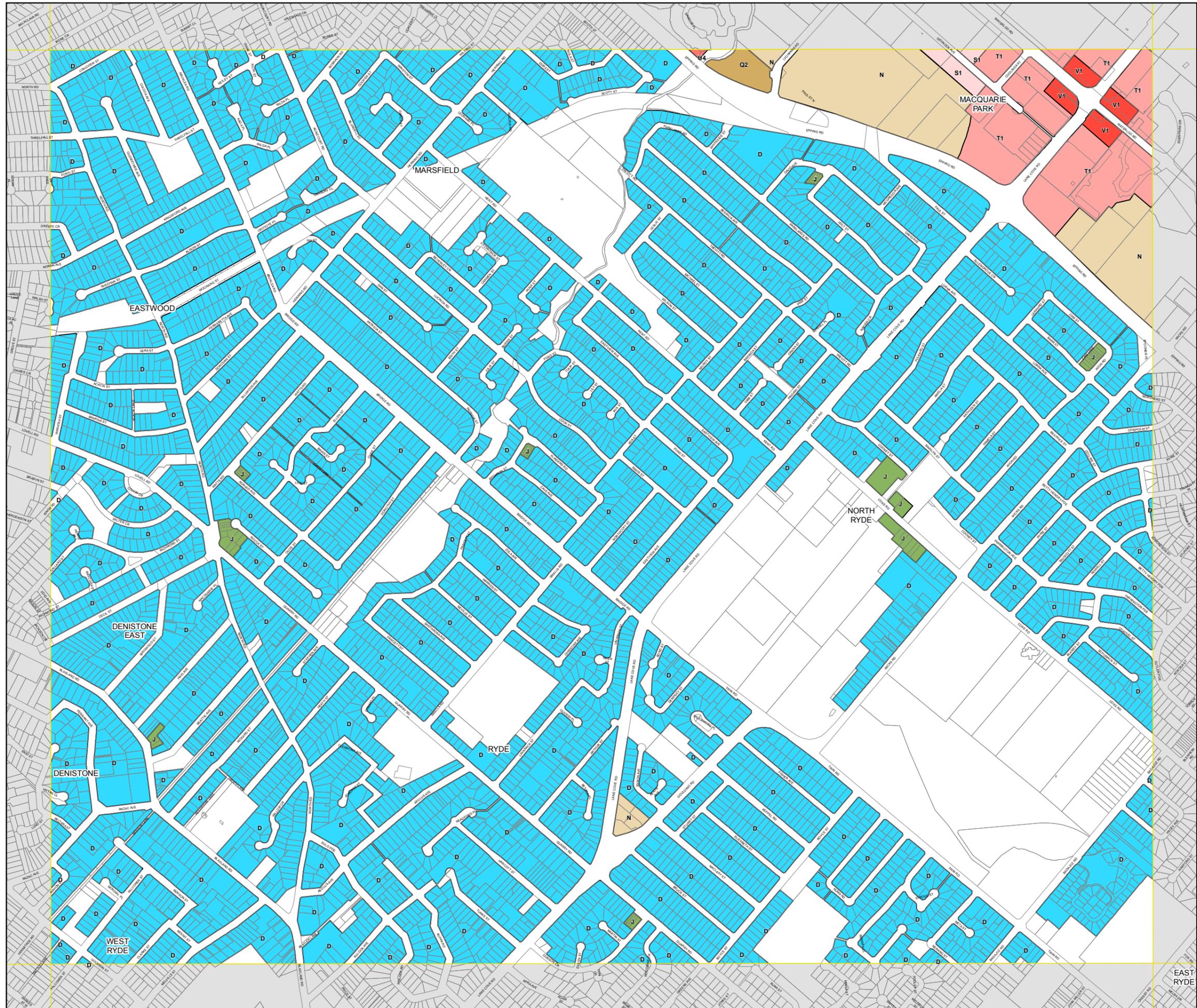
Floor Space Ratio Map - Sheet FSR_005

Maximum Floor Space Ratio (n:1)

A1	0.00	T1	2.00
A2	0.30	T2	2.20
A3	0.33	T3	2.30
D	0.50	U1	2.50
G	0.65	U2	2.60
I	0.75	U3	2.70
J	0.80	U4	2.90
K	0.88	V1	3.00
N	1.00	V2	3.20
O	1.10	W	3.50
P1	1.20	X1	4.00
P2	1.25	X2	4.30
Q1	1.30	X3	4.37
Q2	1.39	Y	4.50
S1	1.50	Z	5.00
S2	1.80		

Cadastre

□ Cadastre 27/03/2014 © City of Ryde



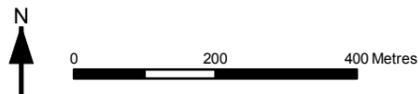
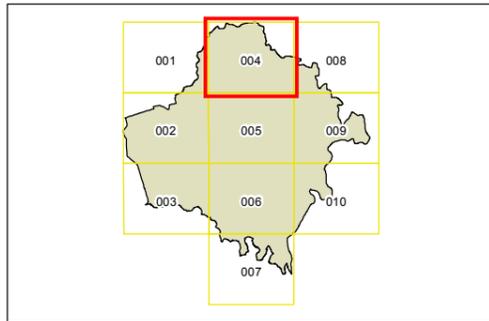
Projection: GDA 1994
MGA Zone 56
Scale: 1:10,000 @ A3

Map identification number: 6700_COM_FSR_005_010_20140407

Land Reservation Acquisition Map - Sheet LRA_004

- Local Open Space (RE1)
- Regional Open Space (RE1)
- Classified Road (SP2)

Cadastre
 Cadastre 27/03/2014 © City of Ryde



Projection: GDA 1994
 MGA Zone 56
 Scale: 1:10,000 @ A3



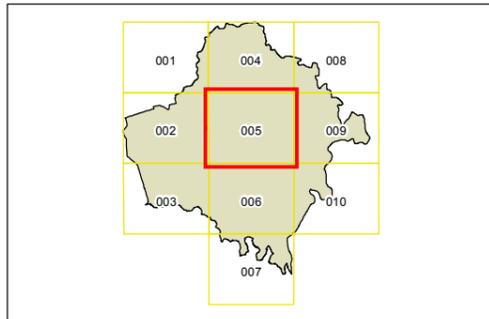
Ryde Local Environmental Plan 2014

Land Reservation Acquisition Map - Sheet LRA_005

- Local Open Space (RE1)
- Regional Open Space (RE1)
- Classified Road (SP2)

Cadastre

Cadastre 27/03/2014 © City of Ryde



Projection: GDA 1994
MGA Zone 56
Scale: 1:10,000 @ A3

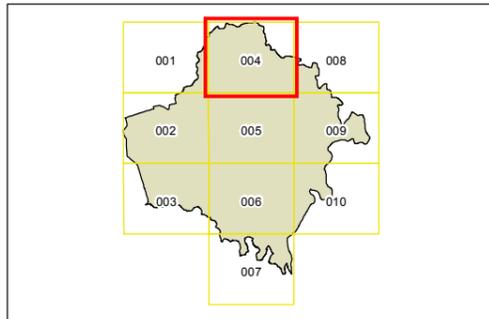
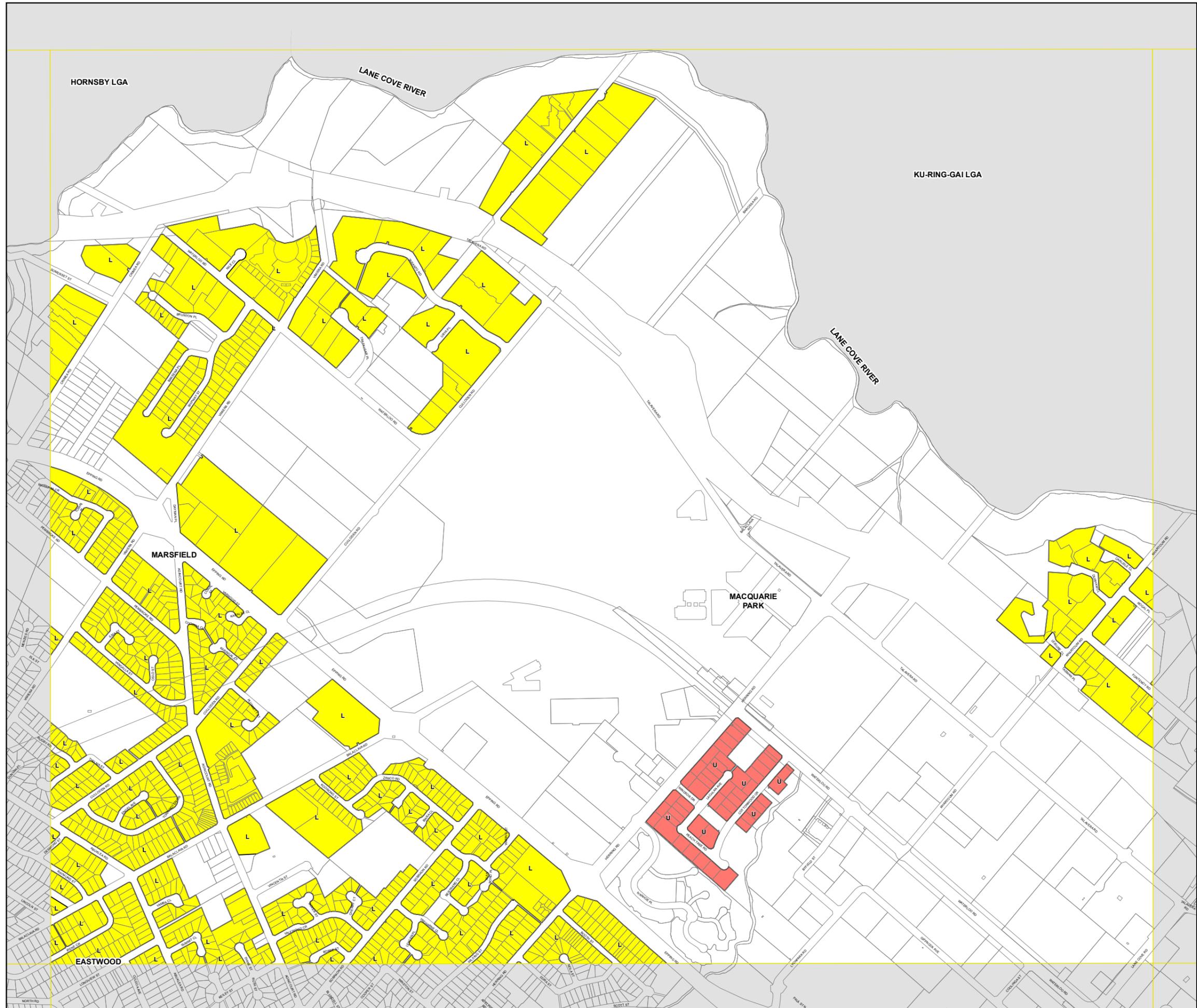
Lot Size Map - Sheet LSZ_004

Minimum Lot Size

- L 580
- U 1800

Cadastre

Cadastre 27/03/2014 © City of Ryde



Projection: GDA 1994
 MGA Zone 56
 Scale: 1:10,000 @ A3

Herring Road Urban Activation Precinct

Appendix B - State plans and strategies

Summary of State plans and strategies

NSW 2021 State Plan

NSW 2021 is the state government's 10 year plan which in conjunction with the NSW Budget guides policy and budget decisions for delivering community priorities. The plan aims to increase patronage on public transport, improve efficiency of the road network, restore accountability to the NSW government, achieve environmental and economic benefits, build liveable centres, and involve the community in decision making on government policy, services and projects.

Draft Metropolitan Strategy for Sydney to 2031

The Draft Metropolitan Strategy for Sydney to 2031 sets out the plan for Sydney for the next 20 years. It identifies the need for 545,000 more homes and 625,000 more jobs by 2031. Herring Road is located within the Global Economic Corridor, which extends from Sydney Airport and Port Botany through the Sydney Central Business District, North Sydney, Chatswood, Macquarie Park and Parramatta. One of the priorities of the Global Economic Corridor is to facilitate the delivery of the Herring Road Urban Activation Precinct.

The delivery of urban activation precincts are key to the urban renewal program as they are areas identified as appropriate to intensify housing and employment and accommodate urban growth.

The City of Ryde is located within the Central Subregion of the Draft Metropolitan Strategy for Sydney. It identifies Macquarie Park as a 'Specialised Precinct' within Sydney's Global Economic Corridor which will accommodate a minimum of 16,000 additional jobs by 2031.

New South Wales Long Term Transport Master Plan

The NSW Long Term Transport Master Plan identifies objectives which focus on improving liveability and supporting economic growth and productivity. These objectives are to be facilitated by the provision of a transport network which reduces journey times, improves connectivity, increases efficiency and provides services that support job growth in centres close to where people live. There is an emphasis on the delivery of more transit-orientated development both as part of urban renewal projects and in new developments.

There are several transport challenges facing Macquarie Park over the next 20 years:

- congestion on arterial and local road network impacts on reliability of buses and increases travel times
- currently 85 per cent of commuters travel by car – car travel is still dominant after the opening of the rail link
- arterial roads have heavy traffic and create barriers for pedestrians and cyclists and lack well located crossings
- improved connectivity to the greater metropolitan area is required to support business-to-business connections

The Herring Road precinct supports the objectives and focus of the NSW Long Term Transport Master Plan through the utilisation of the existing Macquarie University Train Station, to ensure connectivity and minimise journey times for those living and working within the precinct.

New South Wales State Infrastructure Strategy

The NSW State Infrastructure Strategy aims to increase the NSW economy by \$50 billion and add over 100,000 jobs. The State Infrastructure Strategy focuses on the need for infill development within local and strategic centres to mitigate and manage infrastructure costs associated with greenfield residential growth.

Herring Road precinct is located adjacent to Macquarie Park which is expected to provide 16,000 new jobs by 2031. This indicates that the precinct may need to accommodate increased commercial and residential areas to provide adequate support for employment growth at Macquarie Park.

Herring Road Urban Activation Precinct Appendix C - Demographic profile

Macquarie Park / Herring Road precinct - Summary demographic profile

This appendix provides a summary demographic profile of Macquarie Park, which includes the Herring Road precinct and provides some comparisons with the City of Ryde LGA and Greater Sydney.

The source of the data is the Census (Australian Bureau of Statistics), with statistics and analysis provided courtesy of .id (www.id.com.au).

Residential population

The City of Ryde's residential population has been growing steadily since 2005, as illustrated in Figure 70 below. In 2012, the City of Ryde LGA had an Estimated Residential Population (official population) of 110,390 persons, which equates to an average density of 27.28 persons per hectare.

In 2011, Macquarie Park as a whole had an estimated residential population of 6,149 but exhibits a lower average density of 9.10 persons per hectare, due largely to the number of business park and employment uses (2011 Census, ABS).

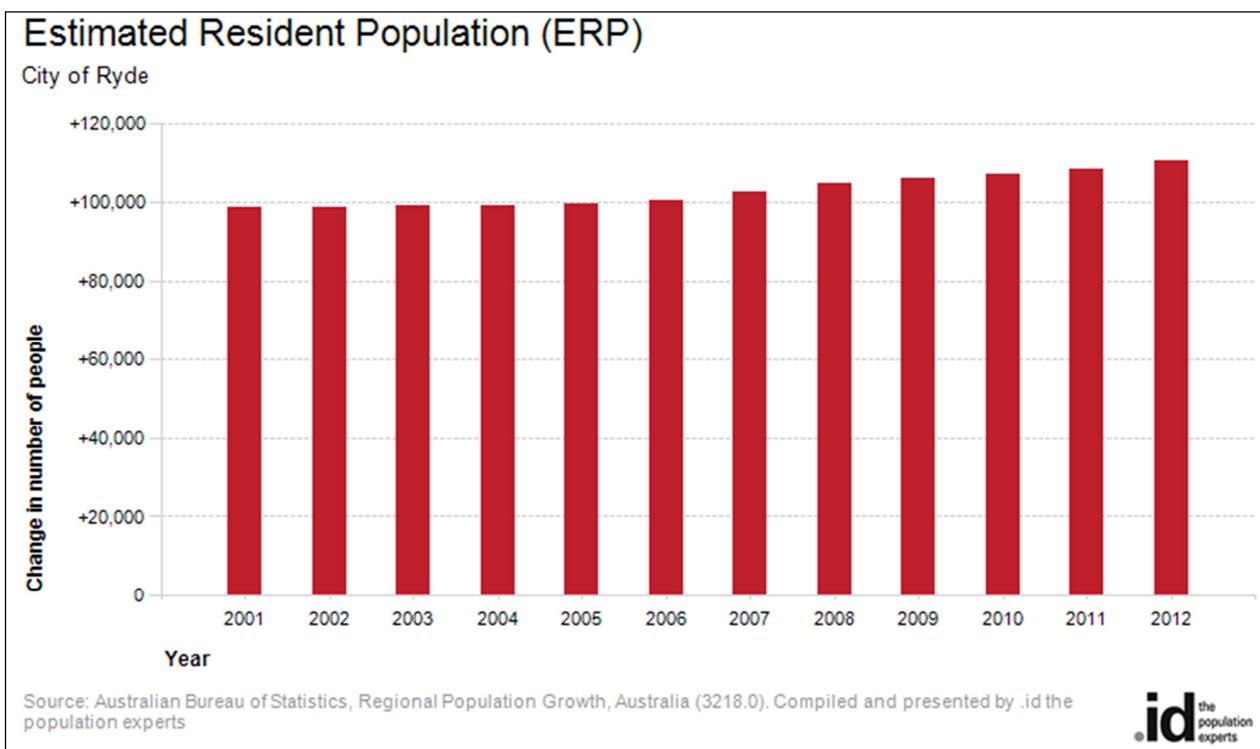


Figure 1 Estimated Residential Population for the City of Ryde from 2001 to 2012

Age structure

Five year age groups present an age profile of the population, with each age group covering exactly five years and enabling direct comparison between each group.

Analysis of the five year age groups of Macquarie Park in 2011 compared to the City of Ryde revealed a lower proportion of people in the younger age groups (under 15) as well as a lower proportion of people in the older age groups (65+). Overall, 8.6% of the population was aged between 0 and 15, and 13.0% were aged 65 years and over, compared with 16.6% and 14.3% respectively for the City of Ryde. Figure 71 illustrates the major differences between the age structure of Macquarie Park and the City of Ryde which were:

- A larger percentage of persons aged 20 to 24 (20.0% compared to 8.7%)
- A larger percentage of persons aged 25 to 29 (14.1% compared to 8.3%)
- A larger percentage of persons aged 30 to 34 (11.5% compared to 8.1%)
- A larger percentage of persons aged 85 and over (4.6% compared to 2.4%)

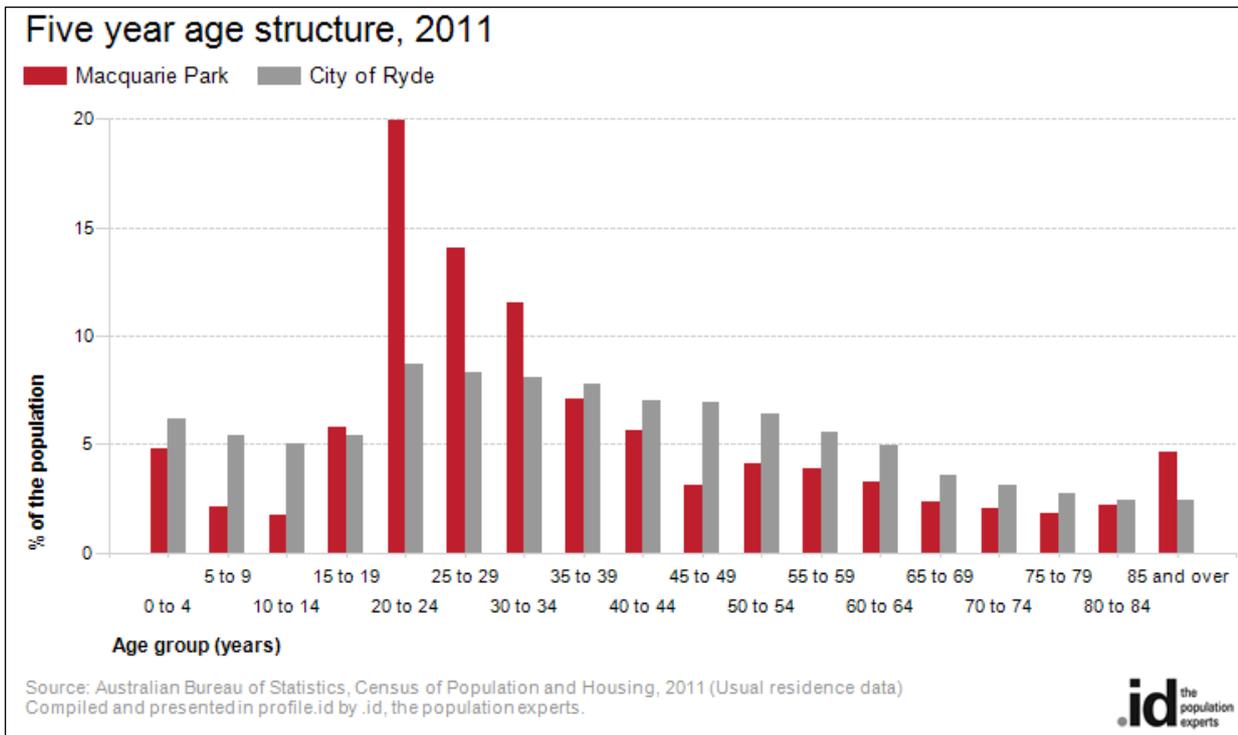


Figure 2 Five year age structure comparisons, Macquarie Park & City of Ryde

From 2006 to 2011, Macquarie Park's population increased by 544 people (9.7%) representing an average annual population change of 1.87% per year over the period. Figure 72 illustrates that the areas of largest change in Macquarie Park's age structure were in the following age groups:

- 20 to 24 (+156 persons)
- 25 to 29 (+178 persons)
- 30 to 34 (+98 persons)
- 45 to 49 (-99 persons)

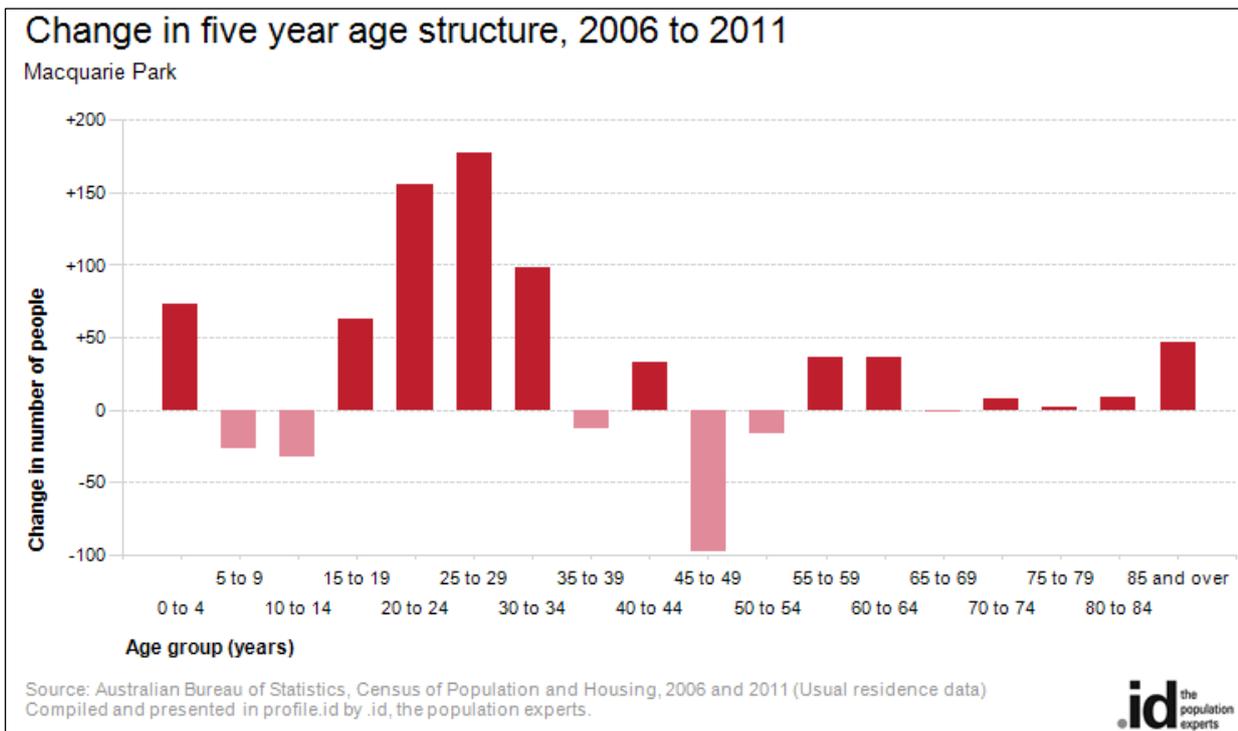


Figure 3 Changes in Macquarie Park's five year age structure, 2006 to 2011

Service age groups

Service age groups divide the population into age categories that reflect typical life-stages. They indicate the level of demand for services that target people at different stages in life and how demand is changing.

Analysis of the service age groups of Macquarie Park in 2011, illustrated in Figures 73 & 74, compared to the City of Ryde shows that there was a lower proportion of people in the younger age groups (0 to 17 years) as well as a lower proportion of people in the older age groups (60+ years). The Macquarie Park age structure provides key insights into the level of demand for services & facilities now and in the future.

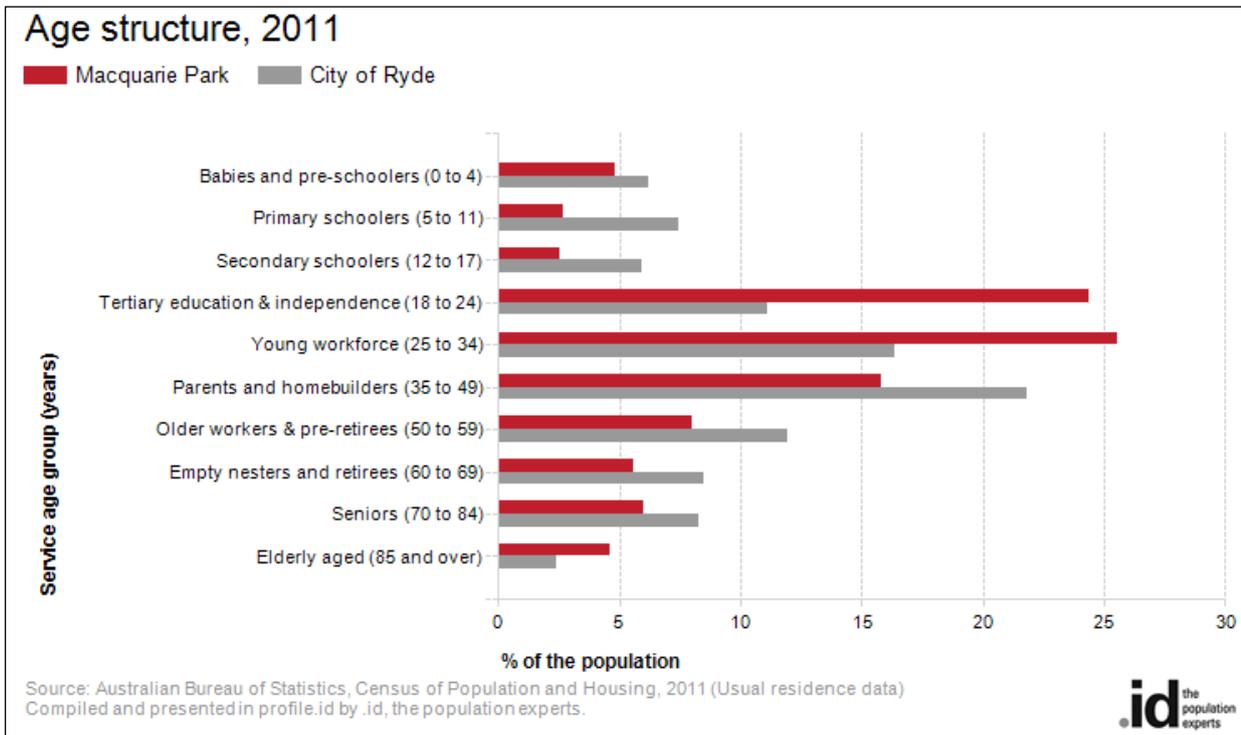


Figure 4 Age structure comparisons for Macquarie Park and the City of Ryde

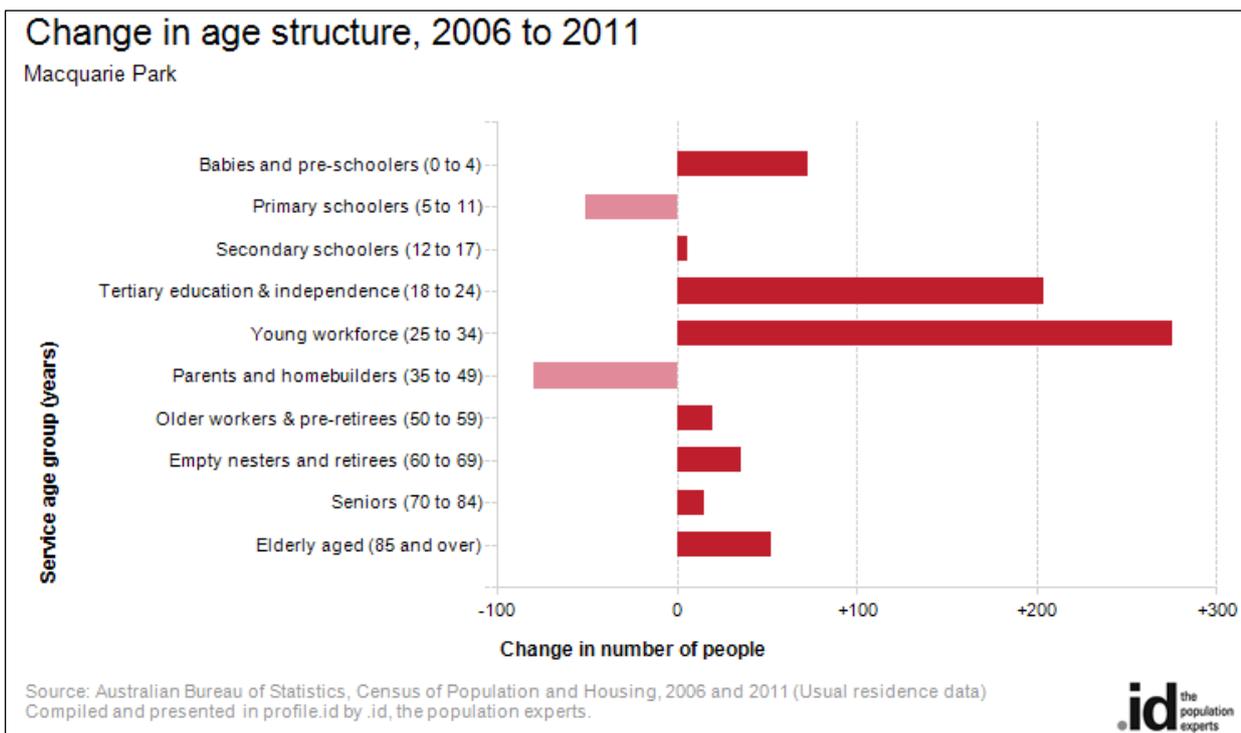


Figure 5 Changes in age structure for Macquarie Park between 2006 and 2011

Overall, 10.0% of the population was aged between 0 and 17, and 16.2% were aged 60 years and over, compared with 19.6% and 19.2% respectively for the City of Ryde. The major differences between the age structure of Macquarie Park and the City of Ryde were:

- A larger percentage of 'Tertiary education & independence' (24.4% compared to 11.1%)
- A larger percentage of 'Young workforce' (25.6% compared to 16.4%)
- A larger percentage of 'Frail aged' (4.6% compared to 2.4%)
- A smaller percentage of 'Parents and homebuilders' (15.8% compared to 21.8%)

From 2006 to 2011, Macquarie Park's population increased by 550 people (9.8%). This represents an average annual population change of 1.89% per year over the period. The largest changes in age structure in this area between 2006 and 2011 were in the age groups:

- Young workforce (25 to 34) (+275 persons)
- Tertiary education & independence (18 to 24) (+204 persons)

Education

Analysis of the share of the population attending educational institutions in Macquarie Park in 2011 compared to the City of Ryde (Refer to Figure 75) shows that the major differences between the shares of the population attending learning institutions were:

- A larger percentage of persons attending University (23.3% compared to 9.1%)
- A smaller percentage of persons not attending (59.9% compared to 68.3%)
- A smaller percentage of persons attending a Government primary school (2.7% compared to 6.9%)
- A smaller percentage of persons attending a Government secondary school (2.0% compared to 5.3%)

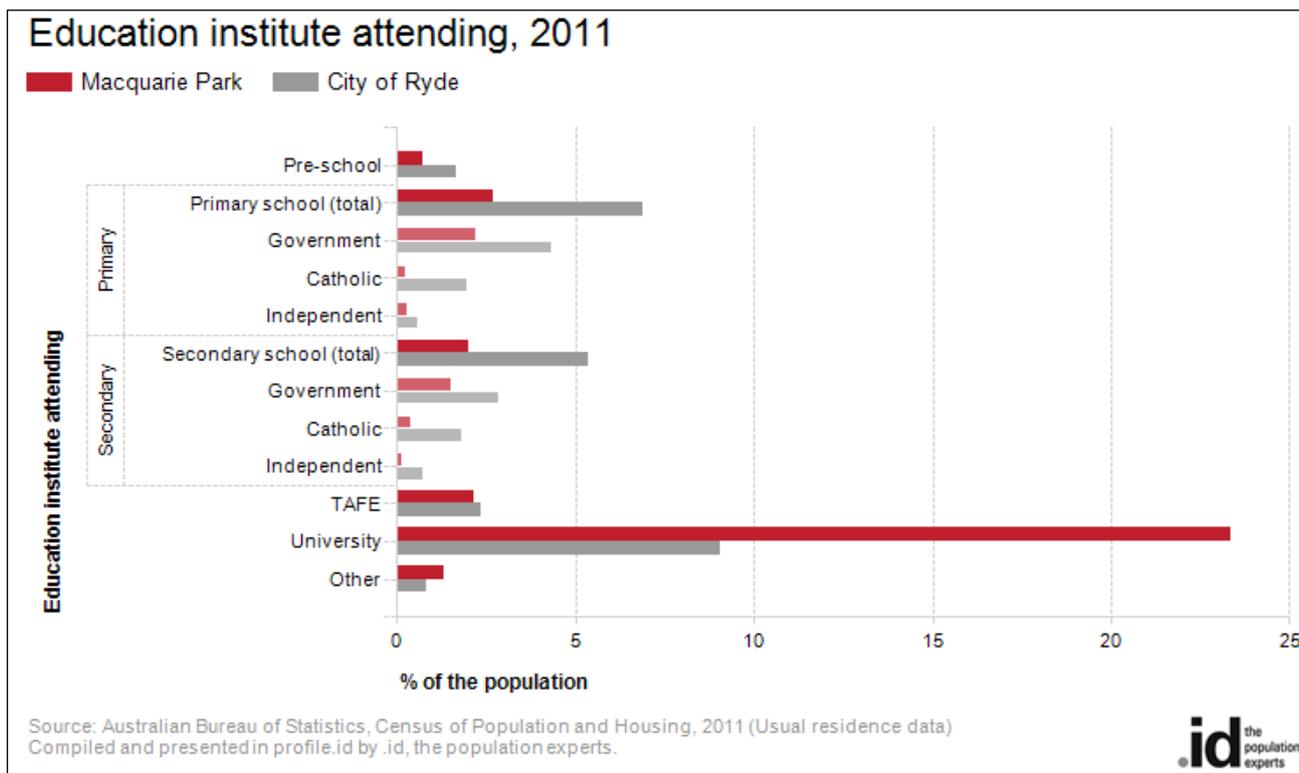


Figure 6 Education institute attending for Macquarie Park & City of Ryde

As illustrated in Figure 76, when compared to Greater Sydney, the City of Ryde has significantly higher number of people qualified with Bachelor or Higher degrees and a slightly higher number of people qualified with Advanced Diplomas or Diplomas.

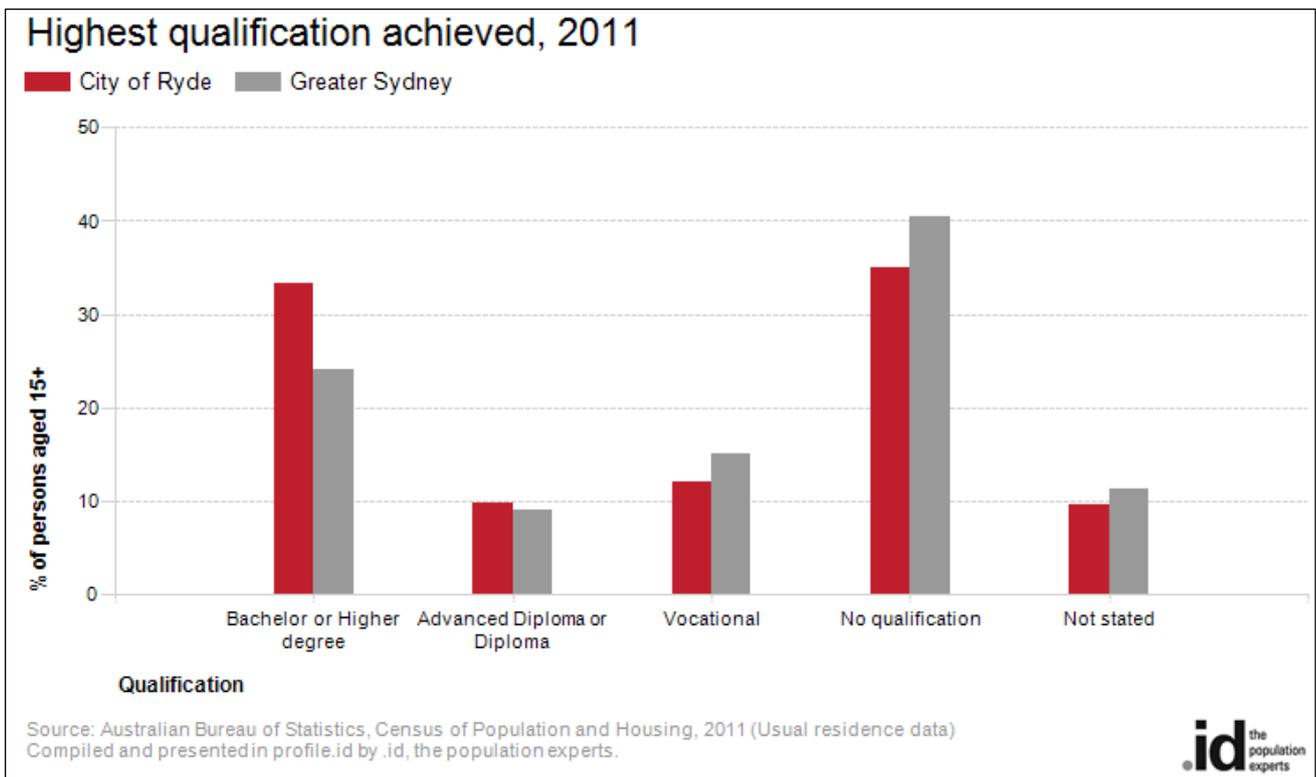


Figure 7 Highest qualification achieved for the City of Ryde & Greater Sydney

In Macquarie Park in 2011, over 40% of people were attending an educational institution. Of these, 6.8% were in primary school, 4.8% in secondary school and 63.7% in a tertiary / technical institution. The tertiary / technical statistic is some 3 times the state and national averages. These statistics reinforce the importance of Macquarie University to the local area and impacts positively on the percentage of persons in Macquarie Park / City of Ryde with higher educational qualifications, when compared to Greater Sydney.

Dwelling structure

Dwelling type is an important determinant of residential role and function. A greater concentration of higher density dwellings is likely to attract more young adults and smaller households, often renting. Whilst larger, detached or separate dwellings are more likely to attract families and prospective families.

In 2011, as illustrated by Figure 77, of the 2,787 existing private dwellings in Macquarie Park, 64.4% (1,795) were high density (apartments) and over 32.4% (902) were medium density (such as townhouses or semi-detached dwellings) and just 0.2% (6) as single dwelling houses.

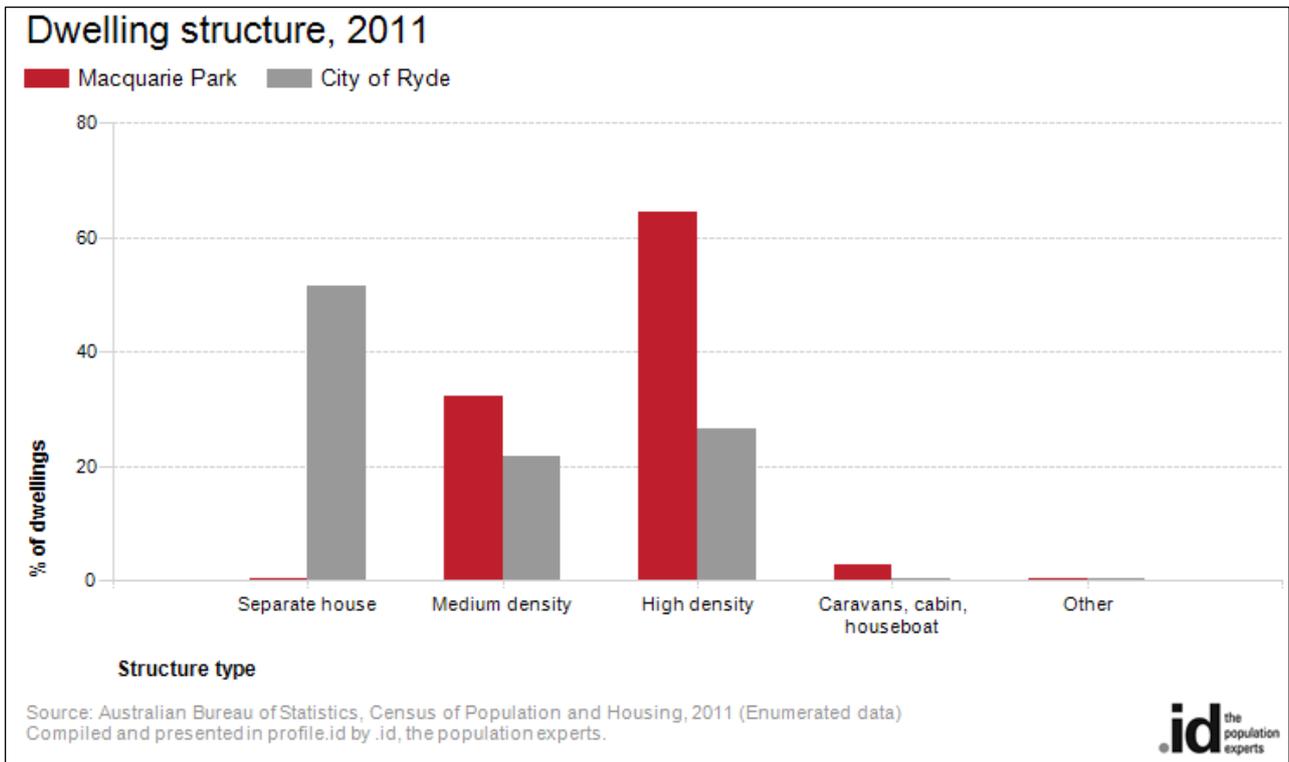


Figure 8 Dwelling structure comparisons for Macquarie Park and the City of Ryde

Over 60% of these dwellings provide 2 bedrooms, with over 17% as studio or 1 bedroom and over 17% as 3+ bedrooms. When compared to the City of Ryde, there was a higher proportion of dwellings with 1 and 2 bedrooms, and a lower proportion of dwellings with 4 or more bedrooms.

In Macquarie Park, the population averages at 2.0 persons per household, which compares to an average of 2.6 persons per household across the City of Ryde LGA.

Herring Road Urban Activation Precinct Appendix D - Ryde DCP 2011 amendments

City of Ryde's Development Control Plan 2011 - Recommended amendments

The City of Ryde has prepared and exhibited Draft Development Control Plan 2011 (Ryde DCP 2011) to replace Ryde DCP 2010.

To facilitate the transformation of the urban structure and built form of the Herring Road precinct, the agency recommends that the City of Ryde amend Ryde DCP 2011. The agency recommends that Ryde DCP 2011 be amended to:

- establish a number of new streets and links that can improve connectivity
- respond to the proposed amendments to increase building height and density in the precinct
- provide development with active uses fronting onto Herring Road
- reduce typical building setbacks to promote active street edge uses and ensure the street can benefit from the improved pedestrian amenity
- define new street wall and setback controls for all existing and proposed new streets

Specific amendments are required to *Part 4.5 Macquarie Park Corridor* (Structure plan, Special precincts, Public domain, Site and building design) and *Part 9.3 Parking Controls* of Ryde DCP 2011. Table 8 outlines the recommended scope of amendments.

Table 8 Recommended areas for amendment in Ryde DCP 2011

DCP - Part and Section	Herring Road precinct - Recommended areas for amendment
DCP Part 4.5 Macquarie Park Corridor	
3.0 Structure plan	
Section 3.2 - Street network	Amend <i>Figure 4.5.05 Street Network Structure Plan</i> , to reflect the proposed streets and connections in the Herring Road precinct
Section 3.3 - Pedestrian ways, through-block connections and arcades	Amend <i>Figure 4.5.06a Proposed Pedestrian Structure Plan</i> to reflect the pedestrian ways, through-block connections and arcades proposed in the Herring Road precinct
Section 3.3 - Open space network	Amend <i>Figure 4.5.06 Open Space Structure Plan</i> to reflect open spaces, new connections and green links proposed in the Herring Road precinct
Section 3.4 - Built form network	Amend <i>Figure 4.5.07 Built Form Structure Plan</i> to reflect the built form, active frontage, street connections and public spaces proposed in the Herring Road precinct
4.0 Special precincts - Macquarie University Station Precinct	
4.1 Introduction	Amend <i>Figure 4.5.08 Special precincts - location plan</i> to redefine the Macquarie University Station Precinct (2.) to better reflect the extent of the Herring Road precinct
4.3 Macquarie University Station Precinct	Amend <i>Figure 4.5.25 Macquarie University Station Precinct Plan</i> to reflect built form, street structure and public spaces and definition of the Herring Road precinct Amend the desired <i>Character statement</i> to reflect the Herring Road precinct proposal Amend the <i>Objectives</i> areas to reflect and include the Herring Road precinct proposal
4.3.2 Public domain	Amend the public domain character statement and controls as they relate to Herring Road precinct proposal Amend Herring Road public domain as it relates to specific upgrade proposals and <i>Figure 4.5.32 Public Domain Plan</i>

4.3.3 Site and building design	Amend the controls for building heights and setbacks and building zone to reflect the Herring Road precinct proposal. Amend <i>Figure 4.5.35 Special Precinct 2 Height Plan</i> and <i>Figure 4.5.36 Special Precinct 2 Setback Plan</i> to reflect the Herring Road precinct proposal.
4.3.4 Public domain interface	Amend the controls colonnades to reflect the Herring Road precinct proposal. Amend <i>Figure 4.5.37 Special Precinct 2 Public Domain Interface Plan</i> and <i>Figure 4.5.38 Illustrative Colonnade Section</i> .
5.0 Public domain	
5.1.4 Type 1 Streets	Amend 5.1.4 to refer to Herring Road upgrade proposals (as a Type 1 street)
5.1.4 Type 2 Streets	Amend <i>Figure 4.5.53 Location Plan - Type 2 streets</i> to reflect the Type 2 streets proposed for the Herring Road precinct
5.1.4 Type 3 Streets	Amend <i>Figure 4.5.56 Location Plan - Type 3 streets</i> to reflect the streets proposed for the Herring Road precinct
5.1.4 Type 4 Streets	Amend <i>Figure 4.5.58 Location Plan - Type 4 streets</i> to reflect the street connection to Lyonpark Road proposed for the Herring Road precinct and reclassify as a Type 3 Street.
5.2.4 Shrimptons Creek South (Wilga Park)	Amend relevant objectives and controls in Section 5.2.4 and amend <i>Figure 4.5.64 Illustrative Plan</i> to reflect the Herring Road precinct proposal including: <ul style="list-style-type: none"> ○ the proposed new park adjacent to Shrimptons Creek and ○ the proposed new street across Shrimptons Creek from Peach Tree Road to Lyonpark Road.
5.2.10 Macquarie University Station Square - East	Amend necessary objectives and controls and amend <i>Figure 4.5.73 Illustrative Plan</i> to reflect the Herring Road precinct proposal.
5.2.11 Macquarie University Station Square - West	Amend necessary objectives and controls and amend <i>Figure 4.5.75 Illustrative Plan</i> to reflect the Herring Road precinct proposal.
5.3.1 Cycle strategy	Amend <i>Figure 4.5.77 – Indicative cycleways</i> to: <ul style="list-style-type: none"> ○ reflect the streets and connections consistent with the Herring Road precinct proposal and illustrate cycleways in the Ivanhoe Estate and Strata unit area ○ illustrate which of the local bike routes and regional bike routes are existing and which are proposed ○ illustrate existing and potential regional bike connections outside the precinct, including the potential link south along Herring Road
6.0 Site building and design	
6.1.1 Height controls	Amend objective 5 to state: <i>To implement a strategic design approach that focuses building height around significant places such as train stations, local centres, key streets and parks.</i>
6.1.2 Floor space ratio controls	Amend objective 1 to state: <i>To locate higher densities around significant places such as train stations, local centres, key streets and parks.</i>
6.1.3 Site planning and staging	Amend <i>Figure 4.5.80 Site planning and staging plan</i> to: <ul style="list-style-type: none"> ○ include the Ivanhoe Estate and the strata title area south of

	Waterloo Road and obe consistent with the Herring Road precinct proposal.
6.1.4 Street setbacks and Build-to lines	Amend the range of street setbacks and build to lines and amend <i>Figure 4.5.83 Street setback plan</i> to be consistent with the Herring Road precinct proposal.
6.1.7 Building bulk	To limit building bulk and promote tall residential buildings that are slender in form consistent with Herring Road precinct proposal: <i>Amend 6.1.7 Building bulk</i> to insert a control that states: <i>For residential and mixed use residential buildings, the floorplate of residential tower buildings above the street wall height is not to exceed 800sqm.</i> To limit building bulk of tall commercial buildings, consistent with Herring Road precinct proposals, <i>amend clause 6.1.7b</i> to state: <i>The floorplate of buildings above the street wall height is not to exceed 1,400sqm, unless it can be demonstrated that building bulk and form can be limited through the use of courtyards, atria and articulation.</i>
6.1.11 Active frontages	Amend <i>Figure 4.5.92 Active frontages plan</i> to include Herring Road and part of Waterloo Road as 'potential for primary active frontage' consistent with the Herring Road precinct proposal.
DCP Part 9.3 Parking Controls	
Section 2.2 – Residential land uses	For residential development located within the Herring Road precinct, amend the maximum on-site parking requirements for both high density (residential flat buildings) and medium density (multi dwelling housing) to: Studio - 0 spaces 1 bed – 0.5 spaces 2 bed – 1 space 3+ bed - 1 space Visitors - 1 space / 10 dwellings

Herring Road Urban Activation Precinct

Appendix E - Community consultation report

Herring Road Macquarie Park Urban Activation Precinct

Consultation Report

Herring Road Macquarie Park Urban Activation Precinct

Consultation Report

Prepared for: Department of Planning & Infrastructure

Prepared by

AECOM Australia Pty Ltd

Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 2 8934 0000 F +61 2 8934 0001 www.aecom.com
ABN 20 093 846 925

30-Jul-2013

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

Quality Information

Document Herring Road Macquarie Park Urban Activation Precinct

Date 30-Jul-2013

Prepared by Sara Wilson

Reviewed by Carlos Frias

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
1	30-Jul-2013		Carlos Frias Associate Director	

Contents

1.0	Consultation Report	1
1.1	Introduction	1
1.2	Consultation process for Herring Road Urban Activation Precinct	2
1.3	Summary of issues	2
1.4	Summary of Community Reference Group meetings and workshops	3
	1.4.1 Community Workshop - 26 March 2013	3
	1.4.2 Community Reference Group Meeting - 1 May 2013	3
	1.4.3 Community Reference Group - 5 June 2013	4
1.5	Stakeholder consultation	5
1.6	Consultation next steps	6
	Appendix 1: Summary list of participants of stakeholder and community consultation meetings and workshops	7

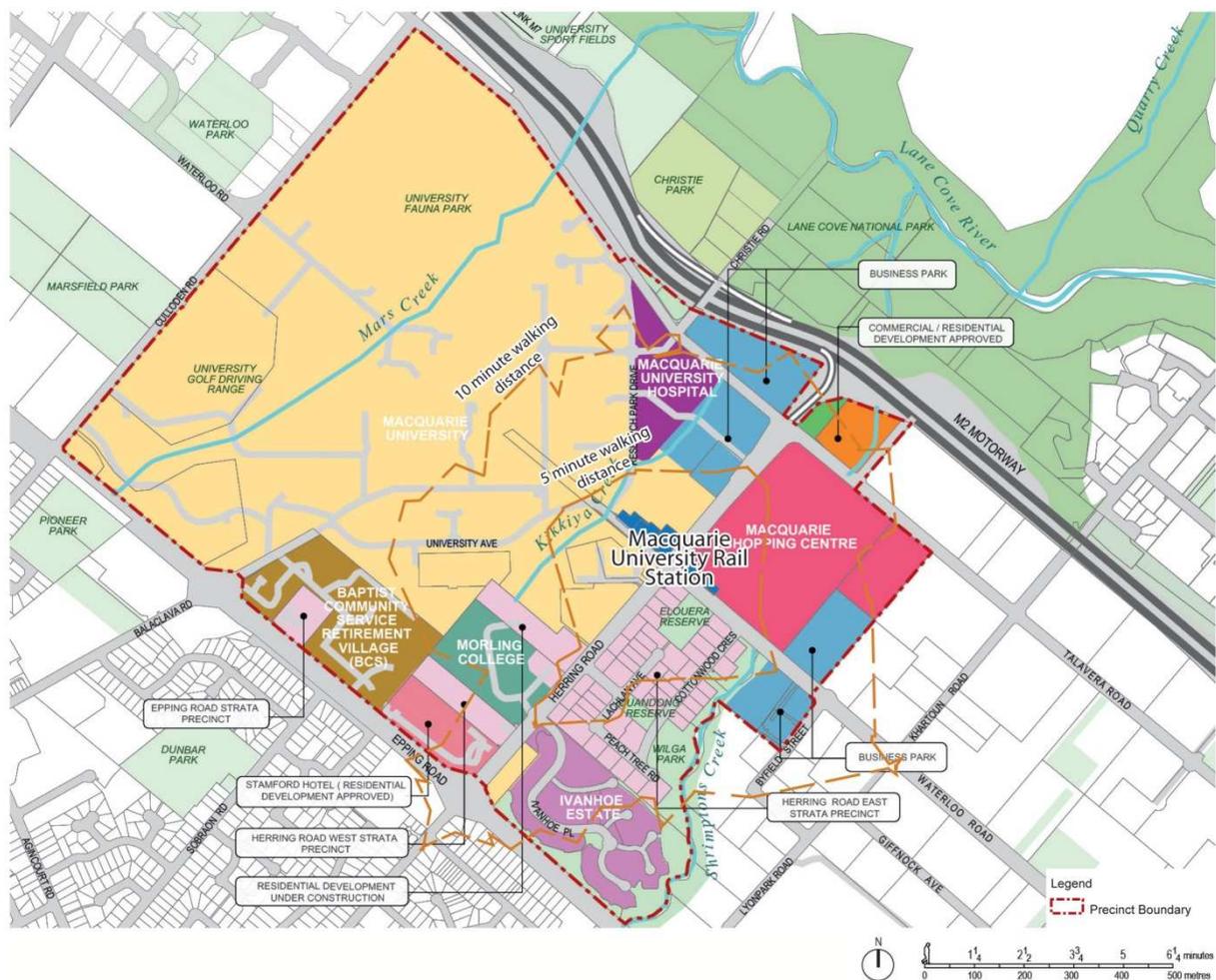
1.0 Consultation Report

This report describes the stakeholder and community consultation done by the NSW Department of Planning and Infrastructure (DP&I) during preparation of the Herring Road Macquarie Park Urban Activation Precinct proposals.

1.1 Introduction

The Herring Road Urban Activation Precinct is located within the suburb of Macquarie Park, approximately 16 kilometres north-west of the Sydney CBD. The precinct lies within the suburb of Macquarie Park, in the Ryde Local Government Area, and is bounded by Lane Cove River, Talavera Road and the M2 Motorway to the north, the Macquarie Park Business Park to the east, Epping Road to the south and Culloden Road to the west.

Herring Road Urban Activation Precinct context plan (Fig 2.2 from Structure Plan)



It includes a number of smaller, specialised precincts: a commercial and retail precinct centred along the M2 Motorway and Herring Road, taking in Macquarie Shopping Centre and the Macquarie University train station; a 10.5 hectare residential area made up of around 45 low rise apartment blocks; Ivanhoe Public Housing Estate, covering 8.3 hectares and bounded by Herring Road to the north, Shrimpton's Creek to the south and Epping Road to the west; and an education precinct comprising Macquarie University and Morling College. There is also an area providing aged care living accommodation.

1.2 Consultation process for Herring Road Urban Activation Precinct

The NSW Government has committed to ensuring that the community is consulted throughout the planning for all urban activation precincts. DP&I has consulted with stakeholders and the community throughout the development of the Herring Road proposal. A stakeholder briefing was held early in the project, to brief other government agencies and major landowners on the project and its purpose, and several follow up meetings were held to provide updates on progress and gather feedback.

A community reference group was established, and met twice, and there were several meetings with the City of Ryde Council. A community briefing session was held early in the proposal development, to gather input on the community's vision and aspirations for the precinct, prior to the planning work progressing too far. Representatives from the AECOM planning team and DP&I also met separately with the Ivanhoe Estate Tenants Group, to inform the group of the progress of the proposal and to gather feedback as planning progressed.

1.3 Summary of issues

A wide range of issues were raised during consultation on the future plans for the Herring Road Urban Activation Precinct. The following is a summary of the key issues raised.

Traffic and traffic

The main concern regarding traffic raised by stakeholders and the community is the impact that an increase in population density and therefore cars within the precinct will have on an already congested surrounding road network and traffic bottlenecks. Specifically, this related to concerns regarding:

- existing traffic congestion and accessibility affecting the area, and
- the impact of potential new traffic on the amenity of existing residential areas

Community facilities

There were a number of issues related to community facilities that were raised, but the main issue was the shortage of community facilities currently, and access to them. The only childcare centre that currently exists is within the Ivanhoe Estate precinct, and has long waiting lists. Other community facilities are ageing and not easily accessible or attractive places for people to gather. There is also very limited opportunity in the way of activities for people to do at night, which are safe and accessible.

Accessibility

Accessibility was raised as a concern overall, not only in relation to community facilities but also in relation to main streets and roads and public transport. Elderly people and others have difficulty negotiating the busy bus interchange around the train station, and Herring Road and other streets are seen as being unpleasant and unsafe places to walk and ride. Access to the station was also seen as becoming a bigger problem when the North West Rail Link is opened and more commuters are using Macquarie University train station.

Connectivity

Connectivity between areas, particularly open space along creek corridors and between precincts, is an issue. There is a perceived shortage of open space across the precinct, and that is despite the proximity of large areas of open space within the University precinct, and just outside the precinct in Lane Cove National Park and other parks nearby. The poor connectivity is exacerbated by a lack of diversity that means some of the open space areas are not as well utilised as they could be.

Safety

The community certainly feels there could be significant safety improvements made to the precinct. The areas of improvement include better lighting and general visibility along creek corridors and better lighting around the rail station and between the rail station and the residential areas.

Ivanhoe Estate

Some existing residents of the Ivanhoe community expressed their concerns over the possible redevelopment of the Ivanhoe Estate. Should the renewal of the Ivanhoe Estate proceed, a number of the residents expressed the importance of replacing existing public housing in the same area.

1.4 Summary of Community Reference Group meetings and workshops

Invitations were sent to local community and environment groups, business groups and residents, calling for nominations to participate in the Community Reference Group (CRG). Responses to the invitations came mainly from community groups, as well as from residents of the strata apartments.

Summary from CRG meetings and other workshops

1.4.1 Landowner Workshop - 26 March 2013

A workshop with representatives from the major landowners within the precinct was held on 26 March 2013 at Macquarie University from 2:00pm to 4:00pm. The workshop was attended by 10 stakeholders representing Macquarie University, Goodman, Morling College, Baptist Community Services and Meriton. The team introduced the project and explained the purpose and mechanism for creating and designing urban activation precincts.

The key points that were considered by the landowner group included:

- The proposed plans need to have clear planning controls that will apply to the land ensuring that these make future development viable;
- The development controls need to be flexible to ensure that they development is feasible and can be implemented;
- It would be important to consider the reduction of parking rates to make the development more viable. It was noted how recent approved developments within the UAP have already lower parking rates; and
- Infrastructure needs to be implemented to support the future expected growth in the area. Clarity was sort in relation to the staging and funding of the infrastructure.

1.4.2 Community Workshop - 26 March 2013

A community workshop was held on 26 March 2013 at Macquarie University from 6:00pm to 8:00pm, attended by approximately 25 stakeholders representing a number of interest groups. An introduction to the project was provided, and an explanation about the purpose and mechanism for creating and designing urban activation precincts. There was also a presentation on urban design concepts, and one on open space and traffic planning, followed by a discussion of the opportunities and constraints for the precinct.

Participants were asked to consider what works and what doesn't work in the precinct currently, as well as what they would like to see included in future planning. Connectivity and open space were seen as priorities, with an emphasis on accessibility for all age groups and abilities.

Other priorities included making better use of the available open space by improving their amenity and linkages to other parts of the precinct, as well as providing better pedestrian and bike paths to encourage walking and cycling within the precinct and between it and the surrounding areas. Maintenance of public transport facilities from the shops and further afield was also considered important. Diversity of building styles and heights within the precinct was seen as a positive, to allow for a range of lifestyles to exist within the precinct.

1.4.3 Community Reference Group Meeting - 1 May 2013

The first Community Reference Group Meeting was held on 1 May 2013, at Macquarie University and was attended by around 25 residents and representatives of community groups. The purpose of the meeting was to present the urban design principles that had been developed by the AECOM team based on the input and feedback gathered to date from the precinct major land owners, community representatives and residents.

Participants were asked to provide feedback on the principles and to comment on the draft structure plan that had been developed based on those principles. Ten public domain projects were presented, and participants were asked to choose their top five and to also offer ideas for how the projects could be improved or in fact whether there were additional projects that should be considered.

The ten possible public domain upgrade projects presented were:

1. Improvements to Herring Road.
2. Enhancement and embellishment of local creeks.
3. New local parks.

4. Signalised intersections.
5. New plaza.
6. Improvements to Wilga Park.
7. Improvements to Elouera Reserve.
8. New civic and community facilities.
9. Public space at hospital.
10. Improved access to Lane Cove National Park.

The following is a summary of the community's feedback.

Public domain

Participants supported the creation of additional active open space, particularly along the creeks but also by using space along either side of Herring Road. Key priorities for public domain improvements include the creation of new recreation facilities and upgrades to existing facilities, a new plaza in front of the AMP shopping centre, improvements to existing parks and the creation of new parks, providing signalised intersections on Herring Road, the enhancement and embellishment of the creeks areas, improvement to Elouera Reserve and improved access to Lane Cove National Park.

Participants commented that they would like to see new civic and community facilities provided close to the civic square, and that walkways, bike lanes and safe pedestrian areas near the shopping centre were also important. Enhancing the existing facilities was also considered an important aspect of the plan, as it was recognised that funding for public domain upgrades would be limited.

Improvements to the bus interchange, improving lighting and other infrastructure such as pathways and seating along the two creek areas, and improving Elouera Reserve were further suggestions from the group. Support was also given for improving accessibility to the public domain areas for all age groups and abilities.

Participants would like to see the upgrades to Herring Road continued beyond the precinct, past Epping Road.

There was recognition that it was unlikely that the \$5 million available for upgrades to the public domain from the state government would be sufficient to complete all of the proposed public domain projects.

Connections

Concerns were raised regarding connections to Shrimpton's Creek, and to Macquarie Shopping Centre from the station (an underground walkway was suggested). There were also concerns about poor connections within Ivanhoe Estate, and between Macquarie University and the rest of the precinct (made difficult by the location of bus pull in areas along Herring Road, and the location of the signalised intersections). There was also a view expressed that the Baptist Community Services site should be better connected to Macquarie University.

Underground access across Epping Road and an overpass on Herring Road for pedestrians was suggested as well as changes to the traffic management plan to ensure traffic congestion was reduced.

Building height

Clarity was sought regarding economic modelling and the justification for the proposed heights. Further justification was sought for the height proposed at Shrimpton's Creek and Epping Road. Lower density (height) housing was proposed for Ivanhoe Estate. Some participants expressed concern that taller buildings / increased density will result in greater congestion along Herring Road, and that 20 storeys is too high and will generate traffic in the area. Concerns were also raised in relation to the overshadowing of the public domain.

1.4.4 Community Reference Group - 5 June 2013

The second Community Reference Group meeting was held on 5 June 2013 at Macquarie Graduate School of Management, with approximately 18 participants. The purpose of this meeting was to present the draft structure plan to the members of the CRG, respond to questions and receive final feedback, prior to the plan being finalised and going on exhibition.

There was general consensus that most of the requests and feedback provided by the CRG had been incorporated into the final proposal. There remained some concerns about traffic within and around the precinct, however most participants were satisfied with the outcome.

1.5 Stakeholder consultation

The process has included a series of stakeholder meetings which have taken place to help inform the proposal and to communicate its intent. Consultation with stakeholders has included:

Stakeholder	Activity
Working Group <ul style="list-style-type: none"> • City of Ryde Council • Macquarie University • AMP • Transport for NSW 	Meetings throughout the different stages of the project, including: <ul style="list-style-type: none"> • Visioning exercise to understand what is important for the study area and its potential development. • Presentation and discussion of the opportunities, constraints and issues that should be considered as part of the design process. • Presentation and assessment of three development options. • Presentation of potential public domain projects and confirmation of the ones to prioritise. • Presentation and discussion regarding the draft LEP controls.
City of Ryde Council	Meetings with Council staff to discuss options and the strategic approach of the project. Presentation and discussion regarding the draft LEP controls.
Housing NSW and UrbanGrowth NSW	Meetings to discuss opportunities and constraints for the Ivanhoe Estate. Presentation of the draft structure plan and the design options for the Ivanhoe Estate.
Stamford Property Services	Meeting to discuss the Part 3A Concept Design approval and proposed modification to approved plans.
Baptist Community Services and Morling College	Individual site visit to assess development opportunities and constraints. Separate meetings to discuss requirements and desires for the site. Presentation and discussions on the draft structure plan and implications for the site.
Goodman Group	Meeting to discuss development opportunities for landholding within and adjoining the Herring Road UAP.
AMP Capital	Meeting to discuss desire to add residential building above the existing Macquarie Park Shopping Centre. Presentation and discussions on the draft structure plan and implications for the AMP Capital site Presentation and discussion regarding the draft LEP controls.
Macquarie University	Meetings to discuss intention to modify Part 3A concept plan approval for Macquarie University site. Presentation and discussions on the draft structure plan and implications for the site. Presentation and discussion regarding the draft LEP controls.

1.6 Consultation next steps

Feedback from the stakeholder and community consultation has been incorporated into the Planning Proposal. Consultation will continue throughout the exhibition period and beyond.

The following activities will support community and stakeholder consultation throughout the public exhibition phase:

1. Proactive engagement with the community and stakeholders during the public exhibition phase, including at community information sessions.
2. Advertising of the information sessions and exhibition.
3. A feedback form will be made available for stakeholders and the community to complete.
4. The exhibition and information sessions will be promoted on the DP&I website.
5. A summary of the proposal will be distributed, to assist the community in completing submissions to the proposal.

Appendix 1: Summary list of participants of stakeholder and community consultation meetings and workshops

ORGANISATION	STAKEHOLDER
NSW State Government department/agency	Transport for NSW
	NSW Roads & Maritime Services
	NSW Land & Housing Corporation
	Housing NSW
Local government	City of Ryde Council
Business and commercial	Macquarie University
	AMP Capital
	Stamford Property Services
	Ryde Macquarie Park Chamber of Commerce
	Baptist Community Services
	Goodman Group
	Morling College
	Meriton
	Centuria
	Ryde Business Forum
	Dunmore Lang College
Community group / organisation	The Salvation Army
	Residents For Ryde Group
	Ivanhoe Estate Tenants Group
	Bike North Inc
Schools / early childhood	Ku Children's Services

Herring Road Urban Activation Precinct Appendix F - Transport strategy

Herring Road Urban Activation Precinct

Transport Strategy



Herring Road Urban Activation Precinct

Transport Strategy

Client: Department of Planning and Infrastructure

ABN: 38 755 709 681

Prepared by

AECOM Australia Pty Ltd

Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia

T +61 2 8934 0000 F +61 2 8934 0001 www.aecom.com

ABN 20 093 846 925

20-Dec-2013

Job No.: 60287184

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

Quality Information

Document Herring Road Urban Activation Precinct

Ref 60287184

Date 20-Dec-2013

Prepared by Zak Roslie

Reviewed by Russell Yell

Revision History

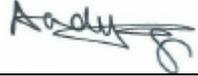
Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	22-April-2013	First draft	Russell Yell Principal Consultant	
B	29-April-2013	Revised draft	Russell Yell Principal Consultant	
C	10-May-2013	DRAFT	Russell Yell Principal Consultant	
D	07-Jun-2013	DRAFT	Russell Yell Principal Consultant	
E	26-Jun-2013	DRAFT	Russell Yell Principal Consultant	
F	22-Jul-2013	DRAFT	Russell Yell Principal Consultant	
G	29-Jul-2013	FINAL DRAFT	Robin Jackson Associate Director	
0	02-Aug-2013	FINAL	Russell Yell Principal Consultant	
1	16-Aug-2013	FINAL ISSUE	Russell Yell Principal Consultant	Original Signed
2	20-Dec-2013	FINAL ISSUE	Andy Yung Principal Consultant	

Table of Contents

Executive Summary		i
1.0	Introduction	1
	1.1	Context
	1.2	The Herring Road Urban Activation Precinct
	1.3	Study purpose
2.0	Existing Context	3
	2.1	NSW Long Term Transport Master Plan 2012
	2.2	Ryde draft Local Environmental Plan (and transport study) 2011
	2.3	Ryde Development Control Plan 2010
	2.3.1	Street Hierarchy
	2.3.2	Parking Provisions
	2.3.3	Bicycle Parking
	2.4	Previous Traffic and Transport Studies
	2.4.1	Macquarie Park Traffic Management and Accessibility Plan 2002
	2.4.2	Macquarie Park Traffic Study 2007
	2.4.3	Macquarie University TMAP 2009
	2.4.4	Macquarie Park Pedestrian Movement Study 2009
	2.5	Mode Share
	2.5.1	Herring Road precinct
	2.5.2	Macquarie Park
	2.6	M2 Motorway Upgrade
	2.7	Proposed Western Sydney Light Rail Network – Macquarie Park Line
	2.7.1	Proposed Macquarie Park Line
	2.8	Sydney's Rail Future
3.0	Existing Conditions	22
	3.1	Pedestrian & Cycle Network
	3.2	Public Transport Network
	3.2.1	Sydney Trains
	3.2.2	Bus Network
	3.3	Existing street network
	3.3.1	Herring Road
	3.3.2	Talavera Road
	3.3.3	Waterloo Road
	3.3.4	Epping Road
	3.3.5	Other Streets
	3.4	Intersection Modelling
	3.4.1	LINSIG Overview
	3.4.2	Results
4.0	Herring Road proposal	32
	4.1	Overview
	4.2	Transit-oriented development at Herring Road
	4.2.1	Emerging travel patterns for the Herring Road precinct
	4.3	Proposed Pedestrian and Cycle Network
	4.3.1	North-South Connections
	4.3.2	East-West Connections
	4.4	Bus Network
	4.4.1	Short term improvements
	4.4.2	Medium term improvements
	4.4.3	Long term improvements
	4.5	Proposed street network
	4.5.1	Intersections
	4.5.2	New street connections
	4.5.3	New Streets west of Herring Road
	4.6	Parking Provisions
	4.7	Travel Demand Management

4.8	Sub-regional Transport Planning	42
4.8.1	Sub-regional Delivery Plans and Growth Infrastructure Plans	43
5.0	Network Impact	44
5.1	Indicative growth scenarios	44
5.1.1	2021 horizon	44
5.1.2	2031 horizon	44
5.1.3	Vehicle trip generation	45
5.2	Trip distribution	46
5.3	Traffic Impact	47
5.3.1	2021 Horizon Impacts	47
5.3.2	2031 Horizon Impacts	48
5.3.3	Precinct and corridor wide impacts	49
6.0	Summary and recommended measures	50
6.1	Pedestrian and Cycle Network	50
6.2	Public Transport	51
6.3	Street Network	52
6.4	Demand management	52

Executive Summary

The NSW Government aims to increase the delivery of housing and jobs across Sydney. Through the Department of Planning and Infrastructure (DP&I), the NSW Government recently released the Draft Metropolitan Strategy for Sydney (the Draft Strategy). By 2031, the Draft Strategy estimates Sydney will need an additional 545,000 dwellings and 625,000 jobs for 1.3 million additional residents.

The Draft Strategy identifies eight initial Urban Activation Precincts in response to continued demand for housing in proximity to services, jobs and public transport. The eight initial Urban Activation Precincts have the potential to deliver 30,000 dwellings. The Urban Activation Precinct Program is based on the following DP&I principles:

- A strategic precinct-based approach (rather than a single site or development);
- Close involvement with local government at an early stage and throughout the process as an integral partner;
- Precincts located in proximity to existing and planned transport and service infrastructure; and
- Precincts, zones and development controls that are based on financial viability and affordability, and reflect market demand and investor feasibility.

AECOM was commissioned by DP&I to prepare a Transport Strategy to support the activation and development of the Herring Road precinct, as part of the Urban Activation Precinct Program.

The Herring Road precinct is located within the City of Ryde Local Government Area (LGA) in the suburb of Macquarie Park. The Herring Road precinct was identified as a suitable candidate for the Urban Activation Precinct Program because of its proximity to Macquarie University Train Station, providing access to the Sydney Trains Network. Furthermore, the Herring Road precinct is located within walking and cycling distance of the Macquarie Park business district. Macquarie Park is identified in the Draft Strategy as a 'Specialised Centre' because it performs a vital economic and employment role as the northern anchor of the 'Global Economic Corridor' which includes the employment hubs of Chatswood, St Leonards, North Sydney, Sydney CBD, Sydney Airport and Port Botany.

Private vehicles are the dominant mode of transport for people travelling to Macquarie Park with a mode share of 68 per cent for journeys to work, however the mode share of residents who walk or cycle to work from the local area is at 24 per cent. The City of Ryde aims to reduce the all-purpose daily mode share of private vehicle trips in Macquarie Park to 60 per cent by 2031. Consequently, the inclusion of the Herring Road precinct in the Urban Activation Precinct Program presents an opportunity for state and local government to propose a range of measures which could reduce the reliance on private vehicles in the area. In a broader context, the Herring Road precinct has the potential to enhance Macquarie Park as a 'live / work community' that enables more residents to walk or cycle.

The following measures are recommended to support the development of the Herring Road precinct;

Executive Summary Table 1 Recommended transport measures

Number	Recommendation
Pedestrian and Cycle Network	
PC1	<p>Improve internal connections east of Herring Road.</p> <ul style="list-style-type: none"> - Realign roads in the Ivanhoe Estate to better integrate it with the wider Herring Road precinct by removing cul-de-sacs. - Make open space safer and more accessible by removing obstructions, improving sightlines and orienting new buildings and roads to provide passive surveillance.
PC2	<p>Make Herring Road the key urban pedestrian and cycleway link.</p> <ul style="list-style-type: none"> - Create multiple opportunities for mid-block crossings. - Provide wider footpaths. - Design street tree planting and landscaping to suit the scale and activity of the street, creating an environment that benefits pedestrians. - Provide adequate street lighting for pedestrians. - Connect Talavera Road and Epping Road with a two-way off-road cycleway along Herring Road. - Extend the cycleway to Kent Road connecting with Ryde's regional cycle network.
PC3	<p>Link to local open space areas such as Kikkiya Creek, Shrimpton's Creek and the Lane Cove National Park.</p> <ul style="list-style-type: none"> - Provide opportunities for activity along the creek corridors for pedestrians and cyclists. - Ensure pedestrian and cycle links have clear sightlines and orienting new buildings and streets to provide passive surveillance.
PC4	<p>Strengthen connections between Herring Road and Macquarie University.</p> <ul style="list-style-type: none"> - Enhance University Avenue as a key urban pedestrian link by providing adequate street lighting, wider footpaths, shared off-road cycle ways and street tree planting that benefits pedestrians. - Upgrade the Macquarie University to Macquarie Centre link.
PC5	<p>Improve access points to the Macquarie Centre so that pedestrians and cyclists do not have to navigate the car park from Waterloo Road.</p>
Public Transport	
PT1	<p>Make public transport a more attractive option for residents, workers and students.</p> <ul style="list-style-type: none"> - Improve directional signage throughout the Herring Road precinct making public transport more legible. - Provide a timetable and service map at each bus stop. - Provide adequate shelter and seating for commuters at bus stops. - Ensure bus stops are well lit.
PT2	<p>Consider the ways in which buses can better service the Herring Road precinct in the short, medium and longer timeframes.</p> <ul style="list-style-type: none"> - Short term – improve amenity and bus stop locations. - Medium term – TfNSW continues to monitor and if necessary refine bus services to the Herring Road precinct including Macquarie University Train Station, the Macquarie Centre Bus Interchange and Macquarie University based on demand and in conjunction with any whole of North West Region redeployment of bus services prior to the opening of NWRL. - Long term – The potential upgrade of the Macquarie Centre Bus Interchange should be considered in the TfNSW assessment for priorities in the Transport Access Program.
PT3	<p>TfNSW in consultation with DP&I and the City of Ryde to continue to work on possible refinements to bus stop locations in and around the Herring Road precinct that optimises the operations of bus services for the planned increase in riders whilst preserving current levels of passenger convenience and amenity.</p>

PT4	Integrate the Herring Road precinct proposals into a Subregional Transport Corridor Strategy to determine the optimal solutions for public transport including bus operations and integration of NWRL services.
PT5	Improve the average end-to-end travel speed of centre-to-centre core bus network services to be not less than 25 km/h for 95 per cent of services achieved by bus priority infrastructure, potentially including localised road widening, bus priority intersection treatments and reallocation of traffic lanes on Herring, Waterloo and Talavera Roads.
Street Network	
S1	<p>Improve the street network west of Herring Road to provide new connections to Epping Road and reducing dependence on the over capacity Herring Road southbound approach to Epping Road.</p> <p>Improve internal connections west of Herring Road with:</p> <ul style="list-style-type: none"> - New through connections to University Avenue from the two proposed intersections along Herring Road. - New internal streets for better connectivity.
S2	<p>Improve internal connections east of Herring Road.</p> <ul style="list-style-type: none"> - Rationalise internal streets. - Remove cul-de-sacs to improve connections and better integrate the Ivanhoe Estate into the Herring Road precinct. - Link Lachlan Avenue and Cottonwood Crescent south of Elouera Reserve.
S3	<p>Increase the number of signalised intersections on Herring Road by introducing two new signalised intersections at:</p> <ul style="list-style-type: none"> - Herring Road and Ivanhoe Place - Herring Road and Macquarie University (south of University Avenue). <p>This will help disperse traffic movements and reduce dependence on over-capacity intersections.</p>
S4	Introduce a one-way (west to east) connection from Peach Tree Road to Lyonpark Road to provide an alternative route for cars to Macquarie Park. This will help to reduce dependence on the Herring Road / Waterloo Road intersection during the morning peak (projected LoS 'D').
S5	Consider the Herring Road precinct in the sub-regional transport study to be undertaken by TfNSW to determine the traffic behaviour in a regional context and to identify the future road network management strategy.
Demand Management	
T11	<p>Introduce Residential Travel Plans for new residential development.</p> <p>Residential Travel Plans aim to provide residents with full access to services, require quality design outcomes and minimise traffic congestion. The Herring Road precinct provides an opportunity for the City of Ryde to introduce residential travel plans as a key part of the planning process and a means by which travel behaviour can be influenced on a precinct scale.</p>
T12	<p>Promote the benefits of live / work communities.</p> <p>Live / work communities are an ideal alternative to long work and study days and increasingly long commutes. Developing the Herring Road precinct will give residents the opportunity to walk or cycle to work or university. Furthermore, residents would also have convenient access to recreational activities such as sport, shopping and dining.</p>
T13	<p>Parking controls and management.</p> <p>Introduce more stringent residential parking controls and management as a measure to influence people's travel choice.</p>

1.0 Introduction

1.1 Context

By 2031, the Draft Metropolitan Strategy for Sydney (the Draft Strategy) aims to deliver 545,000 new dwellings and 625,000 new jobs for 1.3 million additional residents. The Draft Strategy recognises demand will continue for housing in established areas close to services, jobs and public transport. The Draft Strategy responds to this demand through Urban Activation Precincts, a key component of the NSW Government's housing policy, with potential for 30,000 new dwellings.

The Herring Road Urban Activation Precinct has been identified as one of eight initial Urban Activation Precincts. It is well located to provide housing close to the expanding employment hub of Macquarie Park. The Draft Strategy aims for 16,000 additional jobs to be created in Macquarie Park by 2031.

AECOM has been commissioned by the Department of Planning and Infrastructure (DP&I) to prepare a Transport Strategy alongside a Structure Plan to support the activation and development of the Herring Road Urban Activation Precinct.

1.2 The Herring Road Precinct

The Herring Road precinct is located within the suburb of Macquarie Park, approximately 16 kilometres north-west of the Sydney CBD. The Herring Road precinct (shown in Figure 1.1) is bounded by the Lane Cove River, Talavera Road and the M2 to the north, the Macquarie Park business area to the east, Epping Road to the south and Macquarie University to the west.

In a wider context, Macquarie Park is identified in the Draft Strategy as a 'Specialised Centre' because it performs a vital economic and employment role. Macquarie Park acts as the northern anchor of the 'Global Economic Corridor' which includes the employment hubs of Chatswood, St Leonards, North Sydney, Sydney CBD, Sydney Airport and Port Botany.

Figure 1.1 – Herring Road precinct



Source: AECOM (2013)

1.3 Study purpose

AECOM was commissioned by DP&I to prepare a Transport Strategy to support the activation and development of the Herring Road precinct. As part of the Transport Strategy, a desktop study of statutory planning instruments and previous transport studies was undertaken. The existing condition of pedestrian and cycle, public transport and street networks within the Herring Road precinct were analysed with LINSIG modelling used to assess the performance of key road intersections.

In conjunction with landuse and built form proposal for the precinct, proposed changes have been made for the pedestrian and cycle, public transport and street networks. In keeping with the objectives of the City of Ryde and DP&I, the changes have focused on reducing the mode share of private vehicles in Macquarie Park and improving active and public transport options. LINSIG modelling was used to assess the staged impacts of the Herring Road precinct.

A package of recommended measures has been put forward to oversee improvements to active and public transport options. The recommended measures focus on;

- Improving pedestrian and cycle connections and subsequently permeability and safety.
- Measures to improve public transport use such as simplifying bus services and rationalising bus services once NWRL is operational.
- Better integrating the street network into the wider Macquarie Park street network.
- Travel initiatives designed to manage demand and reduce dependence on private vehicles.

2.0 Existing Context

2.1 NSW Long Term Transport Master Plan 2012

The NSW Long Term Transport Master Plan 2012 (LTTMP) provides an integrated approach to transport planning for New South Wales through to 2031. It integrates with the NSW 2021 in the NSW Government's hierarchy of strategic plans, and aims to align with other long term strategies such as the Draft Strategy.

Like the Draft Strategy, LTTMP identifies Macquarie Park as a Specialised Centre at the northern end of the Global Economic Corridor. LTTMP acknowledges that Macquarie Park will see an increase in employees by 2031 and lists the following key transport challenges over the next 20 years;

- Existing pressure on the road network reduces reliability of bus network.
- Dominance of the car due to generous parking rates.
- Precedence of the car over pedestrians and cyclists makes Macquarie Park an unattractive place for active transport options.
- Improved connectivity to the wider Metropolitan Area is required.

2.2 Ryde draft Local Environmental Plan (and transport study) 2011

The draft LEP 2011 and the supporting transport study outline the strategy for integrating land use and transport planning through:

- Centres planning
- Corridors planning
- Planning for sustainable transport
- Managing travel demand
- Planning for parking

2.3 Ryde Development Control Plan 2010

The Ryde Development Control Plan 2010 (Ryde DCP) provides guidelines, objectives and controls for development in the City of Ryde. The Ryde DCP is supported by the Ryde Local Environmental Plan 2011 (Ryde LEP) and relevant State and Regional Environmental Planning policies. The City of Ryde requires landowners to consult with council prior to redevelopment in order to assess a range of impacts including on the road network.

2.3.1 Street Hierarchy

The Ryde DCP classifies four street types, three of which are present in the Herring Road precinct; primary, tertiary and small streets.

Primary Streets (Type 1)

Within the Herring Road precinct, the important north-south and east-west connections of Herring Road, Waterloo Road, Epping Road and Talavera Road are identified as Primary Streets. Controls for Streets are shown in Table 2.1, whilst Figure 2.1 shows the Primary Streets within Macquarie Park.

Tertiary Streets (Type 3)

Tertiary streets provide access to sites within Macquarie Park. The City of Ryde aims for more tertiary streets to be created with the redevelopment of specific sites. Within the Herring Road precinct, all proposed tertiary streets are south of University Avenue and west of Herring Road.

Small Streets (Type 4)

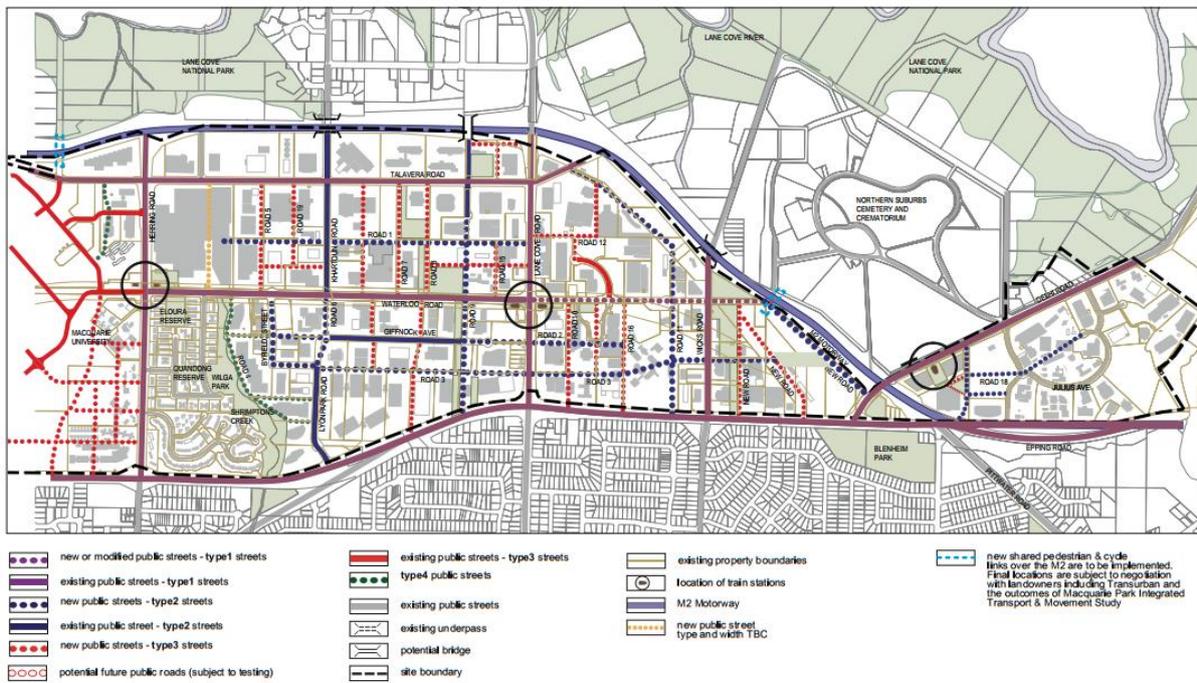
The City of Ryde proposes small streets at the eastern edge of Shrimptons Creek connecting Waterloo Road to Lyonpark Road, and the eastern edge of College Creek between Research Park Drive and Talavera Road. Small streets will improve access to creek corridors and facilitate better surveillance of footpaths, bicycle paths and open spaces.

Table 2.1 –Street Planning Controls

Control	Primary Street	Tertiary Street	Small Street
Width	Generally 30m	Generally 15.5m	Generally 7.2m
Street Definition	Generous landscaped setbacks, retain mature trees A 3.4m landscaped median where possible	A minimum 5m landscaped setback	Defined by landscaped setbacks. Active uses at ground level
Cycles	In accordance with Ryde Bicycle Strategy & Masterplan 2007	In accordance with Ryde Bicycle Strategy & Masterplan 2007	Cyclists share carriageway

Source: City of Ryde (2010)

Figure 2.1 - Preferred Future Road Network



Source: City of Ryde DCP (2010)

Figure 2.1

2.3.2 Parking Provisions

Table 2.2 summarises the existing Ryde DCP parking provisions for the Herring Road precinct. The proposed Herring Road precinct parking provisions are detailed in Section 0.

Table 2.2 – Parking Provisions

Dwelling Type	High Density Residential	Mid Density Residential
1 bedroom	0.6 to 1 space	1 space
2 bedroom	0.9 to 1.2 spaces	1 space
3 bedroom	1.4 to 1.6 spaces	2 spaces
Visitor	1 visitor space per 5 dwellings	1 visitor space per 4 dwellings

Source: City of Ryde (2010)

The parking rates ascribed in the DCP which apply to the Herring Road precinct have been reviewed as part of this strategy. The Herring Road precinct is well served by public transport, along a major transit corridor and as such has the ability to accommodate lower parking rates and higher public transport mode share. The proposed parking controls are based on local best practice documented in the planning of similar urban renewal precincts and residential communities adjacent to major employment centres.

2.3.3 Bicycle Parking

The Ryde DCP also lays out provisions for bicycle parking. These rates are designed to;

- Provide adequate bicycle parking in new residential and commercial buildings.
- Provide adequate end of trip facilities such as showers and change rooms.
- Ensure bicycle parking is consistent with Safer by Design principles and Australian Standards.
- Minimise conflict between bicycle parking and access and vehicles.

2.4 Previous Traffic and Transport Studies

2.4.1 Macquarie Park Traffic Management and Accessibility Plan 2002

Maunsell (now AECOM) was commissioned by the City of Ryde in 2002 to complete a Traffic Management and Accessibility Plan (TMAP) for Macquarie Park. This TMAP was part of a broader planning and design exercise looking at the growth potential in the Macquarie Park area. The TMAP assessed the performance of the road network and the adequacy of active and public transport options and made the following recommendations to be implemented by both local and state agencies:

Table 2.3 – Macquarie Park TMAP actions

Recommendation	Implemented
Investigate the potential for improved bus services in the north-south, Ryde Road-Lane Cove Road corridor	Yes
With the introduction of bus priority measures, provide improved services	No
Construct the Chatswood-Parramatta Rail Link	Partially: Epping-Chatswood completed only.
Commence planning for bus infrastructure once the Chatswood-Parramatta Rail Link is operational	Partially: Routes 289 and 291 are no longer in service.
Implement substantial infrastructure upgrades for pedestrians and cyclists	No
Resolve train station access issues for pedestrians and cyclists	Yes
Selected intersection improvements	Yes
Reduce the capacity and enhance the design of Waterloo Road	Yes
Implement comprehensive public transport information systems at all bus stops and key retail locations	Partially
Provide comprehensive directional signage systems for pedestrians and cyclists	Partially – good around existing transport hubs.
Implement bus priority measures at nominated key intersections	No

Source – Maunsell (2002)

2.4.2 Macquarie Park Traffic Study 2007

Bitzios Consulting prepared a traffic study for the City of Ryde in 2007. A Paramics model was used to calibrate the existing traffic conditions and assist in preparing a package of recommendations to improve the efficiency of the road network in Macquarie Park. Within the Herring Road precinct, Bitzios made the following recommendations:

Table 2.4 – Macquarie Park Traffic Study actions

Recommendation	Implemented
Talavera Road is four lanes between Herring Road and Lane Cove Road and intersection widening is undertaken.	Yes
Talavera Road is widened to six lanes between Christie Road and Herring Road.	Widened to four lanes Completion date: Feb 2013
Waterloo Road is four lanes and widened at intersections with Lane Cove Road and Herring Road. This includes a double right turn from Waterloo Road into Herring Road.	Four lanes – yes Widened intersections – no Double right turn into Herring Road - no
Herring Road is four lanes and widened at intersections with Waterloo Road and Talavera Road.	Four lanes – yes Widened - no
The M2 west of Herring Road is widened to a minimum of six lanes, eight lanes if possible.	6 lane widening to be completed by Mid 2013
The M2 between Herring Road and Lane Cove Road is widened to ten lanes.	Being widened to six lanes
The M2 / Herring Road Interchange has new on and off ramps and Herring Road is extended north with a two lane overpass of Talavera Road to the new on and off ramps to the M2.	New Herring Road westbound off ramp and Christie Road eastbound on ramp are complete.
A Herring Road overpass for Epping Road to allow through vehicles to bypass the signalised intersection. Changes to lane marking are proposed at the Epping Road and Herring Road intersection.	No

Source – Bitzios (2007)

2.4.3 Macquarie University TMAP 2009

Cardno was commissioned by Macquarie University in 2009 to deliver a TMAP as part of the University's updated concept plan. The following infrastructure upgrades were recommended within the Herring Road precinct;

Table 2.5 – Macquarie University TMAP actions

Recommendation	Implemented
<p>At the intersection of Waterloo Road and Herring Road</p> <ul style="list-style-type: none"> - Provide a shorter left turn slip lane from Waterloo Road westbound. - Provide an additional Waterloo Road through lane westbound with additional through shared lanes. - Create a favourable movement on Herring Road northbound during morning peak. 	No
<p>At the intersection of Epping Road and Herring Road</p> <ul style="list-style-type: none"> - Additional through lane on Herring Road southbound - Additional right turn lane on Epping Road eastbound - Two through lanes and two right turn lanes on Herring Road northbound - Adjusted signal phasing Resulted in intersection performance improvements when remodelled. 	No
<p>At the intersection of Waterloo Road and Herring Road</p> <ul style="list-style-type: none"> - Adjusted signal phasing 	No
<p>Map-based way-finding signage at the Macquarie University Train Station and at the pedestrian crossing from the Macquarie University to the Macquarie Centre and bus interchange.</p>	Installed at Macquarie University Station, but not at Macquarie University / Macquarie Centre crossing
<p>Physical integration between the Macquarie University Train Station and the Macquarie Centre bus interchange.</p>	No
<p>Bus bypass provisions at the intersections of;</p> <ul style="list-style-type: none"> - Epping Road and Herring Road on the Herring Road approaches - Waterloo Road and Herring Road 	No
<p>A dedicated cycle network with on road cycle lanes on the following streets;</p> <ul style="list-style-type: none"> - University Avenue - Eastern Road - Western Road - Research Park Drive 	No. City of Ryde Cycle Map identifies Waterloo Road (east of Khartoum Road) and Balaclava Road (south of Epping Road) as unmarked cycling routes only.

Recommendation	Implemented
<ul style="list-style-type: none"> - Waterloo Road - Macquarie Drive - Balaclava Road - Gymnasium Road 	
<p>An enhanced pedestrian network that improves cross campus connections. Pedestrian priority is recommended for when these paths cross roads.</p> <ul style="list-style-type: none"> - Waterloo Road, Balaclava Road, Macquarie Drive – a key pedestrian spine that provides connections between Macquarie University Train Station and the Macquarie University bus interchange. - An east-west spine that builds on existing connections by upgrading footpaths along Research Park Drive. 	To be addressed in Concept Plan implementation
<p>With the opening of the Epping to Chatswood Rail Link (ECRL), the TMAP also recommended ending bus services with a similar alignment to the new rail line - Macquarie Park to the Sydney CBD via the Lower North Shore. This included bus routes 288, 289, 290, 291, 292, 293 and 294.</p>	Partially: Routes 289 and 291 are no longer in service. The remaining routes still operate to the Sydney CBD.

Source – Cardno (2009)

2.4.4 Macquarie Park Pedestrian Movement Study 2009

Space Syntax completed the Macquarie Park Pedestrian Movement Study in 2009 for the City of Ryde. The study found that Macquarie Park's layout can be enhanced by improving pedestrian links and creating two urban villages. One urban village was mooted for Waterloo Road, in close proximity to Macquarie University Train Station, and the other was along Waterloo Road to Lane Cove Road. Some of the key ideas in the study included;

- Improving pedestrian links
- Encouraging cross-block pedestrian connections
- Ensuring the two urban villages are active, attractive centres for pedestrians
- Improving socio-economic performance by providing better amenity and encouraging more movement through the precinct

The study made the following recommendations;

Table 2.6 – Macquarie Park Pedestrian Movement Study actions

Recommendation	Implemented
New land uses distributed according to degree of sensitivity (for heavy use = retail, commercial, cultural uses, quieter streets = residential)	No
Introduce pedestrian only laneways with clear sightlines	No
Implement 'Safer by Design' guidelines such as pedestrian signals, phased traffic lights and traffic islands and avoid grade separation	Recommended only
Locate pedestrian spaces to enable multi-directional movement	Recommended only
Separate cycleways from pedestrian footpaths	Recommended only
Ensure pedestrian footpaths are built to a 3.5 metre width	Recommended only
Construct quality concrete footpaths with minimal signage to enable passive surveillance	Yes - where new footpaths have been built (University Avenue west of Herring Road).
Pedestrian spaces remain in public ownership with access across private land secured as a condition of consent	Recommended only
Ensure public spaces are accessible 24 hours a day, seven days a week and open air	Yes
Where footpaths pass through new buildings, access must be unrestricted and available for public trade each day (including weekends)	No

Source – Space Syntax (2009)

2.5 Mode Share

2.5.1 Herring Road precinct

Table 2.7 compares Census data over a ten year period from 2001 to 2011 for Journey to Work (JTW) trips by residents within the Herring Road precinct. Analysis shows consistent growth in train mode share over the ten years to 2011. The opening of ECRL in 2009 resulted in a 17 per cent increase in train mode share from 2006 to 2011.

Table 2.7 - JTW Mode Share for Herring Road precinct

Mode	2001	2006	Change from 2001	2011 Percentage	Change from 2006
Worked at home/did not go to work	21%	16%	-5%	11%	-5%
Vehicle driver (inc motorbike and truck)	43%	31%	-12%	31%	0%
Vehicle – as passenger	4%	3%	-1%	2%	-1%
Private Vehicle Total	47%	34%	-13%	33%	-1%
Bus	12%	21%	+9%	9%	-12%
Train	3%	6%	+3%	23%	+17%
Non-Private Vehicle Total	15%	27%	+12%	32%	+5%
Other Modes (inc walk and cycle)	17%	22%	+5%	24%	+2%
Total	100%	100%		100%	

Source –Bureau of Transport Statistics (2013)

Table 2.8 compares the Herring Road precinct's JTW mode share with existing residential neighbourhoods in close proximity to train stations. At 24 per cent, the Herring Road precinct has a considerably higher 'other mode' (including walking and cycling) mode share than the other centres listed with Chatswood second at 16 per cent. This is likely to be a result of local employment opportunities and people's decision to live and work in the local area. In a broader context, this supports the notion that the Herring Road precinct could enhance Macquarie Park as a live/work community.

It was also found that the Herring Road precinct has the third lowest vehicle (as driver and passenger) mode share at 33 per cent (behind Bondi Junction and Parramatta at 28 per cent each). However, the Herring Road precinct has the lowest public transport (bus, train, tram and ferry) mode share at 32 per cent with Rhodes second lowest at 39 per cent.

Table 2.8 – 2011 JTW Mode Share Comparison

Mode	Proportion of Trips					
	Herring Road precinct	Bondi Junction	Chatswood	Parramatta	Wolli Creek	Rhodes
Worked at home or did not go to work	11%	12%	10%	6%	8%	9%
Vehicle driver (inc motorbike and truck)	31%	26%	31%	25%	33%	43%
Vehicle – as passenger	2%	2%	3%	3%	3%	4%
Private Vehicle Total	33%	28%	34%	28%	36%	47%
Bus	9%	7%	4%	8%	1%	1%
Train	23%	39%	35%	44%	53%	37%
Public Transport Total	32%	46%	39%	52%	54%	38%
Other Modes (inc walk and cycle)	24%	12%	16%	12%	2%	6%
Non Vehicle Total	56%	58%	55%	64%	56%	44%
Not Stated	1%	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%	100%

Source: Bureau of Transport Statistics (2013)

2.5.2 Macquarie Park

Table 2.9 highlights the JTW mode share for travel to the Macquarie Park precinct from 1996 to 2011. Travel behaviour between 1996 and 2006 shows that private vehicles are still the dominant mode, but there has been an 11 per cent reduction in mode share from 79 per cent to 68 per cent. During the same period, travel by train rose to 13 per cent in 2011; a nine per cent increase directly attributable to the opening of the ECRL.

Table 2.9 – JTW Mode Share for Macquarie Park

Mode	1996	2001	Change from 1996	2006	Change from 2001	2011	Change from 2006
Worked at home/did not go to work	9%	10%	+1%	9%	-1%	8%	-1%
Vehicle driver (inc motorbike and truck)	73%	72%	-1%	74%	+2%	64%	-10%
Vehicle – as passenger	6%	5%	-1%	5%	0%	4%	-1%
Private Vehicle Total	79%	77%	-2%	79%	+2%	68%	-11%
Bus	5%	5%	0%	5%	0%	6%	+1%
Train	4%	4%	0%	4%	0%	13%	+9%
Public Transport Total	9%	9%	0%	9%	0%	19%	+10%
Other Modes (inc walk and cycle)	3%	4%	+1%	3%	-1%	4%	+1%
Non-Private Vehicle Total	12%	13%	+1%	16%	+3%	23%	+7%
Total	100%	100%		100%		100%	

Source –Bureau of Transport Statistics (2013)

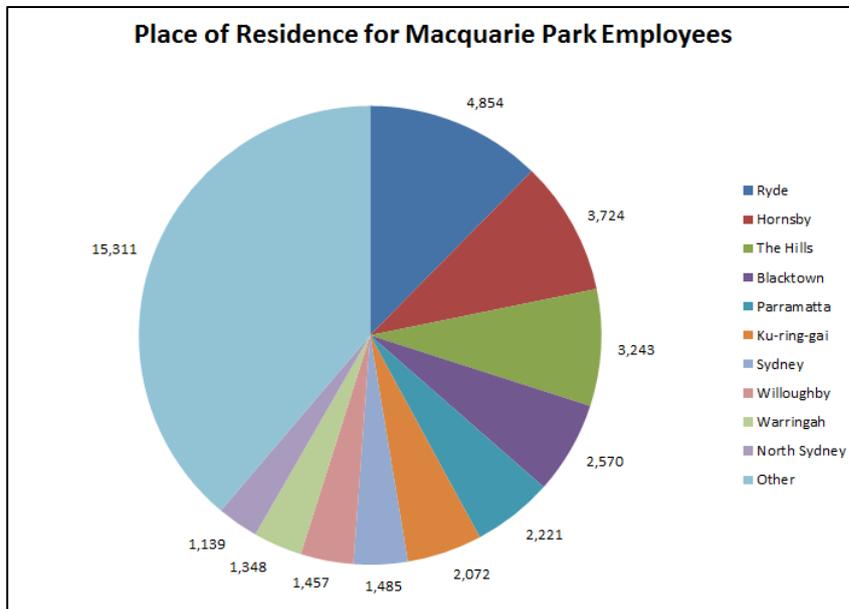
By way of comparison, the City of Ryde has a 2031 mode share target for Macquarie Park of 60 per cent by private vehicle and 40 per cent by non-car modes. This accounts for all trip types, rather than journey to work trips used for comparison reported in this section.

The Bureau of Transport Statistics estimate that there are 39,424 employees in Macquarie Park. The top three LGAs collectively account for 11,821 (or 30 per cent) of all employees in Macquarie Park. The top three LGAs are:

- 4,854 (12.31 per cent) from Ryde
- 3,724 (9.45 per cent) from Hornsby
- 3,243 (8.23 per cent) from Baulkham Hills

Figure 2.2 shows the most common places of residence for Macquarie Park employees.

Figure 2.2 – Place of Residence

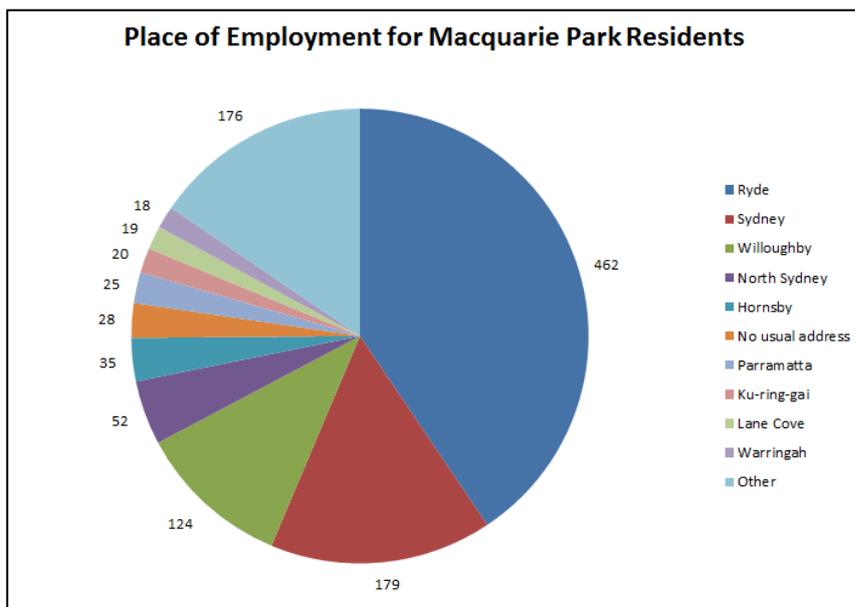


Source – Bureau of Transport Statistics (2013)

The Bureau of Transport Statistics estimate that Macquarie Park has 1,138 employed residents. Figure 2.3 shows the most common places of employment for Macquarie Park residents. The top three LGAs are;

- 462 (40.6 per cent) in Ryde
- 179 (15.7 per cent) to Sydney
- 124 (10.9 per cent) to Willoughby

Figure 2.3 – Place of Employment



Source – Bureau of Transport Statistics (2013)

2.6 M2 Motorway Upgrade

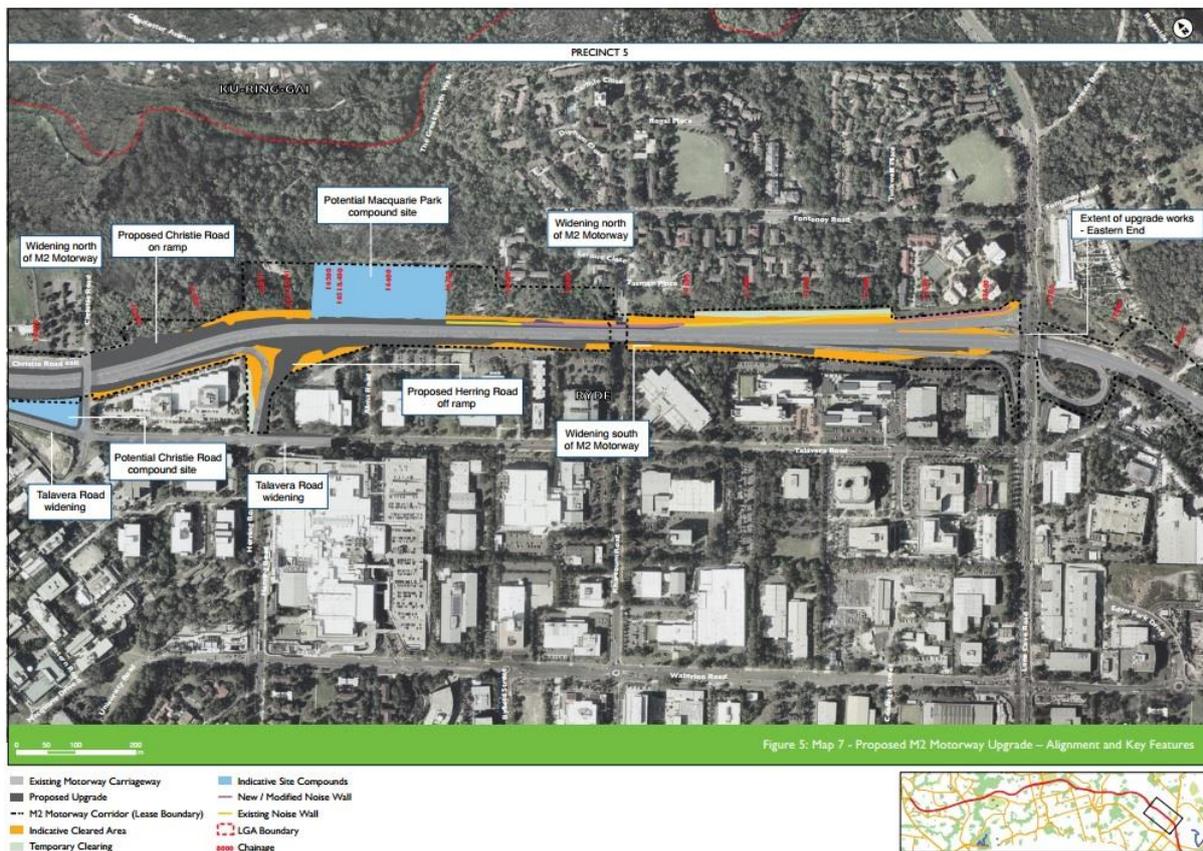
The M2 Motorway has been upgraded between Windsor Road, Baulkham Hills and Lane Cove Road, Macquarie Park. Completed in August 2013, the upgrade reduces congestion, increases the signed speed limit and improves access to the M2 Motorway.

Specific upgrades being undertaken around the Herring Road precinct include:

- A new Herring Road westbound off ramp from the M2
- A new Christie Road eastbound on ramp to the M2
- An additional westbound lane from Lane Cove Road to Beecroft Road
- An additional eastbound lane from Pennant Hills Road to Lane Cove Road
- Between Christie Road and Alma Road, Talavera Road is widened to two lanes in each direction

Figure 2.4 provides an overview of the M2 Motorway upgrade.

Figure 2.4 – M2 Motorway Upgrade at Macquarie Park



Source: RTA (2010)

Figure 2.5 illustrating the Macquarie Park ramps improving access to Herring Road.

Figure 2.5 New Macquarie Park Ramps to Herring Road



Source: Transurban 2013

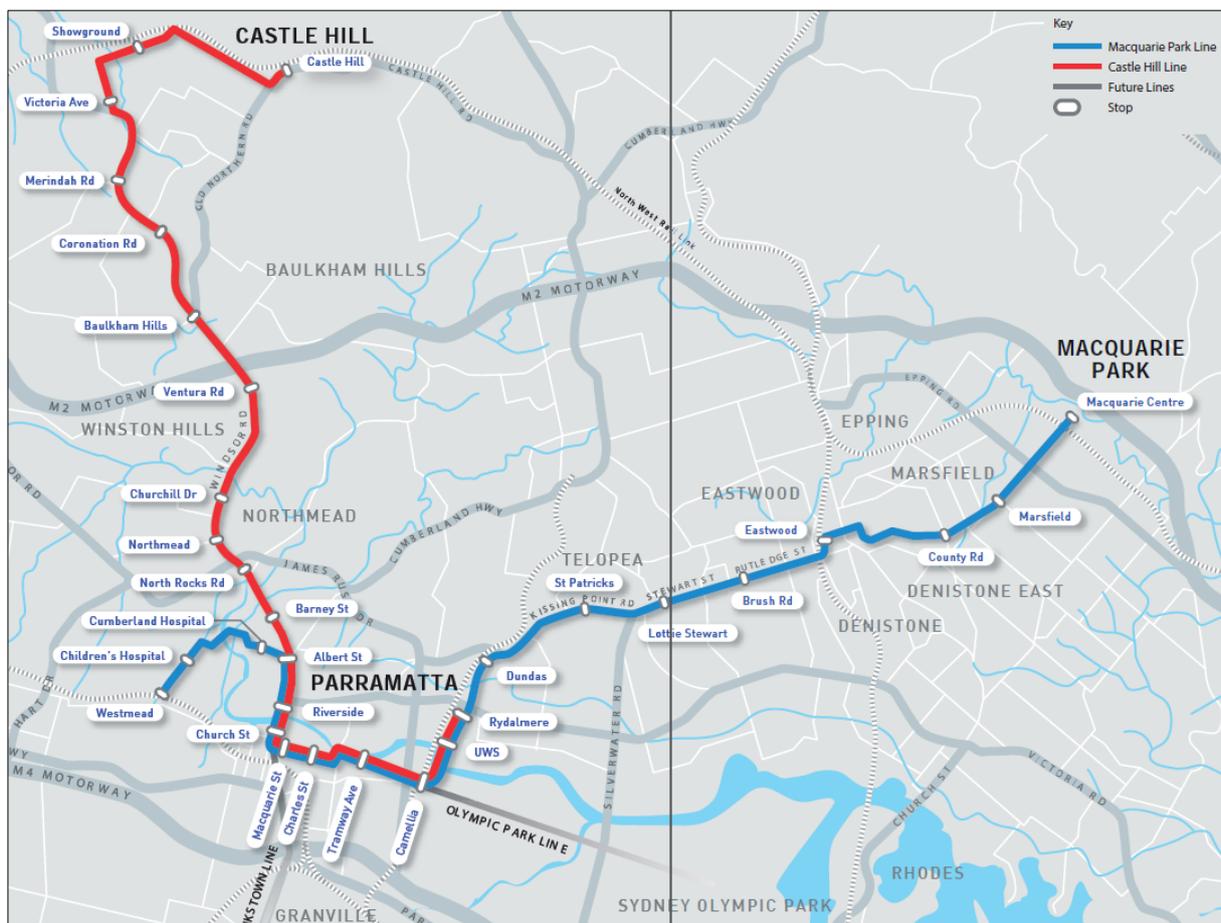
2.7 Proposed Western Sydney Light Rail Network – Macquarie Park Line

Parramatta City Council has recently completed a two part feasibility study into a proposed Western Sydney Light Rail Network.

The study states that the Western Sydney Light Rail Network will help change the structure of Greater Sydney from a mono-centric to a poly-centric model and help build a new city at Parramatta. The network can connect the major economic centres of the region and provide new access and opportunity to the residents, businesses, commuters and students and help unlock the social and economic potential of the region. The majority of projected growth will be focused on consolidating existing centres and intensification along the immediate light rail corridor.

- Part 1 of the feasibility study comprised five integrated studies on transport, land use, environmental, economic and health and social areas, a light rail network design and preferred first stage scheme.
- Part 2 further investigated potential light rail lines to Macquarie Park and to Castle Hill (as illustrated in Figure 2.6) which emerged as the most feasible two alignments in Part 1 of the study.

Figure 2.6 First stage network of the proposed Western Sydney Light Rail Network



Source: Parramatta City Council (2013)

According to the feasibility study, the estimated cost for both the Macquarie Park Line and the Castle Hill Line is \$1.525b, which includes 30km of lines, a depot and 21 light rail vehicles. The study recommends that the Macquarie Park Line be constructed before the Castle Hill Line.

In the study, light rail refers to a transit system that predominately operates in a segregated alignment with less frequent stops and higher average speeds than local bus services.

2.7.1 Proposed Macquarie Park Line

According to the feasibility study, the Macquarie Park Line can connect Westmead health precinct, Parramatta CBD, University of Western Sydney at Rydalmere, Eastwood town centre and Macquarie Park.

The proposed Macquarie Park Line is 17km long. It is to be serviced by ten light rail vehicles with a service frequency of 10 minutes in the peak period and 15 minutes at other times. It has a forecast patronage of approximately 5,000 people per peak hour and an estimated cost of \$919M.

After passing through Eastwood town centre (refer to Figure 2.7), the proposed Macquarie Park Line continues along the County Road freeway reserve, connects into the southern end of Herring Road and then continues north on Herring Road, crossing over Epping Road and into Macquarie Park. The light rail line terminates close to the existing train station, bus interchange and shopping centre.

Figure 2.7 The Rydalmere to Macquarie Park section of the proposed Macquarie Park Line



Source: Parramatta City Council (2013)

Parramatta City Council has proposed that the next stage of the light rail network feasibility studies focus on the following:

community consultation, short term public transport options for strengthening preferred alignments, public transport network analysis and patronage modelling, road network analysis, detailed engineering feasibility, utilities investigations, detailed cost estimation, funding sources and modelling for capital and operation and alignment, stop and depot site finalisation.

Parramatta City Council is to request that State and Federal Governments assist in the funding a detailed study that further investigates the Western Sydney Light Rail Network and prepares a business case for the first stage of the network.

Should the proposed Macquarie Park Line be implemented along this route, its alignment and termination on Herring Road can have significant benefits for the Herring Road precinct. These include:

- an additional public transport mode servicing Macquarie Park, that can supplement the existing Epping to Chatswood Rail Line and the local / regional bus network
- a direct public transport connection westwards to Parramatta that can benefit, residents, workers and students

- the potential to increase the use of public transport to and from Macquarie Park and facilitate a mode shift away from private vehicle use and towards public transport
- the potential for the development of a transport interchange that manages connections and access between three public transit modes – rail, light rail and bus
- reinforcing the vision of Herring Road transformed into a major active street that supports a mix of uses and activities

Notwithstanding the potential transport and accessibility benefits, the detailed design and implementation of the proposed Macquarie Park Line will have implications for the design of Herring Road itself.

Herring Road design issues that will need to be resolved at a more detailed level include:

- location of light rail tracks in the street space
- location, design and accessibility of stops and the light rail terminus
- relationship of the light rail to the train station and the bus interchange
- impact on traffic movement and flow, number of trafficable lanes and capacity of Herring Road
- impact on traffic movements at intersections with Epping Road and Waterloo Road
- impact on street footpaths and pedestrian and cycleway movements
- impact upon existing public space landscaping and street trees
- proposed public space improvements associated with the light rail proposal

2.8 Sydney's Rail Future

The Herring Road precinct will benefit from the completion of the North West Rail Link (NWRL) in 2019/2020. NWRL (shown in Figure 2.8) represents the first stage of the NSW Government's vision for the rail network, as set out in Sydney's Rail Future. Under Sydney's Rail Future, NWRL is the first stage of a new single deck rapid transit network. At an estimated cost of \$A8.5 billion, the 23 kilometre NWRL will connect Cudgegong Road in the north-west with Epping in the northern suburbs. In addition, the 13 kilometre ECRL will be upgraded for NWRL single deck trains to connect with Chatswood. Chatswood will become the major interchange for commuters on the NWRL and North Shore Line to access other employment hubs within the Global Economic Corridor.

Figure 2.8 - The NWRL alignment



Source: Transport for New South Wales (2013)

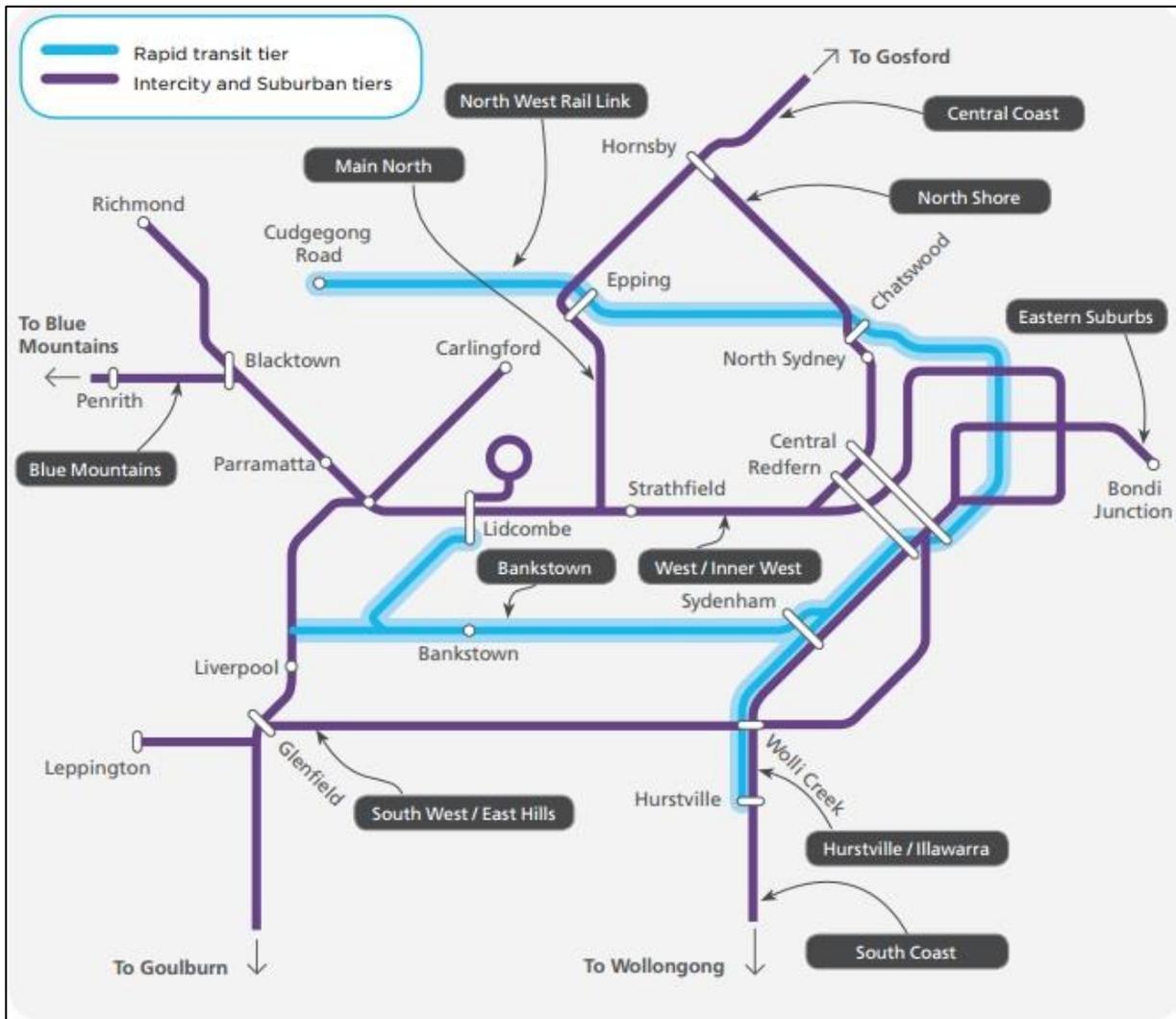
The long term vision for Sydney's Rail Future is for the NWRL to connect with the Bankstown line and Hurstville branch via a second harbour rail crossing, as shown in Figure 2.9. With the completion of the rapid transit network, Macquarie University Train Station could be serviced by up to 20 trains per hour per direction during peak periods (one train every three minutes). Table 2.10 summarises the rapid transit network's potential service frequency and carrying capacity.

Table 2.10 – Additional Capacity with the staged implementation of Sydney's Rail Future

Variable	Current Operation	NWRL (on opening)	NWRL (by 2036)
Trains per peak hour	4	12	20
Frequency (in minutes)	15	5	3
Train Capacity	1,300	1,300	1,300
Capacity per hour	5,200	15,600	26,000

Source: Transport for New South Wales (2012)

Figure 2.9 – The proposed Rapid Transit Network (shown in blue)



Source: Transport for New South Wales (2012)

3.0 Existing Conditions

3.1 Pedestrian & Cycle Network

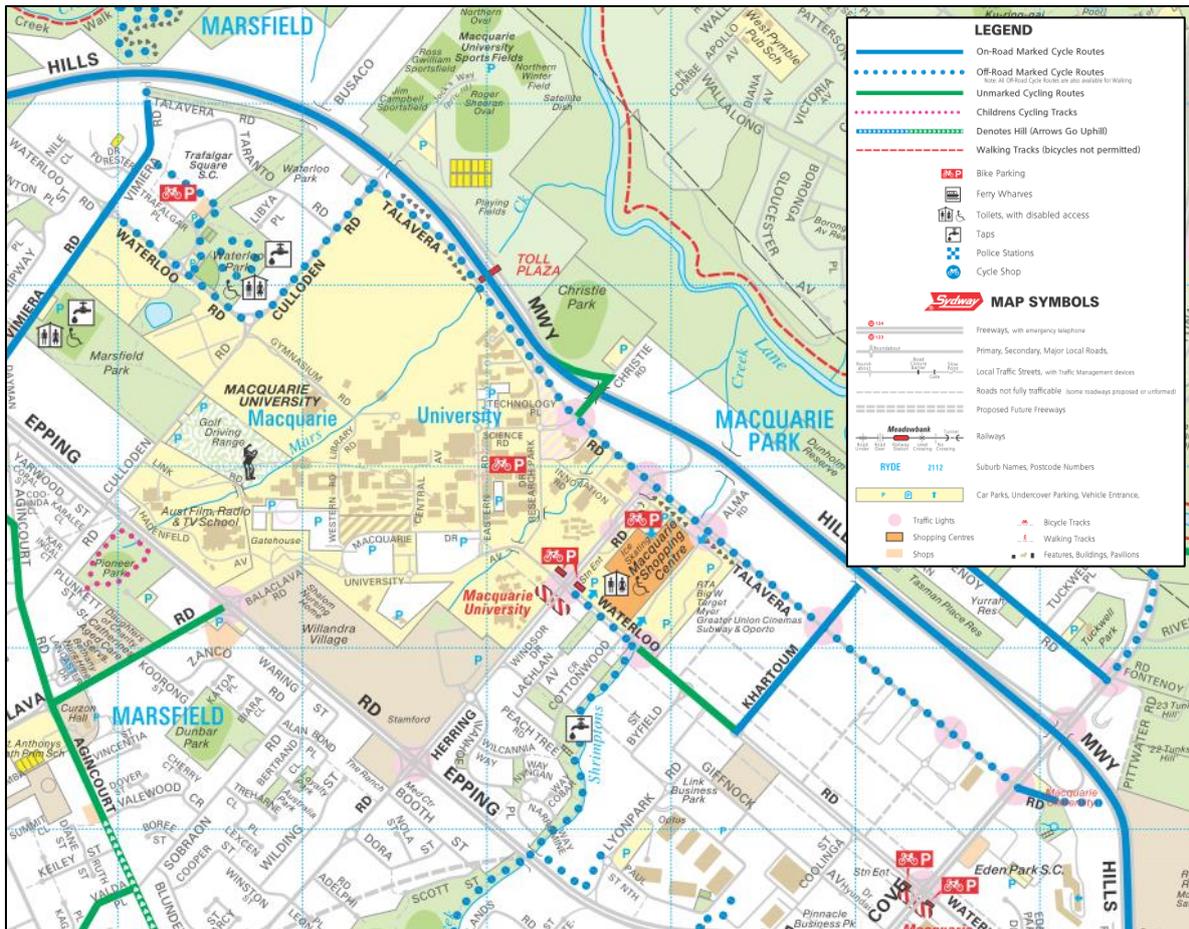
The Herring Road precinct access network prioritises cars over people. Along the one kilometre length of Herring Road, there are only four signalised crossings for pedestrians. Between Epping Road and Waterloo Road, a distance of 600 metres, there are no legal pedestrian crossings and footpaths are narrow and regularly interrupted by private driveway access.

The Herring Road precinct has limited connections for pedestrians and cyclists to the Macquarie Centre and Macquarie University. Although there are three road frontages, Herring Road is the sole clear access point to the Macquarie Centre. It is possible for pedestrians and cyclists to enter the Macquarie Centre from Waterloo Road, but only via the car park. The primary access point from Herring Road to Macquarie University is via University Avenue, with private properties and student colleges limiting east-west connections.

The key cycle corridor along Shrimpton's Creek is poorly utilised because of safety concerns and its poor condition. Passive surveillance is limited by trees blocking sightlines from residential buildings and both Epping and Waterloo Roads.

In the wider context of Macquarie Park, the cycle network connects with the adjacent suburbs of North Ryde, Ryde, Denistone East and Marsfield. Shrimpton's Creek and Waterloo Road are the western extremities of the cycle network within Macquarie Park, connecting to the M2 (via Khartoum Road) and Epping Road, as show in Figure 3.1.

Figure 3.1 – City of Ryde Bike Map



Source: City of Ryde Bike Map (2009)

3.2 Public Transport Network

3.2.1 Sydney Trains

Macquarie University Train Station provides the Herring Road precinct with access to the Sydney Trains network. The station opened in 2009 as part of ECRL. In peak periods, four services per hour operate in each direction (inbound to the city and outbound to Epping or Hornsby) on the T1 North Shore, Northern & Western Line. The Sydney Trains Network is shown in Figure 3.2.

Figure 3.2 – Current Operation of the T1 North Shore, Northern & Western Line on the Sydney Trains Network



Source: Sydney Trains (2013)

Table 3.1 shows the train station’s growth in patronage since opening. The station rank is 26th on the Sydney rail network based on the daily station entries and exits.

Table 3.1 – Macquarie University Train Station Patronage Growth

Year	Entries and Exits/Day	Station Rank	Percentage Growth
2009	10,980	43	
2010	14,960	32	36.2%
2011	17,020	26	13.4%

Source: Bureau of Transport Statistics (2012)

ECRL will be integrated into the NWRL when it is completed in 2019 / 2020. The Stage Two Environmental Impact Statement (EIS) for NWRL states that the new rapid transit line will replace many commuter bus trips to Macquarie Park. Furthermore the EIS indicates that travel times will be reduced between the north-west and key employment destinations like Macquarie Park by up to 30 per cent.

NWRL is expected to run 12 trains per hour per direction during peak periods (one train every five minutes) and six trains per hour per direction off peak (one train every ten minutes). The EIS states that each new single deck train will have eight carriages and be capable of transporting up to 1,300 passengers. Therefore the new rapid transit network will play an important role in increasing the mode share of public transport to Macquarie Park.

3.2.2 Bus Network

The Herring Road precinct is serviced by 27 different bus routes which provide connections across the Sydney Metropolitan Area, as shown in Figure 3.4. Figure 3.4 shows the current service patterns through the Herring Road precinct and Table 3.2 summarises the frequency and routes of these services.

Figure 3.3 – Macquarie Park Bus Connections across the Sydney Metropolitan Area

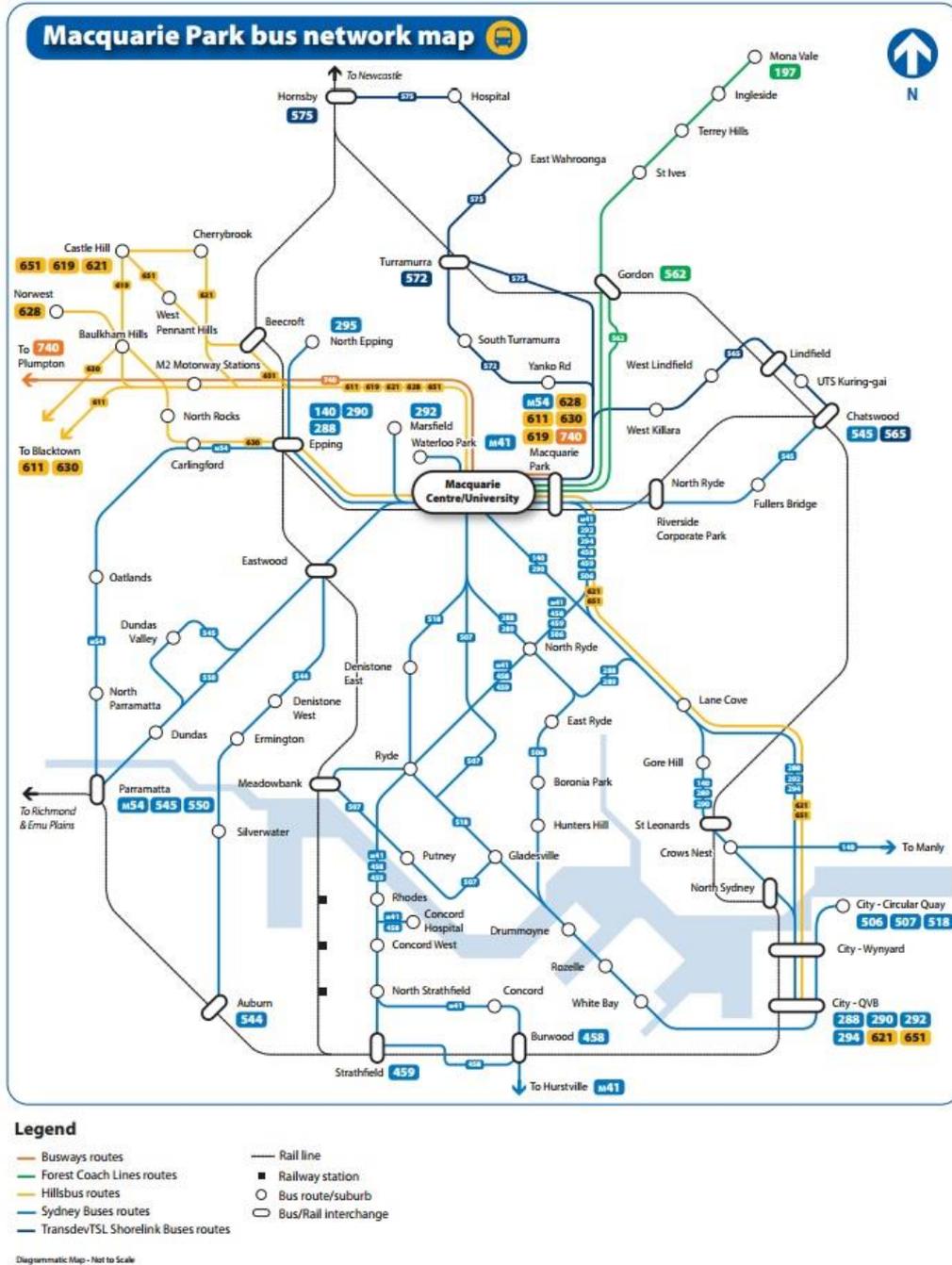
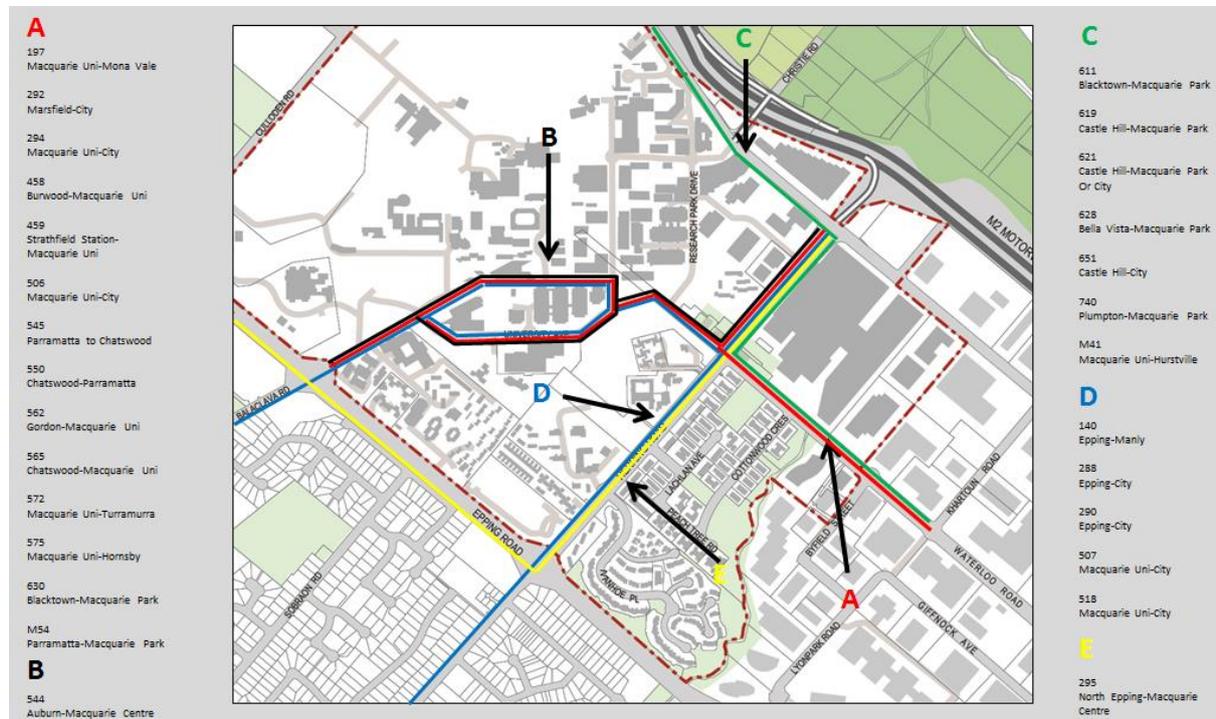


Figure 3.4 – Existing Sydney Buses operations within the Herring Road precinct



Source: AECOM (2013)

Table 3.2 – Existing bus operations

Service #	Route	AM Peak/hr		PM Peak/hr	
		Inbound	Outbound	Inbound	Outbound
140	Manly Wharf to Epping and Epping to Manly Wharf	1	0	0	1
197	Macquarie Uni to Mona Vale via Macquarie Centre	4	1	4	1
288	Epping to City via Macquarie Uni, Macquarie Centre	2-3	1	2	3
290	Epping to City via Macquarie Uni, Macquarie Centre	2	4	1	2
292	Marsfield to City via Macquarie Uni, Macquarie Centre	1-2	3-5	3	2
294	Macquarie University to City via Lane Cove	1	1	1	
295	North Epping to Macquarie Centre via Epping	2-3	3	2	2-5
458	Burwood to Macquarie University	1-2	2	1-2	2
459	Macquarie University to Strathfield Train Station	2	1-2	2	2
506	Macquarie University to City via Macquarie Centre	1-2	2	2	2
507	Macquarie University to City via Macquarie Centre	1-2	1-2	1-2	2
518	Macquarie University to City via Macquarie Centre	2	2	1-2	1-3
544	Auburn to Macquarie University	2	1	1	2
545	Parramatta to Chatswood via Macquarie Centre	3-5	5-6	3-6	5
550	Chatswood to Parramatta via Macquarie Centre	0	0	0	0

Service #	Route	AM Peak/hr		PM Peak/hr	
		Inbound	Outbound	Inbound	Outbound
562	Gordon to Macquarie University via Gordon	0	0	0	0
565	Chatswood to Macquarie via Macquarie Centre	0-1	0	1-2	1-2
572	Macquarie University to Turramurra via Macquarie Park	2-3	1-2	2-3	3
575	Macquarie University to Hornsby	2-4	3	3	3
611	Blacktown to Macquarie Park	2-6	2-3	3	5-6
619	Castle Hill to Macquarie Park	3-4	1	1-2	3-4
621	Castle Hill to City via Macquarie Park	1-2	1-4	2	1-2
628	Bella Vista to Macquarie Park via the M2	0	3	2	0
630	Blacktown to Macquarie Park				
651	Castle Hill to City via Macquarie Park	2	1-2	2	1-2
740	Plumpton to Macquarie Park	2	1	2	1
M41	Hurstville to Marsfield/Waterloo Park via Macquarie Park and Macquarie Centre	6	6	6	6
M54	Parramatta to Macquarie Park via Macquarie University and Macquarie Centre	6	6	6	6

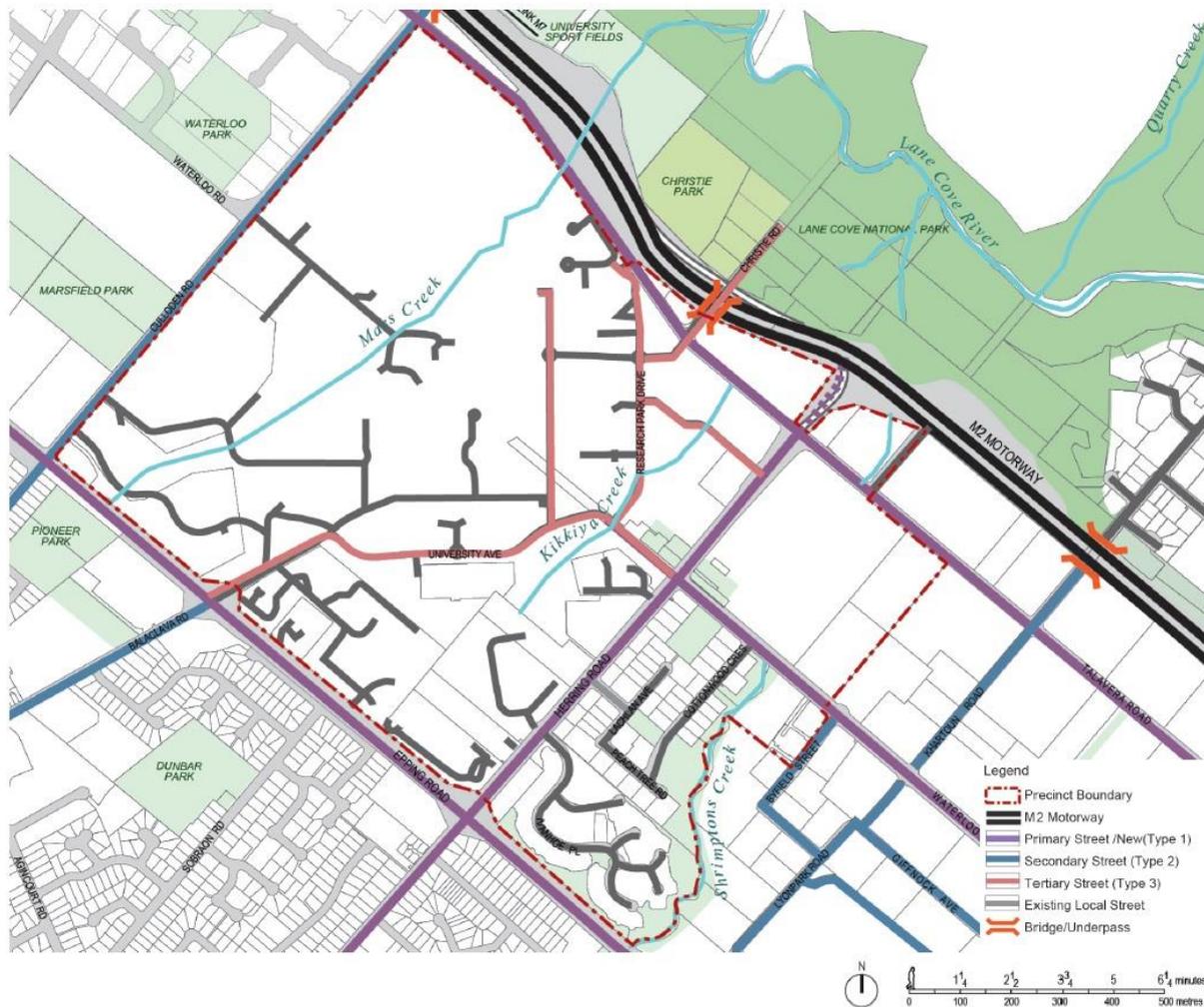
Source: Sydney Buses, Hills Buses, Transdev, Forest Coach Lines and Busways (2013)

The 2002 Macquarie Park TMAP and the 2009 Macquarie University TMAP assumed that an increase in bus services and bus priority measures would be capable of supporting a greater population of workers and residents in Macquarie Park and the desired shift in mode share from cars to public transport. Both reports suggested the need to prioritise bus movements over cars and to better integrate the Macquarie Centre Bus Interchange into the wider precinct.

3.3 Existing street network

Ryde DCP 2010 identifies Herring Road, Talavera Road, Waterloo Road and Epping Road as Primary Streets (Type 1) within the Herring Road precinct. See Section 2.3.1 for details on street hierarchy.

Figure 3.5 Herring Road precinct and Existing street network



Source: AECOM (2013)

3.3.1 Herring Road

Herring Road is the major north-south route within the Herring Road precinct, connecting Talavera Road to Epping Road. Herring Road has a signed speed limit of 60 kilometres per hour with two median-separated lanes in each direction. Additional turning lanes are provided at signalised intersections at Talavera Road, University Avenue / Waterloo Road and Epping Road. A roundabout controls traffic movements between Herring Road and Ivanhoe Place. Herring Road also has non-signalised intersections with Innovation Road and Windsor Drive. Private driveways on both sides of Herring Road provide residents of strata-titled buildings, university colleges and the Stamford Grand North Ryde with access to the street.

3.3.2 Talavera Road

Talavera Road runs perpendicular to Herring Road at the northern end of the Herring Road precinct. Talavera Road has a signed speed limit of 50 kilometres an hour with two median separated lanes in each direction east of Herring Road. At the intersection with Herring Road, an additional left turn lane and bus only right turn lane are provided. West of Herring Road, Talavera Road is being widened as part of the M2 Upgrade. When complete, this part of Talavera Road will also have two median separated lanes in each direction.

3.3.3 Waterloo Road

Waterloo Road intersects with Herring Road at the entrance to Macquarie University. Waterloo Road has a signed speed limit of 60 kilometres an hour with two median separated lanes in each direction. On approach to Herring Road, Waterloo Road has three westbound lanes – one right turn, one shared through and right turn and one left turn. On approach to Herring Road, University Avenue has three eastbound lanes – one right turn, one through and one shared through and left turn. Westbound, University Avenue has two lanes with one becoming a right turn only lane into Research Park Drive.

3.3.4 Epping Road

Epping Road runs perpendicular to Herring Road at the southern end of the Herring Road precinct. Epping Road has a signed speed limit of 80 kilometres an hour with three median separated lanes in each direction. The eastern approach to Herring Road has two additional right turn lanes and one additional left turn lane. The western approach to Herring Road has one additional right and one additional left turn lane.

In a regional context, Epping Road runs for ten kilometres from the Pacific Highway and Lane Cove in the east to Epping in the west. It provides an important link between Sydney's Northern and North West suburbs and the North Shore and CBD. The RMS identifies Epping Road as an arterial road. With the opening of the Lane Cove Tunnel in 2007, Epping Road's capacity east of the Lane Cove River has been reduced to encourage drivers to use the Lane Cove Tunnel.

3.3.5 Other Streets

Ryde DCP 2010 does not specifically identify the remaining streets in the Herring Road precinct as tertiary or small streets. Ivanhoe Place, Windsor Drive, Cottonwood Crescent, Research Park Drive and Innovation Road provide access to Primary Streets and smaller streets within the Herring Road precinct.

3.4 Intersection Modelling

AECOM commissioned Austrafic to conduct traffic surveys for the busiest morning and afternoon peak hours at the following intersections within the Herring Road precinct;

- Herring Road and Epping Road
- Herring Road and University Avenue / Waterloo Road
- Herring Road and Talavera Road

The traffic surveys were conducted on Thursday 13 February 2013 with the results modelled in LINSIG.

3.4.1 LINSIG Overview

The following LINSIG performance indicators have been used to provide an accurate reflection of intersection operation:

- Degree of saturation (DoS) – a ratio between traffic volumes and the capacity of the intersection;
- Level of service (LoS) – an index based on delay, as shown in Table 3.3; and
- Queue lengths – the mean max back-of queue length for a movement.

Table 3.3 – LoS Overview

Level of Service	Average Delay / Vehicle (secs/veh)	Traffic Signals
A	Less than 14	Good Operation
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; incidents will cause significant delays
F	> 70	Over capacity.

Source: Guide to Traffic Generating Developments, Roads and Traffic Authority (1993)

The RMS Guide to Generating Traffic Developments offers the following explanation of the various Levels of Service:

Level of Service A

This, the top level is a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.

Level of Service B

This level is in the zone of stable flow and drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is little less than that of the level of Service A.

Level of Service C

This service level is also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.

Level of Service D

This level is close to the limit of stable flow but is approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.

Level of Service E

This occurs when traffic volumes are at or close to capacity and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause a traffic-jam.

Level of Service F

This service level is in the zone of forced flow. With it, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow break-down occurs and queuing and delays result.

3.4.2 Results

Figure 3.6 shows the location of the three key intersections along Herring Road;

- Herring Road and Epping Road.
- Herring Road and Waterloo Road / University Avenue.
- Herring Road and Talavera Road.

Figure 3.6 Herring Road Intersection Location



Source: AECOM (2013)

Table 3.4 and Table 3.5 summarise the peak period performance of the key intersections.

Table 3.4 – 0800-0900 peak period Intersection Performance

AM Intersection Performance			
Intersection Arm	Degree of Saturation	Delay (s)	Level of Service
Herring Road / Talavera Road Intersection Average	79.3%	36.2	C
Herring Road / Waterloo Road Intersection Average	90.2%	57.3	E
Herring Road / Epping Road Intersection Average	99.2%	100.2	F

Source: AECOM (2013)

Table 3.5 – 1700-1800 peak period Intersection Performance

PM Intersection Performance			
Intersection Arm	Degree of Saturation	Delay (s)	Level of Service
Herring Road / Talavera Road Intersection Average	75.2 %	43.6	D
Herring Road / Waterloo Road Intersection Average	92.9%	64.3	E
Herring Road / Epping Road Intersection Average	92.5%	65.7	E

Source: AECOM (2013)

Based on the results shown in Table 3.4 and Table 3.5;

- The Epping Road and Herring Road intersection is operating over capacity in the morning peak and at capacity in the afternoon peak.
- The Herring Road and Talavera Road intersection is performing satisfactorily in the morning peak and is approaching capacity in the afternoon peak.
- The Herring Road and Waterloo Road intersection is approaching capacity in both peak periods.

4.0 Herring Road proposal

4.1 Overview

The Herring Road precinct proposal recognises the need for much improved pedestrian and cycle links within the Herring Road precinct to major activity nodes such as;

- Macquarie Park for employment
- Macquarie University for education and recreation
- Macquarie Centre for shopping and entertainment

The NSW Government's commitment to improve public transport through Macquarie Park enhances the Herring Road precinct as a suitable candidate for the Urban Activation Precinct Program. By integrating with the ECRL, the NWRL will provide residents with direct access to the first stage of the rapid transit network for trips outside the walking and cycling catchment. NWRL will improve rail services to the Global Economic Corridor (including Chatswood, St Leonards, North Sydney and the Sydney CBD) and provide rail services to the North-West (including Bella Vista, Castle Hill, Norwest and Rouse Hill) for the first time.

The increase in rail capacity will be complemented by a modified bus network which will respond to the extended coverage of the rail network. There are opportunities to improve bus infrastructure within the Herring Road precinct, through improved stops and some modification to the route structure and the future form of the interchange.

The objective of the modified local street network is to increase vehicle permeability and connections to the main road network, but in a manner which won't encourage short cuts and increase traffic on local roads.

The analysis in this report and previous studies indicate that the arterial road network connecting to Macquarie Park will suffer from capacity bottlenecks. The intersection of Herring Road and Epping Road is the southern gateway to the precinct and suffers from high peak period congestion at the moment. A capacity response is outlined in Section 5.

4.2 Transit-oriented development at Herring Road

The Herring Road precinct proposal applies transit-oriented development (TOD) and design principles in the future development of residential, commercial, retail, education and mixed uses.

Transit-oriented development generally:

- Establishes around activity centres and transport / transit nodes.
- Provides a mix of medium to high density and affordable housing.
- Provides a mix of retail, employment, commercial and civic development.
- Is located within a 400m or 800m walkable distance from a transport stop / transit node.
- Enables ease of accessibility to via walking and cycling links
- Provides quality open space accessible to the community
- Reduces parking to encourage use of public transport
- Is serviced by frequent, fast, reliable public transport

Through the 'Balanced Growth' chapter of the Draft Metropolitan Strategy for Sydney to 2031, the NSW Government advocates integrated land use and transport planning as a key element for the balanced and sustainable growth of Metropolitan Sydney.

Integrated land use and transport planning and transit-oriented development are beneficial as they can:

- Decrease car dependency.
- Increase the utilisation and viability of public transport investment.
- Promote 'active transport' and achieve potential shifts in transport modes that increase trips by public transport, reduce 'car as driver' trips, increase cycling trips and increase walking trips.
- Increase residential densities and facilitate the redevelopment and renewal of existing transport corridors.
- Create active centres and neighbourhoods with a mixed use and residential focus that integrate services and the communities who access them.
- Improve opportunities to access a greater range of metropolitan jobs.
- Improve public domain and public spaces of urban areas.
- Provide priorities for sustainability, such as energy and water conservation.
- Reduce the need for further greenfield development at the urban edge.

Transit-oriented development generally suits people who wish to make better use of public transport services and actively reduce car dependency, those unable to drive or who choosing not to drive and those seeking better access to a greater range of metropolitan lifestyle and work opportunities. TODs also appeal to 'downsizers', retirees and seniors who are looking for alternatives to large family houses in suburban areas as well as those seeking convenient locations close to activity centres, educational establishments transport and services, such as students and young professionals.

To be successful, the implementation of transit-oriented development requires an integrated approach across government, broadly based precinct design and planning that incorporates existing communities, economically viable solutions and community understanding and acceptance of the TOD principles and benefits.

The City of Ryde and the department agree that the Herring Road precinct presents an excellent opportunity to create a transit-oriented development, focused on the Macquarie University Train Station. This approach, as described in the Herring Road precinct proposal and Transport Strategy can establish a flexible development and active transport framework that meets the TOD characteristics outlined above.

4.2.1 Emerging travel patterns for the Herring Road precinct

The analysis of the 2011 Census Journey to Work (JTW) data undertaken in Section 2.5.1 reveals some valuable statistics regarding existing travel patterns for residents that support a TOD strategy.

The JTW analysis shows that in 2011, 24 per cent of existing residents in the Herring Road precinct either walked or cycled to work. This figure is significantly higher than the other existing centres and urban renewal areas the Herring Road precinct was compared with. A further 23 per cent travelled to work by rail and nine per cent by bus. These two modes equate to 56 per cent of local residents already using 'active transport' modes to travel to work, either by walking, cycling or taking the train or the bus.

These statistics demonstrate that existing residents in the Herring Road precinct benefit significantly from the close proximity of diverse local employment opportunities provided by the university, the shopping centre and the business park. Herring Road precinct appears to demonstrate many characteristics of a transit-oriented development and a live-work community.

4.3 Proposed Pedestrian and Cycle Network

The proposed pedestrian and cycle network shown in Figure 4.1 proposes significant improvements to the pedestrian and cycle network to provide a connected, legible and safe environment.

4.3.1 North-South Connections

Herring Road is envisaged as the key north-south urban pedestrian and cycle connection, linking Epping Road with Talavera Road. It is also planned for the cycleway to be extended south to Kent Road in Marsfield, an important existing east-west connection.

Two new signalised intersections on Herring Road are proposed at Macquarie University (south of University Avenue) and Ivanhoe Place. This will bridge the 600 metre gap between the Herring Road and Epping Road and Herring Road and Waterloo Road intersections, reducing the distance between signalised intersections to a maximum of 250 metres. Consequently, pedestrians and cyclists will be able to cross Herring Road safely and in more locations.

The Herring Road precinct will be complemented by improvements to several other key north-south pedestrian links. These include;

- 1) Kikkiya Creek Corridor; running from the Lane Cove National Park in the north to Epping Road in the south via Christie Road, Research Park Drive and Kikkiya Creek. This corridor will connect open space (Lane Cove National Park, Christie Park and Kikkiya Creek), Macquarie University and bus routes on Epping and Talavera Roads.
- 2) Shrimpton's Creek Corridor; running from Waterloo Road in the north to the suburb of Marsfield in the south. This corridor will connect the Macquarie Centre, open space (Shrimpton's Creek), the residential areas of Marsfield and bus routes on Waterloo and Epping Roads.
- 3) Cottonwood Crescent Corridor; running from Waterloo Road in the north to Ivanhoe Place in the south. This corridor will better connect residents with the Macquarie Centre and open space (Elouera Reserve, Wilga Park and Quandong Reserve) as well as bus routes on Waterloo and Herring Roads.
- 4) Peach Tree Road to Epping Road Corridor; linking the open space of Wilga Park with bus routes on Epping Road.

4.3.2 East-West Connections

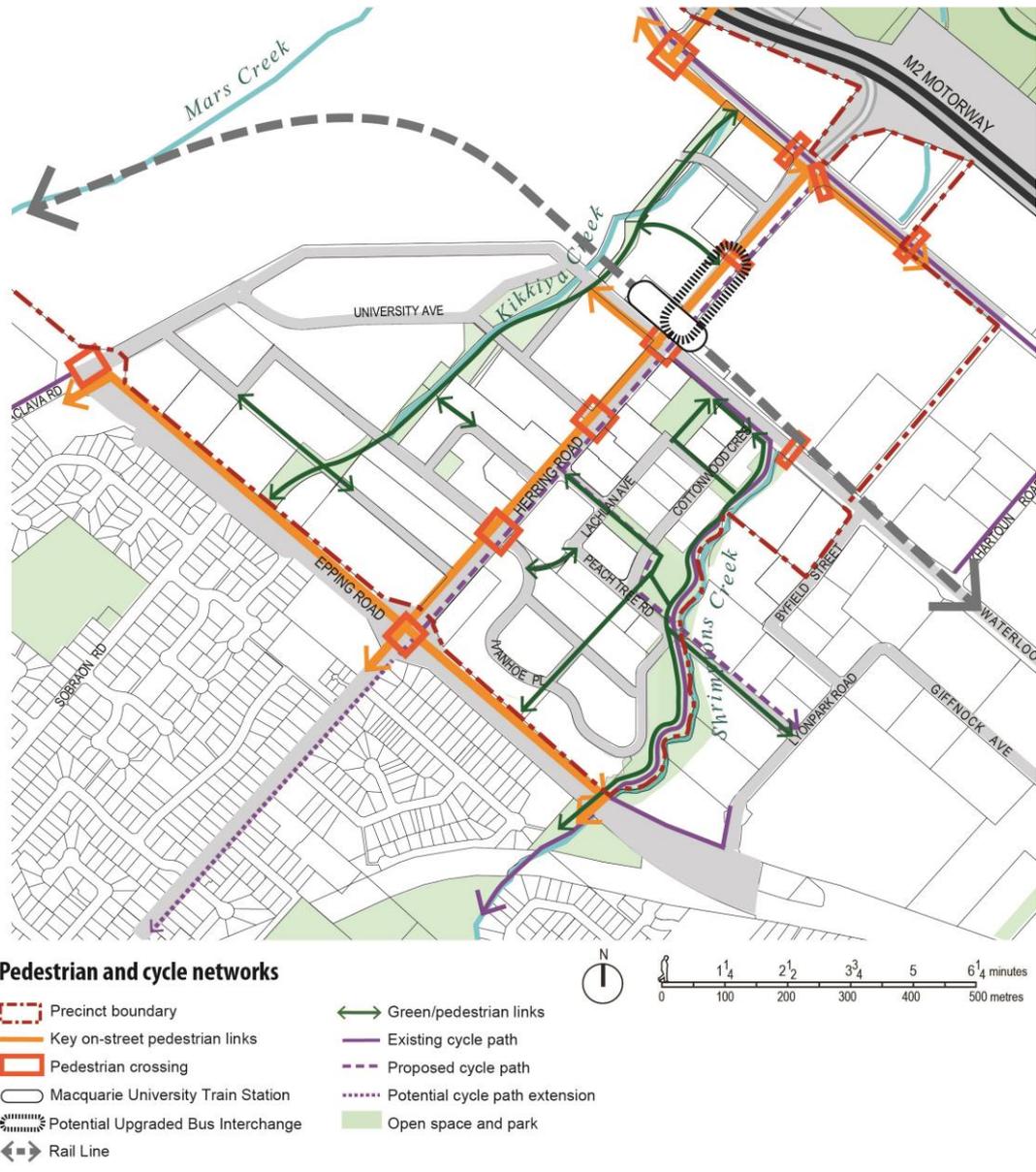
Two key east-west urban pedestrian links are proposed;

- 5) University Avenue and Waterloo Road Corridor; directly connects the Herring Road, Kikkiya Creek and Cottonwood Crescent north-south links. This corridor will improve connections within the Herring Road precinct to Macquarie University Train Station, bus stops on Herring Road and a potential civic square at the north-west corner of the Herring Road and University Avenue intersection.
- 6) Macquarie University-Macquarie Centre Corridor; connects the Macquarie Centre with Research Park Drive.
- 7) Herring Road to Lyonpark Road connection; there is potential to establish a strong east west pathway / cycleway connection between Macquarie Business Park and Herring Road. Specifically, a mainly on-street cycleway could connect to and be part of the new street proposed to link Lyonpark Road to Peach Tree Road across Shrimptons Creek. It could then continue on-street around Wilga Park, then head west and uphill through Quandong Reserve, over Lachlan Ave, onto Windsor Drive and finally connect with the proposed new two way cycleway on Herring Road.

Other east-west connections that can strengthen the pedestrian and cycle network are;

- 8) Talavera Road; linking Macquarie Park in the east with the Macquarie Centre, Herring Road, Macquarie University and Marsfield in the west.
- 9) Kikkiya Creek-Herring Road Corridor; connects Kikkiya Creek with Herring Road
- 10) Epping Road; connects Shrimpton's Creek in the east with Herring Road and Balaclava Road in the west.

Figure 4.1 – Proposed Pedestrian and Cycle Network



Source: AECOM (2013)

4.4 Bus Network

This Transport Strategy has considered ways in which current bus operations through the Herring Road precinct could have staged improvements to ensure that greater capacity can be provided as needed. Refer to Figure 4.2.

Bus routes that use Herring, Waterloo, Epping, Lane Cove and Talavera roads are part of Sydney's core bus network. This network was identified in the NSW Long Term Transport Master Plan as consisting of the city's highest demand, centre-to-centre bus routes. A high average end-to-end travel speed, no worse than 25 km/h for 95 per cent of services, is desirable for the core bus network to meet customer needs.

4.4.1 Short term improvements

In the short term (0-5 years) it is recommended that the amenity, visual appearance and utility of the existing bus interchange be improved and that the allocation of stops and stands be optimised. It is also proposed that bus stops on Herring Road and Waterloo Road be upgraded to provide full bus shelters and real time information.

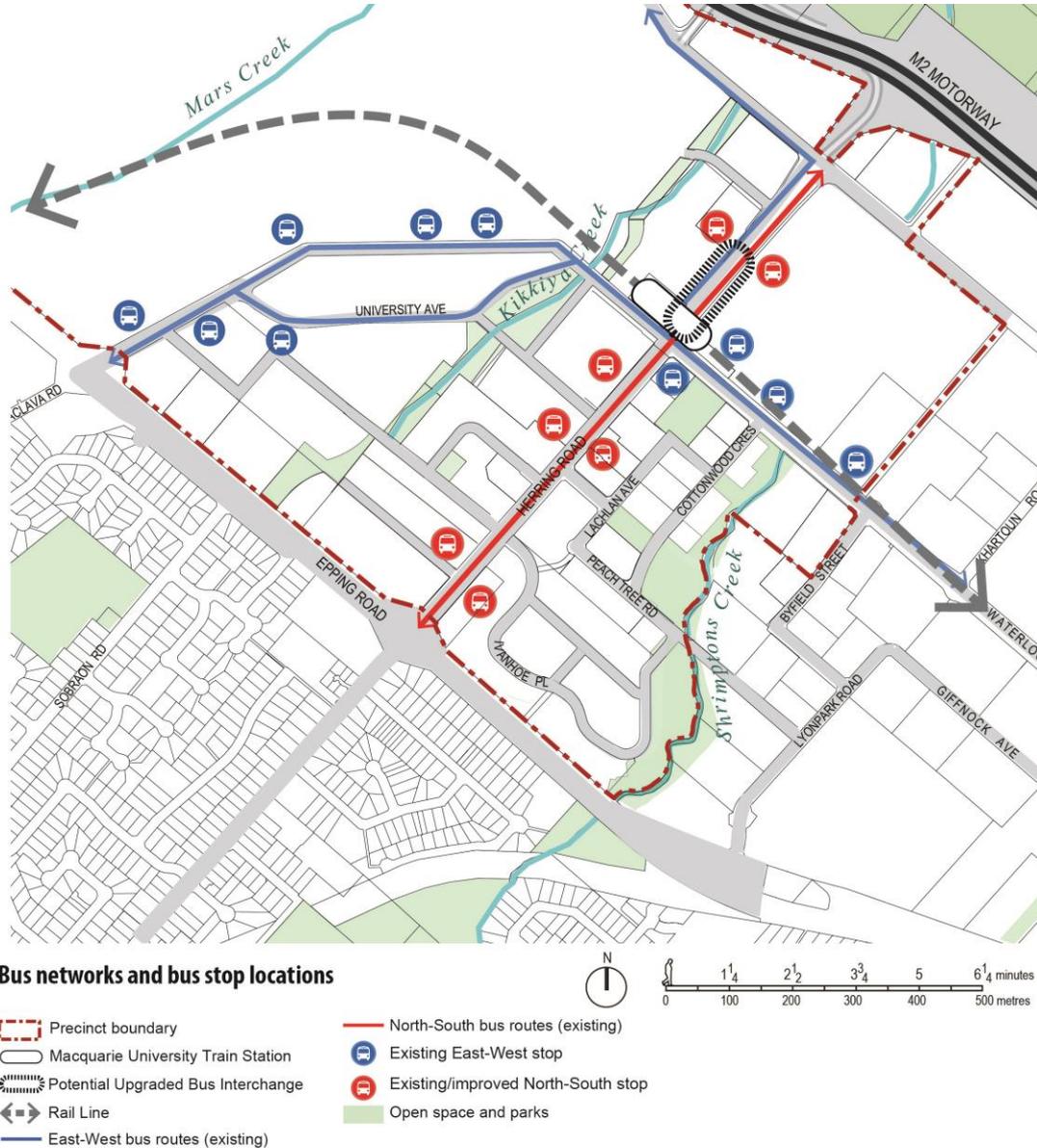
4.4.2 Medium term improvements

TfNSW advises that bus service levels are continually reviewed and that bus services may be altered prior to the introduction of NWRL in 2019. Revisions to bus timetables are made as required and based on development in the area and changes in patronage. TfNSW propose to undertake a broader Macquarie Park transport study when appropriate.

TfNSW advises that it will continue to monitor and if necessary refine bus services to the Herring Road precinct, including Macquarie University Train Station, Macquarie Centre Bus Interchange and Macquarie University. This process will be based on demand and in conjunction with any redeployment of bus services for the whole of the North West Region, prior to the opening of the North West Rail Link.

TfNSW will continue to consult with DP&I and the City of Ryde to work on possible refinements to bus stop locations in and around the Herring Road precinct. This continual review will seek to optimise the operations of bus services for the planned increase in riders whilst preserving current levels of passenger convenience and amenity. It can also potentially benefit local users by improving access to and travel times through Macquarie Park, providing and activating the public domain, with bus stops as part of increased networked pedestrian activity around the Herring/Waterloo Road transit and activity hub.

Figure 4.2 Herring Road bus stop locations



Source: AECOM (2013)

4.4.3 Long term improvements

Bus services will need to play a major role in accommodating future public transport growth in Macquarie Park. To accommodate this growth, a comprehensive upgrade of the Macquarie Centre Bus Interchange may be required in the longer term.

A new bus interchange could present opportunities to:

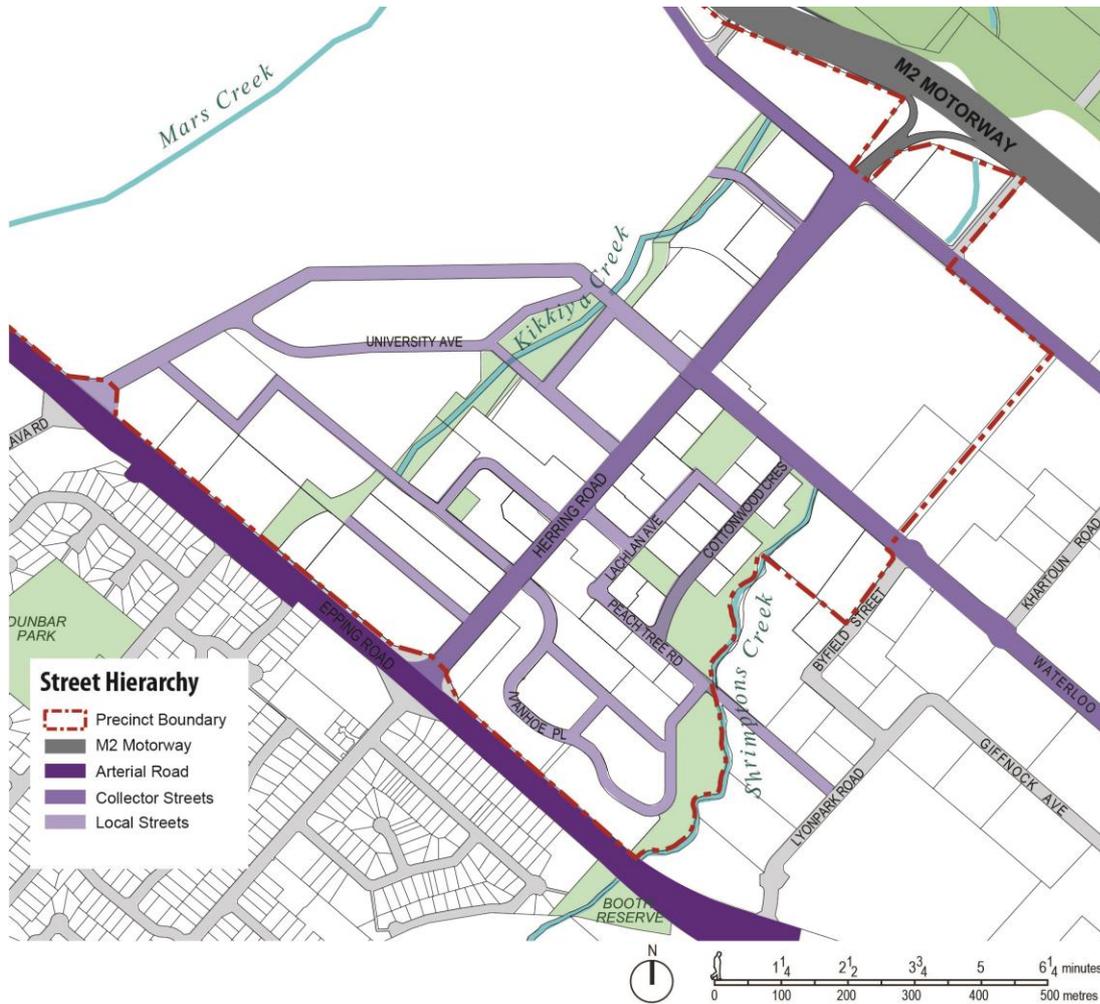
- Accommodate more bus services
- Create a better integrated transport interchange with direct links to the train station
- Improve pedestrian connectivity and amenity between Macquarie Shopping Centre and Macquarie University and
- Improve the amenity and activity along Herring Road

TfNSW advise that the potential upgrade of the Macquarie Centre Bus Interchange should be considered in its assessment for priorities in the Transport Access Program.

4.5 Proposed street network

The primary objective of the proposed local street network modifications is to better connect the different areas of the precinct by reducing the number of cul-de-sacs and introduce more links to the main road network. Figure 4.3 shows proposed changes to the street network.

Figure 4.3 – Proposed street network



Source: AECOM (2013)

4.5.1 Intersections

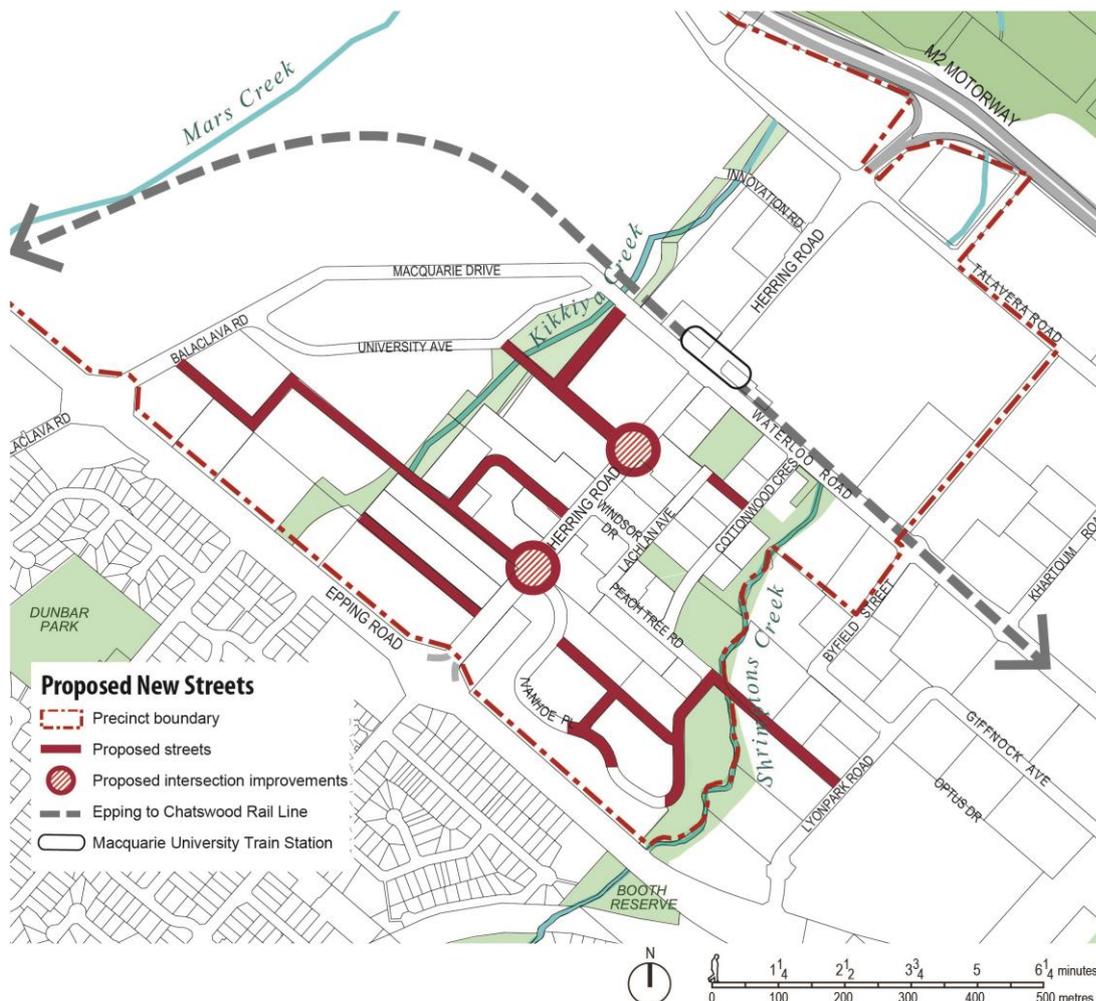
- 1) The intersection of Herring Road and Epping Road is currently experiencing capacity constraints which result in high congestion levels, particularly during the AM peak period. Addressing congestion requires a whole-of-network planning strategy, including a suite of measures that reduce reliance on car travel, enhance public transport and manage congestion and traffic flows efficiently. The performance of the state and regional road network will be assessed in the light of current and future demand, including the additional traffic generated from urban activation precincts and other developments proposed within the precinct. These issues will be further investigated by TfNSW as part of the development of a sub-regional transport study which will identify the future road network management strategy and Growth Infrastructure Plan for the Central Subregion.
- 2) Herring Road/Ivanhoe Place. Currently a roundabout, it is proposed that this intersection be upgraded to a four arm signalised intersection. Adding traffic signals will increase capacity, provide greater control of movements and also provides the opportunity to introduce a new pedestrian crossing over Herring Road.

- 3) Herring Road/Dunmore College. This is a potential link that could be provided as and when the Dunmore College site is re-developed and is consistent with the Macquarie University Concept Plan. The new link would connect with Herring Road via a three arm signalised intersection approximately 200m upstream from the Herring Road/Waterloo Road intersection. If signalised, the intersection will control traffic flow from the university, limiting the risk that the new connection may become a “rat run”. The intersection will also provide a controlled pedestrian crossing point.
- 4) Herring Road/Waterloo Road. The future form of this intersection will need to reflect any changes to access for the bus interchange and the Macquarie Centre. The operation of the signals will also need to reflect any changes in bus priority or bus movements to ensure that bus delays are minimised.
- 5) Herring Road/Talavera Road. As one of the links to the M2 this intersection must maintain capacity to cater for motorway movements, especially any future bus movements. The intersection will also need to reflect any changes to the interchange and Macquarie Centre access.

4.5.2 New street connections

Proposal new streets will benefit local area accessibility, facilitate better traffic circulation in the precinct and dissipate traffic movements to the main road network.

Figure 4.4 – Proposal new streets



Source: AECOM (2013)

4.5.2.1 New Streets east of Herring Road

The following improvements to the street network are proposed east of Herring Road;

- 1) A new street between Cottonwood Crescent and Ivanhoe Place will create a circulation route across the eastern side of the precinct, drawing local traffic through what are currently quiet cul-de-sacs. will assist in passive surveillance for the south-east corner of the Ivanhoe Estate.
- 2) A new connection between Lachlan Avenue and Cottonwood Crescent south of Elouera Reserve. This link will provide a new connection between the residential, commercial areas and open spaces with a one-way access from Cottonwood Crescent to Lachlan Avenue.
- 3) The Ivanhoe Estate road network is realigned with cul-de-sac streets removed to improve permeability, particularly for pedestrians and cyclists.
- 4) A one way link for vehicles from Peach Tree Road to Lyonpark Road that allows for the two way movement of pedestrians and cyclists.

4.5.3 New Streets west of Herring Road

The following improvements to the street network are proposed west of Herring Road;

- 1) A new street from Herring Road through to Balaclava Road. This link will provide a secondary connection for traffic to dissipate depending on their direction of travel – vehicles will be able to access Balaclava Road directly, as well as Herring Road.
- 2) New streets to better integrate the approved projects at 110-114 and 120-128 Herring Road into the wider Herring Road precinct road network. This will include links with the BCS and Morling College sites. These links will provide better connections from Morling College and 120-128 Herring Road to bus services on Epping Road, and from the BCS site to bus services on Herring Road.
- 3) A new to better integrate the Macquarie University campus with the rest of the Herring Road precinct. This will include a new connection between Research Park Drive and Herring Road, via the Dunmore College site.

4.6 Parking Provisions

As part of this Transport Strategy, the Ryde DCP parking rates, which would apply to the Herring Road precinct, have been reviewed.

The Herring Road precinct is well served by public transport along a major transit corridor and demonstrates a high proportion of residents using 'active transport' modes that can reduce impact on congested roads. In these circumstances, Herring Road precinct has the capacity to achieve reduced residential car parking rates that can support higher public transport mode share.

The proposed reduced residential car parking rates for the Herring Road precinct are based upon best practice for transit-oriented development. This is demonstrated in the planning and development of similar urban renewal precincts and residential communities adjacent to public transport or as part of well-connected major employment centre across Sydney.

As part of the Urban Activation Program, it is recommended that the City of Ryde amend its parking rates to match those provided in Table 4.1. These provisions compare favourably with legislated parking provisions in other centres in close proximity to public transport such as Bondi Junction, Chatswood, Parramatta, Wolli Creek and Rhodes.

Table 4.1 – Parking provision comparison

Type of Dwelling	Herring Road precinct (proposed maximum)	Ryde DCP 2010	Bondi Junction	Chatswood	Parramatta	Wolli Creek	Rhodes
Studio	0 spaces	N/A	N/A	0.5 spaces	N/A	1 space	1 space
1 Bedroom	1 space	0.6-1 space	0-0.6 spaces	1 space	1 space	1 space	1 space
2 Bedroom	1 space	0.9-1.2 spaces	0-0.8 spaces	1 space	1 space	1-2 spaces	1.5 spaces
3+ Bedroom	1 space	1.4-1.6 spaces	0-1.2 spaces	1.25 spaces	1.2-2 spaces	2 spaces	2 spaces
Visitor	1 space/10 dwellings	1 space/5 dwellings	0 spaces for first 12 dwellings, 1 space/7 dwellings thereafter	1 space/4 dwellings	1 space/4 dwellings	1 space/4 dwellings	1 space/5 dwellings or less, 0.5 spaces/6 dwellings or more

Source: AECOM, Ryde, Waverley, Willoughby, Parramatta, Concord and Rockdale Councils (2013)

Parking demand management and the allocation of parking controls for on and off-street parking needs to strike a balance between discouraging multi-car households and private vehicle use whilst still providing parking facilities for essential vehicle trips.

4.7 Travel Demand Management

Reduced private vehicle use and travel behaviour can also be influenced by other travel demand initiatives, such as:

- Local car share schemes
- On street parking management – parking meters, time limits and residential permits
- Residential travel plans – that inform residents of the economic, social and environmental benefits of active transport.

To better manage residential parking demand within the Herring Road precinct, the Transport Strategy's recommends the introduction of *Residential Travel Plans* and car share schemes for new residential development and more stringent residential parking controls and management.

4.8 Sub-regional Transport Planning

Intersection modelling for the busiest morning and afternoon peak periods was undertaken as part of this Transport Strategy for the Herring Road precinct, for three key intersections of Herring Road with Epping Road, University Avenue / Waterloo Road and Talavera Road.

This intersection modelling revealed that the:

- Epping Road / Herring Road intersection is operating over capacity in the morning peak and at capacity in the afternoon peak
- Herring Road / Talavera Road intersection is performing satisfactorily in the morning peak and is approaching capacity in the afternoon peak
- Herring Road / Waterloo Road intersection is approaching capacity in both peak periods

Macquarie Park (and the Herring Road precinct) has been the beneficiary of significant sub-regional traffic and transport upgrades in recent years. These include the Lane Cove Tunnel, the M2 Motorway and the Epping to Chatswood Rail Link. The scale of employment and housing growth projected for Macquarie Park, the North Ryde Urban Activation Precinct and the Herring Road precinct requires a strategic response to the changes to transport infrastructure that can support this anticipated growth.

TfNSW has advised that traffic congestion that affects the Herring Road precinct and the Macquarie Park Corridor is part of a broader, regional set of traffic and transport issues for the north and north western suburbs of Sydney. Some of the major transport works that are planned to address these regional transport, traffic and congestion issues include:

- The completion North West Rail Link envisaged for 2019
- Introduction of Waratah rolling stock in the period prior to 2019
- Introduction of the Opal Card system
- Bus fleet replacement and upgrade
- Upgrade of the Hills M2 motorway
- Review and potential implementation of the F3 to M2 motorway connection proposal

The analysis undertaken in the Transport Strategy assumes that existing travel patterns continue, however the increased capacity of the M2 may change how people access the precinct. Similarly, the opening of North West Rail Link will also influence travel patterns and peoples transport mode choice.

Resolving the peak hour congestion at the Epping Road / Herring Road intersection and the Talavera Road intersection with the M2 will be part of a sub-regional Transport Strategy for the corridor.

4.8.1 Sub-regional Delivery Plans and Growth Infrastructure Plans

The NSW Government proposes to prepare a Growth Infrastructure Plan to provide a single integrated capital works program that can support the broader Macquarie Park Corridor sub-region and the future development of the Herring Road precinct. In the first instance, a Subregional Delivery Plan will inform the Growth Infrastructure Plan. This plan will demonstrate how city growth will be closely integrated with long term transport and infrastructure planning and identify the subregional infrastructure priorities, strategic planning and an infrastructure delivery framework.

The Epping Road / Herring Road intersection that serves the Herring Road precinct is either at or exceeding capacity during peak periods. This intersection, along with others in the Macquarie Park Corridor, will be further investigated by TfNSW as part of the development of a Sub Regional Transport Strategy. This will identify the future road network management strategy and inform the Subregional Delivery Plan and Growth Infrastructure Plan for the Metropolitan Central Subregion.

A Sydney-wide mesoscopic road network modelling tool is being progressively developed to assist strategic and regional traffic analysis including bus movements in support of the NSW Long Term Transport Plan, the Metropolitan Strategy for Sydney and the development of sub-regional delivery plans for Sydney. The mesoscopic model will be developed by TfNSW in partnership with RMS, to be used alongside the Sydney Strategic Transport Model (STM) and the Public Transport Project Model (PTPM).

The model will be used to assess transport impacts on the road network of new development and rezoning proposals and as an aid to determining the optimal locations to investigate possible mitigation measures. For example in the case of the Herring Road precinct the proposed structure plan could be incorporated into the model to determine the sub-regional traffic behaviour. These issues will be further investigated by RMS and TfNSW as part of the development of a sub-regional transport study which will identify the future road network management strategy and Growth Infrastructure Plan for the Central Subregion.

5.0 Network Impact

5.1 Indicative growth scenarios

Urban renewal and revitalisation is a gradual process that takes place over time and is implemented in stages. Some sites will be developed sooner because of their availability and market demand, whilst other sites will take much longer to redevelop, if at all. For the Herring Road precinct, this transport analysis is based upon the forecast dwelling yield for the future redevelopment horizons of 2021 and 2031.

The 2021 and 2031 growth scenarios for Herring Road are informed by a market demand overview, undertaken as part of the economic feasibility assessment and an assessment of site availability and indicative annual dwelling yield. The overview anticipates that an average market take-up rate of between 250 and 300 dwellings per year may be achievable in the Herring Road precinct.

Assuming an average of 300 new dwelling completions each year, the overall number of new residential dwellings in the Herring Road precinct could increase to approximately 2,400 dwellings by 2021 and up to 5,400 dwellings by 2031.

If this dwelling yield is fully realised, at an average occupancy rate of 2.1 persons per dwelling, this could deliver a future residential population for the Herring Road precinct of up to 5,040 persons by 2021 and 11,340 persons by 2031.

For the purposes of transport demand forecasting, a longer-term growth horizon beyond 2031 has not been addressed. The reasons for this are that the planned infrastructure provision for this sub-region along with changes in travel demand and behaviour are likely to make significant differences to future travel patterns.

5.1.1 2021 horizon

By 2021, assuming 300 new dwelling completions each year, the overall number of new residential dwellings in the Herring Road precinct could increase to approximately 2,400 dwellings. It is anticipated that this can be realised through:

- Completion of existing development approvals
- Up to 35 per cent development of the Macquarie Centre
- Up to 25 per cent redevelopment of the identified sites to the west of Herring Road
- Up to 25 per cent redevelopment of Ivanhoe Place
- Up to 20 per cent redevelopment of the strata units to the east of Herring Road.

5.1.2 2031 horizon

Assuming a continued 300 new dwelling completions each year, by 2031, the overall number of new residential dwellings in the Herring Road precinct could increase to approximately 5,400 dwellings. It is anticipated that this can be realised through:

- Up to 50 per cent of the Macquarie Centre residential development
- Up to 50 per cent redevelopment of the identified lots to the west of Herring Road
- Up to 40 per cent redevelopment of the strata units to the east of Herring Road
- Up to 50 per cent of Ivanhoe Place
- Up to 50 per cent of the proposed university accommodation.

5.1.3 Vehicle trip generation

Roads and Maritime Services' *Guide to Land Use Traffic Generation for High Density Residential* (the RMS Guide) was used to summarise the following information in Table 5.1.

The RMS Guide suggests residences near major centres generate 0.24 vehicles per hour per dwelling during peak periods.

The RMS Guide also assumes 80 per cent of morning peak movements are outbound and 20 per cent inbound. This split is reversed with 20 per cent of vehicle trips outbound and 80 per cent inbound during the afternoon peak.

For modelling purposes, a growth rate of 2 per cent per annum has been assumed for background traffic, taking in vehicle trip growth for Macquarie University and commercial development in Macquarie Park. The background traffic growth has been extrapolated linearly for 8 and 18 years to reach a theoretical traffic scenario at 2021 and 2031. This growth approximates an increase in existing travel patterns to the university and commercial areas of Macquarie Park, thereby representing traffic growth which results from new development in the precinct.

Table 5.1 – Vehicle trip generation in peak periods for Structure Plan

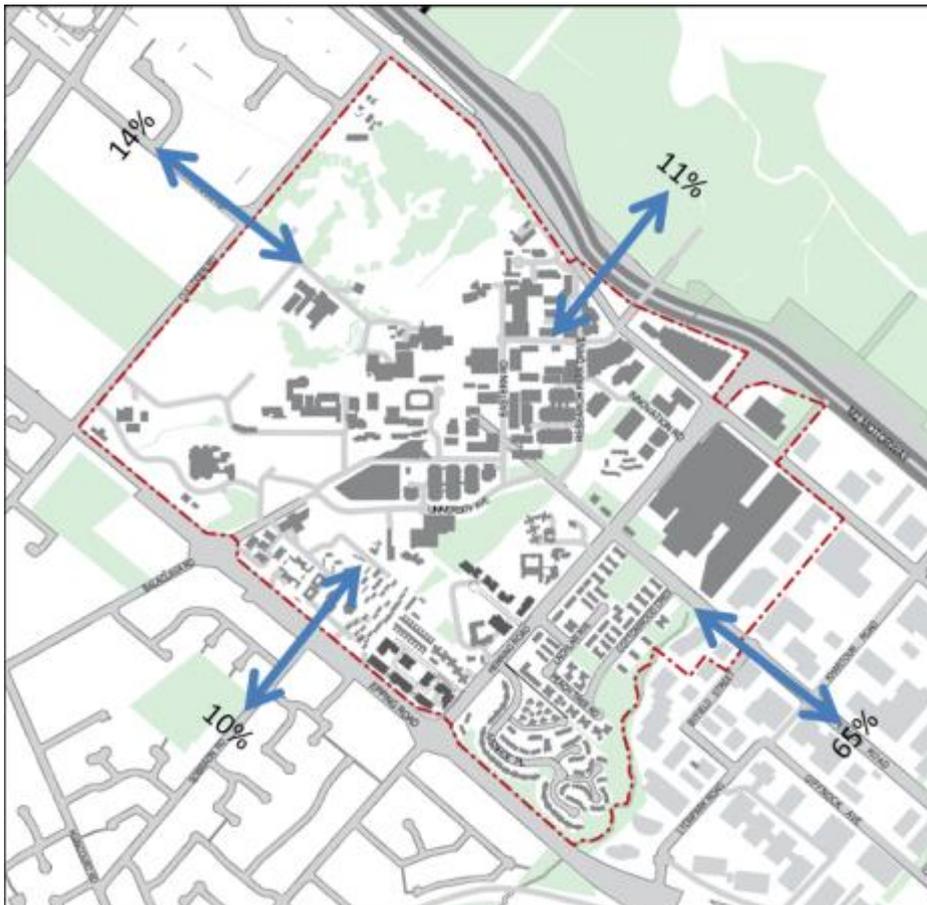
Generator	Vehicle trips per peak period	AM Inbound	AM Outbound	PM Inbound	PM Outbound
2021	118	24	94	94	24
2031	694	139	555	555	139

Source: AECOM (2013)

5.2 Trip distribution

Having assumed 80 per cent of morning peak hour trips are outbound and 20 per cent are inbound in the Herring Road precinct. Figure 5.1 shows the distribution sourced from movement patterns in the traffic surveys. 65 per cent of peak hour trips are to / from the east, 14 per cent to / from the west, 11 per cent to / from the north and 10 per cent to / from the south.

Figure 5.1 – Trip distribution to / from the Herring Road precinct in peak periods



Source – AECOM (2013)

5.3 Traffic Impact

5.3.1 2021 Horizon Impacts

Table 5.2 and Table 5.3 summarise the peak period performance of key intersections in the Herring Road precinct for 2021 when including indicative development staging assumptions, existing approvals and background growth.

Table 5.2 0800-0900 peak period Intersection Performance (2021)

AM Intersection Performance			
Intersection	Degree of Saturation	Delay (s)	2021 Level of Service (Existing in brackets)
Herring Road / Talavera Road / M2	79.7%	39.7	C (C)
Herring Road / Waterloo Road	93.1%	64.0	E (E)
Herring Road / Epping Road	107.8%	173.5	F (F)

Source – AECOM (2013)

The analysis shows the Herring Road / Epping Road and Herring Road / Waterloo Road intersections are operating at, or over, capacity in the morning peak. The intersection of Herring Road / Talavera Road / M2 is satisfactory. The worst movements at each intersection are:

- M2 off ramp (LoS F) at the intersection of Herring Road / Talavera Road;
- All movements (LoS F) except Herring Road south at the intersection of Herring Road / Waterloo Road; and
- All movements (LoS F) at the intersection of Herring Road / Epping Road.

Table 5.3 – 1700-1800 peak period Intersection Performance (2031)

PM Intersection Performance			
Intersection	Degree of Saturation	Delay (s)	2021 Level of Service (Existing in brackets)
Herring Road / Talavera Road / M2	75.4%	49.6	D (D)
Herring Road / Waterloo Road	97.6%	90.1	F (E)
Herring Road / Epping Road	104.2%	119.3	F (E)

Source – AECOM (2013)

Table 5.3 shows the Herring Road / Epping Road and Herring Road / Waterloo Road intersections are both operating over capacity in the afternoon peak. The intersection of Herring Road / Talavera Road is approaching capacity. The worst movements at each intersection are:

- M2 off ramp (LoS F) at the intersection of Herring Road / Talavera Road;
- Herring Road north and south and University Avenue west (LoS F) at the intersection of Herring Road / Waterloo Road; and
- Herring Road south and Epping Road east and west (LoS F) at the intersection of Herring Road / Epping Road.

5.3.2 2031 Horizon Impacts

Table 5.4 and Table 5.5 summarise the peak period performance of key intersections in the Herring Road precinct for 2031 when including indicative development staging assumptions, existing approvals and background growth.

Table 5.4 – 0800-0900 peak period Intersection Performance (2031)

AM Intersection Performance			
Intersection	Degree of Saturation	Delay (s)	2031 Level of Service (Existing in brackets)
Herring Road / Talavera Road / M2	88.9%	46.4	D (C)
Herring Road / Waterloo Road	102.4%	132.1	F (E)
Herring Road / Epping Road	128.5%	385.8	F (F)

Source – AECOM (2013)

Based on the results shown in Table 5.4, the Herring Road and Epping Road and Herring Road and Waterloo Road intersections are operating over capacity in the morning peak. The intersection of Herring Road and Talavera Road is approaching capacity. The worst movements at each intersection are:

- M2 off ramp (LoS F) at the intersection of Herring Road / Talavera Road;
- All movements (LoS F) at the intersection of Herring Road / Waterloo Road; and
- All movements (LoS F) at the intersection of Herring Road / Epping Road.

Table 5.5 – 1700-1800 peak period Intersection Performance (2031)

PM Intersection Performance			
Intersection	Degree of Saturation	Delay (s)	2031 Level of Service (Existing in brackets)
Herring Road / Talavera Road / M2	82.8%	54.7	D (D)
Herring Road / Waterloo Road	112.3%	185.3	F (E)
Herring Road / Epping Road	112.9%	259.0	F (E)

Source – AECOM (2013)

Table 5.5 shows the Herring Road / Epping Road and Herring Road / Waterloo Road intersections are operating over capacity in the afternoon peak. The intersection of Herring Road / Talavera Road is approaching capacity. The worst movements at each intersection are:

- M2 off ramp and Talavera Road west (LoS F) at the intersection of Herring Road / Talavera Road;
- All movements (LoS F) at the intersection of Herring Road / Waterloo Road; and
- All movements (LoS F) at the intersection of Herring Road / Epping Road.

5.3.3 Precinct and corridor wide impacts

The transport analysis has demonstrated that the intersection performance of Herring Road and Talavera Road, Herring Road and Waterloo Road and Herring Road and Epping Road is currently poor. It indicates that the performance of each intersection will deteriorate with increased local development. Localised intersection upgrades and regional transport system changes may be able to mitigate some of this impact.

This analysis assumes that existing travel patterns will continue, but that the increased M2 capacity may change how people access the area. Similarly, the opening of NWRL may also influence travel patterns and modal choice. However, given the scale of employment and housing development growth that is forecast for Macquarie Park, it is clear that there needs to be a whole of network management approach to support this growth. Forecasting of strategic traffic patterns and capacity responses is beyond the scope of this study.

It is acknowledged that demand during peak periods puts a strain on Sydney's entire transport network, and that key bottlenecks are at capacity. This, in turn, affects the performance of intersections in and around the Herring Road precinct. Addressing congestion requires a whole-of-network planning strategy, including a suite of measures that reduce reliance on car travel, enhance public transport and manage congestion and traffic flows efficiently. The performance of the state and regional road network will be assessed in the light of current and future demand, including the additional traffic generated from urban activation precincts and other developments proposed within the precinct. These issues will be further investigated by TfNSW as part of the development of a sub-regional transport study which will identify the future road network management strategy and Growth Infrastructure Plan for the Central Subregion.

6.0 Summary and recommended measures

AECOM was commissioned by DP&I to prepare a urban activation precinct proposal and transport strategy to support the activation and development of the Herring Road precinct.

Three key challenges for the Herring Road precinct were identified;

- Connections and access – create a connected, comfortable and convenient living environment.
- Diversity of activities and places – create multiple things to do for multiple types of people.
- Place, character and community – create a unique place that provides for the community.

The proposals for the Herring Road precinct are likely to be redeveloped over a 20 to 30+ year timeframe. This transport strategy proposes a number of measures and strategic directions which could help to deliver the suitable transport environment and sufficient network capacity at a mode share aligned with the Long Term Transport Masterplan and the City of Ryde's transport targets.

6.1 Pedestrian and Cycle Network

In order to address some of the key challenges, Table 6.1 recommends a suite of measures to improve the pedestrian and cycle network.

Table 6.1 – Pedestrian and Cycle Recommendations

Number	Recommendation
PC1	<p>Improve internal connections east of Herring Road.</p> <ul style="list-style-type: none"> - Realign roads in the Ivanhoe Estate to better integrate it with the wider Herring Road precinct by removing cul-de-sacs. - Make open space safer and more accessible by removing obstructions, improving sightlines and orienting new buildings and roads to provide passive surveillance.
PC2	<p>Make Herring Road the key urban pedestrian and cycleway link.</p> <ul style="list-style-type: none"> - Create multiple opportunities for mid-block crossings. - Provide wider footpaths. - Design street tree planting and landscaping to suit the scale and activity of the street, creating an environment that benefits pedestrians. - Provide adequate street lighting for pedestrians. - Connect Talavera Road and Epping Road with a two-way off-road cycleway along Herring Road. - Extend the cycleway to Kent Road connecting with Ryde's regional cycle network.
PC3	<p>Link to local open space areas such as Kikkiya Creek, Shrimpton's Creek and the Lane Cove National Park.</p> <ul style="list-style-type: none"> - Provide opportunities for activity along the creek corridors for pedestrians and cyclists. - Ensure pedestrian and cycle links have clear sightlines and orienting new buildings and streets to provide passive surveillance.
PC4	<p>Strengthen connections between Herring Road and Macquarie University.</p> <ul style="list-style-type: none"> - Enhance University Avenue as a key urban pedestrian link by providing adequate street lighting, wider footpaths, shared off-road cycle ways and street tree planting that benefits pedestrians. - Upgrade the Macquarie University to Macquarie Centre link.
PC5	<p>Improve access points to the Macquarie Centre so that pedestrians and cyclists do not have to navigate the car park from Waterloo Road.</p>

6.2 Public Transport

The housing and jobs growth forecast for Macquarie Park and the Herring Road precinct will necessitate increases in public transport capacity and coverage. Table 6.2 identifies potential measures that can improve the future public transport network.

Table 6.2 – Public Transport Recommendations

Number	Recommendation
PT1	<p>Make public transport a more attractive option for residents, workers and students.</p> <ul style="list-style-type: none"> - Improve directional signage throughout the Herring Road precinct making public transport more legible. - Provide a timetable and service map at each bus stop. - Provide adequate shelter and seating for commuters at bus stops. - Ensure bus stops are well lit.
PT2	<p>Consider the ways in which buses can better service the Herring Road precinct in the short, medium and longer timeframes.</p> <ul style="list-style-type: none"> - Short term – improve amenity and bus stop locations. - Medium term – TfNSW continues to monitor and if necessary refine bus services to the Herring Road precinct including Macquarie University Train Station, the Macquarie Centre Bus Interchange and Macquarie University based on demand and in conjunction with any whole of North West Region redeployment of bus services prior to the opening of NWRL. - Long term – The potential upgrade of the Macquarie Centre Bus Interchange should be considered in the TfNSW assessment for priorities in the Transport Access Program.
PT3	<p>TfNSW in consultation with DP&I and the City of Ryde to continue to work on possible refinements to bus stop locations in and around the Herring Road precinct that optimises the operations of bus services for the planned increase in riders whilst preserving current levels of passenger convenience and amenity.</p>
PT4	<p>Integrate the Herring Road precinct proposals into a Subregional Transport Corridor Strategy to determine the optimal solutions for public transport including bus operations and integration of NWRL services.</p>
PT5	<p>Improve the average end-to-end travel speed of centre-to-centre core bus network services to be not less than 25 km/h for 95 per cent of services achieved by bus priority infrastructure, potentially including localised road widening, bus priority intersection treatments and reallocation of traffic lanes on Herring, Waterloo and Talavera Roads.</p>

6.3 Street Network

With the key intersections in the Herring Road precinct already over or approaching capacity, upgrades need to be made to the street network. Table 6.3 highlights the recommended measures. It is noted that upgrades to arterial roads such as Epping Road will need to be considered against their strategic role and the future strategic function of the corridor. In the case of Macquarie Park and Epping Road it is understood that TfNSW is in the process of developing a Subregional Transport Corridor Strategy that will analyse the corridor impacts of future growth and how the corridor capacity should be increased.

Table 6.3 – Street Recommendations

Number	Recommendation
S1	<p>Improve the street network west of Herring Road to provide new connections to Epping Road and reducing dependence on the over capacity Herring Road southbound approach to Epping Road.</p> <p>Improve internal connections west of Herring Road with:</p> <ul style="list-style-type: none"> - New through connections to University Avenue from the two proposed intersections along Herring Road. - New internal streets for better connectivity.
S2	<p>Improve internal connections east of Herring Road.</p> <ul style="list-style-type: none"> - Rationalise internal streets. - Remove cul-de-sacs to improve connections and better integrate the Ivanhoe Estate into the Herring Road precinct. - Link Lachlan Avenue and Cottonwood Crescent south of Elouera Reserve.
S3	<p>Increase the number of signalised intersections on Herring Road by introducing two new signalised intersections at:</p> <ul style="list-style-type: none"> - Herring Road and Ivanhoe Place - Herring Road and Macquarie University (south of University Avenue). <p>This will help disperse traffic movements and reduce dependence on over-capacity intersections.</p>
S4	<p>Introduce a one-way (west to east) connection from Peach Tree Road to Lyonpark Road to provide an alternative route for cars to Macquarie Park. This will help to reduce dependence on the Herring Road / Waterloo Road intersection during the morning peak (projected LoS 'D').</p>
S5	<p>Consider the Herring Road precinct in the sub-regional transport study to be undertaken by TfNSW to determine the traffic behaviour in a regional context and to identify the future road network management strategy.</p>

6.4 Demand management

Improvements to the public transport and pedestrian and cycle networks will contribute to a reduction in car use. In order to encourage the shift in mode share to active and public transport, travel initiatives can play an important role. These are outlined in Table 6.4.

Table 6.4 Travel demand management measures

Number	Recommendation
T11	<p>Introduce Residential Travel Plans for new residential development.</p> <p>Residential Travel Plans aim to provide residents with full access to services, require quality design outcomes and minimise traffic congestion. The Herring Road precinct provides an opportunity for the City of Ryde to introduce residential travel plans as a key part of the planning process and a means by which travel behaviour can be influenced on a precinct scale.</p>
T12	<p>Promote the benefits of live / work communities.</p> <p>Live / work communities are an ideal alternative to long work and study days and increasingly long commutes. Developing the Herring Road precinct will give residents the opportunity to walk or cycle to work or university. Furthermore, residents would also have</p>

Number	Recommendation
	convenient access to recreational activities such as sport, shopping and dining.
T13	Parking controls and management. Introduce more stringent residential parking controls and management as a measure to influence people's travel choice.