
# Eden Gardens Redevelopment
# Traffic Impact Assessment

Prepared for:

Thunderbirds Are Go Pty Ltd atf the Gardeners Trust

2 March 2021

The Transport Planning Partnership

# Eden Gardens Redevelopment
# Traffic Impact Assessment

Client: Thunderbirds Are Go Pty Ltd atf the Gardeners Trust

Version: V09

Date: 2 March 2021

TTPP Reference: 19202

**Quality Record**

| Version | Date | Prepared by | Reviewed by | Approved by | Signature |
|---|---|---|---|---|---|
| V09 | 02/03/21 | Oasika Faiz, Charbel Hanna | Ken Hollyoak | Ken Hollyoak |  |

# Table of Contents

# Tables



# Figures

# APPENDICES

# 1 Introduction

A Development Application (DA) is to be lodged with City of Ryde Council (Council) seeking approval for the alterations and additions to the Eden Gardens site to enable a mixed-use development containing in the order of:

- 17,516m$^2$ of commercial GFA
- 1,222m$^2$ of nursery/ garden centre GFA
- 1,482m$^2$ of neighbourhood shops/ garden centre GFA
- 1,328m$^2$ of restaurant GFA, and
- 995m$^2$ of function area GFA.

On this basis, The Transport Planning Partnership (TTPP) has prepared this traffic impact assessment, to assess the traffic and parking impacts of the proposed development.

This assessment addresses the requirements set by Council during pre-DA consultation. Council comments and the associated location where they have been addressed is summarised in Appendix E.

This report sets out an assessment of the anticipated traffic impacts of the proposed development, including the following:

- existing transport conditions surrounding the site;
- car parking, pedestrian and bicycle requirements;
- the traffic generating characteristics of the proposed development;
- suitability of the proposed access arrangements for the site, and;
- the transport impact of the development on the surrounding road network.

# 2 Existing Conditions

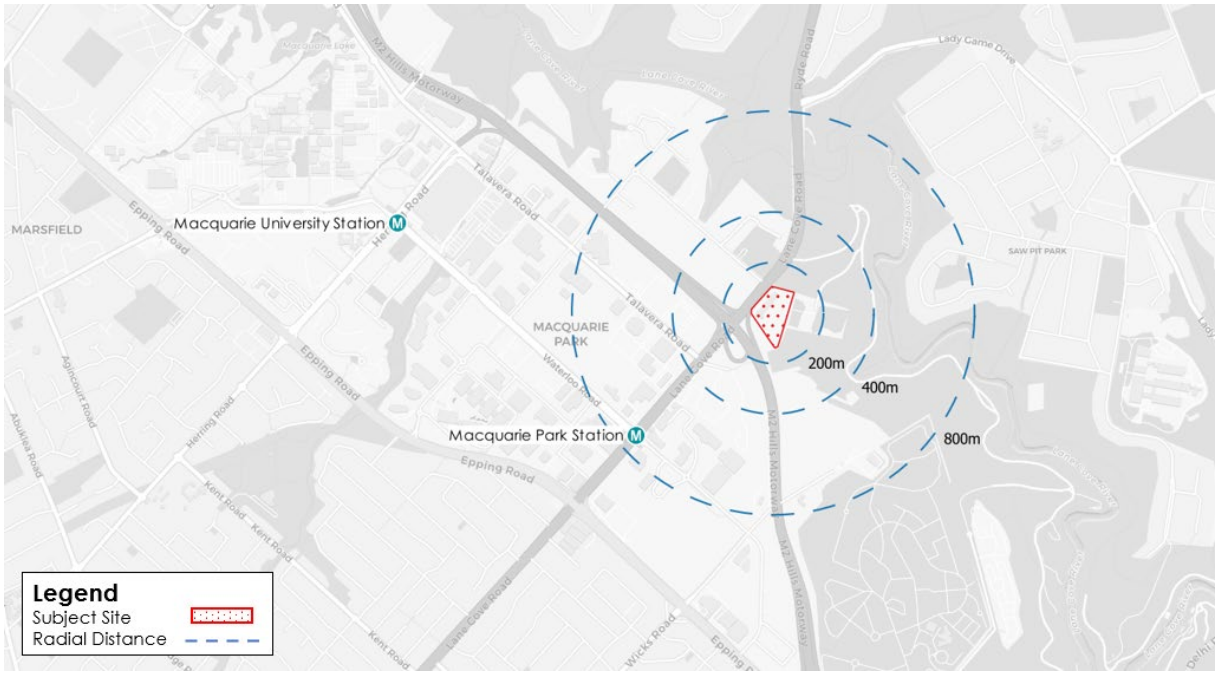
## 2.1 Site Description

The subject site is located at 307 Lane Cove Road, Macquarie Park and is within the Ryde Local Government Area (LGA). The site has one street frontage, Lane Cove Road, which provides access to the site. The site is also situated close to the intersection of Lane Cove Road and the M2 Motorway.

The site is currently occupied by the integrated horticultural development known as Eden Gardens. The garden centre also includes a café with indoor and outdoor dining and event spaces for hire. Land uses surrounding the site primarily comprise high-density residential and public recreation developments, as well as National Parks and Nature Reserves.

The site location and its surrounds are shown in Figure 2.1.

**Figure 2.1: Site Location**




*Base Map Source: Carto Voyager*

An aerial photograph of the site is provided in Figure 2.2.

**Figure 2.2: Site Aerial**


*Base Map Source: Nearmap, photograph dated 18/04/20*

## 2.2 Road Network

### 2.2.1 Lane Cove Road

Lane Cove Road is a State Road (A3) and forms one of the major north-south arterial links in the northern/ north-western suburbs. The road provides good connectivity to the wider arterial road network, notable to Ryde Road, M2 Motorway, Victoria Road and Devlin Street. Within the vicinity of the site, Lane Cove Road runs in a northeast – southwest direction. The road provides 3 through traffic lanes in each direction separated by a central median. Lane Cove Road also provides a dedicated left-turn lane (short lane) into Fontenoy Road which acts as the access road to the subject site. The road has a posted speed limit of 70 km/h in both directions within the vicinity of the site.

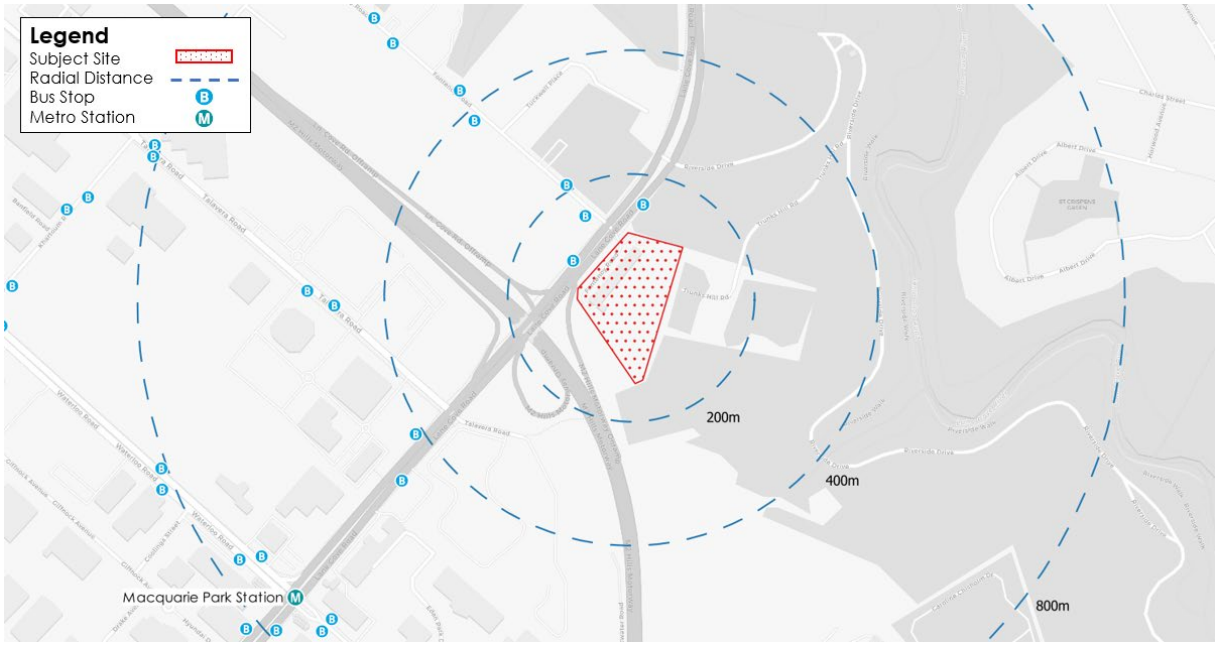
### 2.2.2 Fontenoy Road

Fontenoy Road is a local road which intersects with Lane Cove Road to the west of the site and acts as the site's access road. Fontenoy Road provides one traffic lane in each direction and intersects with Lane Cove Road. The intersection of Lane Cove Road and Fontenoy Road is a signalised intersection.

## 2.3 Public Transport

The site is primarily served by bus services and metro rail services. Figure 2.3 indicates the proximity of the site to nearby bus stops and metro stations.

**Figure 2.3: Public Transport Map**

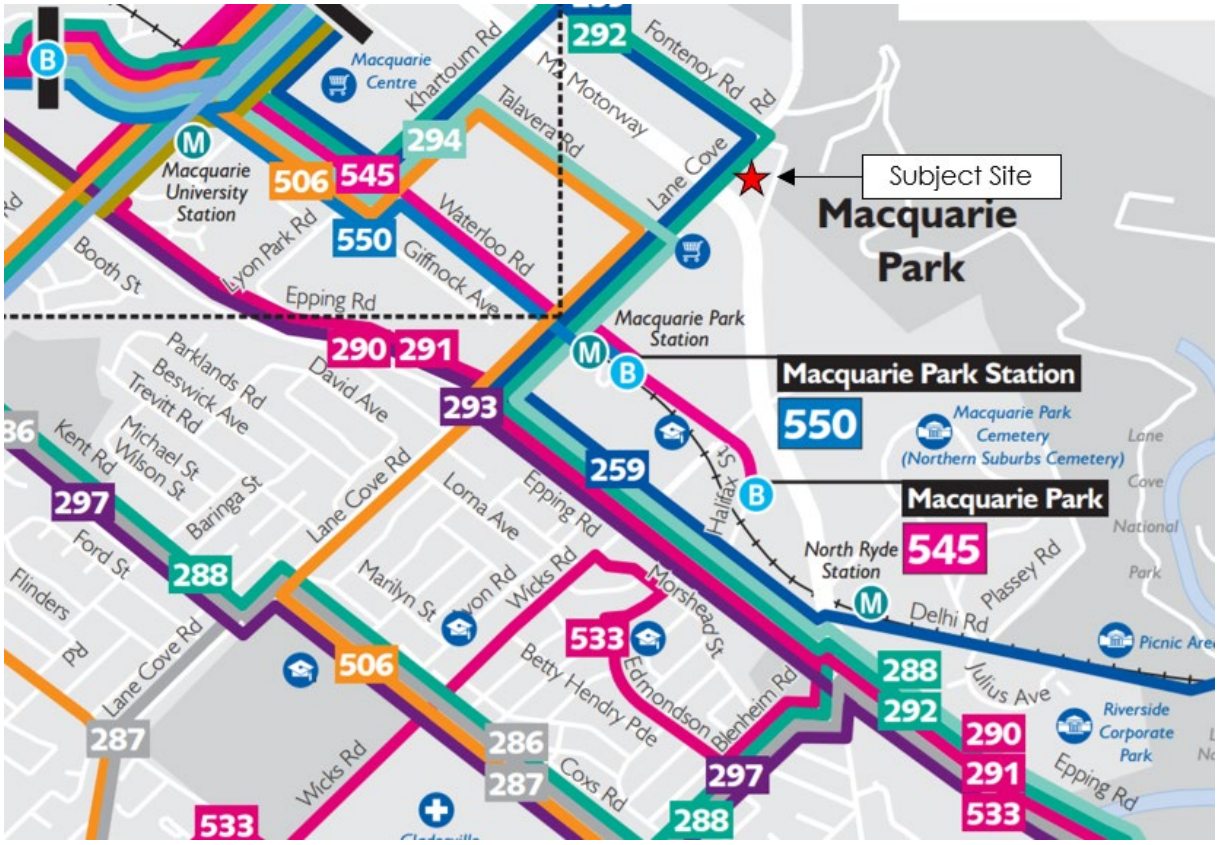



*Base Map Source: Carto Voyager*

### 2.3.1 Bus

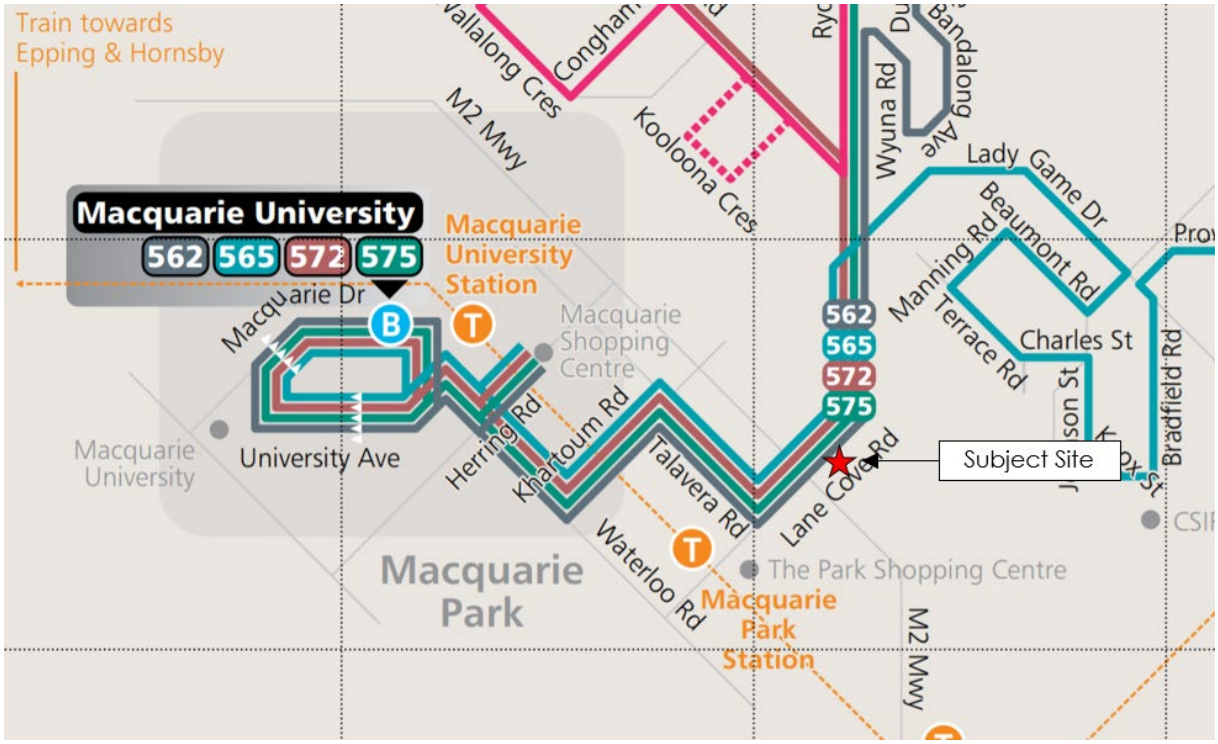
Bus services within the vicinity of the site are provided by State Transit Authority, Transdev and Forest Coach Lines and are shown in Figure 2.4, Figure 2.5 and Figure 2.6.

**Figure 2.4: Bus Routes (North Shore and West)**



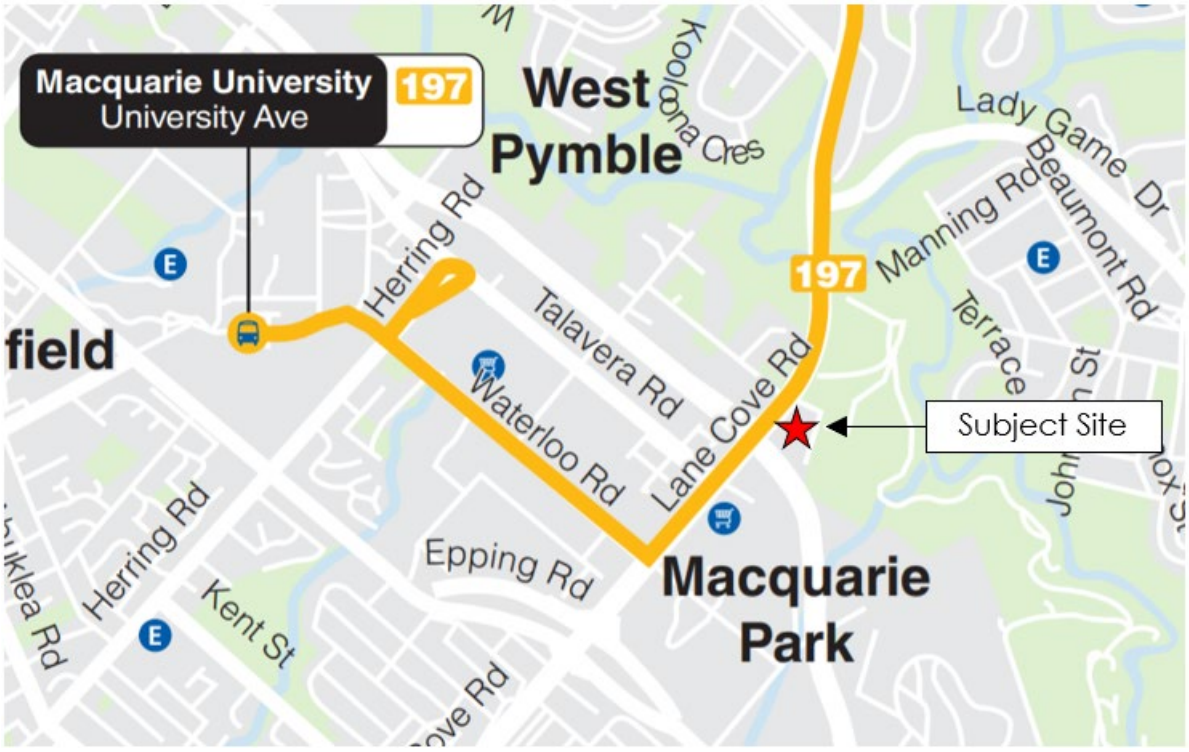

Source: https://transportnsw.info/document/4247/state-transit-north-shore-and-west-network-map_0.pdf

**Figure 2.5: Bus Routes (Upper North Shore)**




Source: https://www.transdevnsw.com.au/uploads/18637_Region_12_Network_Map_20180212_web.pdf

**Figure 2.6: Bus Routes (Forest Coach Lines)**




*Source: https://forestcoachlines.com.au/network-map/sydney/*

Table 2.1 indicates the bus services which run within the vicinity of the site:

**Table 2.1: Public Bus Services**

| Service | Route | Route Description | Location | Frequency (peak / off peak) |
|---|---|---|---|---|
| Bus | 197 | Mona Vale to Macquarie University via Gordon | Lane Cove Road Opposite Eden Gardens<br><br>Stop Nos.<br>2113312<br>2113188 | 15 mins / 30 mins |
| | 562 | Gordon to Macquarie University | | 3 weekday services only, runs between 10:30am – 1:00pm |
| | 565 | Chatswood to Macquarie University | | 20 mins / 60 mins |
| | 572 | Turramurra to Macquarie University via South Turramurra & West Pymble | | 15 mins / 30 mins |
| | 575 | Hornsby to Macquarie University | | 20 mins / 30 mins |
| | 292 | Marsfield to City Erskine St via Macquarie Park | | 30 mins |

Notably, bus route 197 runs between the site and Macquarie Park Station via a 5-minute trip and provides services every 15 minutes during the peak periods.

It is noted that the following School Buses also run within the vicinity of the site:

- 259 – Brigidine College to Gordon Station (stops along Fontenoy Road, stop no. 2113189)
- 8037 – Lane Cove Road before Quarry Road, Ryde to Galstaun College (stops along Lane Cove Road, stop no. 2113188)

The suburbs serviced by the above bus routes are listed in Table 2.2.

**Table 2.2: Bus Stops by Suburb**

| Suburb | Number of Stops within Suburb (Based on Route 197, 562, 565, 572, 575 and 292) |
|---|---|
| WEST PYMBLE | 61 |
| MACQUARIE PARK | 53 |
| LINDFIELD | 50 |
| WAHROONGA | 46 |
| TURRAMURRA | 40 |
| PYMBLE | 31 |
| ROSEVILLE | 29 |
| ST IVES | 28 |
| KILLARA | 26 |
| SOUTH TURRAMURRA | 21 |
| LANE COVE NORTH | 20 |
| TERREY HILLS | 18 |
| HORNSBY | 18 |
| MARSFIELD | 17 |
| MONA VALE | 10 |
| GORDON | 8 |
| BELROSE | 8 |
| INGLESIDE | 8 |
| NORTH RYDE | 7 |
| SYDNEY | 5 |
| CHATSWOOD | 4 |
| LANE COVE | 2 |

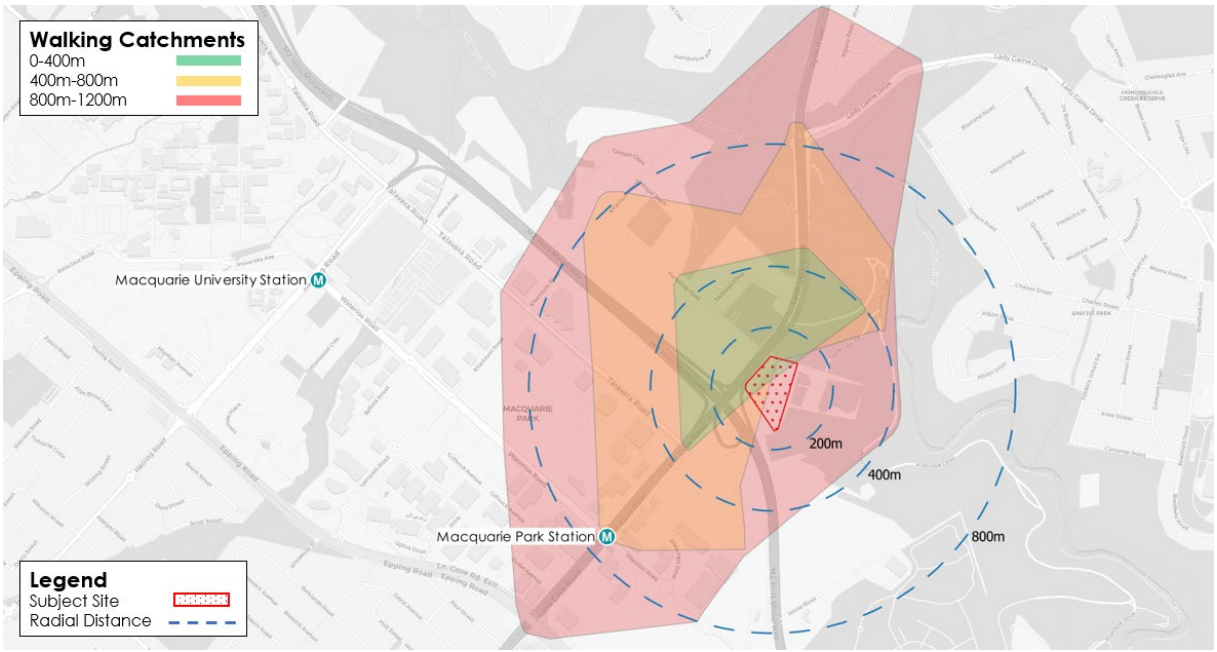
### 2.3.2 Metro Rail

The closest metro station is located at Macquarie Park Station, located 840m in walking distance from the site. Macquarie Park Station services the Tallawong to Chatswood line with services running every 4 minutes during the peak hours and every 10 minutes before and thereafter peak hours.

## 2.4 Pedestrian and Cyclist Infrastructure

Pedestrian footpaths are generally provided on all streets surrounding the site. There are signalised pedestrian crossings on 3 of the 4 legs of the intersection of Lane Cove Road / Fontenoy Road. Figure 2.7 indicates the walking catchments from the site entrance on Fontenoy Road. It should be noted that Macquarie Park Metro Station is located just within an 840m walking distance following the footpath network or within an 800m radial distance.

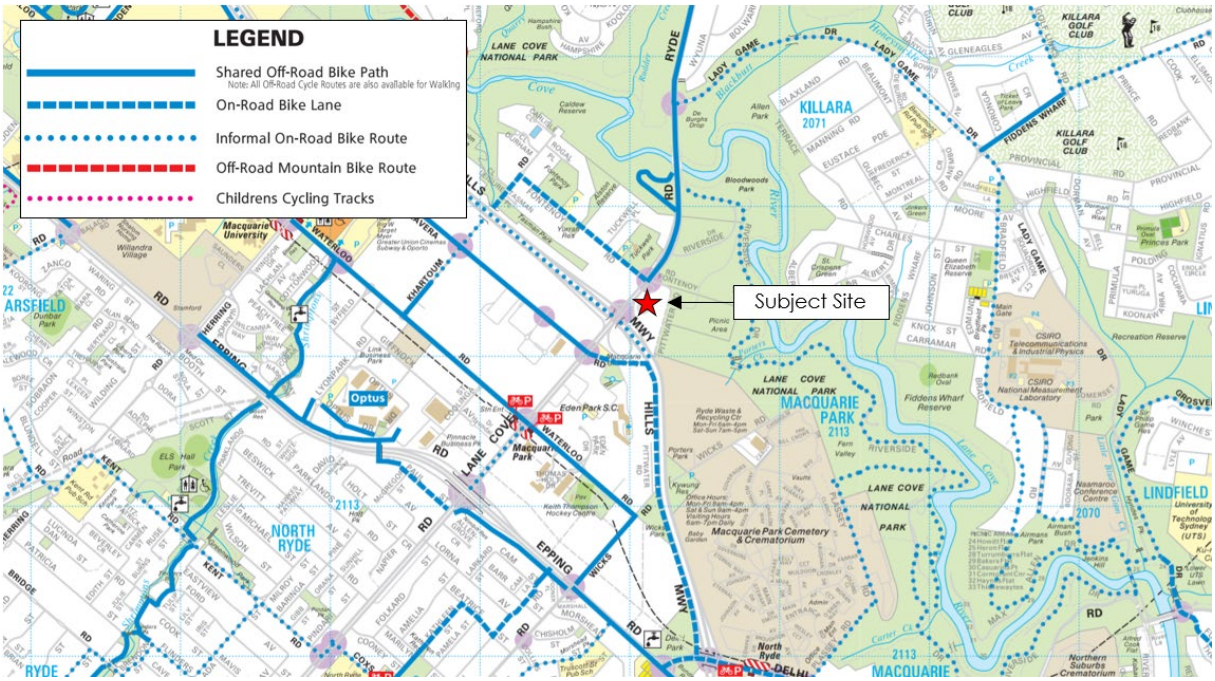
**Figure 2.7: Walking Catchments**




*Source: openrouteservice.org*

Cycling routes surrounding the site are shown in Figure 2.8.

**Figure 2.8: Ryde City Council Cycling Routes**




*Source: https://www.ryde.nsw.gov.au/files/assets/public/maps/city-of-ryde-bike-map.pdf*

## 2.5 Car Share Facilities

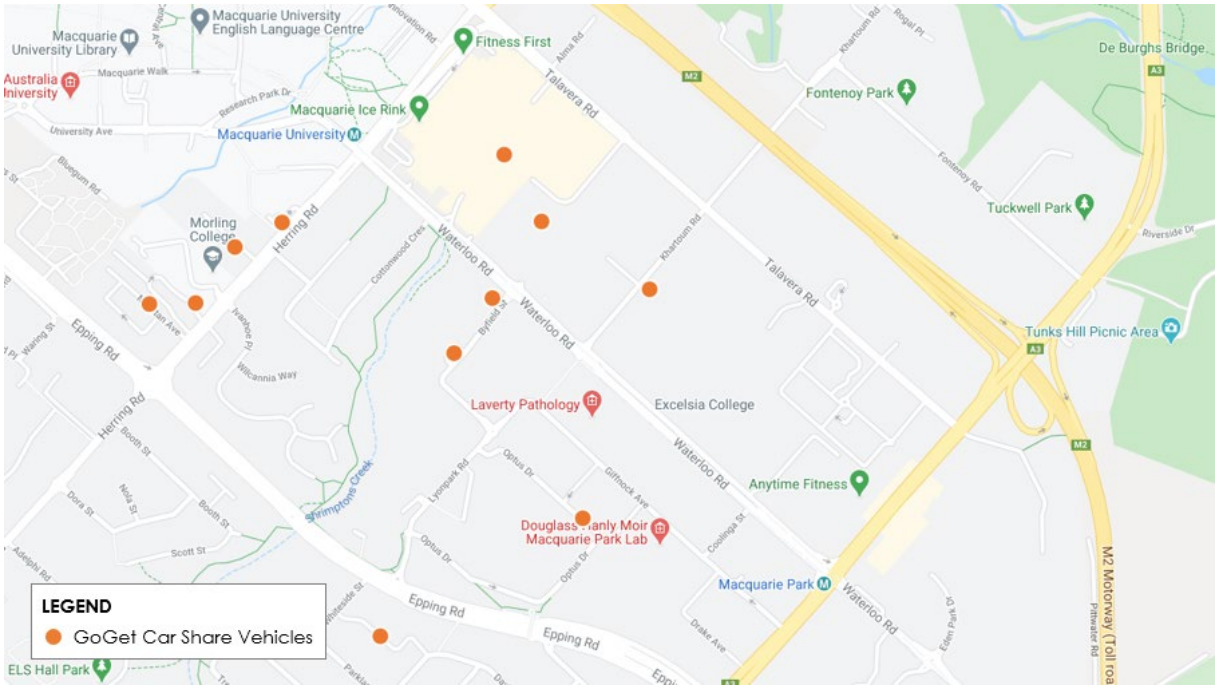
Car sharing is a flexible, cost effective alternative to car ownership and is a convenient and reliable way for staff and visitors to use a car when they need one. GoGet is a car share company operated in Australia, with a number of vehicles positioned within the area.

Car share is a concept by which members join a car ownership club, choose a rate plan and pay an annual fee. The fees cover fuel, insurance, maintenance, and cleaning. The vehicles are mostly sedans, but also include SUVs and station wagons. Each vehicle has a home location, referred to as a "pod", either in a parking lot or on a street, typically in a densely populated urban neighbourhood. Members reserve a car by web or telephone and use a key card to access the vehicle.

Notably, the City of Sydney Council has reported that *"a single car share vehicle can replace up to 12 private vehicles that would otherwise compete for local parking"*.

As such, the provision of car sharing facilities should be able to reduce both the parking demand for the site and the traffic generated by it. The nearest car share facility to the site is approximately 1.2km away from the site on Khartoum road as shown in Figure 2.9, however, the development proposes to include new car share vehicles on-site, as discussed in Section 4.4.

**Figure 2.9: GoGet Car Locations**




*Source: GoGet Australia*

## 2.6 Existing Traffic Generation

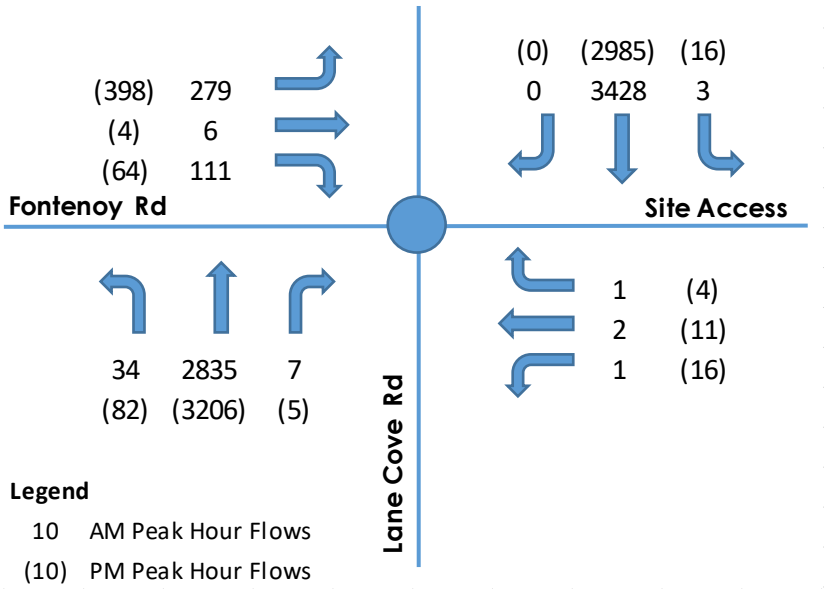
TTPP was unable to undertake traffic surveys of the site access or nearby intersections at the time of this assessment, due to the COVID-19 pandemic which has resulted in atypical traffic flows on the road network. Notably, traffic flows appear to significantly lower than typical.

On this basis, historical traffic data has been sourced from a traffic modelling report prepared by Traffix[1], for the signalised access to the development site. The survey data is understood to be from 2018. This report has been reviewed to obtain traffic flow data for the site access and generalised signal timing and operation information from the appended SIDRA output reports.

The information in the report indicates that the site currently generates 20 vehicles during the morning peak hour and 56 vehicles during the evening peak hour on a typical weekday. The traffic flows are presented in Figure 2.10.

1 Traffix, June 2020, *307 Lane Cove Road, Macquarie Park (Eden Gardens), Traffic Modelling for Planning Proposal*

**Figure 2.10: Existing Peak Hour Traffic Flows**




## 2.7 Mode Split Analysis

Method of Travel to Work (MTW) using 2016 Census data has been obtained from the Australian Bureau of Statistics (ABS) in order to understand the existing travel behaviour of employees in the vicinity of the site. A selection of four destination zones (DZN) have been selected for mode share analysis.

**Figure 2.11: Selected DZN Areas**

An analysis of the data indicates car travel for staff is prominent in the area with an 85% mode share. However, it is relevant to note that the 2016 census was undertaken prior to the opening of the Sydney Metro line and therefore, the mode share for public transport may be higher in 2020. A full breakdown of the results is displayed in Table 2.3.

**Table 2.3: MTW Modal Splits**

| Main Method of Travel | Employee MTW | Sydney Benchmark |
|---|---|---|
| Train | 7% | 20% |
| Bus | 5% | 7% |
| Car Driver/ Passenger | 85% | 66% |
| Motorbike/ Scooter | 0% | 1% |
| Bicycle | 0% | 1% |
| Walk | 3% | 5% |
| Taxi | 0% | 0% |
| **Total** | **100%** | **100%** |

*Note: "Worked at home" or "Did not go to work" have been excluded from this analysis*

# 3 Development Proposal

## 3.1 Development Description

The existing site includes the Eden Gardens integrated horticultural development. The development seeks to demolish some of the existing structures on-site to provide a mixed-use development comprising the following:

- 17,516m$^2$ of commercial NLA
- 1,222m$^2$ of nursery/ garden centre GFA
- 1,482m$^2$ of neighbourhood shops/ garden centre GFA
- 1,328m$^2$ of restaurant and café GFA, and
- 995m$^2$ of function area GFA.

The existing vehicular access to the site would be maintained, which forms the south-east leg of the signalised intersection of Lane Cove Road and Fontenoy Road.

The access connects to the vehicular roadway that runs along the eastern, northern and western boundaries of the site (as per existing conditions) and would provide access to the existing at-grade car spaces.

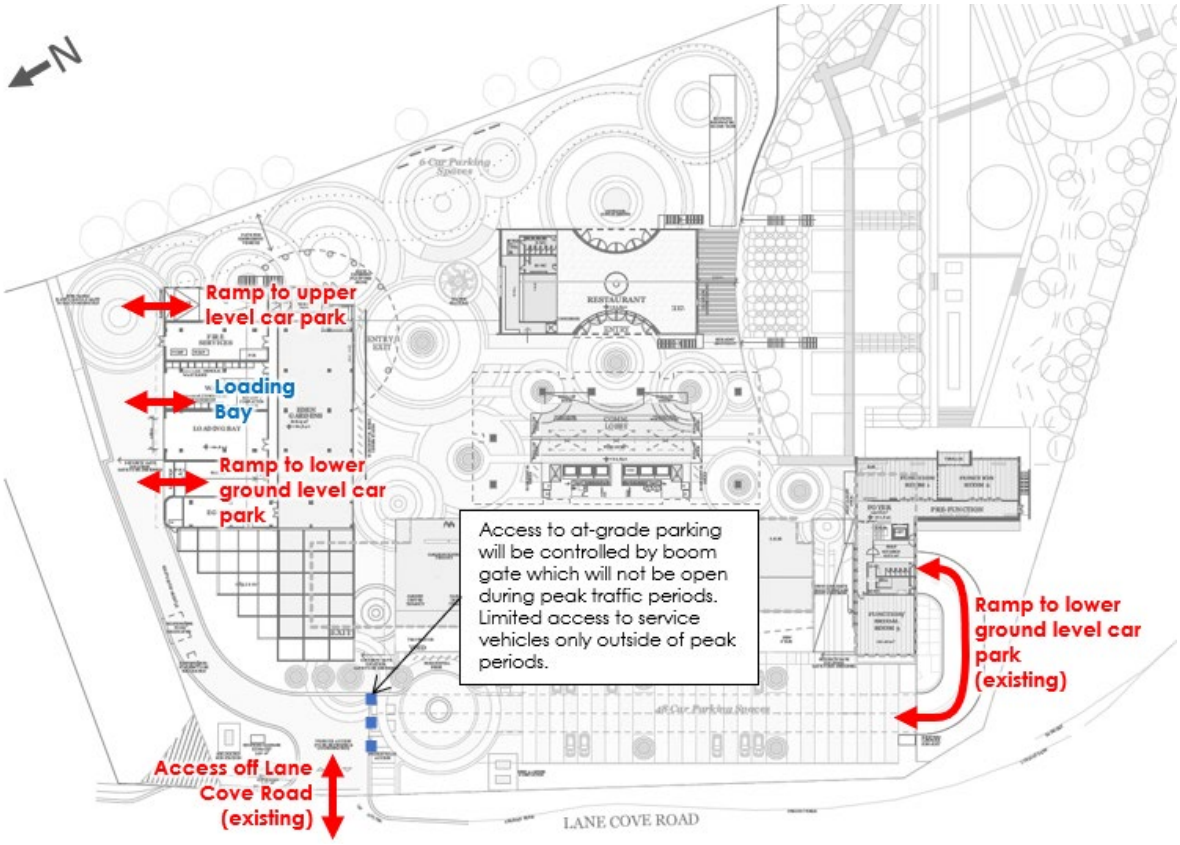
The roadway would also provide separate ramps to the upper car parking levels (level 1-4) and the lower ground car park.

The lower ground car park is existing and would be expanded to the north to retain 175 existing car spaces and provide additional new car spaces. The upper levels of car parking are proposed levels.

The total site car parking provision is expected to be 502 spaces.

The ground floor layout is shown in Figure 3.1.

**Figure 3.1: Concept Layout (Ground Floor Level)**




*Note: Above figure is conceptual. Detailed site plan is shown in Appendix A.*

Customers are expected to access the car parks via the proposed ramps to the left of the site access. The existing ramp to the lower ground level car park is to be controlled through the use of boom gates as further discussed in Section 5.4.

The concept architectural plans are provided Appendix A.

## 3.2 Loading Dock Facilities

It is proposed to provide two loading bays designed for 12.5m long heavy rigid vehicles on the Ground Floor. The loading dock location is indicated in Figure 3.1.

Service vehicle access would be undertaken directly via the internal roadway, which is to be 7.0m wide and facilitate two-way flows for cars accessing the car parks, as well as service vehicles to the loading dock.

Waste collection would be undertaken within these loading bays, with the waste storage area located immediately adjacent to the loading bays. Swept path analysis of the loading dock is provided in Appendix B.

## 3.3 Hours of Operation

The hours of operation for the Eden Gardens Centre is detailed in Table 3.1.

**Table 3.1: Hours of Operation**

| Use | Monday-Friday | Saturday | Sunday | Public Holiday |
|---|---|---|---|---|
| Centre Open Hours | 6am – 12 Midnight | 6am – 12 Midnight | 6am – 12 Midnight | 6am – 12 Midnight |
| Commercial Office | 7am – 7pm<br>Security access available after hours | Security access available after hours | Security access available after hours | Security access available after hours |
| Eden Gardens & Garden Centre | 7:30am – 7pm (9pm on Thursdays) | 7:30am – 7pm | 7:30am – 6pm | 7:30am – 6pm |
| Neighbourhood Shops & Cafe | 7:30am – 7pm (9pm on Thursdays) | 7:30am – 7pm | 7:30am – 6pm | 7:30am – 6pm |
| Restaurant | 7:30am – 11pm | 7:30am – 11pm | 7:30am – 11pm | 7:30am – 11pm |
| Function Centre | 6:30am – 11pm | 6:30am – 11pm | 6:30am – 11pm | 6:30am – 11pm |

*Source: Eden Gardens Site Plan of Management*

Other operational characteristics of the site is detailed in Eden Garden's Plan of Management (submitted as a separate document as part of the DA).

# 4 Parking Assessment

## 4.1 Car Parking Requirements

### 4.1.1 DCP Parking Requirements

The car parking requirements for the proposed development have been sourced from the City of Ryde Development Control Plan 2014 (DCP), except for the garden centre and nursery, for which the DCP does not provide a rate. As such, the rate for the nursery has been obtained from the *Roads and Maritime Guide to Traffic Generating Developments 2002*, which recommends the greater of the following rates for a 'Plant Nurseries':

- 0.5 spaces per 100m$^2$ of site area, or
- minimum of 15 spaces.

The parking requirements for the proposed development is summarised in Table 4.1.

**Table 4.1: Development Parking Requirements**

| Land Use | Size (m$^2$ GFA) | Parking Rate | Parking Requirement |
|---|---|---|---|
| Commercial/ Office | 17,516 | 1 space / 40m$^2$ | 438 |
| Garden Centre | 1,222 | 0.5 space / 100m$^2$ or 15 spaces whichever is greater | 15 |
| Neighbourhood Shops | 1,482 | 1 space / 25m$^2$ | 59 |
| Restaurant and Cafe | 1,328 | 1 space / 25m$^2$ | 53 |
| Function Centre | 995 | 1 space / 25m$^2$ | 40 |
| **Total** | **22,543** | **-** | **605** |

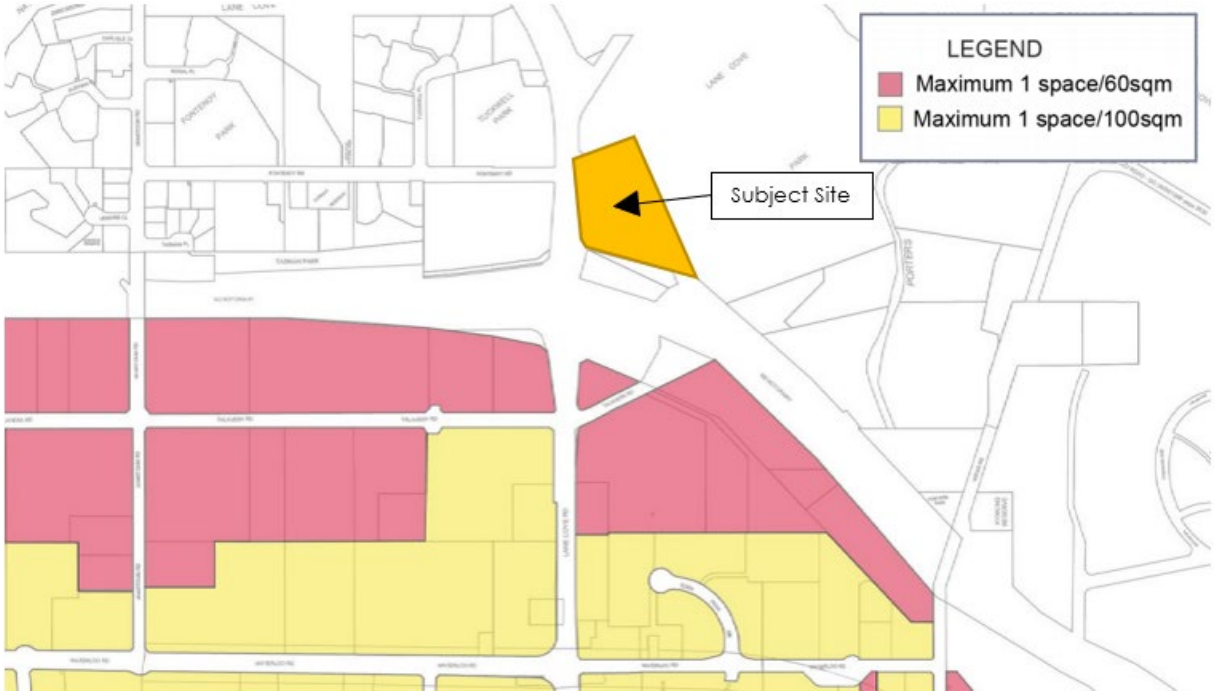
Based on Table 4.1, the development is required a supply of 605 parking spaces, including 438 commercial staff spaces, 112 neighbourhood shop spaces, 15 nursery and 40 function centre spaces.

### 4.1.2 Macquarie Corridor Parking Rate

The DCP stipulates a reduced parking requirement for new industrial and commercial sites within the Macquarie Park Corridor, including 1 space per 100m$^2$ GFA for the centre properties and 1 space per 60m$^2$ GFA for the properties on the outer edges of the corridor.

Notably the site located just outside the Macquarie Park Corridor (by some 200-300m), as shown in Figure 4.1.

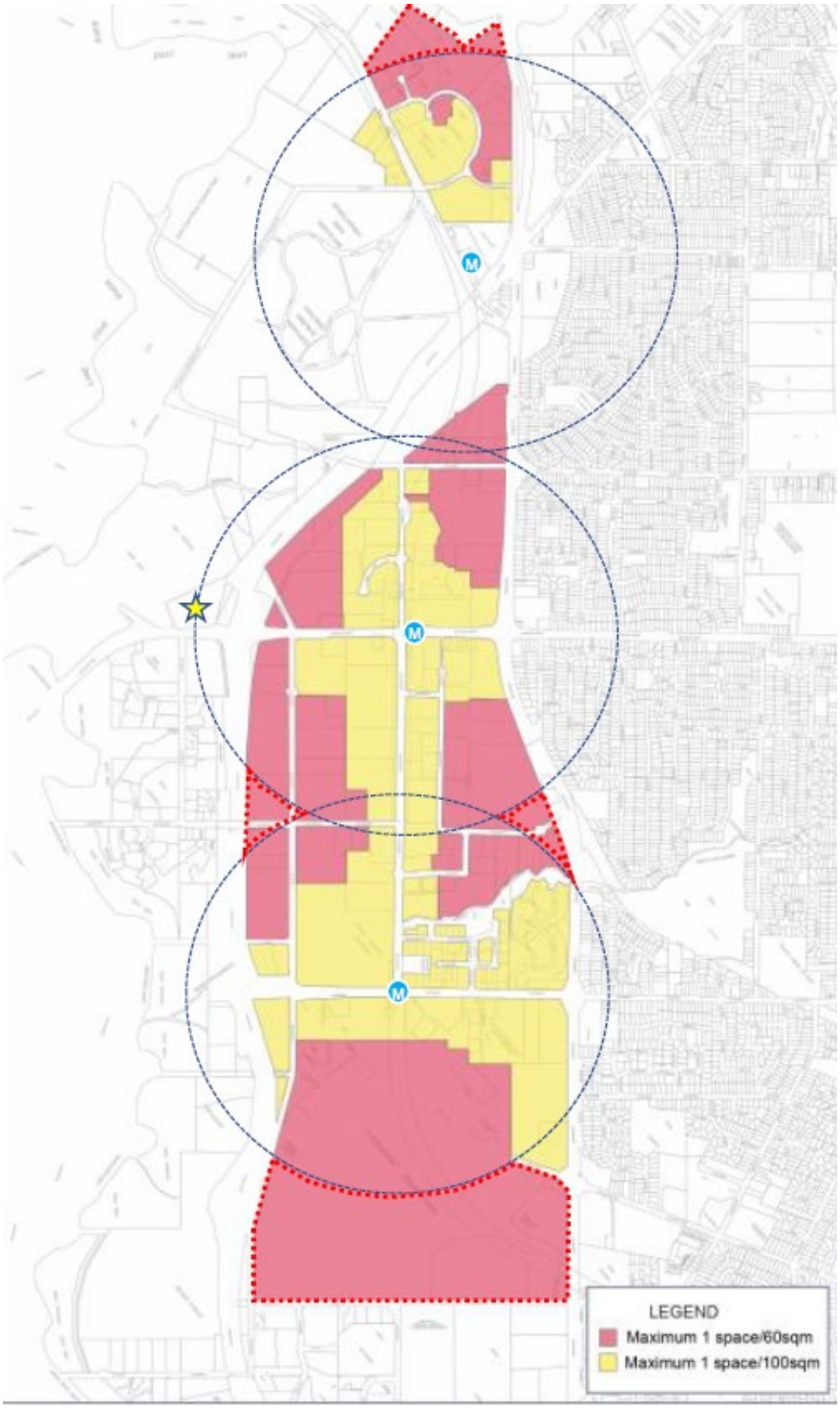
**Figure 4.1: Macquarie Corridor Parking Rates for Commercial Premises**




*Source: Ryde Development Control Plan 2014*

While, not within the Macquarie Park corridor, the site is situated in close proximity to the corridor and is notably, within an 800m radial distance from the Macquarie Park Metro Station. Significantly, the site is closer to the Metro Station than some sites that are part of the Macquarie Park corridor, as indicated in Figure 4.2.

**Figure 4.2: 800m radial distance from Metro Station**




*Note: The subject site is marked with a star.*

On this basis, a reduced parking provision for the site has been assessed.

Based on a rate of 1 space per 60m$^2$ GFA, the development site with 17,516m$^2$ commercial GFA would be required a provision of 292 commercial car parking spaces.

### 4.1.3 Adequacy of Parking Provision

The Ryde DCP parking requirement is considered to be excessive for the following reasons:

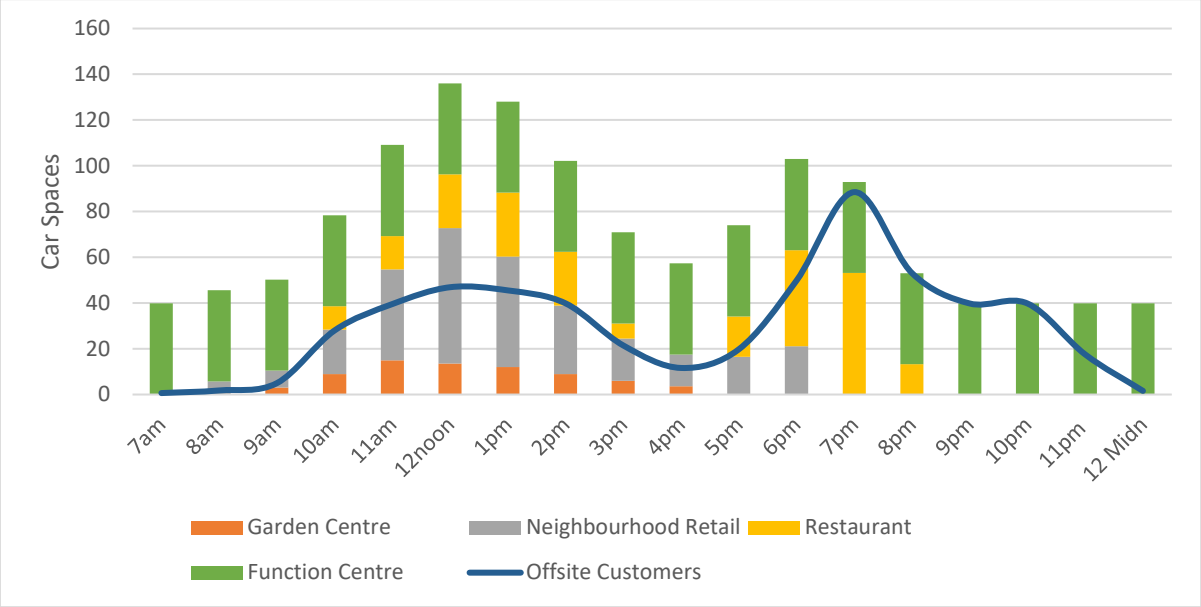
- the rates do not consider multi-purpose trips, with a large portion of neighbourhood shop customers expected to be from the commercial floors above during the weekdays,
- the proposed restaurant facilities are provided to accommodate the demands of the proposed commercial development
- the garden centre has peak customer demand during the weekend and is not expected to generate significant customers during a typical weekday
- the function centre peak customer demand will be during weekday evenings and weekends. It is expected that smaller style corporate events will be held midweek. There is potential for commercial and function centre parking to be shared.
- the parking rate for commercial staff is not supportive of encouraging sustainable transport. Notably, the rate matches the rate recommended by Roads and Maritime Services based on survey data from 1979. However, it is expected that the site could achieve a lower parking generation and higher public transport mode share, with Macquarie Park Metro Station being located within a 5-minute bus trip or a 13-minute walk
- on that note, Macquarie Park Metro Station is within 800m radial distance from the site, which is considered to be the accessible area catchment of a railway station
- the on-foot walking distance between the site and Macquarie Park Metro Station is 840m, which is only 40m beyond the accessible area catchment of 800m
- the DA seeks to contribute to the enhancement of the pedestrian walk from the Macquarie Park Metro Station to the site through a Draft Voluntary Planning Agreement Letter of Offer. This contribution may be provided toward a pedestrian footpath fence on the M2 overpass and footpath widening between Talavera Road and the M2 western on-ramp
- there are also several bus stops within 200m of the site, with the nearest immediately fronting the site and providing services every 15 minutes (Route 197) to Macquarie Park Station
- the DCP car parking rates precedes the opening of the Metro Station which would have reduced the car mode share of the surrounding area significantly
- a Green Travel Plan is to be implemented on-site to reduce car travel (as discussed in Section 6), and would include:
  - on-site parking facility for event buses/coaches as part of the travel demand management of functions
  - car share vehicles are proposed on-site (as discussed in Section 4.4), to reduce the need for staff and tenants to bring their own car. This would be particularly beneficial for commercial staff that attend off-site meetings throughout the day.

On the above basis, it is proposed to provide a reduced parking provision of 358 office spaces (which is 43 spaces greater than the Macquarie Corridor rate).

Additionally, it is not realistic to simply summate all of the individual parking demands when many of the uses will not be coincident (e.g. the function centre would largely be used by the on-site commercial offices).

A parking accumulation assessment has been undertaken based on forecast population data provided by Eden Gardens. The population data forecasts hourly and daily customer demand, which has been interpolated to understand the correlating parking demand on-site as summarised in Figure 4.3.

**Figure 4.3: Neighbourhood Shop and Function Centre Parking Accumulation Assessment**




The data indicates that the peak parking demand as generated by the restaurant component would be at 10am (coffee/breakfast peak) and at 1pm (lunch peak). However, Eden Gardens have estimated that a significant portion of the neighbourhood shop and café/restaurant customers during these times would be office workers from the subject site.

Similarly, the function centre peak event periods will predominantly be weekends and evenings, it is expected that smaller style corporate events will be held midweek, with on-site commercial offices being the primary users.

With this in consideration it is estimated that up to 46 car spaces would be related to off-site customers prior to 6pm as shown in Figure 4.3. Therefore, the proposed provision of 144 neighbourhood shop and function centre spaces is considered well above the expected off-site customer parking demand.

Based on the above, a parking provision of 358 office spaces, 87 spaces for the neighbourhood shop and 57 spaces for the function centre component is considered to be sufficient.

**Table 4.2: Parking Provision Breakdown**

| Land Use | Parking Requirement | | Proposed Provision |
|---|---|---|---|
| | Ryde DCP | Macquarie Park Corridor | |
| Commercial/ Office | 438 | 292 | 358 |
| Neighbourhood Shops + Garden Centre | 127 | 127 | 87 |
| Function Centre | 40 | 40 | 57 |
| **Total** | **605** | **459** | **502** |

It is further noted that a reduced parking provision would align with the objectives of the Ryde DCP which aim "to minimise traffic congestion" and "minimise car dependency" and "promote alternative means of transport – public transport, bicycle, and walking". The relevant objectives of the DCP are:

> *1. To minimise traffic congestion and ensure adequate traffic safety and management;*
>
> *3. To minimise car dependency for commuting and recreational transport use, and to promote alternative means of transport - public transport, bicycling, and walking.*
>
> *4. To provide adequate car parking for building users and visitors, depending on building use and proximity to public transport.*
>
> *7. To reduce congestion in the Macquarie Park Corridor by restricting parking for commercial and industrial development to work towards achieving a target of a 70% private vehicle mode share by 2031.*

Therefore, noting the proximity of the site to public transport, it is considered appropriate to reduce the parking provision on-site with an aim to encourage a greater mode share of sustainable transport.

Notably, a Green Travel Plan or Workplace Travel Plan is proposed to be implemented on site as detailed in Section 6. A balanced parking provision will be a critical measure in ensuring the effectiveness of a Green Travel Plan, which aims to reduce car usage.

On the above basis, the proposed parking provision of 502 spaces is considered suitable for the proposed development.

### 4.1.4 Accessible Parking Requirements

The DCP does not specify accessible parking space requirements. As such, guidance from the Building Code of Australia (BCA) has been sourced.

The accessible parking requirement based on BCA guidelines is summarised in Table 4.3.

**Table 4.3: Accessible Parking Requirements**

| Development Type | Parking Rate | Proposed Parking Spaces | Accessible Parking Requirement |
|---|---|---|---|
| Commercial/ Office | Class 5: 1 space per 100 car spaces | 358 | 4 |
| Shops/ Functions | Class 6: 1 space per 50 car spaces up to 1,000 car spaces | 144 | 3 |
| **Total** | | **502** | **7** |

Table 4.3 indicates that the development should provide seven accessible parking spaces including three for neighbourhood shop and four for commercial staff. It is proposed to comply with this requirement.

## 4.2 Bicycle Parking

Bicycle parking requirements have been assessed against Part 9.3 Section 2.7 of the DCP which stipulates that "*in every new building, where the floor space exceeds 600m² GFA (except for dwelling houses and multi-unit housing) provide bicycle parking equivalent to 10% of the required car spaces or part thereof*".

As such, based on a parking requirement of 502 spaces, the proposed development is required to provide 50 bicycle parking spaces. It is proposed to provide 138 bicycle spaces on-site which complies with this requirement.

End-of-trip facilities such as showers and lockers are also to be provided for commercial offices and staff.

## 4.3 Motorcycle Parking Requirements

No motorcycle parking rates are currently provided within Council's DCP.

The census data for mode share, as detailed in Section 2.7, indicates that there is a zero percent share of motorcycle drivers in the surrounding area, suggesting that travel by motorcycle is likely to be low to the area. Notwithstanding, it is proposed to provide 11 motorcycle spaces within the proposed development.

## 4.4 Car Share Facilities

The DCP does not stipulate any requirements for car share facilities. Notwithstanding, the development proposes to provide four car share vehicles within the lower ground car park.

## 4.5 Car Park Access and Layout

The basement car park and access arrangement have been reviewed for compliance with the Australian Standard requirements, namely AS 2890.1, AS2890.2 and AS2890.6. The review includes an assessment of the following:

- Car park access and circulation
- Parking space and aisle dimensions.

The commercial parking spaces are to be designed as a Class 1 parking facility which require a minimum 2.4m wide by 5.4m long car space with a 5.8m aisle width.

The existing retail/garden centre car park containing 173 car spaces is to be retained as part of total provision of 502 spaces and provides 2.4m wide spaces with 6.0-6.6m aisles. This car park is currently operating well and is to be retained. The new customer parking spaces provided on the ground floor, are to be designed as a Class 3A facility, which require a minimum 2.6m wide by 5.4m long, with a 6.6m aisle.

The car parking spaces are compliant with AS2890.1 which permit vehicles up to a B99 design vehicle to access the spaces.

Accessible parking spaces have been designed in accordance with AS2890.6 with a 2.4m wide by 5.4m long space and an adjoining shared area of equal dimensions.

The loading dock has been designed for up to two 12.5m Heavy Rigid Vehicles and complies with the minimum dimensions of AS2890.2 (min. 3.5m wide, 12.5m long with a headroom of 4.5m).

Bicycle parking is to be provided as secure horizontal parking space, in accordance with AS2890.3 with minimum dimensions of 0.5m wide by 1.8m long with a minimum aisle width of 1.5m.

Swept path analysis of the site access and circulation areas is provided in Appendix B.

# 5 Traffic Impact Assessment

## 5.1 Traffic Generation Rates

Roads and Maritime provides traffic generation rates for different land uses in their Guide to Traffic Generating Developments (the Guide), and in their technical direction TDT2013/4a containing revised rates.

However, the site is expected to generate a number of multi-purpose trips, that is, office workers are expected to use the neighbourhood shop, restaurant and café. Additionally, the neighbourhood shops are expected to be linked to the restaurant customers, similar to existing conditions where a number of customers are generated by the on-site café, however, visit the shops/nursery as an ancillary trip. On this basis, a 20% multi-purpose reduction factor has been applied to the shops and restaurant traffic generation estimate.

The proposed traffic generation estimate is detailed in Table 5.1.

**Table 5.1: Proposed Traffic Generation**

| Development | Size ($m^2$ GFA) | AM Generation Rate | PM Generation Rate | AM Generation (trips per hour) | PM Generation (trips per hour) |
|---|---|---|---|---|---|
| Commercial/ Office | 17,516 | 1.6 trips/100$m^2$ | 1.2 trips/100$m^2$ | 280 | 210 |
| Neighbourhood Shops [1] | 1,482 | 2.3 trips/100$m^2$ | 4.6 trips/100$m^2$ | 34 | 68 |
| Function Centre | 995 | 2.5 trips/100$m^2$ | 5 trips/100$m^2$ | 25 | 50 |
| Restaurant | 1,328 | 2.5 trips/100$m^2$ | 5 trips/100$m^2$ | 33 | 66 |
| **Total** | **22,543$m^2$** | **-** | **-** | **347** | **344** |
| **20% Multi-purpose Reduction to Shops, Restaurant [2]** | | | | **372** | **395** |
| Existing Site (See Section 2.6) | | | | 20 | 56 |
| Proposed Increase in Traffic | | | | +354 | +358 |

*[1] Neighbourhood shop (retail) trip rate in the AM peak typically assumed to be 50% of PM peak*
*[2] RMS Guide recommends an average discount of about 20% for multi-purpose visits at shopping centres.*

Table 5.1 indicates that the proposed development would generate an increase of 314 and 262 vehicle trips per hour in the morning and evening peaks, respectively.

During the weekend, the traffic generation of the site is not expected to be much greater than the existing site, which already includes a garden centre with a café and a function space. The commercial offices will not be in operation on the weekends and therefore any increases to traffic would be generated by the new restaurant, function spaces and neighbourhood shops, which would generate multi-purpose customers with the garden centre. Additionally, there is expected to be greater capacity in the road network on the weekends with Macquarie Park comprising in a high portion of commercial land uses which

generate traffic on weekdays. Therefore, the following assessment relates to the weekday peak periods.

## 5.2 Traffic Impact

The impact of this traffic generation to the road network, namely the signalised intersection of Lane Cove Road, Fontenoy Road and the site access has been assessed using SIDRA Intersection. The existing intersection operation has been based on the data and results provided in the Traffix report as noted in Section 2.6. In addition, to assess the development impact, the following scenarios have been modelled:

- Existing Conditions
- Post Development (Existing plus development traffic)
- 10 Year Future Base (10-year horizon without development traffic)
- 10 Year Post Development (10-year horizon plus development traffic).

### 5.2.1 Background Traffic Growth

The 10-year future base case has been determined by applying a 2.5% pa growth factor along Lane Cove Road. This growth factor has been based on the historical population growth of the 'City of Ryde' area which has seen an average population growth[2] of 2.5% pa between 2015 and 2019.

### 5.2.2 Traffic Distribution

The proposed traffic generation has been distributed to the road network, based on a review of existing traffic flow distribution and the layout of the arterial road network.

10% of traffic is expected to travel west (or straight ahead to Fontenoy Road) in both peak periods. In the AM peak period, there is expected to be a 60% southbound and 30% northbound split along Lane Cove Road and vice versa in the PM peak period.

The expected traffic flows for the assessed modelling scenarios are presented in Figure 2.10, Figure 5.1, Figure 5.2 and Figure 5.3

[2] *Australian Bureau of Statistics, Regional Population Growth, Australia (as cited by profile.id)*

Figure 5.1: Post Development Peak Hour Traffic Flows

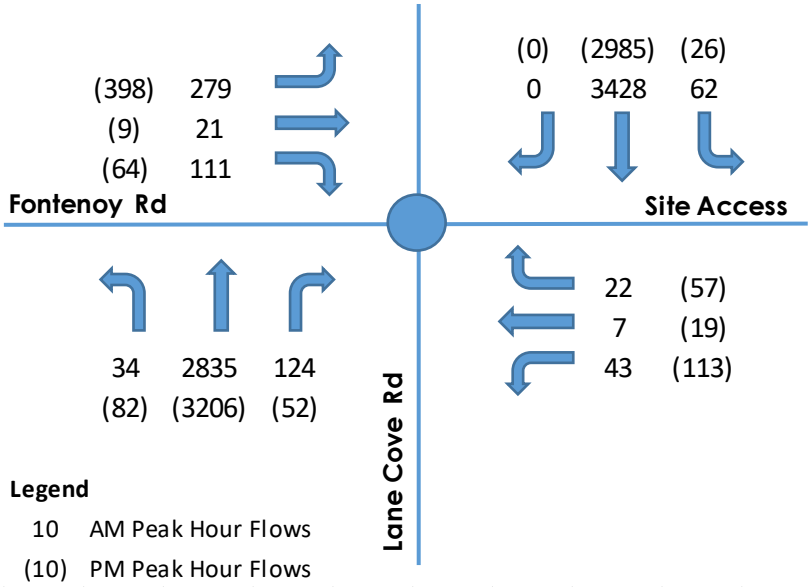



Figure 5.2: 10 Year Future Base Peak Hour Traffic Flows

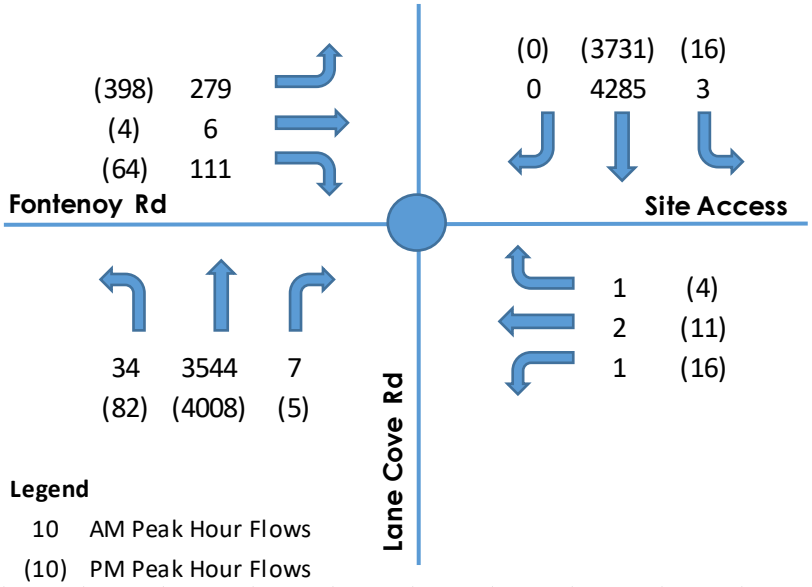
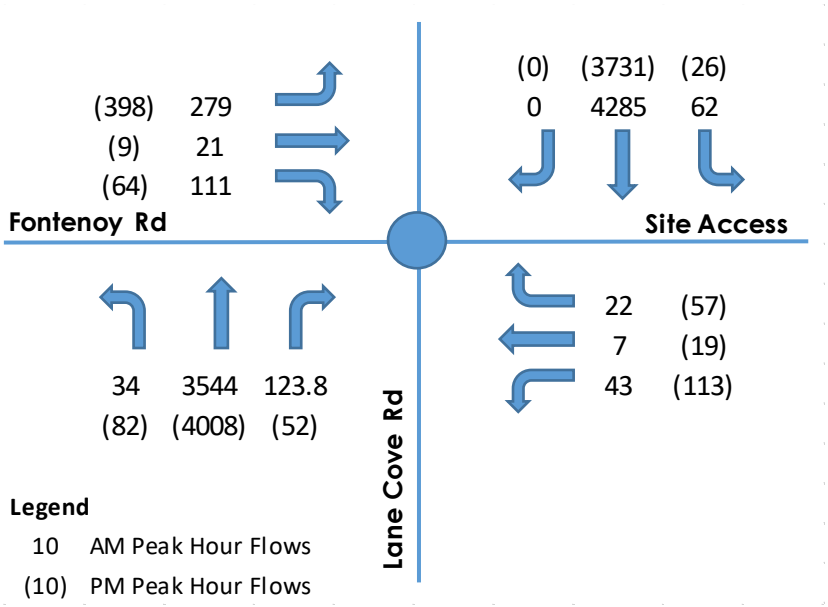


**Figure 5.3: 10 Year Post Development Peak Hour Traffic Flows**




### 5.2.3 Intersection Performance Criteria

RMS uses the performance measure level of service (LoS), to determine how efficient an intersection/network is operating under given prevailing traffic conditions. Level of service is directly related to the delays experienced by vehicles travelling through the intersection. SIDRA's level of service ranges from Los A to Los F, with LoS A indicating that the intersection is operating with spare capacity and LoS F indicating the intersection is operating over capacity. LoS D is the long-term desirable level of service. The criteria that SIDRA intersection adopts in assessing the level of service is shown in Table 5.2.

**Table 5.2: Level of Service**

| Level of Service | Average Delay (seconds per vehicle) | Traffic Signals, Roundabout | Give Way and Stop Signs |
|---|---|---|---|
| A | Less than 14 | good operation | good operation |
| B | 15 to 28 | good with acceptable delays and spare capacity | acceptable delays and spare capacity |
| C | 29 to 42 | satisfactory | satisfactory, but accident study required |
| D | 43 to 56 | operating near capacity | near capacity and accident study required |
| E | 57 to 70 | at capacity<br>At signals, incidents will cause excessive delays. | at capacity, requires other control mode |
| F | Greater than 71 | unsatisfactory with excessive queuing | unsatisfactory with excessive queuing; requires other control mode |

*Source: RMS Guide to Traffic Generating Developments, 2002*

### 5.2.4 Intersection Modelling Results

The existing operation of the intersection of Lane Cove Road and Fontenoy Road is presented in Table 5.3.

**Table 5.3: Existing Intersection Operation**

| Approach | Movement | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | Ave. Delay (s) | LoS | Queue (m) | Ave. Delay (s) | LoS | Queue (m) |
| South - Lane Cove Rd | Left | 16 | LOS B | 273 | 17 | LOS B | 339 |
| | Through | 9 | LOS A | 275 | 11 | LOS A | 342 |
| | Right* | 40 | LOS C | 2 | 27 | LOS B | 1 |
| East (Site Access) | Left* | 55 | LOS D | 0 | 56 | LOS D | 7 |
| | Through* | 59 | LOS E | 2 | 60 | LOS E | 7 |
| | Right* | 62 | LOS E | 2 | 63 | LOS E | 7 |
| North - Lane Cove Rd | Left* | 16 | LOS B | 0 | 16 | LOS B | 3 |
| | Through | 24 | LOS B | 539 | 17 | LOS B | 378 |
| West - Fontenoy Rd | Left | 5 | LOS A | 7 | 5 | LOS A | 11 |
| | Through* | 71 | LOS F | 67 | 69 | LOS E | 39 |
| | Right | 75 | LOS F | 67 | 73 | LOS F | 39 |
| **Overall** | **-** | **18** | **LOS B** | **539** | **14** | **LOS A** | **378** |

**Turning movements entering or exiting the development site*
*Note: SIDRA model is based on data provided in the Traffix report dated June 2020, as discussed Section 2.6. As such limited calibration information was available to prepare the existing scenario.*

Table 5.3 indicates that the traffic movements entering and exiting the site are operating at a LoS D to F during both peaks, however, the through movement along Lane Cove Road is operating well with a LoS A to C, notwithstanding some long queues at through movements. This operation is typical of intersections along major arterial roads where signal timing is prioritised to the arterial road and consequently traffic on the minor roads experience longer delays.

The post development condition of the intersection has been assessed and presented in Table 5.4.

**Table 5.4: Post Development Intersection Operation**

| Approach | Movement | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | Ave. Delay (s) | LoS | Queue (m) | Ave. Delay (s) | LoS | Queue (m) |
| South - Lane Cove Rd | Left | 17 | LOS B | 298 | 17 | LOS B | 353 |
| | Through | 9 | LOS A | 299 | 11 | LOS A | 357 |
| | Right* | 155 | LOS F | 109 | 38 | LOS C | 27 |
| East (Site Access) | Left* | 57 | LOS E | 22 | 60 | LOS E | 59 |
| | Through* | 67 | LOS E | 18 | 74 | LOS F | 46 |
| | Right* | 70 | LOS E | 18 | 77 | LOS F | 46 |
| North - Lane Cove Rd | Left* | 17 | LOS B | 13 | 16 | LOS B | 6 |
| | Through | 29 | LOS C | 594 | 17 | LOS B | 382 |
| West - Fontenoy Rd | Left | 5 | LOS A | 7 | 5 | LOS A | 11 |
| | Through* | 77 | LOS F | 80 | 73 | LOS F | 43 |
| | Right | 81 | LOS F | 80 | 76 | LOS F | 43 |
| **Overall** | **-** | **23** | **LOS B** | **594** | **16** | **LOS B** | **380** |

**Turning movements entering or exiting the development site*

Table 5.4 indicates that there would be an increase in delay to vehicles entering and exiting the site. Notably, there would be a resulting queue of up to 109m turning right into the site.

The right turn bay into the site is approximately 35m long, which indicates that vehicles would overflow into the adjoining through lane. However, despite this overflow, the impact to delay for through traffic along Lane Cove Road is marginal with an increase of five seconds to the north approach through movement. It may however be necessary to extend this right turn lane both in the short and long term.

The 10-year future case (without the development) is presented in Table 5.5.

### Table 5.5: 10 Year Future Base Intersection Operation

| Approach | Movement | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | Ave. Delay (s) | LoS | Queue (m) | Ave. Delay (s) | LoS | Queue (m) |
| South - Lane Cove Rd | Left | 20 | LOS B | 481 | 48 | LOS D | 838 |
| | Through | 13 | LOS A | 483 | 41 | LOS C | 840 |
| | Right* | 54 | LOS D | 3 | 54 | LOS D | 2 |
| East (Site Access) | Left* | 55 | LOS D | 0 | 56 | LOS D | 7 |
| | Through* | 59 | LOS E | 2 | 60 | LOS E | 7 |
| | Right* | 62 | LOS E | 2 | 63 | LOS E | 7 |
| North - Lane Cove Rd | Left* | 16 | LOS B | 1 | 16 | LOS B | 3 |
| | Through | 179 | LOS F | 1523 | 72 | LOS F | 948 |
| West - Fontenoy Rd | Left | 5 | LOS A | 7 | 5 | LOS A | 11 |
| | Through* | 71 | LOS F | 67 | 68 | LOS E | 38 |
| | Right | 75 | LOS F | 67 | 71 | LOS F | 38 |
| **Overall** | **-** | **99** | **LOS F** | **1523** | **54** | **LOS D** | **948** |

**Turning movements entering or exiting the development site*

Table 5.5 indicates that the estimated 2.5% pa increase in traffic along Lane Cove Road would result in a notable increase in delay and vehicle queue lengths for through traffic, even without the proposed development.

The addition of development traffic would have a relatively minor impact as shown in Table 5.6.

### Table 5.6: 10 Year Post Development Intersection Operation

| Approach | Movement | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | Ave. Delay (s) | LoS | Queue (m) | Ave. Delay (s) | LoS | Queue (m) |
| South - Lane Cove Rd | Left | 21 | LOS B | 516 | 55 | LOS D | 898 |
| | Through | 14 | LOS A | 518 | 48 | LOS D | 900 |
| | Right* | 136 | LOS F | 96 | 57 | LOS D | 28 |
| East (Site Access) | Left* | 57 | LOS E | 22 | 60 | LOS E | 59 |
| | Through* | 65 | LOS E | 18 | 71 | LOS E | 46 |
| | Right* | 68 | LOS E | 18 | 74 | LOS F | 46 |
| North - Lane Cove Rd | Left* | 17 | LOS B | 13 | 16 | LOS B | 6 |
| | Through | 193 | LOS F | 1597 | 74 | LOS F | 965 |
| West - Fontenoy Rd | Left | 5 | LOS A | 7 | 5 | LOS A | 11 |
| | Through* | 73 | LOS F | 77 | 71 | LOS F | 43 |
| | Right | 76 | LOS F | 77 | 75 | LOS F | 43 |
| **Overall** | **-** | **106** | **LOS F** | **1597** | **56** | **LOS D** | **965** |

**Turning movements entering or exiting the development site*

In the 10-year horizon model, the intersection will be at capacity but this will be primarily as a result of background traffic growth. The development itself would only marginally add to the impact on the road network performance.

However, the modelled intersection shows that the proposed development will result in queues into and out of the site – notably a queue of 96m is expected for the right turn queue into the site.

The detailed SIDRA output reports are provided in Appendix C.

## 5.3 Mitigation Measures

Based on the above, the primary impact from the proposed development will be the right turn vehicle queue from Lane Cove Road into the site, which is indicated to be:

- 109m in the AM peak in the Post Development scenario, and
- 96m in the AM peak in the 10 Year Post Development scenario.

The right turn bay into the site is currently some 35m and therefore, cannot accommodate the above queues, which would overflow into the adjoining traffic lane. However, the impact of vehicle queues into the site is proposed to be minimised by extending the right turn bay. Based on existing conditions, the right turn bay could be increased by 61m (to 96m) by reducing the width of the central median along Lane Cove Road. This is shown in Figure 5.4.

**Figure 5.4: Right Turn Bay into Site**

## 5.4 Site Traffic Management Measures

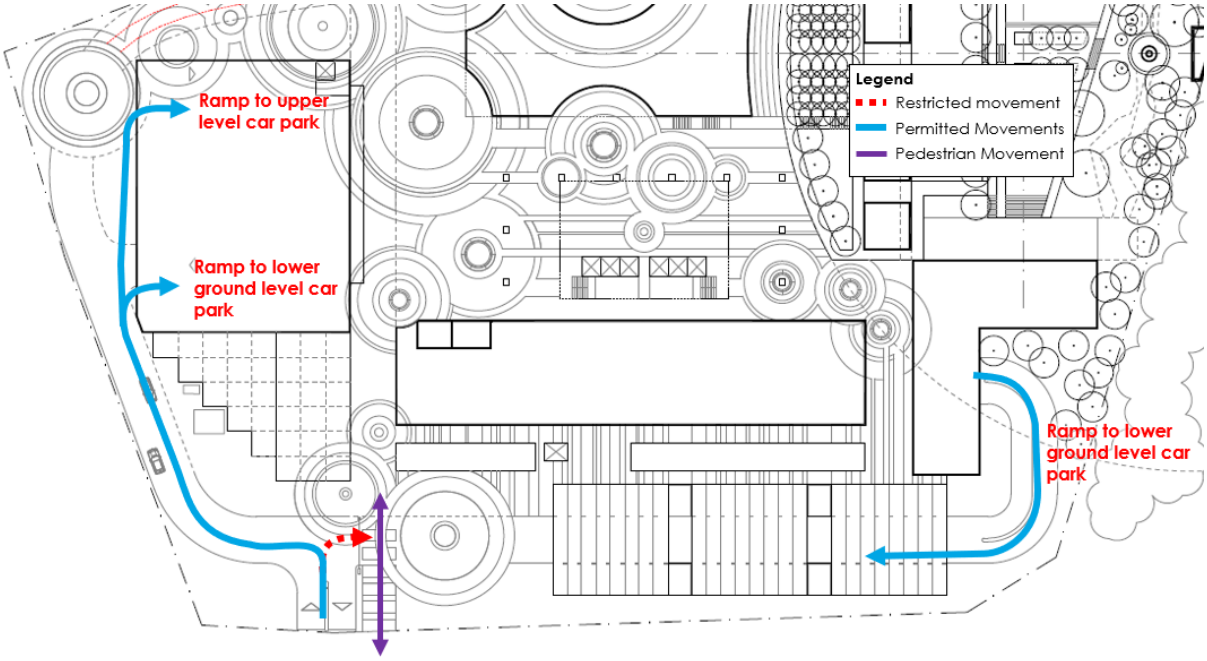
Noting the above traffic modelling results and associated queueing of ingress vehicles, it is proposed to minimise any potential delays to ingress traffic, by ensuring efficient traffic circulation within the site.

Notably, vehicles turning right immediately upon entry can currently be delayed while giving way to pedestrians at the proposed pedestrian crossing as shown in Figure 5.5. This would effectively result in queues backing into Lane Cove Road.

On this basis, during the road network peak periods (which would also be the peak office arrival/departure periods), this right turn movement would be restricted with a boom gate control system, to direct traffic to the left where new ramps into the basement and upper ground car parks are proposed.

The proposed peak period traffic circulation arrangement is shown in Figure 5.5.

**Figure 5.5: Proposed Peak Period Traffic Circulation**




The above traffic management measures is to be included in Eden Garden's Operational Plan of Management (submitted separately as part of the DA).

# 6 Framework Green Travel Plan

## 6.1 What is a GTP

The transport sector is a large contributor of Australia's energy-related greenhouse gas emissions through fossil fuels such as petrol, oil, diesel and gas. Whilst transport is a necessary part of life, the effects can be managed through the implementation of a travel plan.

A Green Travel Plan (GTP) is a package of coordinated strategies and measures to promote and encourage sustainable travel, such as walking, cycling and public transport etc. Such plans aim to influence the way people move to/from their place of residence or work, or any other destination, to deliver better environmental outcomes and provide a range of travel choices, whilst also reducing the reliance on private car usage, particularly single occupancy car trips.

The key objectives of a GTP would be to:

- Identify initiatives to encourage sustainable transport modes
- Identify a methodology to monitor the implementation of the green travel following occupation of the precinct
- Set targets to measure the success of initiatives implemented in the green travel plan.

The planning of the new development would need to accommodate innovative ideas to better manage the transport demand of the project. It will be necessary to introduce new measures to ensure that trips generated by the proposed development are not solely private car based, particularly single occupancy trips. Measures implemented should target specific and sustainable modes of transport to encourage staff to choose alternative modes of transport other than the conventional car.

## 6.2 Travel Plan Pyramid

The GTP will need to be tailored to the proposed development site to ensure appropriate measures are in place for the different land uses to promote a modal shift away from car usage.

The key elements of the GTP are shown in the Travel Plan Pyramid in Figure 6.1.

**Figure 6.1: Travel Plan Pyramid**

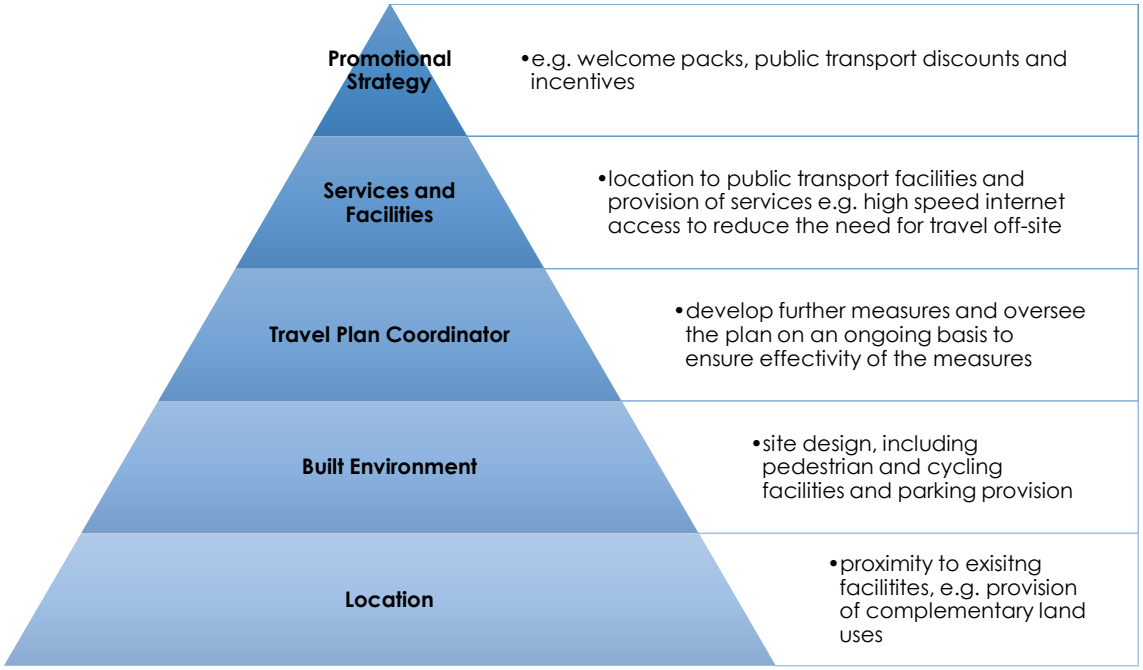



Figure 6.1 demonstrates that the key foundations to ensure the success of a GTP are:

1. **Location** – i.e. proximity to existing public transport services and proximity to mixed land uses, e.g. shops and services, such that walking, or cycling becomes the natural choice
2. **Built Environment** – i.e. provision of high-quality pedestrian and cycling facilities, end-of-trip facilities and reduced car parking provision to encourage sustainable transport choices.

On the above basis, the proximity to new public transport facilities (i.e. the Macquarie Park Metro Station and bus services) will form the foundation of the GTP which should aim to maximise opportunities to encourage staff and visitors to utilise public transport.

## 6.3 Potential Measures

The subject site is located within close proximity to a wide range of sustainable transport, including high frequency public transport services and a well-established pedestrian network. The GTP would put in place measures to encourage a modal shift away from car usage.

Notably, TTPP staff have been involved in a number of green travel plans for an array of different land uses, including sites at the Australia Technology Park and Harold Park in Sydney.

At these sites, the following measures are provided and could be considered for the subject site:

- Limiting parking provision on-site.

- Creation of footpaths and other links to encourage cycling and walking.
  - Notably, the subject DA seeks to contribute to the enhancement of the pedestrian walk from the Macquarie Park Metro Station to the site through a Draft Voluntary Planning Agreement Letter of Offer. This contribution may be provided toward a pedestrian footpath fence on the M2 overpass and footpath widening between Talavera Road and the M2 western on-ramp.
- Provision of a Transport Access Guide (TAG) which would be given to all staff and available to visitors via the website or at the site entrance.
- The Travel Access Guide (TAG) provides customised travel information for people travelling to and from a particular site using sustainable forms of transport – walking, cycling and public transport. It provides a simple quick visual look at a location making it easy to see the relationship of site to public transport facilities, such as train stations and bus stops, via existing walking and cycling routes. The site location is in close proximity to various public transport services. Therefore, a TAG would be effective in encouraging those on-site to use the public transport services by informing them from day one of occupation of the availability of services nearby. An example of a TAG is provided in Appendix D.
- Provision of yearly membership for staff to a car share scheme (e.g. GoGet). This type of initiative promotes the use of shared vehicles and reduces the necessity to own cars and subsequently reduces car trips.
- Provision of dedicated car share vehicles on-site which would encourage commercial tenants to obtain a business membership to the relevant car share scheme and enable business related vehicle trips to be undertaken using car share vehicles.
- Provision of Opal cards with prepaid credits to encourage staff to use public transport.
- Provision of a site-specific shuttle bus to/from the nearest public transport facility (e.g. the Metro Station). This measure would be particularly useful for special events held on-site.
- Provision of high-quality bicycle facilities including bicycle parking facilities for staff and visitors.
- Promotion of staff cycling or walking clubs to promote health and wellbeing in the development. This type of initiative promotes healthy lifestyles which in turn increases walking and cycling trips.

The proposed development would benefit greatly from implementation of the above measures or similar, to promote the use of more sustainable modes of travel, pertinently public transport, car-share, walking and cycling. These measures are required to implemented from 'Day One' of occupation as many people will establish habits of a lifetime from day one.

On the basis of all such measures being fully incorporated into the development, it is anticipated that the subject site would generate less traffic than other comparable sites in

the vicinity. Consequently, this would have the positive effect in reducing the traffic impact associated with the proposed development on the surrounding road network.

## 6.4 Mode Share Targets

The aim of the GTP is to encourage modal shift away from private vehicles by implementing measures that influence the travel patterns of staff working at the proposed development. The implementation of the GTP would be regularly monitored to ensure that the GTP is having the desired effect. The success of the GTP is measured by setting modal share targets and identifying the measures and actions that have the greatest impact.

It is expected that travel patterns for employees of the proposed development will be similar to the modal splits discussed in Section 2.7. A modal shift of 3-5 per cent is typically considered to be a significant achievement (based on knowledge of local and international GTPs, and as stated by experts in Land Environment Court proceedings).

However, noting that surrounding public transport facilities have been upgraded since the collection of the modal split data in Section 2.7, its considered that a greater modal shift could be achieved for the site.

On this basis, the modal split for car driver trips should be lowered by some 10-20% (from 85% to 75-65%). This will be set as a realistic mode share target to be achieved within a one-year period upon occupation.

The detailed Green Travel Plan would be generally be prepared as a condition of consent of any approval and this plan would set out proposed travel management measures and target mode shares.

# 7 Conclusion

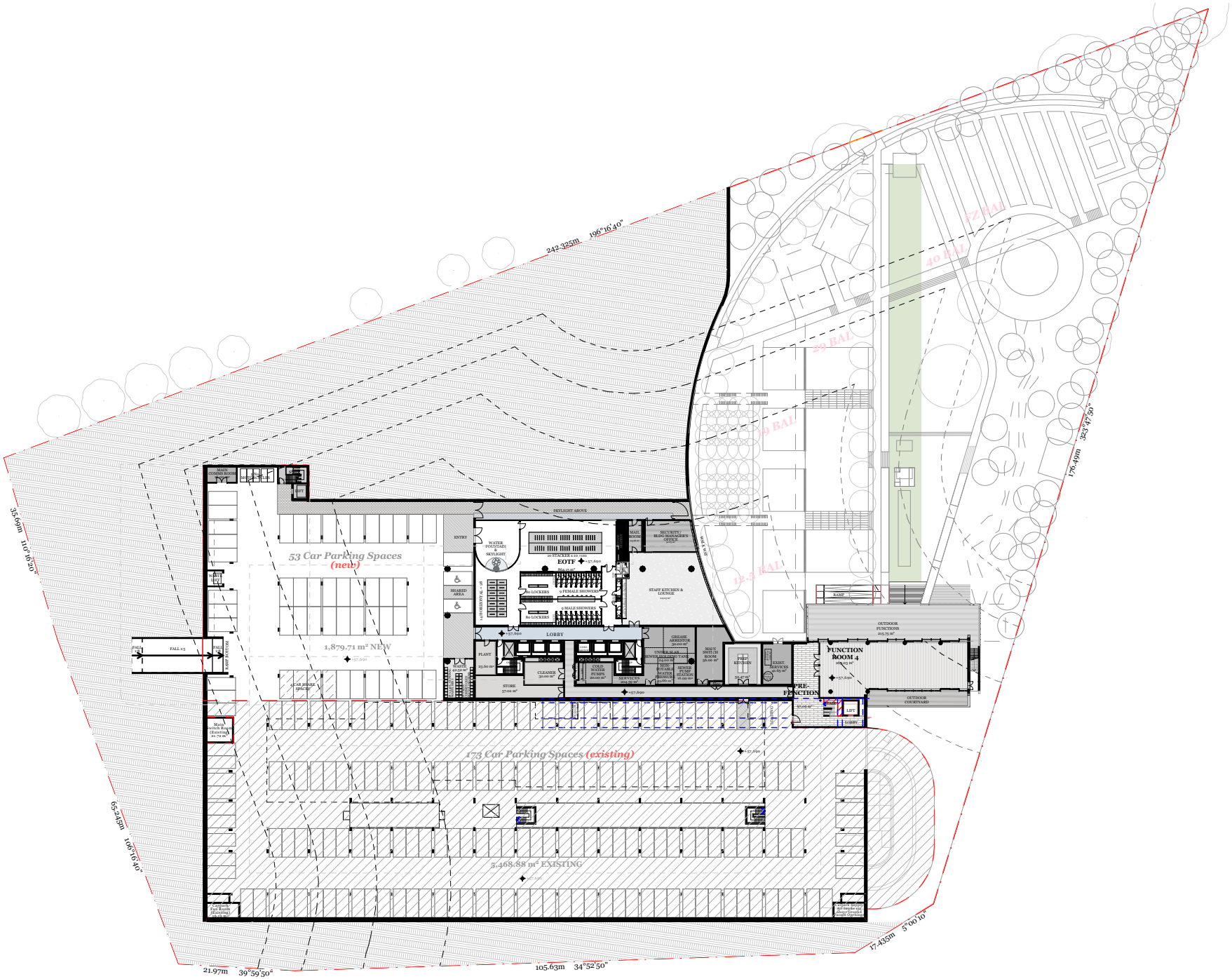
This transport impact assessment relates to a proposed mixed-use development at 307 Lane Cove Road, Macquarie Park.

- It is proposed to deliver a new mixed-use development which would comprise of 17,516m$^2$ commercial GFA, 1,222m$^2$ Garden Centre GFA, 1,482m$^2$ neighbourhood shops GFA, 1,328m$^2$ café/restaurant GFA and 995m$^2$ function centre GFA
- Based on the DCP parking rates, the development is required a provision of 605 car spaces including 438 commercial spaces, 127 neighbourhood shop spaces and 40 function centre spaces.
- However, based on the anticipated use of the site, the DCP rate is considered excessive for the following reasons:
  - the rates do not consider multi-purpose trips, with a large portion of neighbourhood shop customers expected to be from the commercial floors above during the weekdays,
  - the proposed restaurant facilities are provided to accommodate the demands of the proposed commercial development as the primary customers
  - the garden centre has peak customer demand during the weekend and is not expected to generate significant customers during a typical weekday
  - the function centre peak event periods will be during weekday evenings and weekends. It is expected that smaller style corporate events will be held midweek.
  - the parking rate for commercial staff is not supportive of encouraging sustainable transport. Notably, the rate matches the rate recommended by Roads and Maritime Services based on survey data from 1979. However, it is expected that the site could achieve a lower parking generation and higher public transport mode share, with Macquarie Park Metro Station being located within a 5-minute bus trip or 13-minute walking distance
  - it is not realistic to simply summate all of the individual parking demands when many of the uses will not be coincident. (i.e. the function centre parking spaces will not be required when the offices are open)
  - a Green Travel Plan (GTP) is to be implemented on-site would aim to reduce car usage to the site. A limited parking provision will be critical to the effectiveness of the GTP.
  - GTP measures includes the provision of car share vehicles, to reduce the need for on-site staff to bring their own cars.
- On the above basis, it is proposed to supply 502 car spaces including 358 commercial spaces, 87 neighbourhood shop spaces and 57 function centre spaces.

- The proposal would result in an increase of 334 vehicles and 302 vehicles during the AM and PM peak hours on the local road network.
- Based on the above, the modelled intersection shows that the proposed development will result in queues into and out of the site. Notably, the right turn queue from Lane Cove Road would overflow into the adjoining through traffic lane. However, the overall intersection performance would be acceptable with a minor increase to delay for through traffic along Lane Cove Road.
- In the 10-year horizon model, the intersection will be at capacity but this will be primarily as a result of background traffic growth. However, the development itself would marginally add to the impact on the road network performance.
- Proposed mitigation measures to reduce the queuing impact to the site includes the extension of the existing right turn lane into the site from 35m to 96m.

# Appendix A

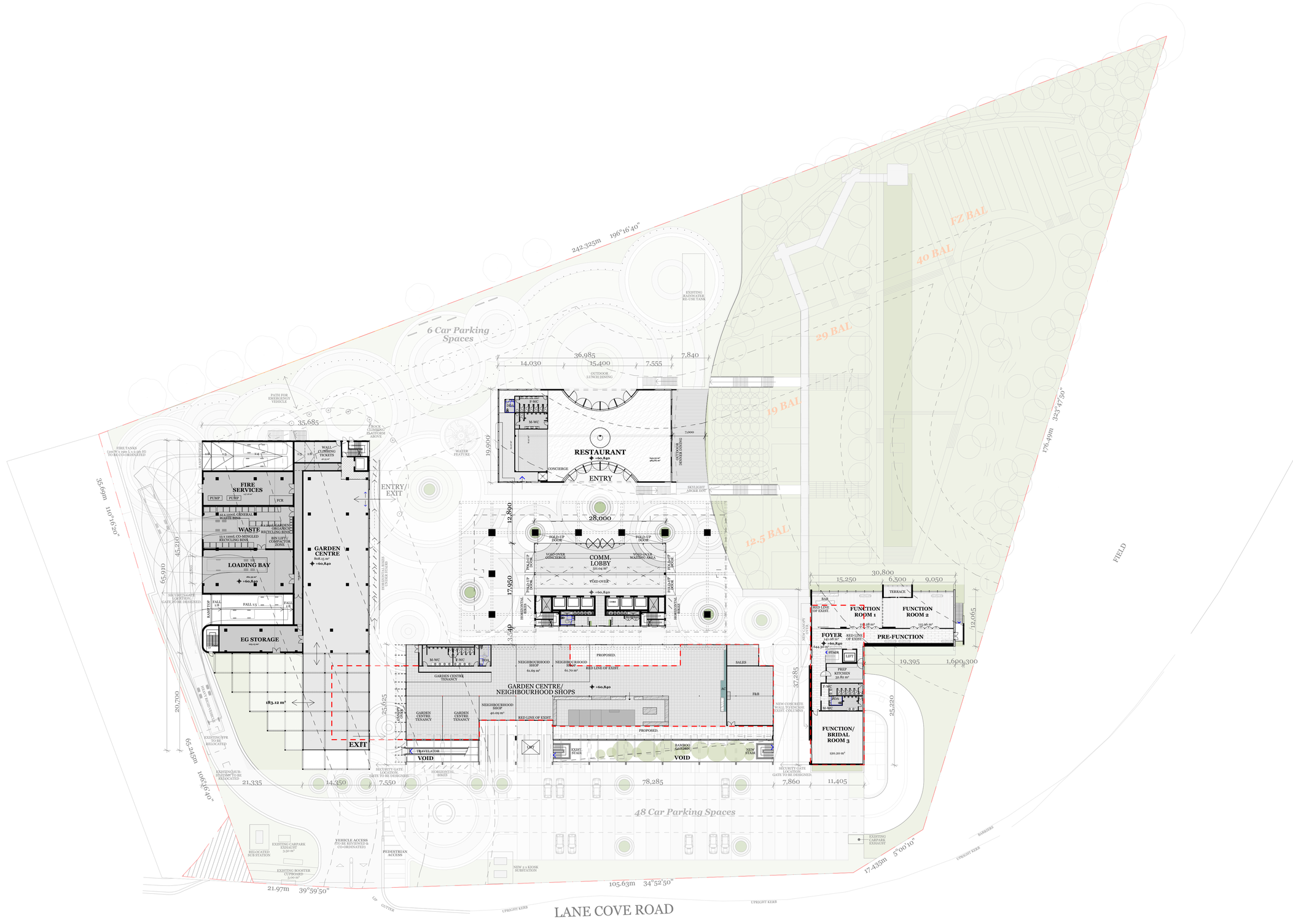
## Architectural Plans




DKO

307 Lane Cove Road
Macquarie Park
NSW 2113

Lane Cove
Site Plan - Lower Ground
Friday, 5 February 2021




0 4 8 12 16 20m

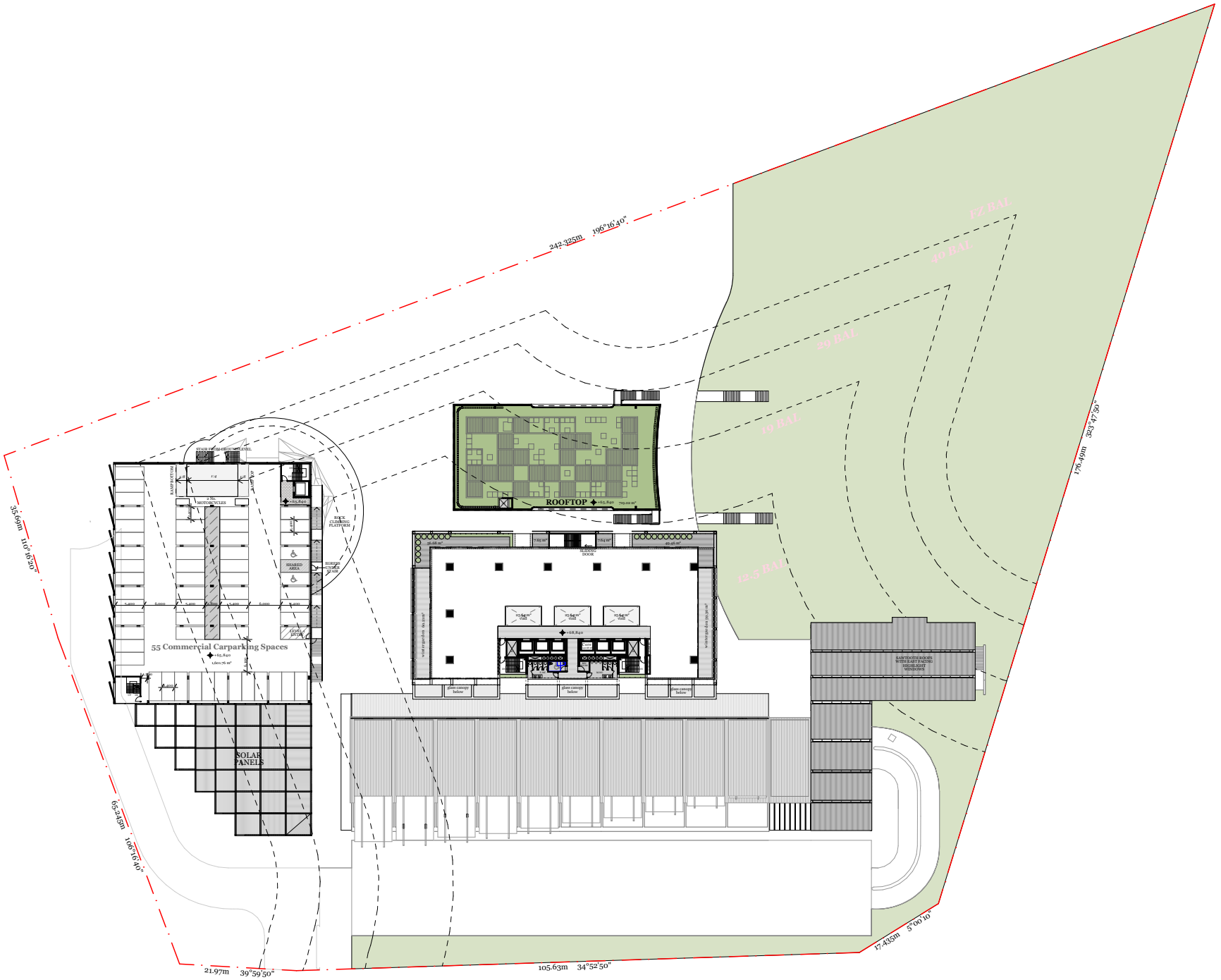
| Rev. | Date | By | Ckd | Description |
|---|---|---|---|---|
| | 14/10/2020 | RR & LS | JL | PRE DA DRAFT |
| | 04/11/2020 | RR, LS, JM | JL | PRE DA DRAFT |
| | 13/02/2021 | RR, LS | | DA APPLICATION |

DKO Architecture (Vic.) Pty Ltd
90-94 Rokeby Street
Collingwood, VIC 3066
T +61 3 8601 6000
info@DKO.com.au
www.DKO.com.au
ABN: 61413783636



DKO

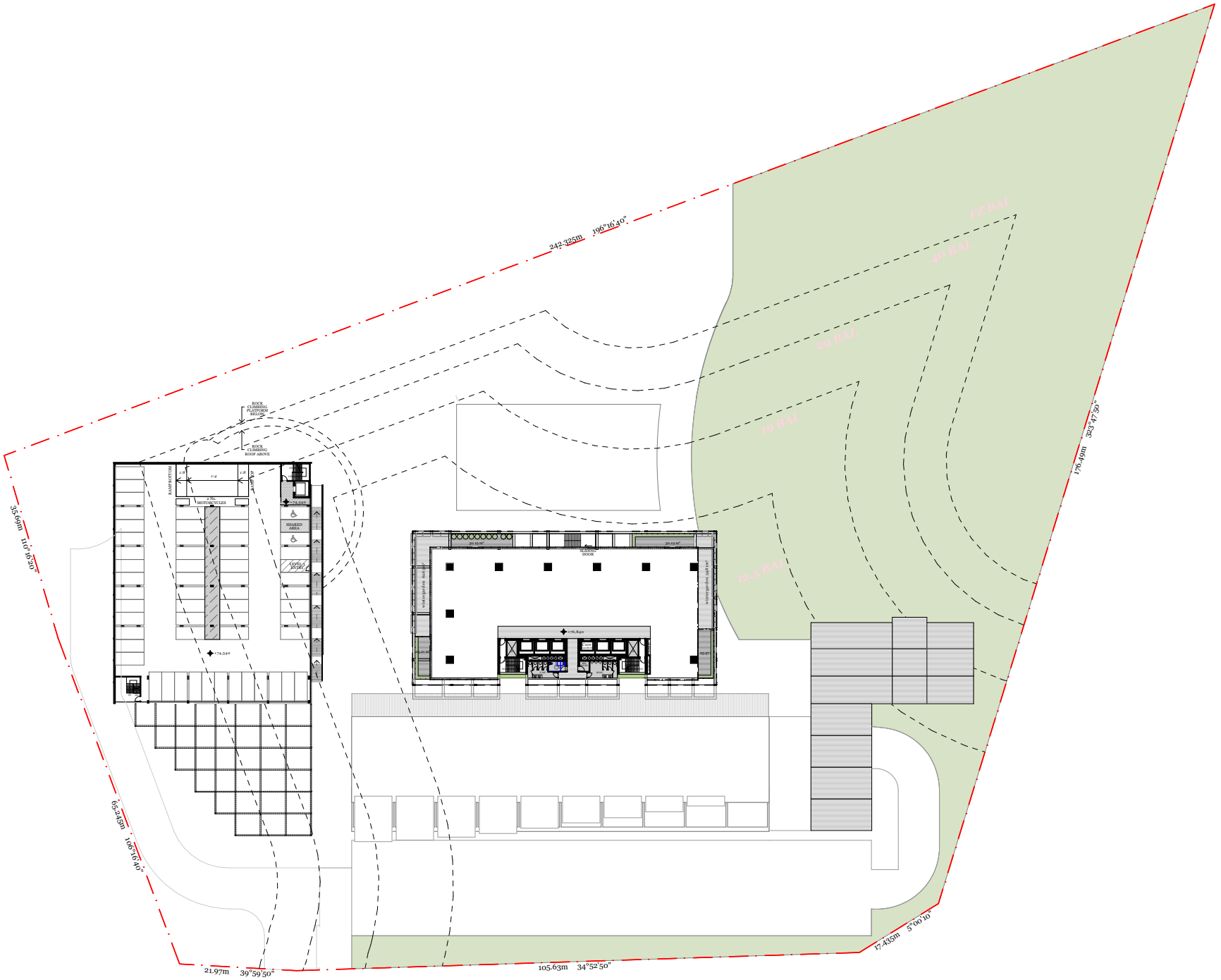
| | | | |
|---|---|---|---|
| Project Name | Lane Cove | Project Number | 12010 |
| Project Address | 307 Lane Cove Road, Macquarie Park, NSW 2113 | Drawing Name | Ground Level |
| | | Scale | 1:400 @A1 |
| | | Date | 16/02/2021 |
| Client | Eden Gardens | Drawing Number | **DA105** |
| | | Revision | |




DKO

307 Lane Cove Road
Macquarie Park
NSW 2113

Lane Cove
Site Plan - Level 1
Friday, 5 February 2021




DKO

307 Lane Cove Road
Macquarie Park
NSW 2113

Lane Cove
Site Plan - Level 3
Friday, 5 February 2021

# Appendix B

## Swept Paths

VEHICLE ENTERING

VEHICLE EXITING

SWEPT PATH ENCROACHES KERB. TRIM KERB TO ACCOMMODATE SWEPT PATH.

HRV - Heavy Rigid Vehicle

HRV - Heavy Rigid Vehicle

12500

2400 5900 1400

HRV - Heavy Rigid Vehicle

| | |
|---|---|
| Overall Length | 12500mm |
| Overall Width | 2500mm |
| Overall Body Height | 4300mm |
| Min Body Ground Clearance | 417mm |
| Track Width | 2500mm |
| Lock-to-lock time | 6.00s |
| Curb to Curb Turning Radius | 12500mm |

KEY:

| | Forward | Reverse |
|---|---|---|
| Wheel path | | |
| Body envelope | | |
| 300mm clearance | | |

| REV. | DESCRIPTION | DRAWN | CHECK | APP'D | DATE |
|---|---|---|---|---|---|
| A | ISSUE FOR DISCUSSION | KM | OF | KH | 17/02/21 |

ttpp transport planning

PROJECT

307 LANE COVE ROAD, MACQUARIE PARK

TITLE

SWEPT PATH ANALYSIS - GROUND LEVEL - ENTRY DRIVEWAY
AS2890.2 12.5m HEAVY RIGID VEHICLE

DWG No. 19202CAD003 FIGURE 4

DATE STAMP 17 FEBRUARY 2021

| PROJECT No. | SCALE | REV. |
|---|---|---|
| 19202 | 1:300 @A3 | A |

Filename: 19202CAD003-210217-CAR PARK REVIEW.dwg Date: 17 February 2021 By: Karl.magistrado

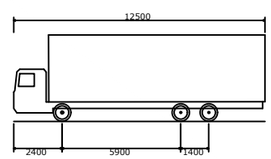
VEHICLE ENTERING

VEHICLE EXITING

FIRE SERVICES
147.26 m²
PUMP
PUMP
FCR
12 x 1100L GENERAL WASTE BINS
WASTE
181.42 m²
6 x 240L GARDEN ORGANICS RECYCLING BINS
13 x 1100L CO-MINGLED RECYCLING BINS
BIN LIFT / COMPACTOR ZONE
GARDEN CENTRE
808.15 m²
+60,840
LOADING BAY
182.39 m²
+60,840
70.67 m²
SECURITY GATE LOCATION. GATE TO BE DESIGNED.
RAMP TOP
FALL 1:8
FALL 1:5
FALL 1:8
EG STORAGE
103.13 m²
UP
183.12 m²
EXISTING FPR TO BE RELOCATED
EXISTING SUB-STATION TO BE RELOCATED
110°16'20"
65910
45210
5800
20700
65.245m
HRV - Heavy Rigid Vehicle
21335

KEY:

| | Forward | Reverse |
|---|---|---|
| Wheel path | | |
| Body envelope | | |
| 300mm clearance | | |




HRV - Heavy Rigid Vehicle

| | |
|---|---|
| Overall Length | 12500mm |
| Overall Width | 2500mm |
| Overall Body Height | 4300mm |
| Min Body Ground Clearance | 417mm |
| Track Width | 2500mm |
| Lock-to-lock time | 6.00s |
| Curb to Curb Turning Radius | 12500mm |

| REV. | DESCRIPTION | DRAWN | CHECK | APP'D | DATE |
|---|---|---|---|---|---|
| A | ISSUE FOR DISCUSSION | KM | OF | KH | 17/02/21 |

ttpp transport planning

PROJECT
307 LANE COVE ROAD, MACQUARIE PARK

TITLE
SWEPT PATH ANALYSIS - GROUND LEVEL - LOADING DOCK
AS2890.2 12.5m HEAVY RIGID VEHICLE

DWG No. 19202CAD003
FIGURE 5

DATE STAMP 17 FEBRUARY 2021

PROJECT No. 19202 | SCALE 1:250 @A3 | REV. A

Filename: 19202CAD003-210217-cAR PARK REVIEW.dwg
Date: 17 February 2021
By: Karl.mogstrasto

VEHICLE ENTERING

VEHICLE EXITING

TO BE CO-ORDINATED

RAMP BOTTOM

1:8 1:5 1:4 1:5 1:8

WALL CLIMBING TICKETS 46.35 m²

FIRE SERVICES 147.26 m²

PUMP PUMP FCR

12 x 1100L GENERAL WASTE BINS

WASTE

6 x 240L GARDEN ORGANICS RECYCLING BINS

13 x 1100L CO-MINGLED RECYCLING BINS

BIN LIFT / COMPACTOR ZONE

GARDEN CENTRE 808.15 m² +60,840

LOADING BAY 182.39 m² +60,840

70.67 m²

60m 110°16'20"

45210

65910

5800

SECURITY GATE LOCATION. TO BE DESIGNED.

RAMP TOP

FALL 1:8 FALL 1:5 FALL 1:8

EG STORAGE 103.13 m²

UP

183.12 m²

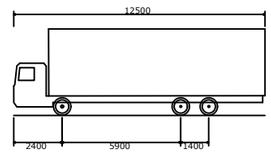
20700

HRV - Heavy Rigid Vehicles

EXISTING FPR TO BE

KEY:

| | Forward | Reverse |
|---|---|---|
| Wheel path | | |
| Body envelope | | |
| 300mm clearance | | |




HRV - Heavy Rigid Vehicle

| | |
|---|---|
| Overall Length | 12500mm |
| Overall Width | 2500mm |
| Overall Body Height | 4300mm |
| Min Body Ground Clearance | 417mm |
| Track Width | 2500mm |
| Lock-to-lock time | 6.00s |
| Curb to Curb Turning Radius | 12500mm |

| REV. | DESCRIPTION | DRAWN | CHECK | APP'D | DATE |
|---|---|---|---|---|---|
| A | ISSUE FOR DISCUSSION | KM | OF | KH | 17/02/21 |

ttpp transport planning

PROJECT

307 LANE COVE ROAD, MACQUARIE PARK

TITLE

SWEPT PATH ANALYSIS - GROUND LEVEL - WASTE
AS2890.2 12.5m HEAVY RIGID VEHICLE

DWG No. 19202CAD003 FIGURE 6

DATE STAMP 17 FEBRUARY 2021

| PROJECT No. | SCALE | REV. |
|---|---|---|
| 19202 | 1:250 @A3 | A |

Filename: 19202CAD003-210217-CAR PARK REVIEW.dwg Date: 17 February 2021 By: Karl maplestrado

EXIT

TRAVELATOR

VOID

LIFT

65.245m

106°16'40"

EXISTING TO BE RELOCATED

RELOCATED SUB STATION

21335

14350

7550

SECURITY GATE LOCATION. GATE TO BE DESIGNED.

HORIZONTAL BIKES

2.6M 2.6M 2.6M

EXISTING CARPARKEXHAUST3.50 m²

RELOCATED SUB STATION

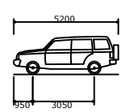
PEDESTRIAN ACCESS

NEW 2 x KIOSK SUBSTATION

EXISTING BOOSTERCUPBOARD3

KEY:

| | Forward | Reverse |
|---|---|---|
| Wheel path | | |
| Body envelope | | |
| 300mm clearance | | |




B99 Vehicle (Realistic min radius) (2004)

| | |
|---|---|
| Overall Length | 5200mm |
| Overall Width | 1940mm |
| Overall Body Height | 1878mm |
| Min Body Ground Clearance | 272mm |
| Track Width | 1840mm |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 6250mm |

| REV. | DESCRIPTION | DRAWN | CHECK | APP'D | DATE |
|---|---|---|---|---|---|
| A | ISSUE FOR DISCUSSION | KM | OF | KH | 17/02/21 |

ttpp transport planning

PROJECT: 307 LANE COVE ROAD, MACQUARIE PARK

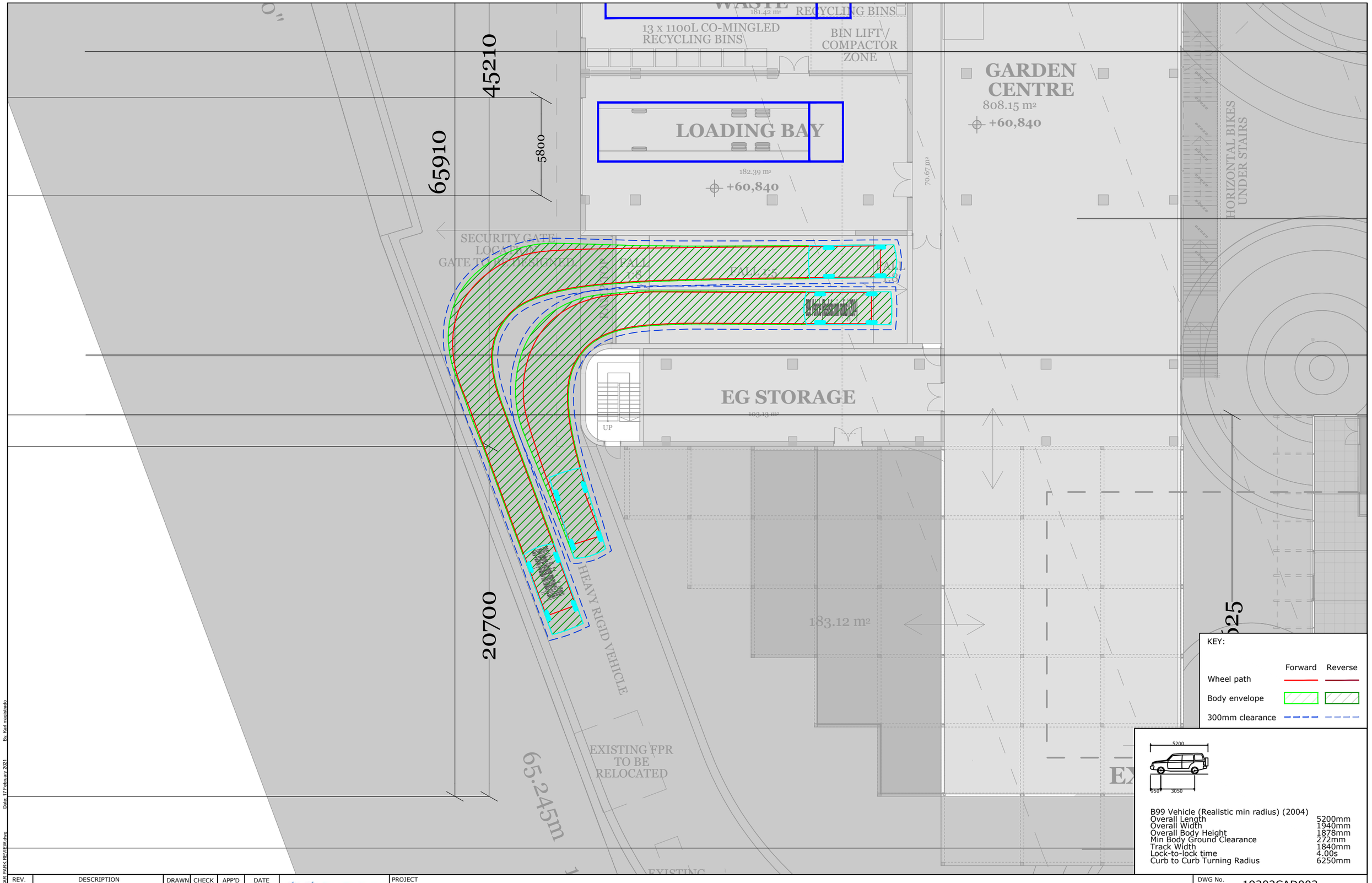
TITLE: SWEPT PATH ANALYSIS - GROUND LEVEL - ENTRY DRIVEWAY
AS2890.1 5.2m B99 VEHICLE

DWG No. 19202CAD003 FIGURE 9

DATE STAMP 17 FEBRUARY 2021

| PROJECT No. | SCALE | REV. |
|---|---|---|
| 19202 | 1:200 @A3 | A |

Filename: 19202CAD003-210217-CAR PARK REVIEW.dwg Date: 17 February 2021 By: Karl.mogstrado




| REV. | DESCRIPTION | DRAWN | CHECK | APP'D | DATE |
|---|---|---|---|---|---|
| A | ISSUE FOR DISCUSSION | KM | OF | KH | 17/02/21 |

ttpp transport planning

PROJECT
307 LANE COVE ROAD, MACQUARIE PARK

TITLE
SWEPT PATH ANALYSIS - GROUND LEVEL - GROUND TO BASEMENT LEVEL RAMP
AS2890.1 5.2m B99 VEHICLE

DWG No. 19202CAD003
FIGURE 10

DATE STAMP
17 FEBRUARY 2021

| PROJECT No. | SCALE | REV. |
|---|---|---|
| 19202 | 1:200 @A3 | A |

Filename: 19202CAD003-210217-CAR PARK REVIEW.dwg Date: 17 February 2021 By: Karl magistrado

PATH FOR EMERGENGY VEHICLE

35685

ROCK CLIMBING PLATFORM ABOVE

FIRE TANKS (2m W x 19m L x 2.5m H) TO BE CO-ORDINATED

35.691m 110°16'20"

WALL CLIMBING TICKETS
46.35 m²

1:5 1:8

DN UP

FIRE SERVICES
147.26 m²

PUMP PUMP

FCR

ENTRY/EX

12 x 1100L GENERAL WASTE BINS

WASTE
181.42 m²

6 x 240L GARDEN ORGANICS RECYCLING BINS

13 x 1100L CO-MINGLED RECYCLING BINS

BIN LIFT / COMPACTOR ZONE

45210

65910

5800

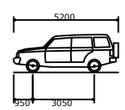
LOADING BAY
182.39 m²
+60,840

GARDEN CENTRE
808.15 m²
+60,840

70.67m

KEY:

| | Forward | Reverse |
|---|---|---|
| Wheel path | | |
| Body envelope | | |
| 300mm clearance | | |




B99 Vehicle (Realistic min radius) (2004)

| | |
|---|---|
| Overall Length | 5200mm |
| Overall Width | 1940mm |
| Overall Body Height | 1878mm |
| Min Body Ground Clearance | 272mm |
| Track Width | 1840mm |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 6250mm |

| REV. | DESCRIPTION | DRAWN | CHECK | APP'D | DATE |
|---|---|---|---|---|---|
| A | ISSUE FOR DISCUSSION | KM | OF | KH | 17/02/21 |

ttpp transport planning

PROJECT

307 LANE COVE ROAD, MACQUARIE PARK

TITLE

SWEPT PATH ANALYSIS - GROUND LEVEL - GROUND TO LEVEL 1 RAMP
AS2890.1 5.2m B99 VEHICLE

DWG No. 19202CAD003
FIGURE 11

DATE STAMP 17 FEBRUARY 2021

| PROJECT No. | SCALE | REV. |
|---|---|---|
| 19202 | 1:200 @A3 | A |

Filename: 19202CAD003-210217-CAR PARK REVIEW.dwg Date: 17 February 2021 By: Karl.magistrado

# Appendix C

## SIDRA Outputs

# MOVEMENT SUMMARY

## Site: 1 [EX.AM LC.Fontenoy (Site Folder: Existing)]

Existing AM Peak Hour
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 34 | 23.5 | 36 | 23.5 | 0.709 | 16.1 | LOS B | 36.6 | 273.3 | 0.56 | 0.54 | 0.56 | 49.8 |
| 11 | T1 | 2835 | 7.3 | 2984 | 7.3 | 0.709 | 9.4 | LOS A | 36.9 | 274.5 | 0.56 | 0.53 | 0.56 | 59.3 |
| 12 | R2 | 7 | 0.0 | 7 | 0.0 | * 0.058 | 39.6 | LOS C | 0.3 | 2.4 | 0.83 | 0.69 | 0.83 | 33.2 |
| Approach | | 2876 | 7.5 | 3027 | 7.5 | 0.709 | 9.5 | LOS A | 36.9 | 274.5 | 0.56 | 0.53 | 0.56 | 59.1 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 1 | 0.0 | 1 | 0.0 | 0.003 | 54.6 | LOS D | 0.1 | 0.4 | 0.82 | 0.58 | 0.82 | 28.3 |
| 2 | T1 | 2 | 50.0 | 2 | 50.0 | 0.017 | 59.0 | LOS E | 0.2 | 1.8 | 0.88 | 0.59 | 0.88 | 25.9 |
| 3 | R2 | 1 | 0.0 | 1 | 0.0 | 0.017 | 62.3 | LOS E | 0.2 | 1.8 | 0.88 | 0.59 | 0.88 | 27.2 |
| Approach | | 4 | 25.0 | 4 | 25.0 | 0.017 | 58.7 | LOS E | 0.2 | 1.8 | 0.86 | 0.59 | 0.86 | 26.8 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 3 | 0.0 | 3 | 0.0 | 0.003 | 16.0 | LOS B | 0.1 | 0.5 | 0.36 | 0.63 | 0.36 | 41.9 |
| 5 | T1 | 3428 | 1.9 | 3608 | 1.9 | * 0.910 | 24.3 | LOS B | 75.8 | 539.3 | 0.91 | 0.89 | 0.94 | 47.8 |
| Approach | | 3431 | 1.9 | 3612 | 1.9 | 0.910 | 24.3 | LOS B | 75.8 | 539.3 | 0.91 | 0.88 | 0.94 | 47.8 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 279 | 1.8 | 294 | 1.8 | 0.174 | 4.9 | LOS A | 1.0 | 7.4 | 0.10 | 0.56 | 0.10 | 51.5 |
| 8 | T1 | 6 | 0.0 | 6 | 0.0 | * 0.656 | 71.4 | LOS F | 8.9 | 66.7 | 1.00 | 0.83 | 1.04 | 23.4 |
| 9 | R2 | 111 | 8.1 | 117 | 8.1 | 0.656 | 74.5 | LOS F | 8.9 | 66.7 | 1.00 | 0.83 | 1.04 | 25.9 |
| Approach | | 396 | 3.5 | 417 | 3.5 | 0.656 | 25.4 | LOS B | 8.9 | 66.7 | 0.37 | 0.64 | 0.38 | 39.7 |
| All Vehicles | | 6707 | 4.4 | 7060 | 4.4 | 0.910 | 18.1 | LOS B | 75.8 | 539.3 | 0.73 | 0.72 | 0.74 | 51.3 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [EX.PM LC.Fontenoy (Site Folder: Existing)]

Existing PM Peak Hour
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 82 | 12.2 | 86 | 12.2 | 0.783 | 17.3 | LOS B | 47.6 | 338.8 | 0.64 | 0.62 | 0.64 | 49.0 |
| 11 | T1 | 3206 | 1.2 | 3375 | 1.2 | 0.783 | 10.7 | LOS A | 48.4 | 342.2 | 0.64 | 0.61 | 0.64 | 58.0 |
| 12 | R2 | 5 | 0.0 | 5 | 0.0 | * 0.041 | 27.2 | LOS B | 0.2 | 1.3 | 0.69 | 0.67 | 0.69 | 37.3 |
| Approach | | 3293 | 1.5 | 3466 | 1.5 | 0.783 | 10.9 | LOS A | 48.4 | 342.2 | 0.64 | 0.61 | 0.64 | 57.7 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 16 | 0.0 | 17 | 0.0 | 0.047 | 55.8 | LOS D | 1.0 | 6.9 | 0.84 | 0.68 | 0.84 | 28.0 |
| 2 | T1 | 11 | 0.0 | 12 | 0.0 | 0.070 | 59.7 | LOS E | 1.0 | 7.0 | 0.89 | 0.65 | 0.89 | 26.0 |
| 3 | R2 | 4 | 0.0 | 4 | 0.0 | 0.070 | 63.0 | LOS E | 1.0 | 7.0 | 0.89 | 0.65 | 0.89 | 27.2 |
| Approach | | 31 | 0.0 | 33 | 0.0 | 0.070 | 58.1 | LOS E | 1.0 | 7.0 | 0.87 | 0.66 | 0.87 | 27.1 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 16 | 0.0 | 17 | 0.0 | 0.014 | 16.1 | LOS B | 0.4 | 3.0 | 0.37 | 0.66 | 0.37 | 41.9 |
| 5 | T1 | 2985 | 3.3 | 3142 | 3.3 | * 0.803 | 17.1 | LOS B | 52.5 | 378.2 | 0.76 | 0.71 | 0.76 | 52.7 |
| Approach | | 3001 | 3.3 | 3159 | 3.3 | 0.803 | 17.1 | LOS B | 52.5 | 378.2 | 0.76 | 0.71 | 0.76 | 52.6 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 398 | 0.0 | 419 | 0.0 | * 0.245 | 4.9 | LOS A | 1.6 | 11.3 | 0.11 | 0.57 | 0.11 | 51.9 |
| 8 | T1 | 4 | 0.0 | 4 | 0.0 | 0.403 | 69.3 | LOS E | 5.0 | 38.6 | 0.97 | 0.77 | 0.97 | 23.8 |
| 9 | R2 | 64 | 12.5 | 67 | 12.5 | 0.403 | 72.5 | LOS F | 5.0 | 38.6 | 0.97 | 0.77 | 0.97 | 26.0 |
| Approach | | 466 | 1.7 | 491 | 1.7 | 0.403 | 14.7 | LOS B | 5.0 | 38.6 | 0.24 | 0.60 | 0.24 | 45.2 |
| All Vehicles | | 6791 | 2.3 | 7148 | 2.3 | 0.803 | 14.1 | LOS A | 52.5 | 378.2 | 0.66 | 0.66 | 0.66 | 54.1 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [EX.AM+D LC.Fontenoy (Site Folder: Existing)]

Existing AM Peak Hour with Development Traffic
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 34 | 23.5 | 36 | 23.5 | 0.737 | 16.5 | LOS B | 39.9 | 298.0 | 0.59 | 0.56 | 0.59 | 49.5 |
| 11 | T1 | 2835 | 7.3 | 2984 | 7.3 | 0.737 | 9.4 | LOS A | 40.2 | 299.3 | 0.56 | 0.53 | 0.56 | 59.2 |
| 12 | R2 | 131 | 0.0 | 138 | 0.0 | * 1.083 | 155.3 | LOS F | 15.6 | 109.0 | 1.00 | 1.15 | 2.03 | 13.6 |
| Approach | | 3000 | 7.2 | 3158 | 7.2 | 1.083 | 15.9 | LOS B | 40.2 | 299.3 | 0.58 | 0.56 | 0.63 | 51.6 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 49 | 0.0 | 52 | 0.0 | 0.144 | 57.2 | LOS E | 3.1 | 21.8 | 0.87 | 0.72 | 0.87 | 27.7 |
| 2 | T1 | 8 | 50.0 | 8 | 50.0 | 0.223 | 66.5 | LOS E | 2.4 | 18.4 | 0.94 | 0.73 | 0.94 | 24.4 |
| 3 | R2 | 25 | 0.0 | 26 | 0.0 | 0.223 | 69.8 | LOS E | 2.4 | 18.4 | 0.94 | 0.73 | 0.94 | 25.5 |
| Approach | | 82 | 4.9 | 86 | 4.9 | 0.223 | 62.0 | LOS E | 3.1 | 21.8 | 0.90 | 0.73 | 0.90 | 26.6 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 66 | 0.0 | 69 | 0.0 | 0.058 | 16.5 | LOS B | 1.8 | 12.6 | 0.39 | 0.68 | 0.39 | 41.7 |
| 5 | T1 | 3428 | 1.9 | 3608 | 1.9 | * 0.926 | 29.4 | LOS C | 83.6 | 594.7 | 0.92 | 0.91 | 0.97 | 44.8 |
| Approach | | 3494 | 1.9 | 3678 | 1.9 | 0.926 | 29.2 | LOS C | 83.6 | 594.7 | 0.91 | 0.91 | 0.96 | 44.7 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 279 | 1.8 | 294 | 1.8 | 0.174 | 4.9 | LOS A | 1.0 | 7.4 | 0.10 | 0.56 | 0.10 | 51.5 |
| 8 | T1 | 22 | 0.0 | 23 | 0.0 | * 0.776 | 77.7 | LOS F | 10.8 | 80.0 | 1.00 | 0.90 | 1.15 | 22.6 |
| 9 | R2 | 111 | 8.1 | 117 | 8.1 | 0.776 | 80.8 | LOS F | 10.8 | 80.0 | 1.00 | 0.90 | 1.15 | 24.9 |
| Approach | | 412 | 3.4 | 434 | 3.4 | 0.776 | 29.2 | LOS C | 10.8 | 80.0 | 0.39 | 0.67 | 0.44 | 37.9 |
| All Vehicles | | 6988 | 4.3 | 7356 | 4.3 | 1.083 | 23.9 | LOS B | 83.6 | 594.7 | 0.74 | 0.74 | 0.79 | 46.5 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [EX.PM+D LC.Fontenoy (Site Folder: Existing)]

Existing PM Peak Hour with Development Traffic
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 82 | 12.2 | 86 | 12.2 | 0.797 | 17.5 | LOS B | 49.7 | 353.7 | 0.66 | 0.64 | 0.66 | 48.8 |
| 11 | T1 | 3206 | 1.2 | 3375 | 1.2 | 0.797 | 10.7 | LOS A | 50.5 | 357.2 | 0.64 | 0.61 | 0.64 | 58.0 |
| 12 | R2 | 64 | 0.0 | 67 | 0.0 | * 0.520 | 38.0 | LOS C | 3.8 | 26.7 | 0.97 | 0.83 | 0.97 | 33.6 |
| Approach | | 3352 | 1.4 | 3528 | 1.4 | 0.797 | 11.4 | LOS A | 50.5 | 357.2 | 0.65 | 0.62 | 0.65 | 56.9 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 125 | 0.0 | 132 | 0.0 | 0.420 | 60.1 | LOS E | 8.4 | 58.7 | 0.92 | 0.78 | 0.92 | 27.1 |
| 2 | T1 | 21 | 0.0 | 22 | 0.0 | 0.659 | 73.8 | LOS F | 6.5 | 45.7 | 1.00 | 0.84 | 1.07 | 23.3 |
| 3 | R2 | 62 | 0.0 | 65 | 0.0 | 0.659 | 77.1 | LOS F | 6.5 | 45.7 | 1.00 | 0.84 | 1.07 | 24.3 |
| Approach | | 208 | 0.0 | 219 | 0.0 | 0.659 | 66.6 | LOS E | 8.4 | 58.7 | 0.95 | 0.80 | 0.98 | 25.8 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 32 | 0.0 | 34 | 0.0 | 0.028 | 16.3 | LOS B | 0.9 | 6.0 | 0.38 | 0.67 | 0.38 | 41.8 |
| 5 | T1 | 2985 | 3.3 | 3142 | 3.3 | * 0.807 | 17.2 | LOS B | 53.1 | 382.4 | 0.76 | 0.71 | 0.76 | 52.7 |
| Approach | | 3017 | 3.3 | 3176 | 3.3 | 0.807 | 17.1 | LOS B | 53.1 | 382.4 | 0.75 | 0.71 | 0.75 | 52.6 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 398 | 0.0 | 419 | 0.0 | * 0.245 | 4.9 | LOS A | 1.6 | 11.3 | 0.11 | 0.57 | 0.11 | 51.9 |
| 8 | T1 | 11 | 0.0 | 12 | 0.0 | 0.509 | 72.9 | LOS F | 5.7 | 43.4 | 0.99 | 0.78 | 0.99 | 23.3 |
| 9 | R2 | 64 | 12.5 | 67 | 12.5 | 0.509 | 76.1 | LOS F | 5.7 | 43.4 | 0.99 | 0.78 | 0.99 | 25.4 |
| Approach | | 473 | 1.7 | 498 | 1.7 | 0.509 | 16.1 | LOS B | 5.7 | 43.4 | 0.25 | 0.60 | 0.25 | 44.3 |
| All Vehicles | | 7050 | 2.2 | 7421 | 2.2 | 0.807 | 15.8 | LOS B | 53.1 | 382.4 | 0.68 | 0.66 | 0.68 | 52.2 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [FU.AM LC.Fontenoy (Site Folder: Future)]

Future (2029) AM Peak Hour
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 34 | 23.5 | 36 | 23.5 | 0.883 | 20.0 | LOS B | 64.5 | 481.4 | 0.79 | 0.76 | 0.79 | 47.4 |
| 11 | T1 | 3544 | 7.3 | 3730 | 7.3 | 0.883 | 13.2 | LOS A | 65.0 | 483.2 | 0.79 | 0.76 | 0.79 | 55.8 |
| 12 | R2 | 7 | 0.0 | 7 | 0.0 | * 0.058 | 54.3 | LOS D | 0.4 | 2.9 | 0.97 | 0.65 | 0.97 | 29.3 |
| Approach | | 3585 | 7.4 | 3773 | 7.4 | 0.883 | 13.4 | LOS A | 65.0 | 483.2 | 0.79 | 0.75 | 0.79 | 55.6 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 1 | 0.0 | 1 | 0.0 | 0.003 | 54.6 | LOS D | 0.1 | 0.4 | 0.82 | 0.58 | 0.82 | 28.3 |
| 2 | T1 | 2 | 50.0 | 2 | 50.0 | 0.017 | 59.0 | LOS E | 0.2 | 1.8 | 0.88 | 0.59 | 0.88 | 25.9 |
| 3 | R2 | 1 | 0.0 | 1 | 0.0 | 0.017 | 62.3 | LOS E | 0.2 | 1.8 | 0.88 | 0.59 | 0.88 | 27.2 |
| Approach | | 4 | 25.0 | 4 | 25.0 | 0.017 | 58.7 | LOS E | 0.2 | 1.8 | 0.86 | 0.59 | 0.86 | 26.8 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 3 | 0.0 | 3 | 0.0 | 0.003 | 16.0 | LOS B | 0.1 | 0.5 | 0.36 | 0.63 | 0.36 | 41.9 |
| 5 | T1 | 4285 | 1.9 | 4511 | 1.9 | * 1.138 | 178.8 | LOS F | 214.0 | 1522.7 | 1.00 | 1.66 | 1.87 | 15.6 |
| Approach | | 4288 | 1.9 | 4514 | 1.9 | 1.138 | 178.7 | LOS F | 214.0 | 1522.7 | 1.00 | 1.66 | 1.87 | 15.6 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 279 | 1.8 | 294 | 1.8 | 0.174 | 4.9 | LOS A | 1.0 | 7.4 | 0.10 | 0.56 | 0.10 | 51.5 |
| 8 | T1 | 6 | 0.0 | 6 | 0.0 | * 0.656 | 71.4 | LOS F | 8.9 | 66.7 | 1.00 | 0.83 | 1.04 | 23.4 |
| 9 | R2 | 111 | 8.1 | 117 | 8.1 | 0.656 | 74.5 | LOS F | 8.9 | 66.7 | 1.00 | 0.83 | 1.04 | 25.9 |
| Approach | | 396 | 3.5 | 417 | 3.5 | 0.656 | 25.4 | LOS B | 8.9 | 66.7 | 0.37 | 0.64 | 0.38 | 39.7 |
| All Vehicles | | 8273 | 4.4 | 8708 | 4.4 | 1.138 | 99.7 | LOS F | 214.0 | 1522.7 | 0.88 | 1.22 | 1.33 | 23.7 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [FU.PM LC.Fontenoy (Site Folder: Future)]

Future (2029) PM Peak Hour
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 82 | 12.2 | 86 | 12.2 | 0.973 | 48.4 | LOS D | 117.8 | 837.9 | 1.00 | 1.07 | 1.14 | 34.6 |
| 11 | T1 | 4008 | 1.2 | 4218 | 1.2 | 0.973 | 41.3 | LOS C | 118.8 | 840.0 | 1.00 | 1.07 | 1.14 | 39.0 |
| 12 | R2 | 5 | 0.0 | 5 | 0.0 | * 0.041 | 54.0 | LOS D | 0.3 | 2.0 | 0.96 | 0.63 | 0.96 | 29.3 |
| Approach | | 4095 | 1.4 | 4310 | 1.4 | 0.973 | 41.5 | LOS C | 118.8 | 840.0 | 1.00 | 1.07 | 1.14 | 38.9 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 16 | 0.0 | 17 | 0.0 | 0.047 | 55.8 | LOS D | 1.0 | 6.9 | 0.84 | 0.68 | 0.84 | 28.0 |
| 2 | T1 | 11 | 0.0 | 12 | 0.0 | 0.070 | 59.7 | LOS E | 1.0 | 7.0 | 0.89 | 0.65 | 0.89 | 26.0 |
| 3 | R2 | 4 | 0.0 | 4 | 0.0 | 0.070 | 63.0 | LOS E | 1.0 | 7.0 | 0.89 | 0.65 | 0.89 | 27.2 |
| Approach | | 31 | 0.0 | 33 | 0.0 | 0.070 | 58.1 | LOS E | 1.0 | 7.0 | 0.87 | 0.66 | 0.87 | 27.1 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 16 | 0.0 | 17 | 0.0 | 0.014 | 16.1 | LOS B | 0.4 | 3.0 | 0.37 | 0.66 | 0.37 | 41.9 |
| 5 | T1 | 3731 | 3.3 | 3928 | 3.3 | * 1.003 | 72.2 | LOS F | 131.8 | 948.4 | 1.00 | 1.18 | 1.28 | 29.4 |
| Approach | | 3747 | 3.3 | 3944 | 3.3 | 1.003 | 71.9 | LOS F | 131.8 | 948.4 | 1.00 | 1.18 | 1.28 | 29.4 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 398 | 0.0 | 419 | 0.0 | * 0.245 | 4.9 | LOS A | 1.6 | 11.3 | 0.11 | 0.57 | 0.11 | 51.9 |
| 8 | T1 | 4 | 0.0 | 4 | 0.0 | 0.393 | 68.0 | LOS E | 4.9 | 38.1 | 0.96 | 0.77 | 0.96 | 24.0 |
| 9 | R2 | 64 | 12.5 | 67 | 12.5 | 0.393 | 71.2 | LOS F | 4.9 | 38.1 | 0.96 | 0.77 | 0.96 | 26.3 |
| Approach | | 466 | 1.7 | 491 | 1.7 | 0.393 | 14.5 | LOS B | 4.9 | 38.1 | 0.23 | 0.60 | 0.23 | 45.3 |
| All Vehicles | | 8339 | 2.3 | 8778 | 2.3 | 1.003 | 53.7 | LOS D | 131.8 | 948.4 | 0.96 | 1.09 | 1.15 | 34.2 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [FU.AM+D LC.Fontenoy (Site Folder: Future)]

Future (2029) AM Peak Hour with Development Traffic
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 34 | 23.5 | 36 | 23.5 | 0.903 | 20.6 | LOS B | 69.2 | 516.4 | 0.83 | 0.80 | 0.83 | 47.0 |
| 11 | T1 | 3544 | 7.3 | 3731 | 7.3 | 0.903 | 14.0 | LOS A | 69.7 | 518.3 | 0.80 | 0.76 | 0.80 | 55.2 |
| 12 | R2 | 131 | 0.0 | 138 | 0.0 | * 1.085 | 135.8 | LOS F | 13.7 | 96.1 | 1.00 | 1.06 | 1.97 | 14.4 |
| Approach | | 3709 | 7.2 | 3904 | 7.2 | 1.085 | 18.4 | LOS B | 69.7 | 518.3 | 0.80 | 0.77 | 0.84 | 50.1 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 49 | 0.0 | 52 | 0.0 | 0.144 | 57.2 | LOS E | 3.1 | 21.8 | 0.87 | 0.72 | 0.87 | 27.7 |
| 2 | T1 | 8 | 50.0 | 8 | 50.0 | 0.223 | 65.3 | LOS E | 2.4 | 18.2 | 0.94 | 0.73 | 0.94 | 24.6 |
| 3 | R2 | 25 | 0.0 | 26 | 0.0 | 0.223 | 68.6 | LOS E | 2.4 | 18.2 | 0.94 | 0.73 | 0.94 | 25.7 |
| Approach | | 82 | 4.9 | 86 | 4.9 | 0.223 | 61.5 | LOS E | 3.1 | 21.8 | 0.89 | 0.73 | 0.89 | 26.7 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 66 | 0.0 | 69 | 0.0 | 0.058 | 16.5 | LOS B | 1.8 | 12.6 | 0.39 | 0.68 | 0.39 | 41.7 |
| 5 | T1 | 4285 | 1.9 | 4511 | 1.9 | * 1.154 | 193.3 | LOS F | 224.4 | 1596.6 | 1.00 | 1.71 | 1.95 | 14.7 |
| Approach | | 4351 | 1.9 | 4580 | 1.9 | 1.154 | 190.6 | LOS F | 224.4 | 1596.6 | 0.99 | 1.70 | 1.92 | 14.8 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 279 | 1.8 | 294 | 1.8 | 0.174 | 4.9 | LOS A | 1.0 | 7.4 | 0.10 | 0.56 | 0.10 | 51.5 |
| 8 | T1 | 22 | 0.0 | 23 | 0.0 | * 0.729 | 73.5 | LOS F | 10.4 | 77.2 | 1.00 | 0.87 | 1.10 | 23.2 |
| 9 | R2 | 111 | 8.1 | 117 | 8.1 | 0.729 | 76.7 | LOS F | 10.4 | 77.2 | 1.00 | 0.87 | 1.10 | 25.6 |
| Approach | | 412 | 3.4 | 434 | 3.4 | 0.729 | 27.9 | LOS B | 10.4 | 77.2 | 0.39 | 0.66 | 0.42 | 38.4 |
| All Vehicles | | 8554 | 4.3 | 9004 | 4.3 | 1.154 | 106.9 | LOS F | 224.4 | 1596.6 | 0.88 | 1.24 | 1.37 | 22.5 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/ Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

## Site: 1 [FU.PM+D LC.Fontenoy (Site Folder: Future)]

Future (2029) PM Peak Hour with Development Traffic
Created by: CH
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)

**Vehicle Movement Performance**

| Mov ID | Turn | INPUT VOLUMES [ Total veh/h | HV ] % | DEMAND FLOWS [ Total veh/h | HV ] % | Deg. Satn v/c | Aver. Delay sec | Level of Service | 95% BACK OF QUEUE [ Veh. veh | Dist ] m | Prop. Que | Effective Stop Rate | Aver. No. Cycles | Aver. Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | | | |
| 10 | L2 | 82 | 12.2 | 86 | 12.2 | 0.982 | 54.7 | LOS D | 126.2 | 897.6 | 1.00 | 1.09 | 1.17 | 32.7 |
| 11 | T1 | 4008 | 1.2 | 4219 | 1.2 | 0.982 | 47.7 | LOS D | 127.3 | 900.4 | 0.98 | 1.08 | 1.16 | 36.6 |
| 12 | R2 | 64 | 0.0 | 67 | 0.0 | * 0.530 | 57.0 | LOS E | 3.9 | 27.6 | 1.00 | 0.74 | 1.00 | 28.6 |
| Approach | | 4154 | 1.4 | 4373 | 1.4 | 0.982 | 47.9 | LOS D | 127.3 | 900.4 | 0.98 | 1.08 | 1.15 | 36.3 |
| East: Fontenoy Rd/Site Access | | | | | | | | | | | | | | |
| 1 | L2 | 125 | 0.0 | 132 | 0.0 | 0.420 | 60.1 | LOS E | 8.4 | 58.7 | 0.92 | 0.78 | 0.92 | 27.1 |
| 2 | T1 | 21 | 0.0 | 22 | 0.0 | 0.659 | 73.8 | LOS F | 6.5 | 45.7 | 1.00 | 0.84 | 1.07 | 23.3 |
| 3 | R2 | 62 | 0.0 | 65 | 0.0 | 0.659 | 77.1 | LOS F | 6.5 | 45.7 | 1.00 | 0.84 | 1.07 | 24.3 |
| Approach | | 208 | 0.0 | 219 | 0.0 | 0.659 | 66.6 | LOS E | 8.4 | 58.7 | 0.95 | 0.80 | 0.98 | 25.8 |
| North: Lane Cove Rd | | | | | | | | | | | | | | |
| 4 | L2 | 32 | 0.0 | 34 | 0.0 | 0.028 | 16.3 | LOS B | 0.9 | 6.0 | 0.38 | 0.67 | 0.38 | 41.8 |
| 5 | T1 | 3731 | 3.3 | 3927 | 3.3 | * 1.007 | 75.1 | LOS F | 134.0 | 964.7 | 1.00 | 1.19 | 1.30 | 28.7 |
| Approach | | 3763 | 3.3 | 3961 | 3.3 | 1.007 | 74.6 | LOS F | 134.0 | 964.7 | 0.99 | 1.19 | 1.29 | 28.8 |
| West: Fontenoy Rd | | | | | | | | | | | | | | |
| 7 | L2 | 398 | 0.0 | 419 | 0.0 | * 0.245 | 4.9 | LOS A | 1.6 | 11.3 | 0.11 | 0.57 | 0.11 | 51.9 |
| 8 | T1 | 11 | 0.0 | 12 | 0.0 | 0.509 | 72.9 | LOS F | 5.7 | 43.4 | 0.99 | 0.78 | 0.99 | 23.3 |
| 9 | R2 | 64 | 12.5 | 67 | 12.5 | 0.509 | 76.1 | LOS F | 5.7 | 43.4 | 0.99 | 0.78 | 0.99 | 25.4 |
| Approach | | 473 | 1.7 | 498 | 1.7 | 0.509 | 16.1 | LOS B | 5.7 | 43.4 | 0.25 | 0.60 | 0.25 | 44.3 |
| All Vehicles | | 8598 | 2.2 | 9051 | 2.2 | 1.007 | 58.3 | LOS E | 134.0 | 964.7 | 0.95 | 1.09 | 1.16 | 32.6 |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

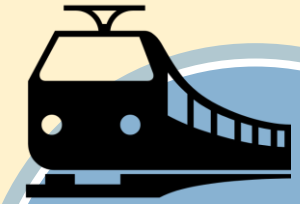
| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Effective Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Lane Cove Rd | | | | | | | | | | | | |
| P4 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 105.5 | 47.1 | 0.45 |
| East: Fontenoy Rd/Site Access | | | | | | | | | | | | |
| P1 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 93.8 | 31.9 | 0.34 |
| West: Fontenoy Rd | | | | | | | | | | | | |
| P3 | Full | 50 | 53 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 97.9 | 37.2 | 0.38 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All Pedestrians | 150 | 158 | 69.3 | LOS F | 0.2 | 0.2 | 0.96 | 0.96 | 99.1 | 38.7 | 0.39 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# Appendix D

## Example Transport Access Guide



Green Square Station services T8 Airport and South Line providing access to:

| | |
|---|---|
| Mascot Station | 2 mins |
| Central Station | 3 mins |
| Circular Quay Station | 12 mins |
| Domestic & International Airports | 5 to 8 mins |

Park your bike in the secure bike parking room located in the Ground and Basement Car Park.

| Cycling Time to Key Destinations/Suburbs | |
|---|---|
| 22 - 25 min | Sydney CBD/ The Rocks/ Circular Quay |
| 18 - 21mins | Randwick/ Coogee |
| 9 - 16 mins | Mascot/ Botany |
| 17 - 21 mins | Newtown/ Enmore |

Map your route using RMS Cycleway Finder:
*rms.nsw.gov.au/maps/cycleway_finder*


2 Car Share vehicles are located in the car park.

Additional car share facilities are located in proximity to the site.

For your nearest car share vehicle visit GoGet:
*goget.com.au/find-cars/*

Multiple bus services are located within a 5-minute (400m) walk from site.

| Route | Description |
|---|---|
| 301 | Eastgardens to Redfern via Mascot |
| 304 | Rosebery to City Circular Quay via Zetland |
| 309 / 310X | Banksmeadow to Central Railway Square |
| 309X | Port Botany to Central Railway Square (Express) |
| 320 | Mascot to Gore Hill |
| 343 | Kingsford to Chatswood |
| 348 | Wolli Creek to Bondi Junction |
| 370 | Leichardt Marketplace to Coogee |

Plan your trip using Sydney's Trip Planning Tool:
*transportnsw.info/trip*

# 94 – 104 Epsom Road Zetland


## Transport Access Guide


TRANSPORT GUIDE MAP
Green Square
13-minute walk
Green Square Library
Sheas Creek
Bourke Rd
X93
301
304
Wolseley Grove
Morris Grove
Levy Walk
Hutchinson Walk
Kirby Walk
Ascot Ave
Defries Ave
Naulty Pl
Bindon Pl
Tilford St
Cook Ln
Christies Ln
Todman Ave
Maccam Pl
Southern Cross Dr
Milroy Ave
Winkurra St
Baker St
McDougall St
Myrtle St
Virginia St
Ingram St
M1
Site
Link Rd
370
Geddes Ave
Paul St
O'Riordan St
Johnson St
Queen St
Victoria Ln
Victoria St
Beaconsfield Ln
Tosh Ln
Hansard St
Chester Ln
Epsom Rd
Reserve St
Emanuel Ln
Dunning Ave
Mentmore Ave
Spring St
Fusel St
Delhi Ln
Cressy St
Collins St
Princess Ave
Salisbury Ln
Beaconsfield St
Crewe Pl
Queen St
Galara St
309
309X
310X
343
Modo Yoga Sydney
400m
5-minute walk
Legend
Train station
Bus stop
301 Bus Route
GoGet Car Share Vehicle
Cycling Routes

# Appendix E

## Council pre-DA Comment Schedule

## Table 1: Pre-DA Comment Schedule

| Comment | TIA Section |
|---|---|
| 2.4 **Car Parking**<br><br>Inadequate information has been provided in relation to parking. Parking must be allocation for commercial/ retail use if proposed on the site based on the parking rate for areas outside Macquarie Park Corridor. A breakdown of each uses and time of use etc must be provided and car paring calculated accordingly.<br><br>A review of the parking capacity required by the DCP part 9.3 (parking requirements) reveals that the development is significantly short of required car parking on the site based on the development type and gross floor space. The reduction in car parking numbers as proposed may not be supported by Council (see discussion under Traffic Comments below). Further detail will be warranted regarding designated uses and associated floor space.<br><br>The development does not appear to comply with parking requirements in regards to the following:<br>o inadequate parking for commercial, retail and other uses.<br>o Inadequate drop off zones;<br>o Unsatisfactory loading/ unloading areas;<br>o spaces are not dimensioned;<br>o parking spaces are not numbered for ease of reference.<br><br>Other issues with parking and vehicle access are listed below: | The DCP does not state specific requirements for drop off zones or loading. However, sufficient loading is considered to be provided.<br>Parking assessment is detailed in Section 4 of the TIA. |
| (a) The reconfiguration to the internal entrance intersection in proximity to the signalised intersection (as well as any other reconfiguration of slip / turning lanes) will require the approval of Transport for New South Wales. It is strongly advised that the applicant liaise with that authority prior to submission of the development application. | Consultation to be undertaken post DA submission. |
| (b) Further to above, the internal access arrangement must take into account potential internal queueing issues, with the commercial parking component having a concentrated inflow / outflow and therefore the accommodation of traffic queues must not impair on vehicle entry to the site, particularly at the "T" intersection on entry. | See Section 5.4 of TIA |
| (c) The driveway ramp configuration has not been designed mindful of vehicle swept path clearances. The ramps intersect the access road/ internal access aisles at right angles which is not conducive to vehicle swept paths and does not facilitate traffic flow.<br><br>(d) The proposed waste and loading bay access will require a swept path analysis . Council does not particular requirements regarding the minimum level of service vehicles required however it is suggested that at least two spaces be provided for vehicles up to a MRV dimension (vehicle as defined by AS2890.2). | Swept paths provided in Appendix B of TIA. |
| (e) With respect to the parking capacity, the development is seeking to comply with the DCP controls for the Macquarie Park Corridor however the site is located just outside the area. The applicability of this control should be confirmed with Council's Strategic section. In the event it is not applicable, the parking standard requirements of DCP Part 9.3 (Parking Controls) will apply. When held in regard to the typical parking controls<br><br>(commercial parking required at 1 space per 40m2) the development appears to be well short of the required parking allocation. The application may seek to rely on a parking study / survey of similar development. | See Section 4 of TIA. |
| (f) The development is noted to accommodate a mix of uses which would allow the parking allocation to be shared. It would be warranted that any coinciding uses (eg function centre & retail) may need traffic control devices implemented to ensure the appropriate allocation of parking. Any such measures must be located mindful of potential queuing issues. | A parking management plan will be prepared during the construction or occupation certificate stage. |
| 2.5 **Traffic comments**<br><br>Council's Traffic Team has provided the following general comments in relation to the submitted development scheme:<br><br>• Provide details on the likely operational characteristics of the café, restaurant and function centre components of the subject development, which include (but not limited) to the following:<br>- Days and hours of operation;<br>- Seating capacity;<br>- Maximum staff employment level; and<br>- Maximum number of visitors/customers expected to be on-site during peak operations of the café, restaurant and function centre. | See Section 3.3 for Hours of Operation.<br>Seating/staff levels unavailable at this stage. |

| | |
|---|---|
| • The traffic and parking demand potentially generated by the function centre during peak operations should be estimated based on surveys of similar facilities. The off-street parking allocated to the function centre is to be adequate in supporting the peak parking demand that is likely to be generated by this land use. | We weren't able to undertake any surveys due to pandemic conditions. Notably function centres are in low demand at present. |
| • Traffic volume surveys (pre-covid) of the intersection of Lane Cove Road and Fontenoy Road are to be provided for the weekday AM & PM and weekend peak periods coinciding with the peak operations of the proposed land uses. | See Section 2.6 |
| • A SIDRA intersection assessment is to be undertaken of the intersection of Lane Cove Road and Fontenoy Road for the following scenarios:<br>- Current traffic conditions based on existing weekday and weekend peak hour traffic demands;<br>- Post-development traffic conditions based on existing + development traffic during peak hour periods; and<br>- 10 year projected traffic conditions (with and without development traffic).<br>Please provide electronic copies of the SIDRA modelling files for review by Council and TfNSW. | See Section 5 |
| • Assess the traffic impact associated with the development on the surrounding road network and provide recommendations for any road improvements/infrastructure upgrades (as necessary) to mitigate these impacts. | See Section 5 |
| • Assess the impact of the development on the surrounding active transport infrastructure (e.g. cycle routes, public transport facilities, pedestrian infrastructure, etc.) and identify any opportunities for potential improvements to encourage greater active transport travel as a means to reduce private vehicle trips to/from the site (e.g. Extending the existing SUP along the western side of Lane Cove Road to provide a pedestrian/cycling link between the site and Macquarie Park railway station, etc.). | VPA contributions are proposed and discussed in Section 4.1.3. |
| • Provide an operational management plan detailing appropriate measures/strategies to assist with managing the safety and efficiency of traffic circulation and the use of parking on-site. | Section 5.4 |
| • The proposed vehicular access, off-street parking and heavy vehicle servicing arrangements shall be designed to comply with the following:<br>- The Australian Standard for *Parking Facilities Part 1: Off-Street Parking* (AS 2890.1);<br>- The Australian Standard for *Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities* (AS2890.2);<br>- The Australian Standard for *Parking Facilities Part 3: Bicycle Parking Facilities* (AS2890.3);<br>- The Australian Standard for *Parking Facilities Part 6: Off-Street Parking for People with Disabilities* (AS2890.6); and<br>- Ryde City Council's *Development Control Plan* | Section 4.5 |

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au