

City of Ryde
Integrating Transport
with Land Use in the City
of Ryde

Centre Report for
Macquarie Park
DRAFT

Project Ref: A0455

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1 Macquarie Park

1.1 Introduction

The Centre Report for Macquarie Park accompanies the City Wide Integrating Transport with Land Use Report, and provides a local overview of the centre, previous work undertaken, and the transport and land use context.

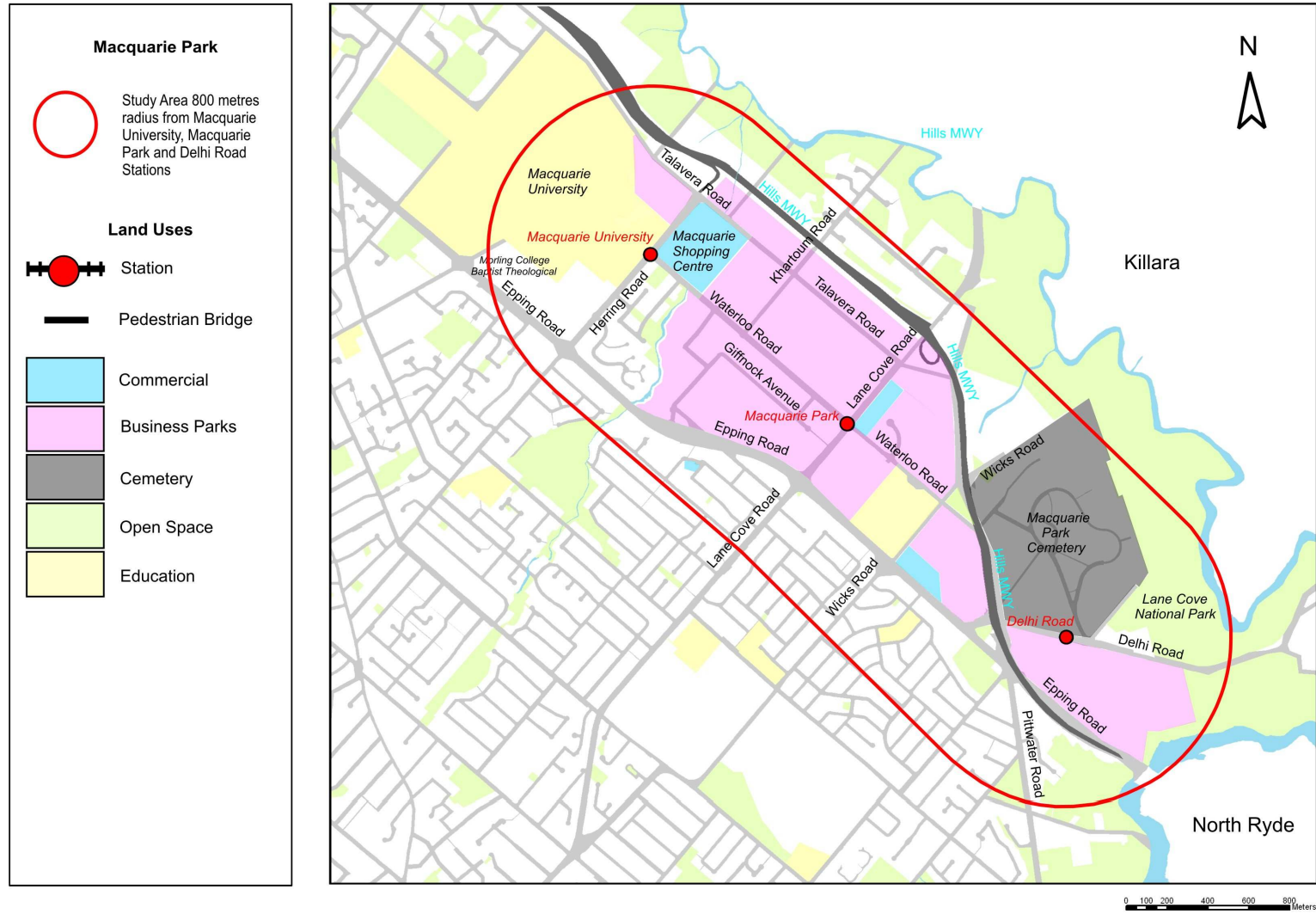
The Centre Report concludes with a Plan for Macquarie Park, consisting of a Vision, Objectives and Recommended Actions.

1.2 Description of Area

The Macquarie Park Employment Corridor is a significant and successful employment area with a focus on high-tech industrial and educational land uses. It is the second largest employment area in Sydney and as such makes a significant contribution to the economic prosperity for NSW and Australia. There is, however, a high level of car dependency, poor pedestrian access and poor links to the surrounding residential areas. There are also limited facilities for those working in the area. The corridor is adjacent to Macquarie University.

The site is bounded by the M2 on the North East, Epping Road on the south-east with Lane Cove intersecting the site at the southern end. The corridor comprises about 177 hectares with 800 000 sq m of existing industrial and commercial floorspace and a potential of 2 million sq m. The Macquarie University has prepared a campus plan which proposes 640,000 sq m of commercial capacity, student housing, high density residential and an increase in student capacity to 50,000 students. Residential uses are permitted in a small number of sites in the vicinity of the university. The low current floor space yields will increase as the area transforms into a business park serviced by high-frequency public transport with the opening of the new Chatswood to Epping railway line. The development of the corridor requires significant investment in infrastructure to be developed in accordance with the master plan for the area. The ongoing transformation of the area from more traditional industrial uses to commercial uses will also result in a shift for the demand for various public services.

Figure 1 – Study Area and Land Uses



1.3 Previous Work Undertaken by Council

Council has undertaken a range of works to improve transport in Macquarie Park in recent years including:-

- Installation of roundabout at Waterloo Road and Trafalgar Place
- Construction of new footpaths in Waterloo Road, between Culloden Road and Vimiera Road, in Vimiera Road from Waterloo Rd to Marsfield Park (by Macquarie Park Student Housing), in Culloden Road between Waterloo Road and Epping Road on the Marsfield side, and in parts on both sides of Busaco Road. Pedestrian signals in Herring Road outside Macquarie shopping Centre.
- Taxi parking and turning area in Herring Road at Macquarie Shopping Centre.
- A Wombat Crossing within Bus Interchange at Shopping Centre in Herring Road.
- A pedestrian refuge in Vimiera Road outside Retirement Village.
- Bus priority and longer bus lane in Epping Road travelling west at Delhi Road intersection.
- Proposed bus priority and longer bus lane in Balaclava Road at Epping Road intersection for southbound traffic.

1.3.1 Strategic Framework

Metropolitan Strategy

The economic importance of the Macquarie Park Corridor is identified in the State Government's Metropolitan Strategy "City of Cities" Policy which places Macquarie Park within the Global Economic Corridor linking Macquarie Park in the North with Chatswood, North Sydney, Sydney CBD and Pyrmont/Ultimo. This Corridor accounts for around 40 per cent of Sydney's total jobs, and over 75 per cent of Sydney's information technology and telecommunications jobs, with the corridor a favoured location for global corporations establishing their regional headquarters in Australia. The "City of Cities" document identifies a range of actions which relate to Macquarie Park including increasing densities in centres, clustering business and knowledge activities and a stronger role for the corridor. Actions such as access and parking plans, economic development plans and an infrastructure plan supporting the priorities outlined in the "City of Cities" Plan have been identified.

Ryde Planning Scheme Ordinance (August 2006)

The Ryde Planning Scheme Ordinance provides for legally binding controls on land use and development within the City of Ryde. Part 10 relates to Macquarie Park Corridor.

The Planning Scheme Ordinance allows for a general increase in development density with increased floor space ratios (from 1:1 to 3:1) and height limits (from 4 to 10 storeys) generally concentrated around the new rail stations. Off street parking supply has also been limited and encourages a greater mode shift to public transport for journey to work. Maximum car parking requirements are stipulated relative to the relationship of sites to the stations.

Clause 99 of the Planning Scheme Ordinance reduces the demand for private motor vehicles by allowing for convenience retail or commercial activities on the ground

floor of developments zoned for 3(f) provided they cater for the needs of employees and account for no more than 5% or 500m² of the site area. For developments zoned 3(g) retail activities are also permitted providing they are located on the ground floor and account for no more than 2,000m².

Bonus floor space ratios are permitted when streets and pedestrian access are developed in accordance with the proposed access network.

For areas within the Transport Strategy study area but outside the Macquarie Park Corridor as defined in the Planning Scheme Ordinance, the planning controls and objectives similar to other areas with equivalent zonings in other parts of the City of Ryde.

Ryde Local Environmental Plan No 137 (January 2006)

A series of planning principles and objectives are provided in Part 10 of the LEP for Macquarie Park. These guide the future development of Macquarie Park as a Specialised Centre with globally competitive businesses with strong links to the University and other research institutions, reduced car dependency and integrated land use and public transport.

This LEP for Macquarie Park aims to:

- Ensure Macquarie Park Corridor matures into a premium location for globally competitive businesses with strong links to the university and research institutions and an enhanced sense of identity.
- Ensure that the employment and educational activities within the Corridor are integrated with other businesses and activities within Sydney's global economic crescent.
- Ensure the Corridor will be characterised by a high-quality, well-designed and safe environment that reflects the natural setting, with three accessible and vibrant railway station areas providing focal points.
- To provide a new street network that will, inter alia:
 - Achieve a more comprehensive network allowing for greater permeability or linkages between land uses and the station nodes.
 - Reduce pressure from existing road intersections
 - Create additional street frontages providing opportunities for new business addresses.
- Provide a transition from the more intense development and street activity focused at the station precincts and the central boulevard spine to the peripheral areas characterised by the lower scale development and greater landscaped elements through:
 - More urban activated streets near the transport nodes with a safe and convenient pedestrian environment that encourages public transport use and social interaction.
 - A more sensitive presentation of employment area to the adjoining residential areas, particular south of Spring Road and the Lane Cove National Park, consisting of lesser scale development and greater landscape opportunities.
 - A variety of business addresses attractive to different types to provide a more mature employment areas, more robust to economic changes.
- Incorporate the principles of ecologically sustainable development.

The Objectives for the Macquarie Park Corridor as set out in the LEP are:

- To promote Macquarie Park Corridor as a premium location for globally competitive businesses with strong links to the university and research institutions and an enhanced sense of identity.
- To implement the State Government's strategic objectives of integrating land use and transport, reducing car dependency and creating opportunities for employment in areas supported by public transport;
- To guide the quality of future development in the Corridor;
- To ensure that the Corridor is characterised by a high-quality, well designed and safe environment that reflects the natural setting, with three accessible and vibrant railway station areas providing focal points;
- To ensure that residential and business areas are better integrated and an improved lifestyle is created for all those who live, work and study in the area.

The Macquarie Park Corridor Draft DCP No 55 (April 2006)

The Macquarie Park Corridor Draft DCP No 55 outlines a Vision for the Macquarie Park Corridor together with a series of development controls and objectives for the desired future character precincts. Of particular note are the maximum car parking provision rates which include provisional arrangements and the requirement for Workplace Travel Plans to be prepared with the aim of reducing the mode share of private motor vehicles by 40%.

Part 3 of the DCP outlines the three levels of development controls that need to be taken into consideration for all sites located within the Macquarie Park Corridor as outlined below.

a) Specific development for character areas

There are 8 character areas namely; Macquarie University Precinct, University Station Precinct, Residential Precinct, M2 Precinct, Technology Precinct, Central Spine Precinct, Macquarie Park Station Precinct and Delhi Road Station Precinct. The development controls specific for each character area include; FSR, height, public domain interface, internal layout, boundary treatment, car parking and other controls.

b) Corridor wide development controls

These include site configuration, site amenity, building design, environmental and other controls.

c) Development controls for the public domain

These include street hierarchy, street character and streetscapes, public domain improvements, parks and open spaces, public art and heritage interpretation.

This DCP has not yet been adopted and is currently being reviewed in order to make sure that the desired future character is achieved and controls are compatible.

Macquarie Park Corridor, North Ryde Masterplan (July 2004)

The Macquarie Park Corridor North Ryde Masterplan was developed in response to earlier work undertaken, including the Macquarie Park Structure Plan and TMAP described below.

The key objectives of the Masterplan are to guide the quality of future development following the opening of the Epping-Chatswood rail line and its new station at Macquarie Park. The brief was to implement the vision for Macquarie Park, and to further the Government's strategic objectives of integrating land use and transport, reducing car dependency and creating opportunities for employment in areas supported by public transport.

A number of concepts outlined in the plan which are relevant to this study are outlined below:

- Establish a fine grain street network allowing for greater permeability or linkages between land uses in the corridor and surrounding residential areas with the station nodes.
- Take pressure off the limited number of existing streets and road intersections to redistribute and circulate traffic.
- Create additional street frontages providing opportunities for land owners to subdivide and create new business addresses and facilitate smaller tenancies.
- Provide additional opportunities for bus network planning.
- Provision must be made for bus stops, taxi ranks and kiss and ride as close to the station entries as practically possible.
- Bus shelters should be provided at all bus stops and taxi ranks.
- Easy and direct pedestrian and wheelchair movement must be enabled between the station entry and bus stops, taxi ranks and kiss-and-ride locations at each plaza.
- Signalised pedestrian crossings must be provided across each street adjoining a station plaza, incorporating pram crossings. Where possible, road pavement areas should be minimised and pedestrian pavement areas maximized near stations.
- The off-road cycle path along Waterloo Road must terminate at the entry to each plaza. Cycle lockers and racks must be integrated within each station entry building, visible and accessed directly from the plaza.
- Pedestrian scale lighting must be provided in each plaza, preferably integrated with other furniture.
- Pedestrian scale centrally located directional signage must be provided in each plaza preferably integrated with other furniture such as light poles and must include minimum walking/cycling distances.
- Parking standards for the area have been developed: the first to be applied before the opening of the Epping to Chatswood Rail Line and the second set to be applied after the opening. The standards to be applied after the opening of the rail line reflect the increased level of public transport available in the area.

Macquarie Park Structure Plan, Part 1 Background Report (April 2002)

The Macquarie Park Structure Plan looks at options for planning in the Macquarie Park Corridor. This document has several parts, all of which are relevant to development planning for the Macquarie Park Corridor:

- The Right Place for Business and Services is concerned with providing alternatives to car use, and ensuring that a network of centres is established that integrate public transport and business growth.

- Improving Transport Choice provides guidelines that help translate broad sustainability objectives into outcomes at the local level. It provides advice on how local councils, the development industry, state agencies and other transport providers can better manage transport planning.

Integration of Land Use and Transport aims to ensure that urban structure, building forms, development designs, subdivision and street layouts help achieve planning objectives such as improving accessibility to housing, employment and services by walking, cycling, and public transport.

1.3.2 Technical and Environmental Input Studies

Draft Parking Demand Review Study Macquarie Park Corridor (2006)

This report recognises the demand for parking in the Macquarie Park area continues to increase, and aims to develop appropriate strategies to resolve the parking issues in the area.

The report recommends introducing a pay parking scheme on streets in the parking area which are currently used by people from the surrounding commercial and educational uses. The report recognises that the introduction of pay parking in the area may have a knock on effect on parking in the surrounding residential streets. After pay parking has been introduced it is recommended that parking on residential streets is monitored and residential parking schemes are introduced if required.

The parking policies developed in the report take into account the opening of the Epping to Chatswood rail link in 2008 and aim to encourage a higher use of public transport among students, employees and other commuters in the area.

Draft Macquarie Park Corridor Parking Demand Study (November 2005)

The City of Ryde undertook a Parking Demand Study for Macquarie Park Corridor in response to community concerns about parking issues in these areas. The study identified the current parking patterns and developed appropriate parking management strategies with respect to future population growth and public transport facilities for the area.

Macquarie Park Corridor Traffic Study Final Report (May 2005)

The aim of this Traffic Study was to develop a traffic management plan, which meets the desires of the majority of local residents and stakeholders. The objectives are to:

- Optimise and improve pedestrian safety;
- Maximise safe use of local roads by all users; and
- Provide more opportunity for public transport.

The main issues examined in the study are:

- Through traffic;
- Speeding;
- Pedestrian safety; and
- On Street parking demand.

The study resulted in the development of a Local Area Traffic Management (LATM) Plan for the area. The primary focus of the developed LATM was to reduce the vehicle speeds and provide improved amenity for cyclists and pedestrians compatible

with the residential environment. The lower speed environment, which forms the strategy, will also be a less attractive route for through traffic.

Locations with specific treatments recommended include Lane Cove Road/Fontenoy Road, Fontenoy Road, Vimiera Road, Culloden Road, Waterloo Road/Trafalgar Place and Culloden Road/Taranto Road.

Macquarie Park Corridor Workplace Travel Plan Strategy (November 2002)

This series of reports prepared by students from the Macquarie Graduate School of the Environment for Planning NSW researched the feasibility of implementing Workplace Travel Plans in the Macquarie Park Corridor. This strategy made a series of practical recommendations on how best to implement such a policy with sharing of responsibilities proposed between the City of Ryde and external agencies such as Planning NSW.

Macquarie Park Transport Management and Accessibility Plan (TMAP) (April 2002)

The purpose of the Transport Management and Accessibility Plan (TMAP) was to develop a transport plan that contributes to the management of growth, generation of employment and facilitation of liveable communities in Macquarie Park. A detailed package of measures was developed for the area. The package contains:

- Recommendations on policy measures for implementation by the State Government and Ryde City Council;
- Transport service measures to encourage higher levels of public transport use, cycling and walking; and
- Infrastructure measures to upgrade pedestrian and cycle facilities (including for those with reduced mobility) and to address the traffic impacts of the forecast development.

Outlined below are a number of specific measures recommended in the plan that relate to this strategy.

Table 1: Summary of TMAP Package of Measures

Area	Measure	Detail
Policy	Parking Policy	Prepare comprehensive Transport DCP (or equivalent) to address needs of all transport modes
		Reduce Parking Provision Rates
	Pedestrian and Cyclist	Integrate pedestrian and cyclist planning principles into Transport DCP
		Make pedestrian and cyclist planning issues fundamental priorities
	Workplace Travel Plans (WTPs)	Require Workplace Travel Plans for all new developments and tenants
		Fund pilot program for implementation of WTPs
Transport Services	Bus Services	Investigate potential for improved bus services in Lane Cove Road – Ryde Road corridor
		Provide improved services in response to new bus priority measures

Area	Measure	Detail
		Commence planning for post-PRL bus service structure
	Rail Services	As per PRL proposal
Infrastructure	Pedestrian Upgrades	Implement comprehensive pedestrian infrastructure upgrade
		Resolve station access issues for pedestrians and cyclists
	Bicycle Upgrades	Implement comprehensive bicycle infrastructure upgrade
	Road Upgrades	Selected intersection improvements
		Reduced capacity and enhanced design for Waterloo Road
	Public Transport Information	Implement comprehensive public transport information system at all bus stops and key retail locations
	Signage	Provide comprehensive directional signage system for pedestrians and cyclists
	Bus priority	Implement bus priority measures at nominated key intersections

1.3.3 Summary of Planning Objectives

According to the clause 94 of Ryde Planning Scheme Ordinance the objectives for the Macquarie Park Corridor are:

- to promote Macquarie Park Corridor as a premium location for globally competitive businesses with strong links to the university and research institutions and an enhanced sense of identity;
- to implement the State Government's strategic objectives of integrating land use and transport, reducing car dependency and creating opportunities for employment in areas supported by public transport;
- to guide the quality of future development in the Corridor;
- to ensure that the Corridor is characterised by a high-quality, well-designed and safe environment that reflects the natural setting, with three accessible and vibrant railway station areas providing focal points; and
- to ensure that residential and business areas are better integrated and an improved lifestyle is created for all those who live, work and study in the area.

1.4 Land Use

The projected growth in employment and residential population within Macquarie Park study area is shown below.

Table 2: Employment and residential population in Macquarie Park study area

	2004	2006	2011	2014	2016	2021	2024	2034
Worker Population	40,000			47,500			55,000	62,500
Resident Population		4,961	5,263		5,526	5,526		

(Employment figures derived from City of Ryde figures and residential figures derived from Planning NSW MDP projections 2006 combined with 2006 residential estimate provided by the City of Ryde. Assumptions based on average occupancy of 2.625 persons per residence assuming a 75%:25% split between detached dwellings and attached dwellings/flats)

The MDP forecasts do not include potential residential development within the Macquarie Park Corridor other than additional 215 student housing within Macquarie University. There are large development sites within the western portion of this area around Herring Road and the new railway station that are zoned to permit mixed use development and these are expected to accommodate medium to high density residential development. There is some potential for these sites to be developed within the next 5-10 years and this would increase the population capacity forecasts for the LGA derived from the MDP data. This will need to be monitored to ensure that the population forecasts within the plan remain accurate over time. These are additional sites owned by TIDC which fall under the previous Industrial zoning. These have the potential to be rezoned.

1.5 A Vision for Macquarie Park

The following vision for Macquarie Park was developed by a range of stakeholders as part of the development of the Macquarie Park Structure Plan.

“Macquarie Park will mature into a premium location for globally competitive businesses with strong links to the university and research institutions and an enhanced sense of identity. The Corridor will be characterised by a high-quality, well-designed, safe and livable environment that reflects the natural setting, with three accessible and vibrant railway station areas providing focal points. Residential and business areas will be better integrated and an improved lifestyle will be forged for all those who live, work and study in the area.”

1.6 Trip Demand

The NSW Transport, Population and Data Centre's (TPDC) Strategic Travel Model (STM) for the metropolitan area was used to extract traffic data for the current year (2006) and future years (2016 and 2026) for the Ryde area. The STM uses Sydney Statistical Division and is based on TPDC's 2001 Travel Zone system.

Car Driver and Public Transport trips are summarised in **Table 4**. Full modelling outputs are included Appendix L of the City Wide Report.

Car Driver AM peak trips to TZ 784 increase by 27% from 8,954 trips in 2006 to 11,353 trips in 2026. Trips from TZ 784 increase by 3% from 2,346 trips in 2006 to 2,407 trips in 2026. Public Transport Passenger AM peak trips to TZ 784 increase by 204% from 1,010 trips in 2006 to 3,069 trips in 2026. Trips from TZ 784 increase by 144% from 536 trips in 2006 to 1,309 trips in 2026.

Table 3: Macquarie Park Travel Zone Origins and Destinations – AM 2-hour Peak Period**Macquarie Park (TZ 784*) – Internal Ryde LGA Car Trips (Units: Car Driver)**

		2006		2016		2026	
TZ	Internal Ryde LGA Car Trips	To	From	To	From	To	From
476	Marsfield	226	44	224	41	256	43
477	North Ryde	128	85	132	91	149	102
478	Ryde East	113	30	120	28	136	30
479	Ryde	169	44	176	43	200	45
480	Eastwood	142	39	150	38	169	40
481	Denistone East	120	32	128	30	147	32
482	Denistone	40	15	42	14	53	16
483	West Ryde	52	11	55	11	67	13
484	Meadowbank	66	14	72	14	81	14
485	Ryde Bridge	112	36	1	32	136	33
486	Putney	79	19	86	18	98	19
487	Field Of Mars	57	24	62	23	71	23
784	Macquarie Uni	220	220	215	215	246	246
785	Northern Suburbs Cemetery	88	96	95	99	112	1
	Total (Internal)	1,612	709	1,558	697	1,921	657
	External to Ryde LGA	7,342	1,637	8,284	1,628	9,432	1,750
	Total (Internal & External)	8,954	2,346	9,842	2,325	11,353	2,407

Macquarie Park (TZ 784*) - Internal Ryde LGA Public Transport Trips (Units: Passengers)

		2006		2016		2026	
		To	From	To	From	To	From
476	Marsfield	32	14	30	12	35	14
477	North Ryde	12	13	12	12	14	14
478	Ryde East	7	2	8	2	9	2
479	Ryde	21	5	22	5	26	6
480	Eastwood	24	5	27	5	32	5
481	Denistone East	14	3	15	3	18	3
482	Denistone	5	1	10	4	12	5
483	West Ryde	7	1	7	1	8	1
484	Meadowbank	16	2	16	1	17	2
485	Ryde Bridge	24	8	26	8	31	8
486	Putney	6	3	7	3	8	3
487	Field Of Mars	6	1	7	1	8	1
784	Macquarie Uni	6	6	6	6	6	6
785	Northern Suburbs Cemetery	4	5	3	4	4	5
Total (Internal)		184	69	196	67	228	75
External to Ryde LGA		826	467	2,227	1,031	2,841	1,234
Total (Internal & External)		1,010	536	2,423	1,098	3,069	1,309

*Travel Zone differs in size and coverage to the centre study area.

1.7 Transport Modes

1.7.1 Rail

Existing

There is no existing rail service in Macquarie Park.

The existing rail infrastructure in Ryde LGA is shown in **Figure 2**. Ryde is currently served by the Northern Line that runs from Hornsby to North Sydney via Strathfield.

Committed

The Epping-Chatswood link is currently under construction and is scheduled for completion in mid-2008. **Figure 2** shows the route of the rail line and location of the associated stations at Macquarie University, Macquarie Park and Delhi Road. The Rail Line will offer Ryde residents an alternative route into the city by rail, as well as giving more direct access to the employment centres of Chatswood, St. Leonards, North Sydney and Sydney City.

The Chatswood to Epping Line will interchange with the Northern Line at Epping and the North Shore Line at Chatswood. Interchange between the Chatswood to Epping Line and the Western, Inner West and South lines could be made at Strathfield. Interchange between the Chatswood to Epping Line and the Eastern Suburbs, Bankstown and Airport Line could be made at Central. There is no direct interchange between the Northern Line and the Cumberland and Carlingford Lines.

The three new stations on the Epping to Chatswood line at Macquarie University, Macquarie Park and Delhi Road will give better rail access to areas of low density educational and commercial/employment use, which are currently heavily dependent on car or bus travel. The Macquarie Park study area stations will have excellent facilities. The key design elements of these stations will include:

- Easy access facilities, including separate lifts to each level of the stations, as well as elevators and stairs.
- Security measures including high intensity lighting, help points and closed circuit television, providing a safe environment for commuters, pedestrians and railway staff.
- Generous cavern and platform spaces, encouraging natural light, ventilation and ease of movement for commuters.
- Bicycle racks.
- Integrated connections with other transport services.
- Attractive surface canopies that signal station entrances and provide shelter for commuters and pedestrians (TIDC, 2004).

Station Area Transport Management Plans (SATMP's) have been prepared for the three new stations associated with the Rail Line. The SATMP's ensure that the stations have been designed to include safe and sheltered access for pedestrians, cyclists and bus passengers, and safe and convenient access to taxis and kiss'n'ride drop-off areas.

The Chatswood to Epping railway line will provide direct rail access to the North Ryde/Macquarie Park area and create capacity for 12,000 rail passengers a day. Train services will run every 15 minutes in each direction.



Macquarie Park Station Entrances

1.7.2 Bus

Existing

Buses are the primary mode of public transport in Macquarie Park as with many other centres in Ryde. Bus services in the area are predominantly provided by STA, with Westbus and Shorelink also providing services from North West Sydney and North East Sydney to the Macquarie Shopping Centre.

The bus routes serving Macquarie Park are shown in **Figure 2**.

Details of route and service frequencies by route for Macquarie Park are shown in **Table 4**. Macquarie Park is very well serviced by buses and when compared to other centres in Ryde LGA is ranked first for the number of bus services per day.

On weekdays 24 routes serve Macquarie Park with 896 buses serving these routes. Over half of these services occur during the AM and PM peak periods. These numbers reduce on the weekends. On Saturday the number of routes serving the area reduces to 12 routes providing 411 services. On Sunday there are only 7 routes providing 192 services.

The bus frequency analysis shows that Macquarie Park is well served during the AM and PM peak periods from Monday to Friday. Weekend and evening services are more limited, especially on Sundays.

Transit lanes and bus priority signals in the Macquarie Park area improve bus journey times. Transit lanes on Epping Road operate in the morning for traffic travelling towards the city, and in the evening for traffic travelling out of the city towards Epping and the Hills District as shown below:

- Travelling towards the city (east bound):
 - T3 (only vehicles with three or more occupants can travel in these lanes) between 6am and 10am west of Delhi Road
 - T2 between 6am and 10am east of Delhi Road
- Travelling to Epping (west bound):
 - T3 between 3pm and 7pm west of Delhi Road
 - During all other times the road is a clearway.

Bus priority signals are provided at Epping Road’s major intersections with Delhi Road, Herring Road, Balaclava Road and Lane Cove Road at the east bound exit from Epping Road.

The major bus interchange in Macquarie Park is the Macquarie Centre interchange located on Herring Road. The bus stops are located along a service road parallel to Herring Road. All buses enter at the northern end of the service road and travel in a southerly direction. The service road allows enough space for one bus to pass another parked at a stop. There are 6 designated bus stops; the rank has the capacity for 9 buses to pick up and set down passengers, and there is a layover bay at the northern end where another 3 buses can wait. The use of the bus rank as a layover facility can cause problems during busy periods when the capacity of the bus facility is not sufficient to accommodate buses that are waiting as well as those picking up/setting down passengers. A bus interchange facility at Macquarie University was explored but these plans encountered difficulties and was not developed.

There is ample sheltered seating for waiting passengers as well as food and drink vending machines and rubbish bins for passenger convenience. There are toilets within the centre which are available during the centre’s opening hours. There is no formal bicycle parking at the interchange so bicycle users are forced to make use of railings.



Macquarie Centre Shuttle Bus

Macquarie Centre runs a shuttle bus from the centre to Macquarie Park via major business parks. The service is designed to connect the people working at Macquarie Park to Macquarie Centre without the hassle of having to find parking. Two routes are available and are shown below. The service is available Monday to Friday, excluding Public Holidays; from 11 am to 3 pm. Service frequency is approximately 20 minutes.

Route map of Macquarie Shopping Centre Biz Park Shuttle



Source: <http://www.macquariecentre.com.au/shuttle.amx>

Committed

Committed bus facilities include:

- Bus priority is to be provided at signals on Epping Road, Lane Cove Road and Balaclava Road.
- Bus lanes are being developed by the RTA on Epping Road and Lane Cove Road

Due to increased development in the Macquarie Park area, together with the opening of the Epping to Chatswood rail link in 2008, bus servicing in the area will need to be enhanced and changed to reflect the new rail line. Discussions with Sydney Buses suggest that bus servicing in the Macquarie Park area will be enhanced to cater for the large employment growth taking place, regardless of the development of the Epping to Chatswood Rail Link.

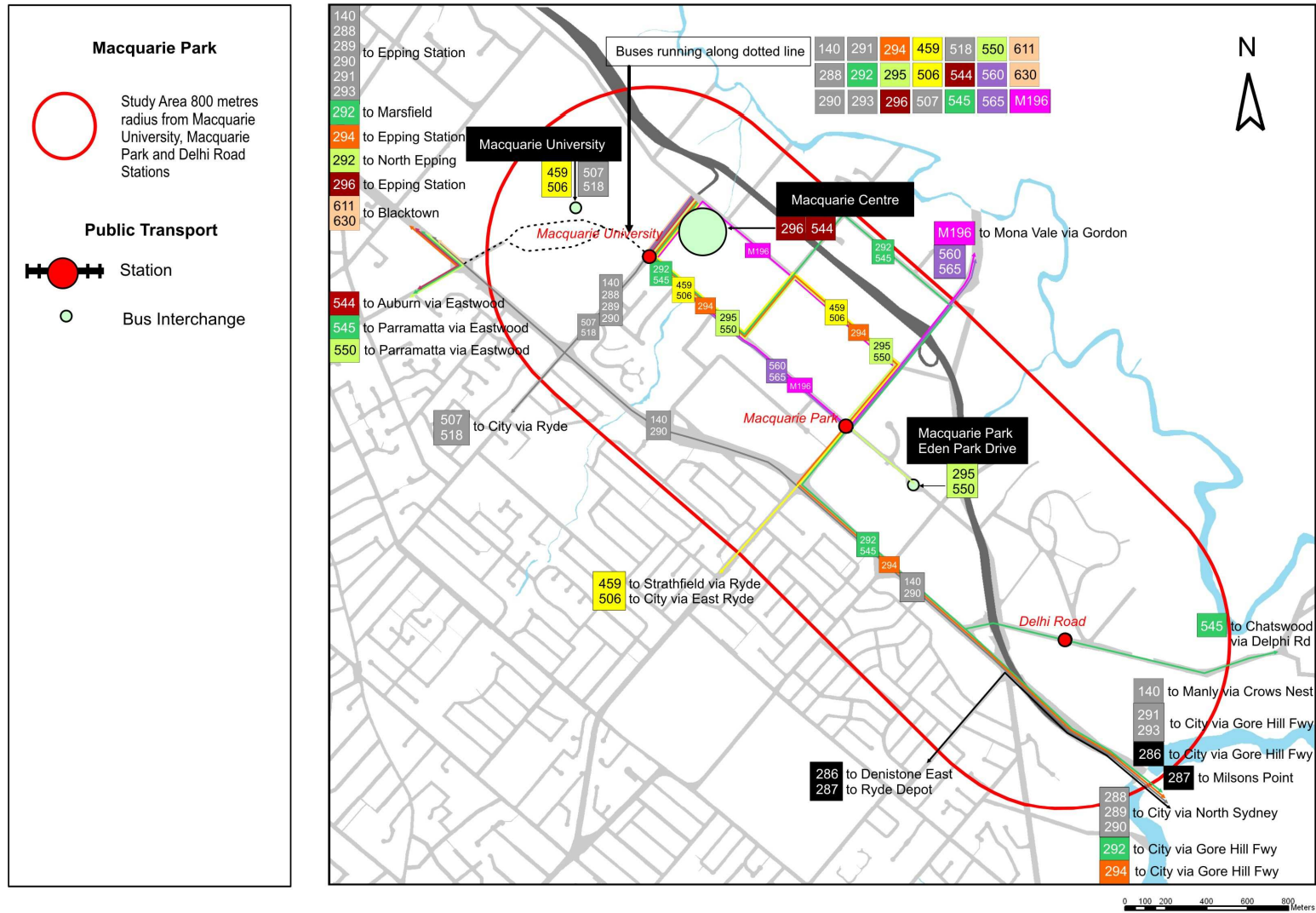
Table 4: Macquarie Park Bus Service Analysis

Weekday (2-way)											
Route Number	Route	To Direction					From Direction				
		First Bus	Last Bus	No. of Services*			First Bus	Last Bus	No. of Services*		
				AM	PM	DAY			AM	PM	DAY
140	Manly to Epping via Macquarie Park	8:29 AM	9:39 AM	2	0	2	4:13 PM	5:18 PM	0	2	2
286	Denistone East to City/ Milsons Point via Macquarie Park	6:37 AM	10:31 AM	12	0	14	3:29 PM	7:08 PM	0	8	10
287	Ryde to Milsons Point via Macquarie Park	6:53 AM	8:19 AM	3	0	4	5:13 PM	6:41 PM	0	5	5
288	Epping to City via Macquarie Park	5:44 AM	11:50 PM	11	10	58	6:35 AM	12:44 AM	6	18	64
289	Epping to City via Macquarie Park	5:17 AM	10:05 AM	2	0	4	6:11 AM	6:52 AM	0	0	2
290	Epping to City via Macquarie Park	6:55 AM	10:03 PM	10	11	35	7:23 AM	12:28 AM	5	9	29
291	Epping to City via Macquarie Park	5:09 AM	8:19 AM	4	0	8	5:13 AM	6:42 PM	1	3	8
292	Marsfield to City via Macquarie Park	7:14 AM	10:03 PM	8	7	31	7:05 AM	11:19 PM	4	5	27
293	Marsfield to City via Macquarie Park	6:21 AM	8:12 AM	7	0	9	4:42 PM	7:32 PM	0	9	11
294	Marsfield to City via Macquarie Park	4:09 PM	6:06 PM	0	7	7	6:44 AM	9:39 AM	16	0	17
295	North Epping to Macquarie Park	6:20 AM	8:48 PM	5	6	25	5:41 AM	9:05 PM	5	7	26
296	Epping to Macquarie Park	8:03 AM	6:56 PM	24	1	33	2:21 PM	6:12 PM	0	7	11
459	Macquarie University to Strathfield	7:47 AM	6:10 PM	4	5	15	7:40 AM	5:53 PM	5	4	14
506	Macquarie University to Circular Quay	7:10 AM	6:40 PM	6	6	24	6:59 AM	6:32 PM	5	6	24
507	Macquarie University to Circular Quay	8:05 AM	6:15 PM	3	5	15	8:51 AM	5:49 PM	2	4	13
518 X18	Macquarie Centre/ University to Circular Quay	6:33 AM	9:14 PM	6	6	27	6:25 AM	8:15 PM	6	6	27
544	Macquarie Centre to Auburn	7:13 AM	6:40 PM	3	6	15	6:58 AM	6:22 PM	6	4	16
545	Parramatta to Chatswood via Macquarie Centre	5:25 AM	12:29 PM	16	16	67	5:15 AM	11:43 PM	15	17	66
550	Parramatta to Chatswood via Macquarie Centre	3:51 PM	3:51 PM	0	0	1	2:59 PM	3:58 PM	0	5	5
560	Macquarie Centre/ University to Gordon	7:12 AM	6:15 PM	4	5	14	7:06 AM	6:10 PM	4	5	14
565	Macquarie Centre/ University to Chatswood	9:07 AM	5:42 PM	1	3	10	8:46 AM	5:37 PM	2	3	9
611	Macquarie Centre to Blacktown	6:46 AM	9:10 PM	6	6	27	6:44 AM	6:25 PM	6	6	23
630	Macquarie Centre/ University to Blacktown	6:45 AM	5:45 PM	3	3	12	6:35 AM	5:39 PM	4	3	13
M196	Macquarie University to Mona Vale	6:55 AM	6:55 AM	1	0	1	3:05 PM	4:30 PM	0	1	2

Saturday (2-way)											
Route Number	Route	To Direction					From Direction				
		First Bus	Last Bus	No. of Services*			First Bus	Last Bus	No. of Services*		
				AM	PM	DAY			AM	PM	DAY
140	Manly to Epping via Macquarie Park	-	-	-	-	-	-	-	-	-	-
286	Denistone East to City/ Milsons Point via Macquarie Park	-	-	-	-	-	-	-	-	-	-
287	Ryde to Milsons Point via Macquarie Park	-	-	-	-	-	-	-	-	-	-
288	Epping to City via Macquarie Park	7:43 AM	11:05 PM	8	9	47	7:34 AM	1:08 AM	6	10	47
289	Epping to City via Macquarie Park	6:03 AM	7:03 AM	1	0	1	6:12 AM	3:59 AM	0	0	4
290	Epping to City via Macquarie Park	8:11 AM	7:03 PM	2	4	19	7:17 AM	3:23 AM	3	3	20
291	Epping to City via Macquarie Park	5:21 AM	6:42 AM	0	0	2	5:31 AM	6:40 AM	0	0	2
292	Marsfield to City via Macquarie Park	7:11 AM	7:17 PM	3	3	17	9:41 AM	7:39 PM	1	3	11
293	Marsfield to City via Macquarie Park	-	-	-	-	-	-	-	-	-	-
294	Marsfield to City via Macquarie Park	-	-	-	-	-	-	-	-	-	-
295	North Epping to Macquarie Park	9:04 AM	7:02 PM	1	3	12	8:19 AM	7:21 PM	3	3	20
296	Epping to Macquarie Park	-	-	-	-	-	-	-	-	-	-
459	Macquarie University to Strathfield	-	-	-	-	-	-	-	-	-	-
506	Macquarie University to Circular Quay	8:30 AM	5:57 PM	4	4	20	8:22 AM	6:40 PM	3	6	21
507	Macquarie University to Circular Quay	8:07 AM	5:07 PM	2	2	10	8:45 AM	5:47 PM	2	2	10
518 X18	Macquarie Centre/ University to Circular Quay	8:02 AM	6:34 PM	4	6	22	7:51 AM	6:41 PM	3	5	20
544	Macquarie Centre to Auburn	9:02 AM	5:02 PM	1	2	9	8:48 AM	4:50 PM	2	1	9
545	Parramatta to Chatswood via Macquarie Centre	7:13 AM	9:47 PM	7	8	39	7:12 AM	9:46 PM	6	8	39
550	Parramatta to Chatswood via Macquarie Centre	-	-	-	-	-	-	-	-	-	-
560	Macquarie Centre/ University to Gordon	9:56 AM	4:56 PM	1	1	5	9:14 AM	4:14 PM	1	1	5
565	Macquarie Centre/ University to Chatswood	-	-	-	-	-	-	-	-	-	-
611	Macquarie Centre to Blacktown	-	-	-	-	-	-	-	-	-	-
630	Macquarie Centre/ University to Blacktown	-	-	-	-	-	-	-	-	-	-
M196	Macquarie University to Mona Vale	-	-	-	-	-	-	-	-	-	-

Sunday (2-way)											
Route Number	Route	To Direction					From Direction				
		First Bus	Last Bus	No. of Services*			First Bus	Last Bus	No. of Services*		
				AM	PM	DAY			AM	PM	DAY
140	Manly to Epping via Macquarie Park	-	-	-	-	-	-	-	-	-	-
286	Denistone East to City/ Milsons Point via Macquarie Park	-	-	-	-	-	-	-	-	-	-
287	Ryde to Milsons Point via Macquarie Park	-	-	-	-	-	-	-	-	-	-
288	Epping to City via Macquarie Park	7:55 AM	10:43 PM	5	5	26	9:22 AM	11:44 PM	2	6	25
289	Epping to City via Macquarie Park	6:12 AM	6:12 AM	0	0	1	7:51 AM	12:50 AM	3	0	4
290	Epping to City via Macquarie Park	7:15 AM	11:16 PM	4	3	18	9:06 AM	11:16 PM	1	4	15
291	Epping to City via Macquarie Park	-	-	-	-	-	-	-	-	-	-
292	Marsfield to City via Macquarie Park	8:09 AM	5:12 PM	2	2	10	9:34 AM	7:25 pm	1	3	11
293	Marsfield to City via Macquarie Park	-	-	-	-	-	-	-	-	-	-
294	Marsfield to City via Macquarie Park	-	-	-	-	-	-	-	-	-	-
295	North Epping to Macquarie Park	9:34 AM	6:32 PM	1	3	10	8:52 AM	5:50 PM	2	2	10
296	Epping to Macquarie Park	-	-	-	-	-	-	-	-	-	-
459	Macquarie University to Strathfield	-	-	-	-	-	-	-	-	-	-
506	Macquarie University to Circular Quay	-	-	-	-	-	-	-	-	-	-
507	Macquarie University to Circular Quay	-	-	-	-	-	-	-	-	-	-
518 X18	Macquarie Centre/ University to Circular Quay	9:04 AM	6:16 PM	1	3	10	8:46 AM	5:49 AM	2	2	10
544	Macquarie Centre to Auburn	-	-	-	-	-	-	-	-	-	-
545	Parramatta to Chatswood via Macquarie Centre	8:44 AM	6:40 PM	3	5	20	7:43 AM	7:33 PM	3	6	22
550	Parramatta to Chatswood via Macquarie Centre	-	-	-	-	-	-	-	-	-	-
560	Macquarie Centre/ University to Gordon	-	-	-	-	-	-	-	-	-	-
565	Macquarie Centre/ University to Chatswood	-	-	-	-	-	-	-	-	-	-
611	Macquarie Centre to Blacktown	-	-	-	-	-	-	-	-	-	-
630	Macquarie Centre/ University to Blacktown	-	-	-	-	-	-	-	-	-	-
M196	Macquarie University to Mona Vale	-	-	-	-	-	-	-	-	-	-

Figure 2 - Public Transport Services



1.7.3 Taxi

Existing

One of the major taxi ranks in Ryde is the Macquarie Shopping Centre rank. It provides seating and shelter but like all taxi ranks in Ryde it does not provide a free phone available to call a taxi.

Long waiting times are experienced at the taxi ranks in Ryde due to a lack of taxi services generally in the area.

Committed

Taxi ranks will be provided at the three new railway stations on the Epping to Chatswood rail line at Macquarie University, Macquarie Park and Delhi Road. Station Area Transport Management Plans have been developed for each station. These include provision for safe and convenient access to taxis.



Taxi rank at Macquarie Centre

1.7.4 Community Transport

Community transport services cover all of the Ryde LGA and are discussed in the **City Wide Report Section 5.3.3**.

1.7.5 Walking

Existing

The local pedestrian network including pedestrian crossings is shown in **Figure 3**.

All of the signalised crossings provided in the Macquarie Park study area are located along major roads such as Epping Road, Waterloo Road, Talavera Road, Herring Road, Lane Cove Road and Delhi Road. Zebra crossings are situated along Talavera Road, Waterloo Road and on Ivanhoe Street.

The Hills Motorway (M2) is a major barrier in the north/south direction for the study area. There are several crossing opportunities available for crossing the Hills Motorway, such as Khartoum Road, Lane Cove Road and Delhi Road. However the distances between crossing opportunities are large and therefore may present problems for pedestrians. Similar problems exist for Epping Road and Waterloo Road in the north/south direction.

Lance Cove Road is a major barrier in the east/west direction for the study area. There is a pedestrian crossing at each intersection of Lane Cove Road with another major road, such as Epping Road. However, these crossings are significantly far from each other and hence impede on pedestrian movement.

All informal footpaths identified in **Figure 3** have the potential to be formalised. Key areas missing footpaths include:

- Wicks Road (both sides) north of Waterloo Road;
- Delhi Road (both sides) near Delhi Road Station;
- Talavera Road (north side) north of Christie Road;
- Epping Road (south side) between Herring and Lane Cove Roads;
- Waterloo Road (south side) between Byfield and Coolinga Streets; and
- Pittwater Road (east side) south of Epping Road.



Pedestrian Accessibility

Pedestrian accessibility is shown in **Figure 4** which maps the 400m and 800m walk isochrones from the three new stations on the Epping to Chatswood line at Macquarie University, Macquarie Park and Delhi Road

The walk isochrones from Macquarie University Station do not include the internal network within Macquarie University. However, the accessibility derived from these isochrones shows that the area surrounding Macquarie University Station is accessible for pedestrians.

The 400m from Macquarie Park Station are well matched in all directions, creating a box shape of isochrones around the station. This extends to the 800m isochrones as well. Given that Macquarie Park covers a large area these isochrones demonstrate good pedestrian accessibility from the station in all directions.

The 400m and 800m isochrones from Delhi Road do not include the internal network of Macquarie Park Cemetery. Given this constraint and the fact that Lane Cove National Park encompasses a significant portion of this study area, the remaining pedestrian isochrones are relatively well spread out from the station.

Accident Analysis

An analysis of pedestrian and cycle accidents in the Ryde LGA was carried out for the five year period from 2000 to 2004 as shown in **Figure 6.3 and 6.4 (City Wide Report)**.

A number of solutions could be provided at the accident cluster locations including:

- Separate pedestrian phases (green time not shared with turning traffic);
- Longer green times;
- Pedestrian refuges;
- Pedestrian barriers / guard rail;
- Reduced vehicle speeds;
- Speed limit enforcement;
- Improve street lighting;
- Improve vehicle and pedestrian visibility; and/or
- Count down displays.

A detailed study of the type of pedestrian accidents occurring in this area should be carried out as part of the proposed PAMP to determine the most appropriate mitigating measures required at this location. It should be investigated if the presence of the hotel in the accident cluster location contributes to the level of accidents.

Committed

Committed pedestrian facilities include:

- An off road shared bicycle/pedestrian path connecting Shrimptons Creek at Waterloo Road and Wicks Road at Epping Road is scheduled for construction by Council.

Figure 3 – Pedestrian Network

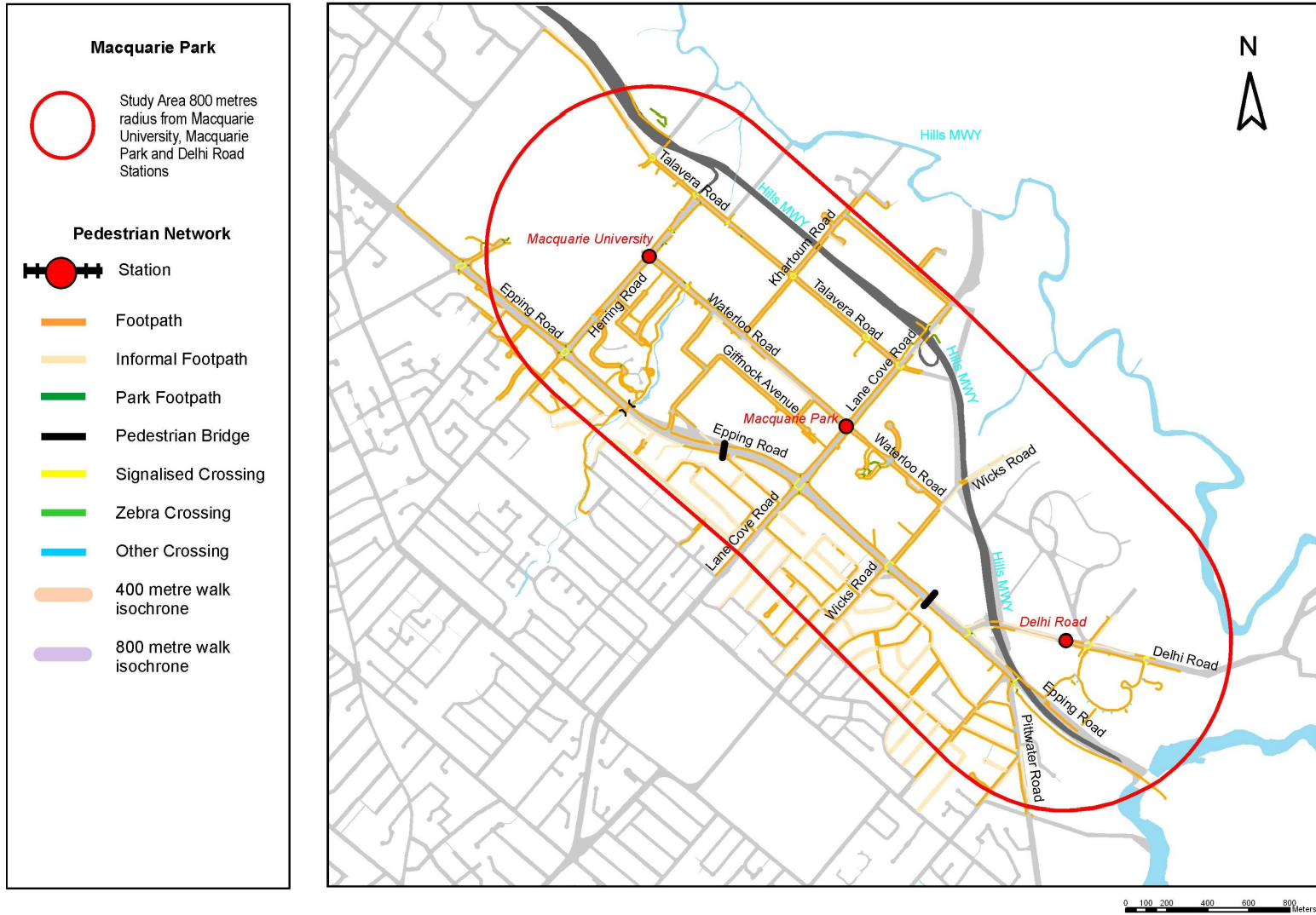
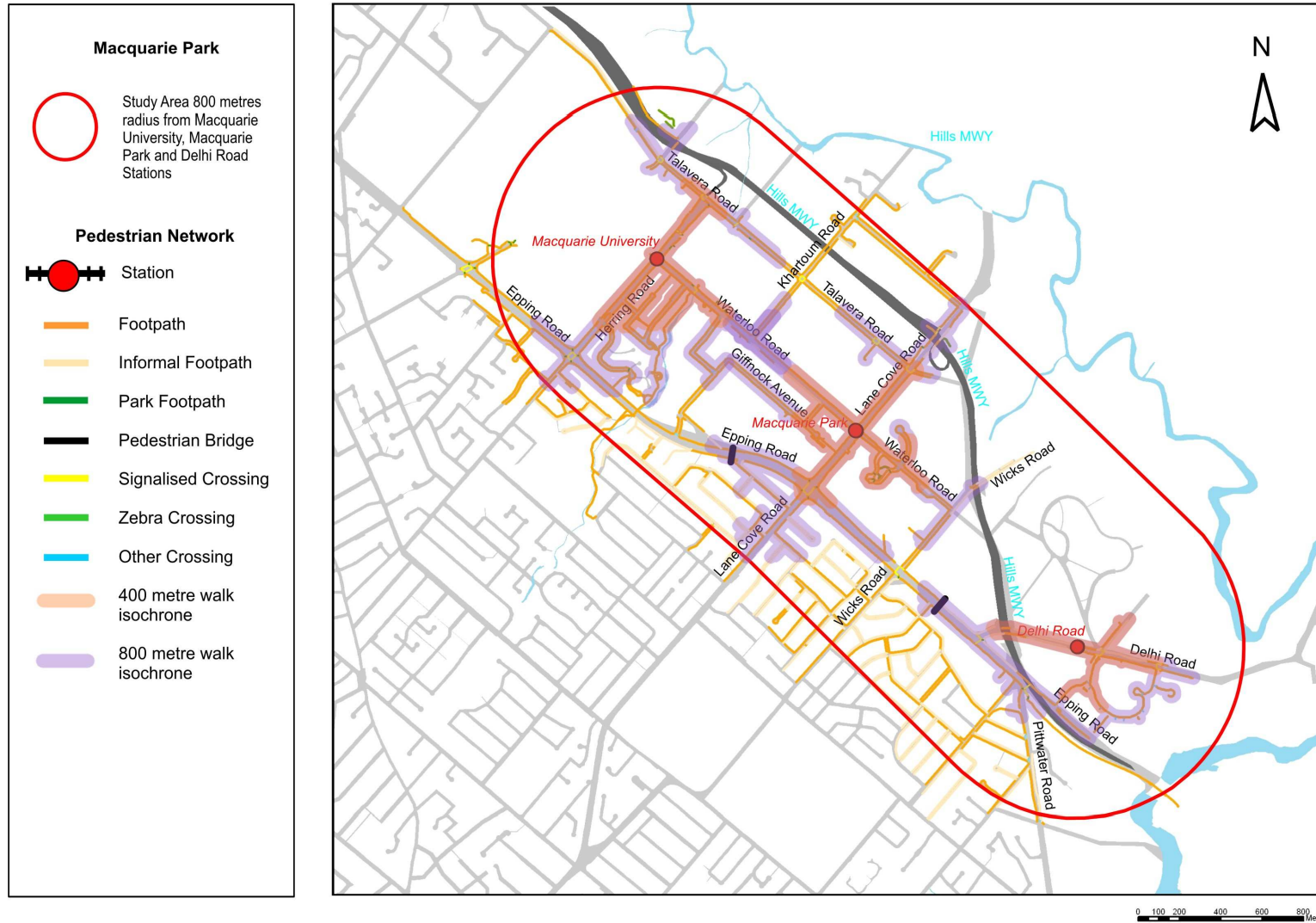


Figure 4 – Pedestrian isochrones



1.7.6 Cycling

Existing

The existing and proposed cycling network is shown in **Figure 5**.

The RTA Action for Bikes 2010 (1999) sets out a 10 year plan for a series of arterial bicycle networks across NSW.

As shown in **Figure 6.4 (City Wide Report)** a number of cycle accidents have occurred in the vicinity of Macquarie Park.

Committed

Ryde have just recently released their Ryde Bicycle Strategy and Masterplan in January 2007. The cycling network for the Macquarie Park study centre is show in **Figure 5**. The regional bicycle routes passing through the Gladesville study area are:

- RR02 – Eastwood to Turrumurra
- RR03 – West Ryde to Mona Vale via Gordon
- RR05 – M2 Cycleway
- RR06 – Sydney City to Epping via Epping Road

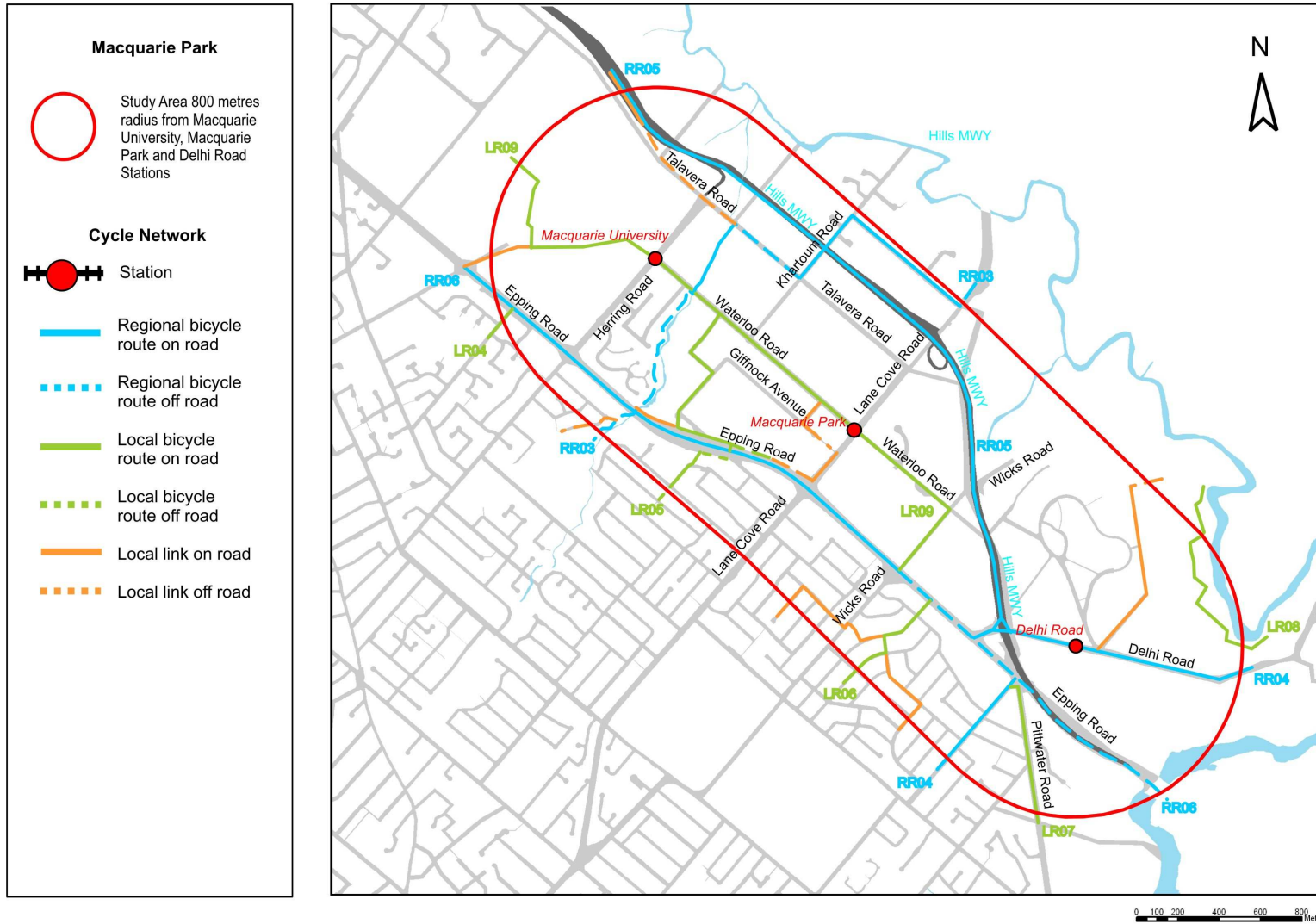
The local bicycle routes passing through the Gladesville study area include:

- LR04 – North Ryde to West Ryde
- LR05 – North Ryde to Meadowbank
- LR06 – Macquarie Park to Putney
- LR07 – North Ryde to Gladesville
- LR09 – Marsfield to Macquarie Park

An off road shared bicycle/pedestrian path connecting Shrimptons Creek at Waterloo Road and Wicks Road at Epping Road is scheduled for construction by Council.



Figure 5 – Cycling Network



1.7.7 Road

Existing

The existing road network is shown in **Figure 6**. The Macquarie Park study area is dominated by major arterial roads including The Hills Motorway (M2), Epping Road, Lane Cove Road and Delhi Road. Secondary Roads in the study area include Wicks Road and Pittwater Road. All other roads in the study area are local roads. Some of the AADT figures for the study area are presented in **Table 5** below.

Table 5: Traffic Volumes in Ryde

Location	Direction	AADT
Epping Road north west of Herring Road	2-way	50,616
Epping Road south east of Herring Road	2-way	49,251
Lane Cove Road	2-way	58,145
Herring Road/Epping Road Intersection	North	9,525
	South	5,404
	East	24,089
	West	19,135
	Total	58,153
Herring Road/Waterloo Road Intersection	North	6,848
	South	12,979
	East	7,296
	West	2,139
	Total	29,262
Lane Cove Road/Talavera Road	North	35,104
	South	32,167
	East	1,270
	West	4,528
	Total	73,069

Source: RTA Traffic volume data 2002

All of the signalised crossings in the Macquarie Park study area are situated on the arterial, secondary and major local roads in the area. There are several intersections controlled by roundabouts in the Macquarie Park study area. These occur at Talavera Road, the Centrecourt Business Park and the following intersections

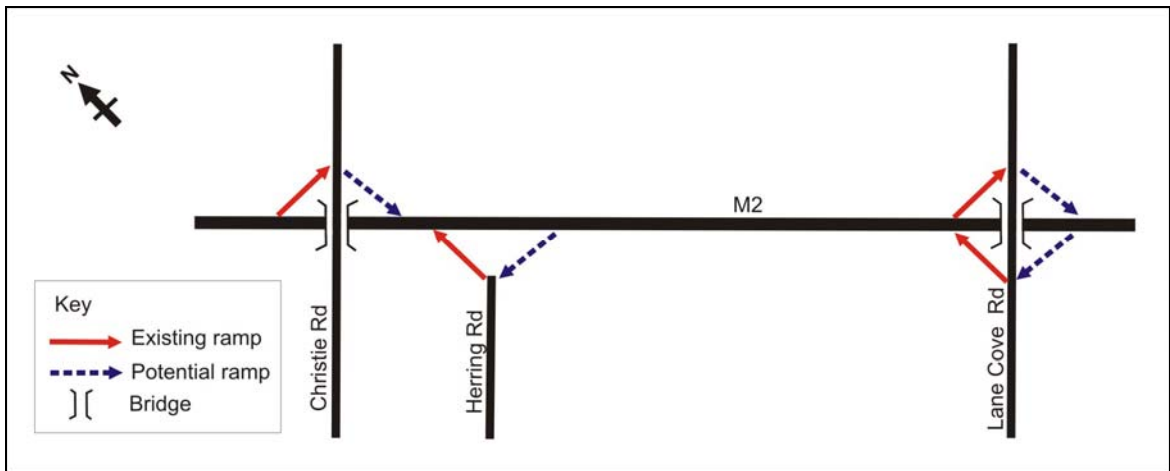
- Khartoum Road and Fontenoy Road
- Waterloo Road and Byfield Street
- Waterloo Road and Eden Park Drive
- Khartoum Road and Waterloo Road
- Lyonpark Road and Giffnock Avenue
- Lyonpark Road and Paul Street

There are no speed control humps in the Macquarie Park study area that are located on road, that is, they are either located in business parks or at car parks. Several roads are gated and these are found at the entrance to Macquarie University, Lane Cove National Park and at various sporting grounds car park entrances.



An analysis of accidents in the Ryde LGA was carried out for the five year period from 2000 to 2004 and is presented in the **Context Report Section 3.6.5**.

Existing and potential M2 ramps are show in the following diagram. There is potential to provide off-ramps at Christie Road and Lane Cove Road and on-ramps at Herring Road and Lane Cove Road, in order to improve traffic access to and from Macquarie Park.

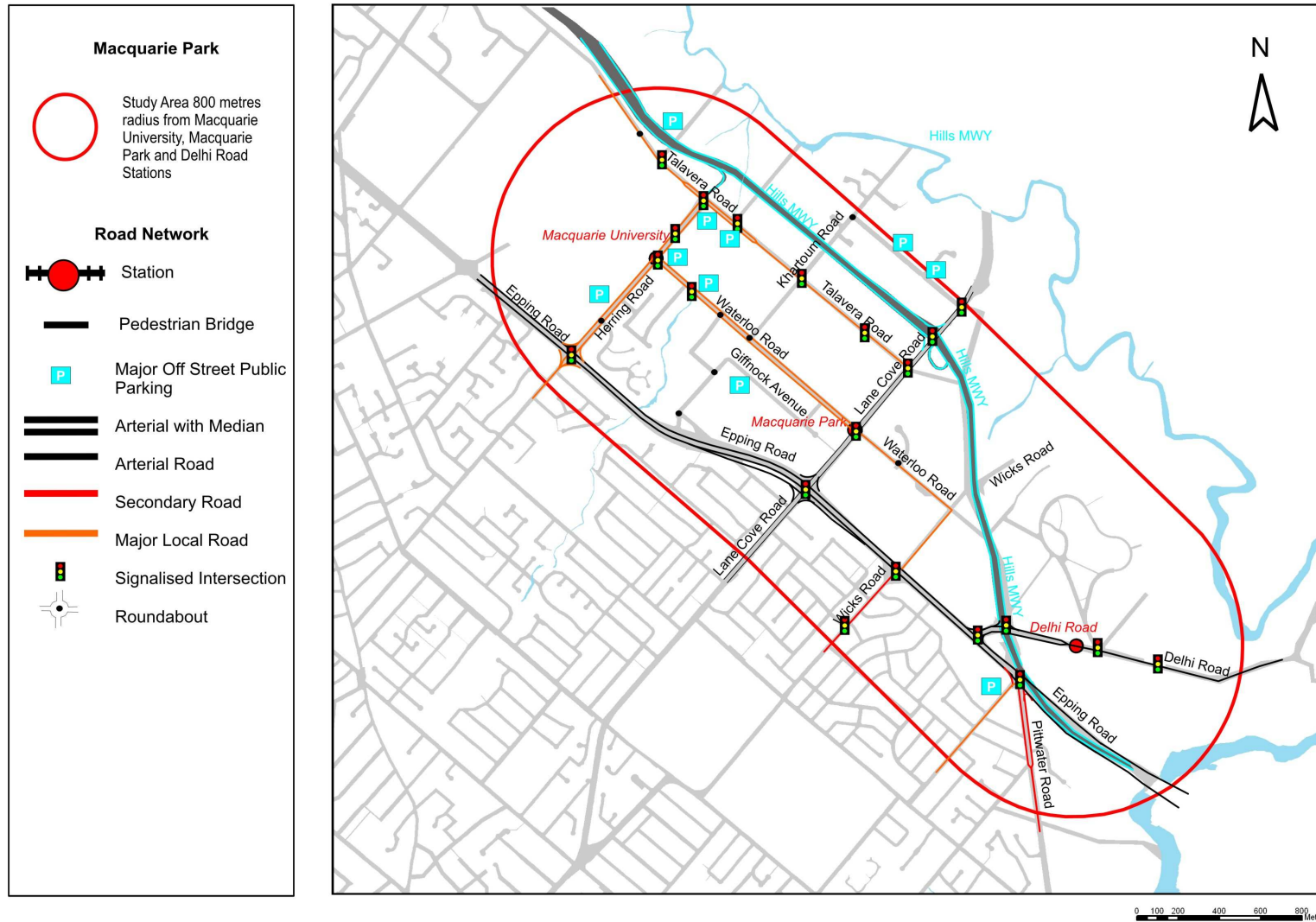


Committed

Committed road facilities include:

- Signalisation of the Culloden Road and Epping Road intersection will occur as part of Macquarie University’s 40 years development plan.
- A series of roundabouts and pedestrian refuges are proposed as part of the Traffic Study for the Macquarie Park residential area.

Figure 6 - Road Network



1.7.8 Parking

Existing

On-street parking is provided in Macquarie Park, however, in some areas time restrictions and other parking restrictions apply.

Following upon the recommendations of the Macquarie Park Corridor Parking Demand Study, parking meters have been installed in selected streets in the Macquarie Park Business Corridor. In order to ensure that this did not result in spill over parking in surrounding residential areas, residential parking permits have also been recently introduced to surrounding areas.

Committed

No additional public car parking facilities are proposed by Council for this area.

1.8 Opportunities and Constraints

1.8.1 Constraints

The following constraints have been identified:

- Lack of direct access from the M2 to Macquarie Park.
- Level of performance and traffic congestion at the following intersections:-
 - Epping Road & Vimiera Road
 - Epping Road and Balaclava Road
 - Epping Road and Herring Road
 - Epping Road and Wicks Road
 - Lane Cove Road and Fontenoy Road
 - Lane Cove Road and Waterloo Road
- Difficulty of developing a fine grained road network with many property owners and few incentives for rapid development.

1.8.2 Opportunities

The following opportunities have been identified:

- There is an opportunity for new signals to be provided at Epping Road and Lyonpark Road in partnership with the RTA and Optus.
- Further investigation of a grade separated interchange for Talavera Road and Lane Cove Road.
- Negotiation with Transurban and the RTA for construction of an East facing ramp for M2 at Lane Cove Road.
- Opportunity for construction of a signalised intersection at Waterloo Road and Culloden Road.
- Negotiation with Transurban and the RTA for construction of a West facing ramp at Herring Road for M2
- East facing ramp at Christie Road or Herring Road
- Potential new footpaths include:-
 - North Side Talavera Road from Christie Road to Busaco Road.
 - Both sides Christie Road from Talavera Road to Christie Park.
 - Waterloo Road south side to east of Byfield Street to No 16.
 - Waterloo Road south side from opposite Khartoum Road to Coolinga Street (except small section No 60)
 - Waterloo Road south side small traffic island opposite No 17
 - Paul Street north both sides
 - Julius Street and Rivett Street south and east sides
 - From pedestrian crossing at north Pittwater Road
 - South side Epping Road from Sobraon Road to bus stop
- Potential cyclist linkage between Lane Cove and the Macquarie Shopping Centre. Route is planned from corner Epping and Wicks Roads to the Macquarie Shopping Centre (i.e. along Wicks Road to Waterloo Road, then along Waterloo Road between Wicks and Herring Roads to connect to the Macquarie Centre).
- Improved access/circulation within the corridor due to a network of proposed additional streets.

1.9 A Plan for Macquarie Park

Ensure that the Macquarie Park Employment Corridor maintains its position as is a significant and successful employment area with Ryde and NSW.

1.10 Objectives for Macquarie Park

The proposed objectives for Macquarie Park are:

- Increased safety;
- Improved amenity and identity;
- Economic prosperity; and,
- Management of through traffic.

1.11 Recommended Actions

Recommended actions for Macquarie Park are summarised in the following tables:

- A1 - Public Transport, Community Transport, Personal Public Transport and Taxis Actions
- A2 - Walking and Cycling Actions
- A3 - Road Management Actions
- A4 - Integrated Land Use Planning / Car Parking Actions

Relevant City Wide Strategies are included (from the City Wide Integrating Transport with Land Use Strategy Report), along with specific local strategies.

A1 - Public Transport, Community Transport, Personal Public Transport and Taxis Actions – Summary

Action	Primary Stakeholders	Secondary Stakeholders	Timescale	Cost to CoR
Mutually Beneficial Partnerships	CoR, STA, Sydney Ferries, CityRail, Developers	RTA, MoT, community	Short Term (Pilot project) Medium - Long Term	Low
Public Transport Information	CoR, Community.	STA, Sydney Ferries, CityRail	Short Term	Low
Demand Responsive Transport	CoR, Community.	MOT, STA, Community Transport, Taxi operators	Short Term	Medium
Bus Infrastructure	CoR, STA	RTA, MoT	Short – Medium Term	Low -High
Train Station Infrastructure	CoR, CityRail		Short Term	Low - High
Lobby for improved Public Transport Services				Low
<ul style="list-style-type: none"> ▪ Increased off peak frequencies ▪ Accessible buses ▪ Strategic Bus Routes ▪ Connection to SOP town centre ▪ Legal taxi pick up/set down areas 	CoR, STA, MoT, RTA, Taxi Council	Community	Short – Medium Term	
Local Actions:				
<ul style="list-style-type: none"> ▪ Lobby for bus priority measures on Epping Road and Lane Cove Road to improve connections with other centres ▪ Development of a TAG for new stations and shopping centre 				

A2 - Walking and Cycling Actions – Summary

Action	Primary Stakeholders	Secondary Stakeholders	Timescale	Cost to CoR
Improved Safety at Pedestrian Crossings	CoR, RTA	Community	Short Term	Medium
Generic Treatments	CoR, RTA	Community	Short – Medium Term	Low – High
Accessibility Mapping	CoR,	STA, CityRail, Sydney Ferries	Short – Medium Term	Medium
Accessibility Audits	CoR, RTA, developers	Community, STA, CityRail, Sydney Ferries	Short Term (existing areas) Ongoing (DA approvals)	\$3,000 per site*
Pedestrian Access and Mobility Plan	CoR, RTA	Community, STA, CityRail, Sydney Ferries	Short Term	Medium
Accident Clusters	CoR, RTA	Community, STA	Short term	Medium - High
Local Actions:				
<ul style="list-style-type: none"> ▪ Detailed analysis of pedestrian accidents and design of mitigating measures including: <ul style="list-style-type: none"> ▪ Separate pedestrian phases (green time not shared with turning traffic); ▪ Longer green times; ▪ Pedestrian refuges; ▪ Pedestrian barriers / guard rail; ▪ Reduced vehicle speeds; ▪ Speed limit enforcement; ▪ Improve street lighting; ▪ Improve vehicle and pedestrian visibility; and/or ▪ Count down displays. ▪ Investigate opportunities to provide pedestrian crossing opportunities on - <ul style="list-style-type: none"> ▪ Epping Road ▪ Herring Road ▪ Lane Cove Road 				

<ul style="list-style-type: none">▪ Potential new footpaths include:-<ul style="list-style-type: none">▪ North Side Talavera Road from Christie Road to Busaco Road.▪ Both sides Christie Road from Talavera Road to Christie Park.▪ Waterloo Road south side to east of Byfield Street to No 16.▪ Waterloo Road south side from opposite Khartoum Road to Coolinga Street (except small section No 60)▪ Waterloo Road south side small traffic island opposite No 17▪ Paul Street north both sides▪ Julius Street and Rivett Street south and east sides▪ From pedestrian crossing at north Pittwater Road▪ South side Epping Road from Sobraon Road to bus stop▪ Wicks Road (both sides) north of Waterloo Road▪ Delhi Road (both sides) near Delhi Road Station▪ Epping Road (south side) between Herring and Lane Cove Roads▪ Pittwater Road (east side) south of Epping Road				
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* Accessibility audits requested as part of the DA process will be supplied by the applicant.

A3 - Road Management Actions – Summary

Action	Primary Stakeholders	Secondary Stakeholders	Timescale	Cost to CoR
Improvements on Arterial Roads				
<ul style="list-style-type: none"> ▪ Improved safety at pedestrian crossings 	CoR, RTA	Community	Short Term	Low
<ul style="list-style-type: none"> ▪ Generic Treatments for walking and cycling 	CoR, RTA	Community	Short – Medium Term	
Improvements on Council Roads				
<ul style="list-style-type: none"> ▪ LATMs 	CoR	STA, Community	Short Term	Medium High -
<ul style="list-style-type: none"> ▪ Improved safety at Pedestrian Crossings 	CoR, RTA	Community	Short Term	
<ul style="list-style-type: none"> ▪ Generic treatments for walking and cycling 	CoR	STA, Community	Ongoing	
<ul style="list-style-type: none"> ▪ Reallocation of road space 	CoR	STA, Community	Ongoing	
Road Network Performance Standards	CoR, RTA	STA, Community	Ongoing	Medium High -
Local Actions:				
Improvements on Arterial Roads:	CoR, RTA	Optus	Short Term	Medium High -
<ul style="list-style-type: none"> ▪ New signals to be provided at Epping Road and Lyonpark Road in partnership with the RTA and Optus. 	CoR, RTA	Community	Medium Term	Medium High -
<ul style="list-style-type: none"> ▪ Grade separated interchange for Talavera Road and Lane Cove Road. 	CoR, RTA, Transurban	Community	Medium Term	Medium High -
<ul style="list-style-type: none"> ▪ East facing ramp for M2 at Lane Cove Road. 	CoR, RTA	Community	Medium Term	Medium High -
<ul style="list-style-type: none"> ▪ Signalised intersection at Waterloo Road and Culloden Road. 	CoR, RTA, Transurban	Community	Medium Term	Medium High -
<ul style="list-style-type: none"> ▪ West facing ramp at Herring Road for M2 	CoR, RTA, Transurban	Community	Medium Term	Medium High -
<ul style="list-style-type: none"> ▪ East facing ramp at Christie Road 	CoR, RTA,	Community	Medium Term	Medium High -

<p>or Herring Road</p> <p>Potential local network improvements:</p> <ul style="list-style-type: none"> Improved access/circulation within the corridor due to a network of proposed additional streets. 	<p>CoR, RTA,</p>	<p>Community</p>	<p>Medium Term</p>	<p>Medium High -</p>
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A4 - Integrated Land Use Planning / Car Parking Actions – Summary

Action	Primary Stakeholders	Secondary Stakeholders	Timescale	Cost to CoR
Public Transport Accessibility Levels (PTALs)	CoR	STA, CityRail, MoT	Short Term	Low
Mixed Land Use	CoR	Developers, Community	Medium – Long Term	Low
Public Car Parking	CoR	Community	Short – Medium Term	Low
Private Car Parking	CoR	Developers	Short – Medium Term	Low
Motorcycle / Scooter Parking	CoR	Community	Short Term	Low
Street Networks	CoR	Community, Developers	Short Term	Low
Local Actions: <ul style="list-style-type: none"> ▪ Continued enforcement of existing parking restrictions. ▪ Continued requirement for Workplace Travel Plan for large employers including area wide initiatives ▪ Promote area car pooling / ride sharing scheme for multiple large scale employers 				