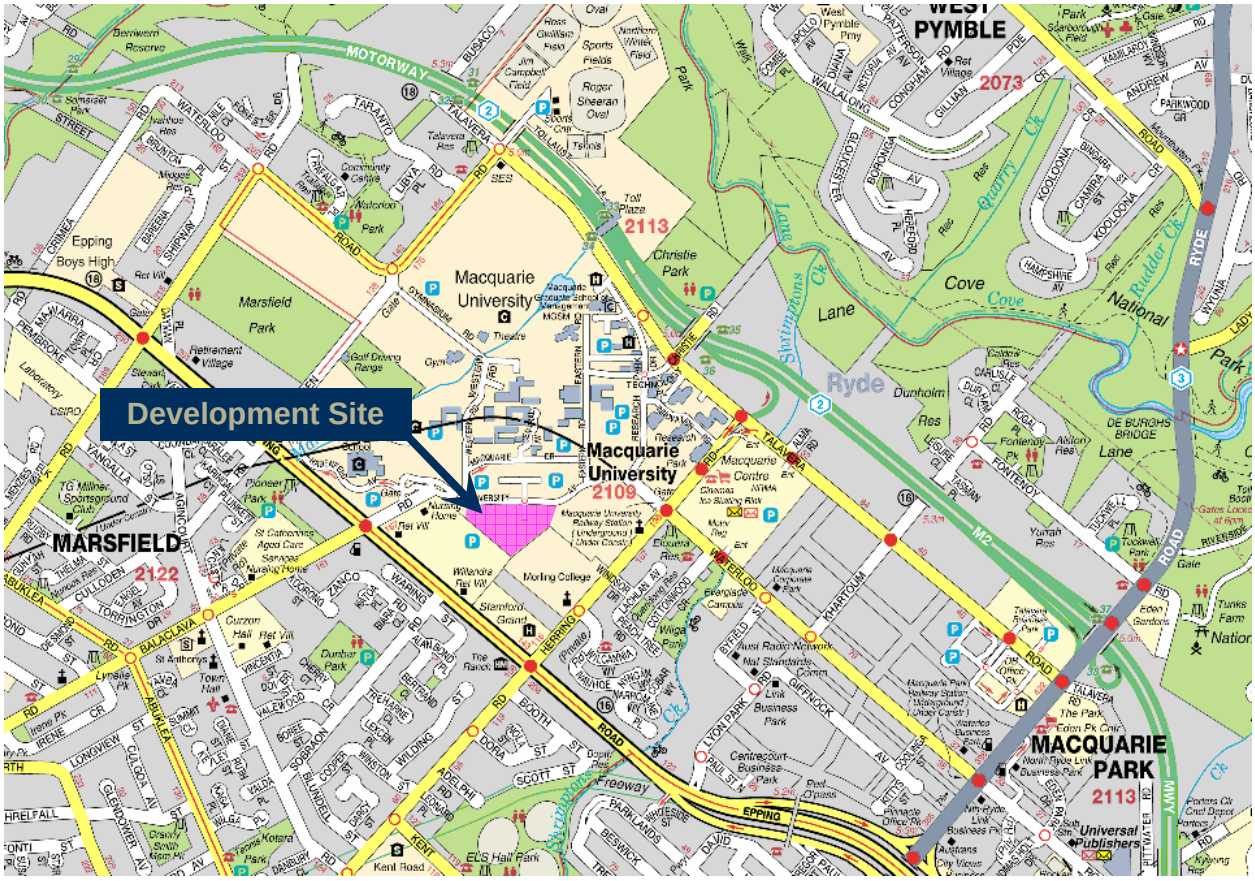
1 INTRODUCTION

Cardno Eppell Olsen has been commissioned by CRI Australia Pty Ltd on behalf of Cochlear Limited to undertake a Traffic and Parking Assessment of the proposed Cochlear Global Headquarters facility to be located on Macquarie University's residual land at the North Ryde Campus known as the 'Station South Precinct' in the Macquarie University Campus Development Plan.

The 'Station South Precinct' is surrounded by Epping Road to the south-west, Herring Road to the south-east, University Avenue to the north and Balaclava Road to the north-west. Current land uses for the precinct consists of educational facilities, a childcare centre and casual accommodation facilities (refer to Figure 1.1).

Figure 1.1 Site Location



Cochlear undertake research and development as well as manufacturing and distribution of hearing implant devices. Cochlear proposes to move their current global headquarters from Lane Cove to the proposed site in Macquarie Park, they propose to maintain the Asia Pacific (APAC) regional office in Lane Cove. The global headquarters houses predominantly office staff but also incorporates research, manufacturing and distribution.

The application is for the development of a new purpose built facility with a Gross Floor Area (GFA) of 24,343m^2 and is proposed as two linked buildings of 6 to 7 storeys in height. The project will consist predominantly of typical A-grade office buildings and some areas for manufacturing/research and product distribution usage.

1.1 SCOPE OF WORKS

The objective of this report is to evaluate the impact of traffic generated by the project, its associated impact on the surrounding road network and to determine the adequacy of parking provision and design layouts.
Cardno Eppell Olsen's scope of works for this study includes:

- Car Park Layout and Design Review;
- Parking Assessment; and
- Traffic Impact Assessment for Project Application (PA) approval.

1.2 BACKGROUND

In 2001 the Department of Planning (DoP) (formerly Planning NSW) and Ryde City Council (RCC) undertook to prepare the Macquarie Park Transport Management & Accessibility Plan (MP TMAP). The MP TMAP was completed in mid 2002.

The Macquarie University campus incorporates the Macquarie University Research Park (a key part of Australia's Silicon "Gully"). The University currently provides academic facilities for around 30,000 enrolled students. In late 2002, the University determined to review its then current "Development Plan 1997" in response to its changing environment.

Macquarie University owns land at North Ryde and Macquarie Park which accommodates the University's teaching, research and student support needs. The University land accounts for approximately 30 per cent of the total land area contained within the Macquarie Park Corridor.

In addition to meeting the University's projected teaching and research requirements, the land also provides the opportunity for the University to develop commercial partnerships. The City of Ryde Local Environmental Plan (LEP 137) excludes the majority of the University campus. This limits opportunity for development and does not provide the flexibility required by the University in the changing higher education environment.

In 2004, Macquarie University celebrated its 40th anniversary of the establishment of its Campus at the northern end of what is known as the Macquarie Park Corridor in North Ryde. In mid 2004, the University Council adopted the "Macquarie University Campus Development Plan 2004" (CDP) as the guiding document for the future development of the University and to complement the Macquarie Park Corridor Master Plan (MPCMP). The Campus Development Plan 2004 was developed to outline the likely directions and to identify opportunities to guide the physical growth of the University Campus through the next 40 years.

1.2.1 Macquarie University Concept Plan (MUCP)

In December 2005, the Minister for Planning agreed to consider Macquarie University as a potential State Significant Site (SSS). The Minister for Planning formed the opinion pursuant to clause 6 of State Environmental Planning Policy (Major Projects) 2005 (MP SEPP) that the project was a Major Project under Part 3A of the Environmental Planning and Assessment Act 1979. This was announced on 4 April 2006. In May 2006 the University submitted a planning study to support this.

Macquarie University subsequently developed the Macquarie University Concept Plan (MUCP) (Cox, Nov 2007). This was submitted to the Department of Planning in December 2007. Cardno Eppell Olsen was engaged by CRI Australia Pty Ltd on behalf of Macquarie University (MU) to prepare a Transport Management and Accessibility Plan (TMAP) for the MUCP. This was in response to the Department of Planning's request that an appropriate Traffic Impact Assessment (TIA) be prepared in association with the Macquarie Park Transport Management & Accessibility Plan (TMAP).

1.2.2 Macquarie University Concept Plan TMAP

The MUCP TMAP methodology included the following:

- Inception:
  - Project familiarisation –background research, site inspections;
  - Data collection;
  - Literature review;
  - Consultation;
- Assess transport context
  - Development of a transport model;
  - Review Existing Transport and land use context;
  - Transport Assessment of Proposal;
- Recommend package of measures
  - Infrastructure options to address the direct transport impacts of the University concept plan;
    - Road infrastructure improvements;
    - Pedestrian & cyclist infrastructure improvements;
    - Public transport infrastructure improvements;
  - Transport service recommendations;
  - Land use and transport planning policy initiatives including travel demand management.

An important element of the transport assessment of the University's CP was the development and running of a project-specific local transport model. This enabled the impacts of the various development scenarios to be tested. The model is a key tool designed to assist in efforts to better integrate land use and transport planning for the Macquarie Park area.

The Macquarie Park transport model was developed to test the relationship between land use and transport. The model was used to estimate the effect on transport outcomes of various land use scenarios and to provide feedback for refinement of the scenarios. With this overall goal, the objectives of the model were identified to be to:

- Identify existing demand patterns;
- Assist in the identification of existing transport deficiencies;
- Forecast transport demand patterns for various scenarios; and
- Assist in the identification of measures for optimising the transport/land use system.

To achieve these objectives, the model needed to be sensitive, in particular, to land use changes in terms of parking provision, traffic generation characteristics and particularly in traffic congestion.

The model constructed for this study was based on the Roads and Traffic Authority's (RTA) EMME/2 Sydney network model, which uses the Transport Data Centre's (TDC) multi-modal Sydney Strategic Transport Model (SSTM) (EMME/2) as its foundation. These models consider the multi-modal trips. The Macquarie Park transport model was developed using the SATURN software package. It is capable of modelling the impacts of various land use scenarios.

Two development scenarios plus the base case were tested for the future target year of 2031, with traffic implications assessed for both the AM and PM peaks. The final element of the modelling process was the detailed analysis of the implications for intersection performance. This task was performed using the SIDRA modelling package. The modelling process is thoroughly documented in the Macquarie University Concept Plan TMAP (Cardno, February 2008).

The 2031 Macquarie Park transport model tested various development scenarios. The MUCP proposal was tested, this included assumptions about the potential development of the subject site as follows:

- Gross Floor Area (GFA) - 56,765 $m^{2;}$
- Parking Provisions: 1235 spaces; and
- 2271 employees.

The Macquarie Park transport model has been utilised in this study to assess the impact of the proposed Cochlear Stage 1 development on the base year model. The ultimate development in future years is considered to be reasonably considered within the Macquarie University Concept Plan.

1.3 DIRECTOR GENERALS REQUIREMENTS

The NSW Government's Department of Planning issued a list of "Director-General's Environmental Assessment Requirements" (DGR) for the Cochlear Global Headquarters Building – 'Station South Precinct', Macquarie University Campus on the 25th of March 2008.

The DGR's indicated a list of key issues to be addressed in relation to transport, traffic and access:

- Demonstrate compliance with the RTA Guidelines for Traffic Generating Developments;
- Existing traffic conditions, road network and road capacity on, and in vicinity of, the site;
- Proposed internal road and access arrangements;
- Measures to promote public transport usage and modal share including bus and train networks and connections;
- Pedestrian and bicycle linkages;
- Proposed car parking arrangements; and
- Proposed emergency evacuation and public access.

In preparing the DGR's the Department of Planning took advice from the RTA and the City of Ryde. Comments from these agencies relating to transport, traffic and access are summarised in the following sections.

1.3.1 City of Ryde

In a letter dated 6 March 2008, the City Of Ryde (CoR) indicated that it recently exhibited the draft Macquarie Park Corridor DCP and draft Public Domain Technical Manual. The CoR stated that the "draft requirements of this document are to be considered as part of the proposal."

They also indicated a particular interest in the following:

- Urban Design;
- Traffic;
- Car parking;
- Noise to adjacent Residential Schools/Student;
- Accommodation;
- Public Domain;
- Open Space; and
- Street Network/Roads.

Furthermore they indicated that the Macquarie Park LEP 137 is being reviewed during 2008 and will be publicly exhibited at a later date. However, a number of preliminary draft LEP maps have been prepared to assist people.

1.3.2 Roads and Traffic Authority

In a letter dated 19 March 2008, the RTA indicated that they would like the following issues to be included in the traffic impact assessment of the proposed project:

- Daily and peak traffic movements likely to be generated by the proposed project including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required);
- Details on the proposed accesses and the adequacy of the parking provisions associated with the proposed project including subsequent compliance with the requirements of the relevant Australian Standards (i.e.: turn paths, sight distance requirements, aisle widths, etc);
- Details on loading and servicing facilities;
- The application must be consistent with the Macquarie University Concept Application;
- Proposed number of car parking spaces and whether it complies with the appropriate parking codes;
- Details on public transport accessibility;
- Details of proposed cycleways and connections to the existing cycle network;
- The report must also address the provision of appropriate pedestrian facilities and links that would serve this site; and
- Implementation of Travel Demand Strategies for the project site, such as:
  - Allocation of shared car spaces (i.e.: for pooled cars);
  - Secure bicycle parking is to be provided on site together with change facilities; and
  - Provision of Travel Guide documents for all employees.

1.4 REFERENCED DOCUMENTS

As a minimum, the following documents have been referenced as part of this study:

- Macquarie University Concept Plan TMAP (Cardno, Feb 2008);
- Macquarie Park Traffic Study Final Draft (Bitzios Consulting, May 2008);
- Macquarie University Campus Development Plan (MQU, 2004);
- Macquarie University Concept Plan (MUCP) and State Significant Site (SSS) Listing (Cox, Nov 2007);
- Cochlear Global Headquarters Project, Macquarie University Campus South Precinct, Schedule 1(a) Scope of Works, Traffic and Parking Consultant (Feb 2008);
- Ryde Local Environmental Plan No 137 (LEP137) – Macquarie Park Corridor (MPC) (adopted by the City of Ryde on 20th January 2006);
- City of Ryde Development Control Plan 2006 (DCP 2006) (adopted by the City of Ryde on the 4th July 2006);
- Draft City of Ryde Development Control Plan (Draft DCP), Part 4.5, Macquarie Park Corridor, exhibited for comment between 15th February and 25th March 2008;
- Ryde Planning Scheme Ordinance (published in Government Gazette No. 73 of 1st June, 1979), incorporating the provisions of local environmental plans gazetted up to 4 August 2006;
- AS1428.1:2001 Design for Access & Mobility Part 1;
- AS2890.1:1993 – Parking Facilities – Part 1: Off-street Car Parking;
- AS2890.1:2004 – Parking Facilities – Part 1: Off-street Car Parking;
- AS2890.2:2002 – Parking Facilities – Part 2: Off-street Commercial Vehicle Facilities;
- Draft AS2890.6 Parking Facilities - Part 6: Off-street parking for people with disabilities;
- Austroads Guide to Traffic Engineering Practice (AGTEP) Part 11 Parking;
- Building Code of Australia (BCA): Part D3 - Access for people with Disabilities;
- RTA's Guide to Traffic Generating Developments (2002);
- www.busways.com.au; and
- www.131500.com.au.

1.5 REPORT STRUCTURE

This report is divided into 6 sections:

- SECTION 1 provides an introduction and background to the study;
- SECTION 2 provides an overview of the project proposal;
- SECTION 3 documents the existing situation;
- SECTION 4 provides an overview of the project proposal in terms of parking layout and adequacy including access arrangements;
- SECTION 5 outlines the transport impacts of the proposal; and
- SECTION 6 summarises the key issues and recommendations of the report.

2 PROJECT PROFILE

The proposed development site for a new purpose built Cochlear Headquarters facility is located on Macquarie University's residual land at the North Ryde Campus known as the 'Station South Precinct'. The facility will contain office/administration areas, as well as some areas for manufacturing/research and warehouse usage. It is envisaged that the form of the buildings will be largely that of typical, newer, 'A' grade office buildings in the Macquarie Park area. Table 2.1 summarises the key planning assumptions of the proposed project.

Table 2.1 Planning Assumptions

	Site Area (m^2)	GFA (m^2)	FSR	Employees	Parking Provision
Administrative/Corporate		17,081			
Manufacturing/Research		5,192			
Warehousing		2,070			
Sub-Total Stage 1	**12,600**	**24,343**	**1.93**	**1,250**	**544**
TOTAL at completion	**12,600**	**54,543**	**4.33**		

2.1 PROJECT DETAILS

Stage 1 of the proposed Cochlear Headquarters facility is to comprise the following:

- Car parking provision for 544 cars, with 146 at grade spaces and 398 basement parking spaces within the site;
- 17,081m^2 GFA of office area;
- 5,192m^2 GFAA of manufacturing/research area; and
- 2,070m^2 GFA warehouse space.

Table 2.2 below shows the location and GFA of the uses within the proposed project.

Table 2.2: Summary of land use by building floor

Floor level	Total GFA (m^2)	Office use (m^2)	Manufacturing/Research use (m^2)	Warehouse use (m^2)
Lower ground	1,765	-	-	1,765
Ground	3,712	2,403	1,004	305
1	3,855	2,478	1,377	-
2	3,861	2,419	1,442	-
3	3,861	2,868	993	-
4	3,833	3,457	376	-
5	3,456	3,456	-	-
Total	**24,343**	**17,081**	**5,192**	**2,070**

The total floor space of this project on completion of Stage 1 will be 24,343m^2 GFA. A concept layout is provided in Appendix A.

At full development (estimated to be in 2025) the Cochlear Global Headquarters is anticipated to comprise:

- Car parking provision for around 1200 car spaces;
- 54,600m^2 GFA of office, manufacturing/research, and warehouse area; and
- approximately 3,000 staff.

2.2 FLOOR SPACE RATIOS (FSR)

The site area is approximately 12,600m^2, hence the FSR for this stage of the project is approximately 1.93:1.

2.3 HOURS OF OPERATION & STAFF NUMBERS

The proposed Stage 1 facility will generally operate 16 hours per day (6am to 10pm), Monday to Friday and Saturday mornings. It has been advised that in the order of 1,250 staff will be employed at the site at Stage 1 full development. Staff associated with the manufacturing/research and distribution (350 employees) businesses will work over 2 shifts - with skeleton staff working 24 hours per day. There will be some 200 staff (16%) manufacturing/research and warehouse working from 6am to 2 pm and 150 (12%) from 2pm to 10pm. The remainder of staff (900 employees) are expected to work normal business hours.

The staff numbers and shifts are summarised in Table 2.3

Table 2.3: Summary of land use by building floor

Floor level	No. of Staff	Typical Work Hours
Office	900	Business Hour
Manufacturing/research and distribution ▪ Day shift ▪ Night Shift	 200 150	 6am to 2pm 2pm to 10pm
Total	**1250**	-