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94 Carrington Road, 203-209 and 223-227 Bronte Road, Waverley Transport Impact Assessment

Client //	Rayda Investments Pty Ltd and Barbary Coast Investments Pty Ltd
Office //	NSW
Reference //	N151210
Date //	01/02/19

94 Carrington Road, 203-209 and 223-227 Bronte Road, Waverley

Transport Impact Assessment

Issue:E 01/02/19
Client: Rayda Investments Pty Ltd and Barbary Coast Investments Pty Ltd
Reference: N151210
GTA Consultants Office: NSW

Quality Record

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1. Introduction

1.1 Background

It is understood that a planning proposal is to be lodged with Waverley Council (Council) for a proposed mixed-use development on land located at 203-209 and 223-227 Bronte Road and 94 Carrington Road (hereby referred to as 'the site'). The indicative scheme that accompanies the planning proposal incorporates 29 apartments, 801 square metres of ground and basement retail space and 482 square metres of upper ground floor commercial area.

Rayda Investments Pty Ltd and Barbary Coast Investments Pty Ltd engaged GTA Consultants (GTA) to undertake a transport impact assessment for the planning proposal which seeks to amend the existing height and floor space controls of the site.

1.2 Purpose of this report

This report sets out an assessment of the anticipated transport implications of the planning proposal, including consideration of the following:

i existing traffic and parking conditions surrounding the site
ii suitability of the proposed parking in terms of supply (quantum)
iii service vehicle requirements
iv pedestrian and bicycle requirements
v the traffic generating characteristics of the planning proposal
vi suitability of the proposed access arrangements for the site
vii initiatives to reduce the reliance on private vehicle travel to the site
viii the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

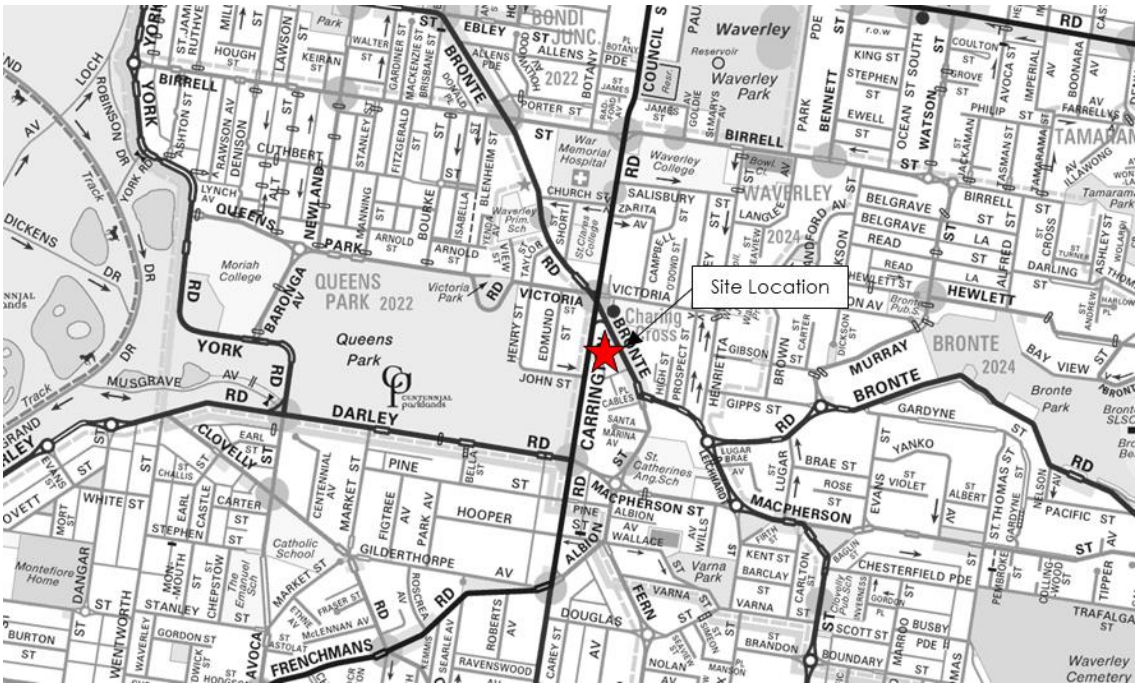
- an inspection of the site and its surrounds
- Council's Development Control Plan (DCP) 2012
- Council's Development Control Plan (LEP) 2012
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- plans for the planning proposal prepared by H&E Architects, 94 Carrington Road, Project Number 2327, Drawing Number SDE-1110-1117, dated 24 January 2019
- Charing Square Urban Design Report prepared by Roberts Day dated January 2019
- other documents and data as referenced in this report.

2. Existing Conditions

The site has an area of 1,229 square metres and has frontages to Carrington Road to the west and Bronte Road to the east. The site currently has a land use classification as B4 Mixed Use and is occupied by 150 square metres of retail tenancies, a drive-thru bottle shop and six residential units which are not occupied due to their dilapidated condition.

The surrounding properties predominantly include retail/ commercial, medium density residential, education, mixed use and religious uses. The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject site and its environs



Base image source: Sydway

2.1 Existing site operation

The peak operation of the existing drive thru bottle shop is predominately Friday and Saturday evenings which does not typically coincide with the surrounding road network commuter peak periods. Existing traffic generation for the bottle shop is recorded to be around 74 vehicle movements per hour on a Friday night[1] which is around 150 per cent higher than during a typical weekday PM commuter peak.

The site currently provides four driveway crossings along Carrington Road.

[1] Traffic movements of the drive thru bottle shop on Friday 18 May 2018 between 5:45pm and 6:45pm.

2.2 Road network

2.2.1 Road hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions, and throughout the State. Roads and Maritime Services (Roads and Maritime) responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the Roads Act 1993, and the regulation to manage the road system is stated in the Australian Road Rules, most recently amended on 19 March 2018.

Roads and Maritime defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

Arterial Roads – Controlled by Roads and Maritime, typically no limit in flow and designed to carry vehicles long distance between regional centres.

Sub-Arterial Roads – Managed by either Council or Roads and Maritime under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).

Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.

Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.2 Surrounding road network

Carrington Road

Carrington Road functions as an arterial road and is aligned in a north-south direction along the western boundary of the site. It is a two-way road configured with generally two lanes in each direction, set within a carriageway of around 12-metres-wide.

Kerbside unrestricted parking is permitted on both sides of the road generally outside of peak periods (weekdays outside of 7:30am-9:30am on the western side only and 4pm-6:30pm on both sides of the road). Carrington Road has a posted speed limit of 60 kilometres per hour.

Bronte Road

Bronte Road functions as a sub-arterial road and is aligned in a north-south direction along the sites eastern boundary. It is a two-way road with generally one traffic lane and one parking lane in each direction set within a carriageway of around 14-metres-wide.

Adjacent to the site, parking is restricted to 30-minute time restrictions on the eastern side of the road between 8:30 and 6pm on weekdays and 8:30am and 12:30pm on Saturdays. On the western side of the road, one-hour time restricted parking is available from 9am to 6pm on weekdays and from 8:30am to 12:30pm on Saturdays. There are also bus and loading zones on both sides of the road, with no stopping restrictions on the western side of the road between 7am and 9am on weekdays. Bronte Road has a posted speed limit of 50 kilometres per hour.

Victoria Street

Victoria Street functions as a collector road and is aligned in an east-west direction to the north of the site. It is a two-way road with one lane in each direction set within a carriageway of around 12-metres-wide. A marked cycleway is provided on both sides of the road between the parking and traffic lanes.

Kerbside parking is permitted along the both sides of the road, with no stopping restrictions in place from 7:30am to 9am and 3pm to 4pm on weekdays on the southern side of the road near the Bronte Road/ Carrington Road intersection.

West of Bronte Road, two-hour time restricted parking is available along the northern side of the road between 8pm and 6pm, while parking on the southern side of the road remains unrestricted. East of Bronte Road, one-hour parking restrictions are in place on both sides of the road between 8:30 and 6pm on weekdays and between 8:30am and 12:30pm on Saturdays. Victoria Street has a posted speed limit of 50 kilometres per hour.

2.3 Car parking

A summary of publicly available car parking near the site is presented in Table 2.1.

Table 2.1: Summary of publicly available car parking near subject site

Road	Location	Type of parking	Restrictions	Time in effect
Carrington Road	Both sides	Parallel on both sides	Unrestricted	East: Outside of 4pm-6:30pm (M-F) West: Outside of 7:30am-9:30am and 4pm-6:30pm (M-F)
Bronte Road	Both sides	Parallel on both sides	½ P	East: 8:30am-6pm (M-F), 8:30am-12:30pm (Sat) West: 9am-6pm (M-F), 8:30am-12:30pm (Sat)
Victoria Street	Both sides	Parallel on both sides	East of Bronte Road: Unrestricted West of Bronte Road: 1P	East of Bronte Road: Unrestricted West of Bronte Road: 8:30am-6pm (M-F), 8:30am-12:30pm (Sat)

2.4 Public transport

The site is well serviced by frequent bus services directly outside the site along Bronte Road and Carrington Road linking the site to Bondi Junction to the north and various beach areas to the south and east. Bondi Junction Railway Station is within a 15-20 min (approximately 1.2 kilometres) walk from the site linking the area with Sydney CBD and broader railway network.

A review of the public transport available near the site is summarised in Table 2.2 and shown in Figure 2.2.

Table 2.2: Public transport provision

Service	Route #	Route Description	Location of Stop	Distance to Nearest Stop	Frequency On/Off Peak
Bus	313	Bondi Junction to Coogee via Carrington Rd	Carrington Road	Outside site	30 mins peak and off peak
	314	Coogee to Bondi Junction via Randwick Junction	Bronte Road		30 mins peak and off peak
	316	Eastgardens to Bondi Junction via Randwick Junction			20-60 mins peak/ 30 mins off peak
	317	Eastgardens to Bondi Junction via Randwick Junction & Beauchamp Rd			30-60 mins peak/ 30 mins off peak
	348	Wolli Creek to Bondi Junction			15-20 mins peak/ 30 mins off peak
	353	Eastgardens to Bondi Junction			5-30 mins peak/ 30 mins off peak
	379	North Bondi to Bronte			10 mins peak/ 10-20 mins off peak
Train	T4, South Coast Line	Eastern Suburbs & Illawarra Line, South Coast Line	Bondi Junction Station	1.2km	3-5 mins peak/ 10 mins off peak

Figure 2.2: Surrounding bus network

Base image source: https://transportnsw.info/document/1699/region-guide-sydney-sydney-east.pdf, accessed 21 January 2019

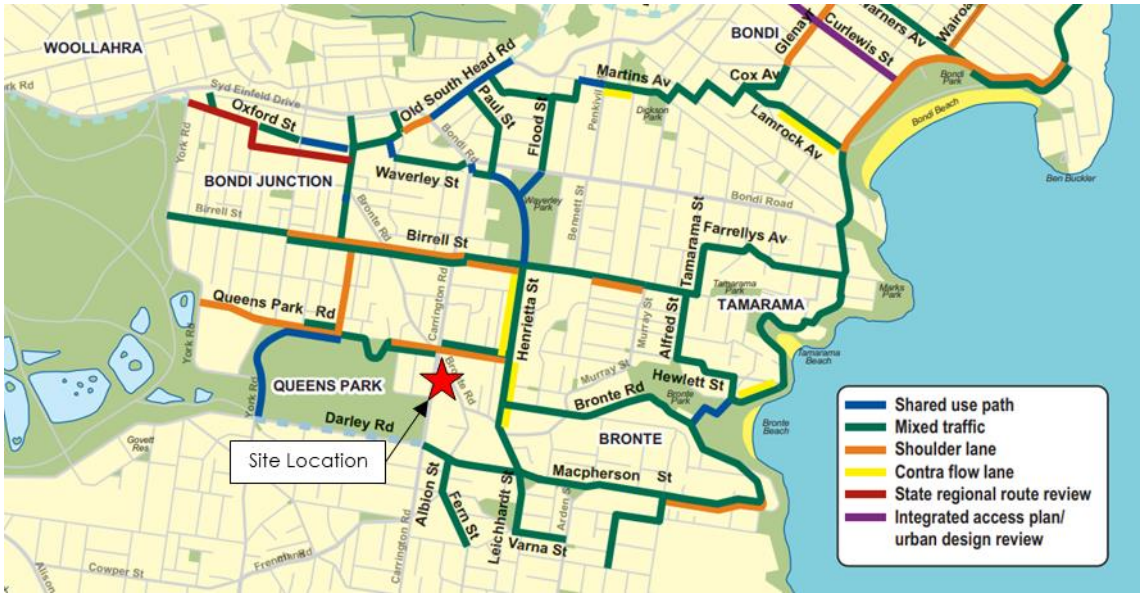
2.5 Pedestrian and cycle infrastructure

Footpath facilities are provided on both sides of Carrington Road, Bronte Road and Victoria Street near the site, with safe crossing points as follows:

- Signalised crossings on all approaches of the Bronte Road/ Carrington Road/ Victoria Street intersection
- Pedestrian crossing south of the site across Bronte Road near Albion Street
- Pedestrian crossing north of the site across the Bronte Road slip lane to Carrington Road.

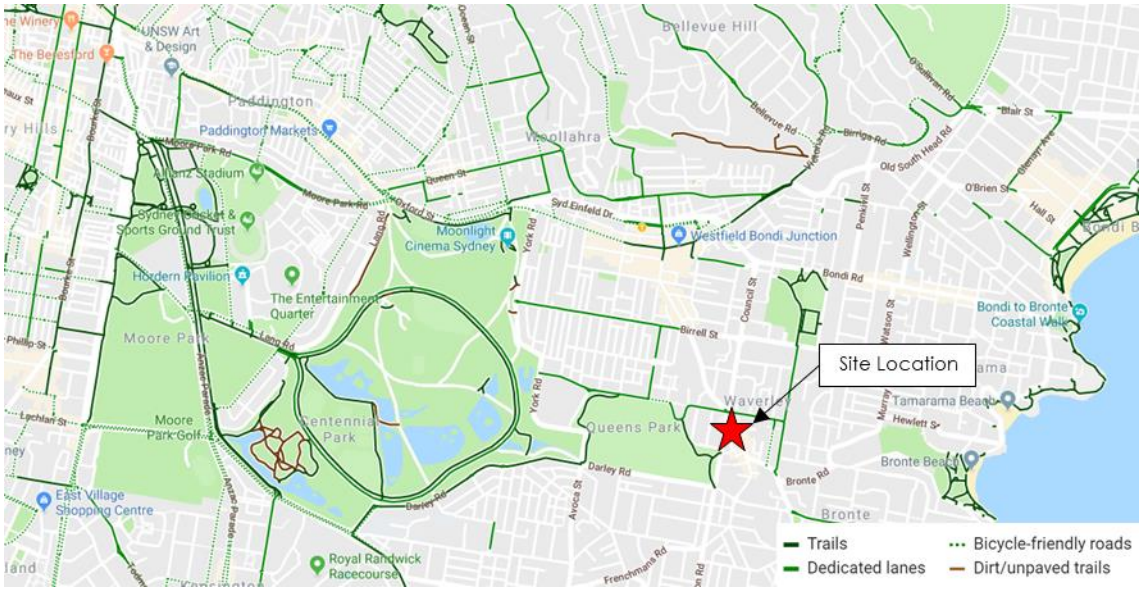
In addition to the surrounding pedestrian infrastructure, a mixture of designated cycleways and bicycle friendly roads surround the site. Onsite observations confirm a high cyclist presence, particularly along Bronte Road and Carrington Road running to and from Bondi Junction Railway Station. Victoria Street to the north of the site provides dedicated on-road bicycle lanes for cyclists adjacent to the parking lanes both east and west of Carrington Road/ Bronte Road. Further roads such as Henrietta Street, Bourke Street and Birrell Street provide connections to key destinations including Centennial Park, Bondi Junction, The Entertainment Quarter and cycle paths into Sydney CBD as shown in Figure 2.3 and Figure 2.4.

Figure 2.3: Surrounding bicycle network



Source: Waverley Bike Plan 2013

Figure 2.4: Broader bicycle network



Source: Google Maps, accessed 9 May 2018

The Complete Streets project is part of Council's plan to enhance the vibrancy of Bondi Junction and its surrounding streets. It involves streetscaping the footpaths and public areas, making meeting places more vibrant and appealing, and improving connections for cycling, walking and access to public transport.

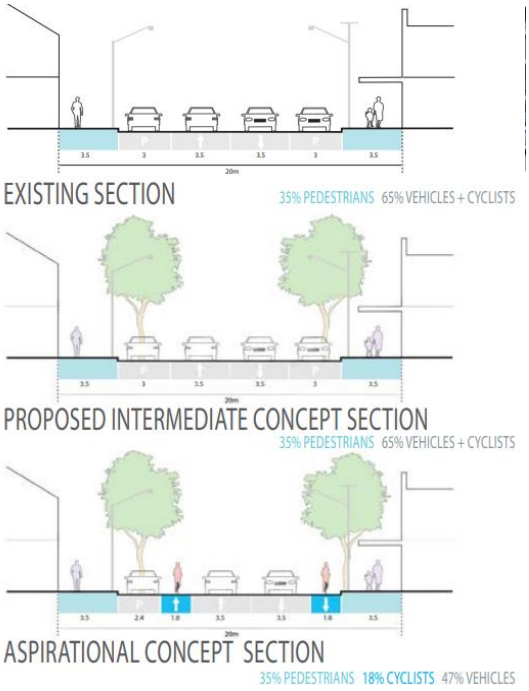
The Complete Streets Report outlines Council's public domain improvements plan for the coming 20 years, with improvements to Bronte Road up to Birrell Street further north of the site.

The Complete Streets project scope and proposed works for Bronte Road include separated on-road cycleway facilities on both sides at the expense of one parking lane as shown in Figure 2.5 to Figure 2.6.

Figure 2.5: Complete Streets project scope

Source: Waverley Council's Complete Streets Report

Figure 2.6: Bronte Road proposed cross section (Ebley Street to Birrell Street)

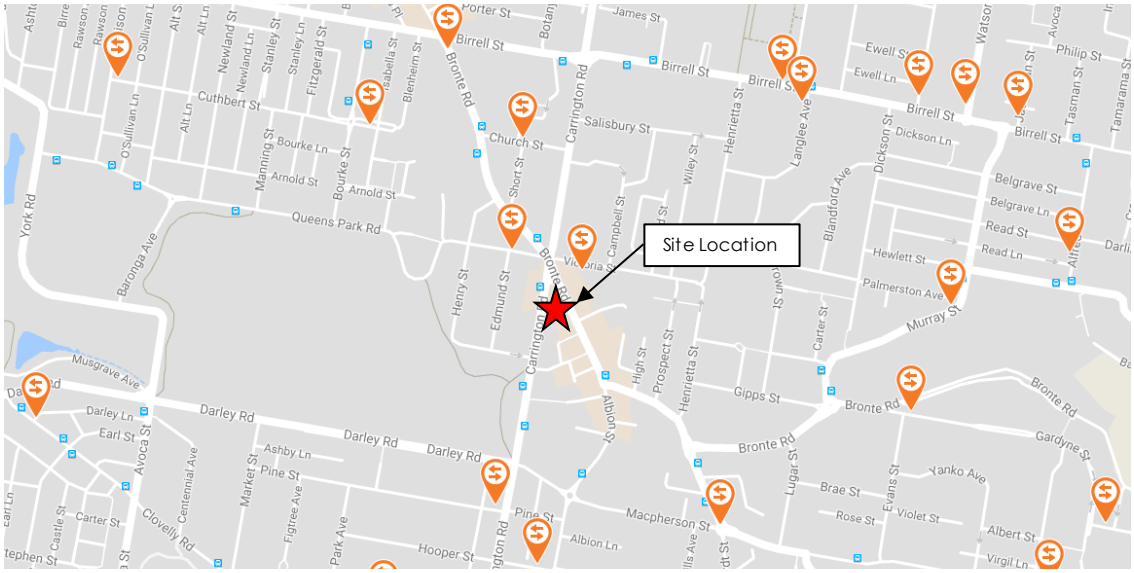


Source: Waverley Council's Complete Streets Report

2.6 Local car sharing initiatives

GoGet (along with other car share schemes) has become increasingly common throughout Sydney and is now recognised as a viable transport option for drivers throughout Sydney. They are now a well-utilised service especially in the inner ring suburbs due to limited parking availability and the expense involved in parking close to the Sydney CBD. GoGet offer a viable alternative to the private car for trips where distances are short and are likely to be of benefit to future tenants and commercial residents of the proposed development. GoGet car share pods located close to the site are shown in Figure 2.7.

Figure 2.7: Surrounding GoGet locations



Source: GoGet

3. Planning Proposal

3.1 Land uses

The Planning Proposal includes the construction of a mixed-use development comprising of residential apartments, along with retail and commercial space, as summarised in Table 3.1.

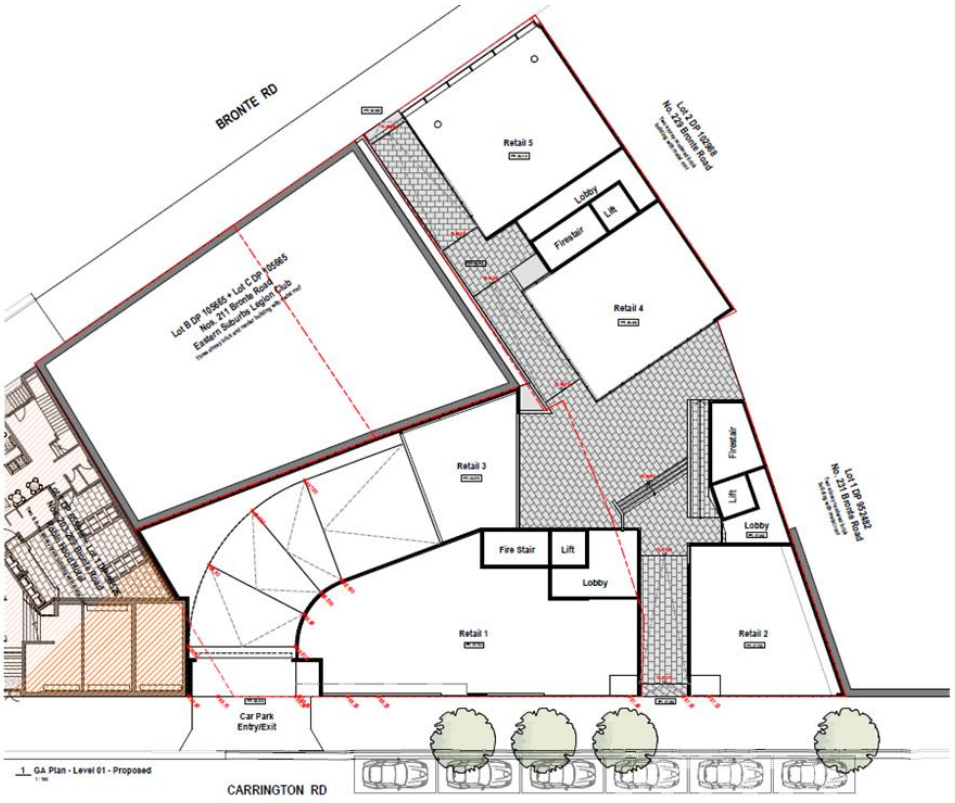
Table 3.1: Development schedule

Use	Description	Size
Residential apartments	1 bed	19 units
	2 bed	10 units
	Total	**29 units**
Retail		801 sqm GFA
Commercial		482 sqm GFA

3.2 Vehicle access

A single two-way vehicular crossover is proposed via Carrington Road providing access to the basement car park. This is proposed to be located in the position of the existing drive-thru bottle shop entry vehicle crossover. There are currently three additional vehicular crossovers located to the south of the proposed driveway that will be disused with opportunity to remove these and provide additional kerbside parking adjacent to the site. The proposed location of the Carrington Road crossover is illustrated in Figure 3.1.

Figure 3.1: Proposed Carrington Road crossover



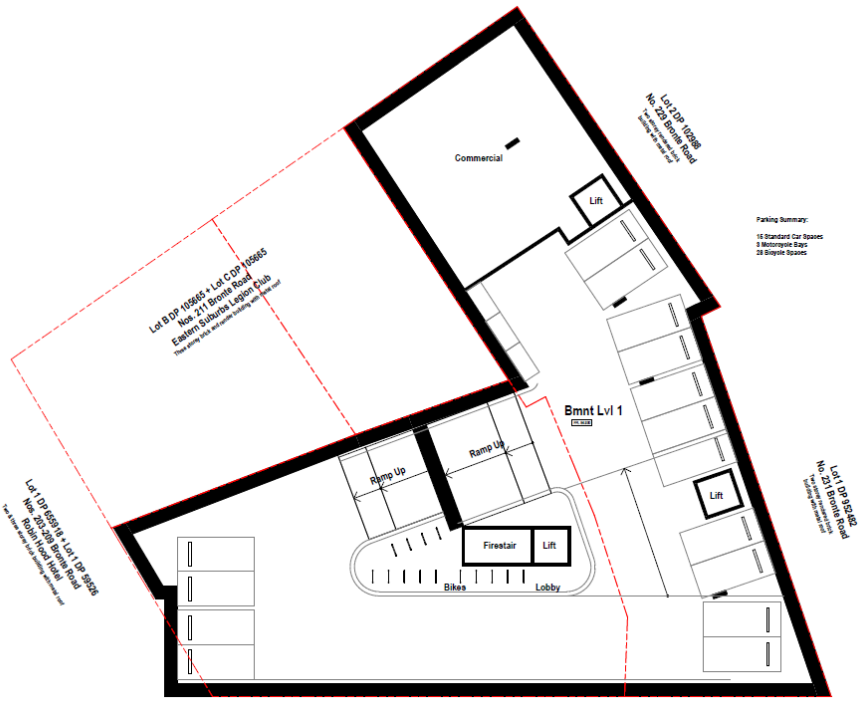
Source: H&E Architects, Project Number 2327 Drawing Number SDE-1112, dated 24 January 2019

The suitability of the proposed access arrangements is discussed in Section 4 of this report.

3.3 Car parking

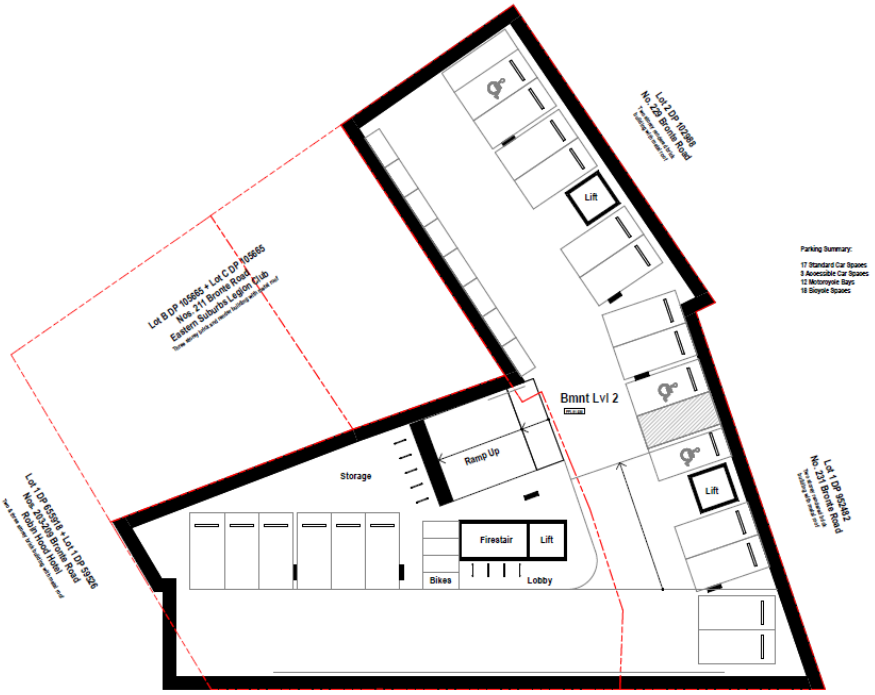
The proposal includes a total of 35 car parking spaces over two basement levels. The indicative layout of the car park is shown in Figure 3.2 and Figure 3.3.

Figure 3.2: Indicative Basement 1 car park layout



Source: H&E Architects, Project Number 2327 Drawing Number SDE-1111, dated 24 January 2019

Figure 3.3: Indicative Basement 2 car park layout



Source: H&E Architects, Project Number 2327 Drawing Number SDE-1110, dated 24 January 2019

The suitability of the car parking provision and layout is discussed in Section 4 of this report.

3.4 Pedestrian facilities

A pedestrian accessway is proposed through the site, with a north-south pedestrian through link proposed to connect with the future Charing Square Precinct. An east-west pedestrian link is proposed between Bronte Road and Carrington Road as shown in Figure 3.4.

Figure 3.4: Proposed pedestrian corridors

Base image source: H&E Architects, Project Number 2327 Drawing Number SDE-1112, dated 24 January 2019

The suitability of the proposed pedestrian facilities is discussed in Section 5 of this report.

3.5 Bicycle facilities

The plans indicate 23 bicycle racks over the two basement levels, suitable for accommodating up to 46 bicycles. There is also additional storage space in the basement car park that has the potential to be used for secure bicycle storage.

Suitable bicycle provisions for the proposal are discussed in Section 5 of this report.

3.6 Loading areas

Loading/ unloading activities are proposed to occur within on-street loading zones.

Suitable loading provisions for the proposal are discussed in Section 4.3 of this report.

4. Car Parking

4.1 Car parking requirements

The car parking provision requirements for different development types are set out in Council's DCP 2012 (Amendment 6). The DCP car parking requirement for the proposal is summarised in Table 4.1.

Table 4.1: DCP 2012 car parking requirements

Description	Use	Size	DCP 2012 Parking Rate	DCP 2012 Parking Requirement
High density residential flat building (more than 20 dwellings)	1-bedroom unit	19 units	Min = 0 Max = 0.6 space per unit	Min = 0 Max = 11
	2-bedroom units	10 units	Min = 0 Max = 0.9 space per unit	Min = 0 Max = 9
	Visitor	29 units	1 space per 5 units	Min = 0 Max = 6
Sub-Total				**Min = 0 spaces Max = 26 spaces**
Retail		801 sqm GFA	Minimum = 0 Maximum = 3.3 space / 100m^2 GFA	Min: 0 Max: 26
Commercial		482 sqm GFA	Minimum = 0 Maximum = 1 space / 100m^2 GFA	Min: 0 Max: 5
Total				**Min: 0 spaces Max: 57 spaces**

Table 4.1 indicates that the proposal requires between 0 and 57 car parking spaces to accord with the DCP 2012 requirements.

4.2 Adequacy of parking supply

The planning proposal includes 35 car parking spaces and therefore meets the DCP 2012 car parking requirements.

There is opportunity to cater for short term parking demands generated by the site and surrounds by increasing on-street car parking supply with the removal of disused vehicular crossovers adjacent to the site, in conjunction with the introduction of time-restrictions along Carrington Road (outside the existing no stopping/ no parking periods). This would result in an increase in on-street car parking of approximately four spaces. It is noted that a portion of this additional on-street frontage could also provide a loading zone, as discussed further in Section 4.3.

Providing parking less than the maximum DCP 2012 requirements presents opportunities to reduce reliance on car ownership and promote the use of sustainable forms of transport such as walking, cycling and public transport, an objective of the DCP 2012.

The provision of an onsite or on-street car share pod or on a nearby local street (i.e. John Street) further enables individuals to reduce or eliminate the need for car ownership. According to the DCP 2012, there is extensive use of car share vehicles in Waverley and as such, one car share space can be provided in lieu of four car parking spaces in new developments. Any onsite car

share pod would be required to be publicly accessible at all times and adequately lit and sign posted to ensure that it not only improves the accessibility for the site, but also the surrounding Waverley community.

4.3 Accessible parking requirements

The DCP 2012 states that developments with 10 or more units, 20 per cent of units are to comply with the provisions of an adaptable unit as specified in accordance with the Australian Standards. One accessible car parking space is to be provided for every adaptable residential unit.

Based on the proposal of 29 apartments, three apartments are required to be adaptable units. As such, the proposal of three accessible spaces on site meets the DCP 2012 requirement.

Further to this, 10 per cent of the non-residential parking allocation is required to be accessible in accordance with DCP 2012.

4.4 Motorcycle parking requirements

The DCP 2012 states that parking is required to be provided at a rate of one motorcycle space for every three car parking spaces. The proposed provision of 35 car parking spaces presents the requirement of 12 motorcycle spaces. This is met with the provision of 15 motorcycle spaces within the basement levels.

4.5 Loading requirements

The loading requirements for different development types are set out in Council's DCP 2012. The DCP requirement for the proposed development is summarised in Table 4.2.

Table 4.2: DCP loading requirements

Use	Size	DCP loading bay rate	DCP loading bay requirement
Residential	29 units	1 per 50+ dwellings	0 bays
Retail	801 sqm GFA	1 per 400 sqm GFA	2 bays
Commercial	482 sqm GFA	1 per 4,000 sqm GFA	0 bays
		Total	**2 bays**

Table 4.2 indicates that the proposal requires one to two loading bays. Due to the constraints of the site, loading is proposed to take place on-street. Bronte Road currently includes a loading zone on the site frontage between the hours of 10am and 4pm Monday to Friday. In addition, the removal of three existing crossovers on Carrington Road presents the opportunity for a dedicated or time restricted loading zone to be provided. This is considered acceptable for such a development, with low loading activity expected for minor retail shops.

5. Sustainable transport infrastructure

5.1 Bicycle end of trip facilities

The bicycle parking provision requirements for different development types are set out in Council's DCP 2012. A review of the parking requirements for the proposed development is summarised in Table 5.1.

Table 5.1: DCP bicycle parking requirements

Use	Size	DCP parking rate		DCP parking requirement	
		Resident/ staff	Visitor	Resident/ staff	Visitor
Residential	29 units	1 spaces / unit	1 space / 10 units	29 spaces	3 spaces
Retail	801 sqm GFA	0.1 spaces / 100 sqm GFA	0.4 spaces / 100 sqm GFA	1 space	4 spaces
Commercial	482 sqm GFA	0.45 spaces / 100 sqm GFA	1 space / 2,000 sqm GFA	3 spaces	1 space
Total				**33 spaces**	**8 spaces**

Table 5.1 indicates that the proposal requires 41 bicycle parking spaces. This is met with the indicative proposed provision of 46 bicycle parking spaces in the form of bicycle racks in the basement car park.

All residential tenant bicycle parking should be provided in Class 1 bicycle lockers, while commercial and retail bicycle parking should be Class 2 enclosures for staff/ employees. Visitor bicycle parking for the site should be Class 3 bicycle racks/ rails located in publicly accessible areas to encourage usage. This will be developed further in the development application stage.

One locker is required for each non-residential bicycle parking space along with one shower/ change cubicle for up to 10 non-residential bicycle parking spaces. As such, nine lockers and one shower should be provided for the retail and commercial space.

The plans indicate there is adequate space for the above to be accommodated within the site and will be detailed in the development application stage.

5.2 Walking and cycling network

The proposal aims to improve site links to the broader Charing Square Precinct, Queens Park and buses running along Bronte Road and Carrington Road. Ground floor retail will access a courtyard, with wide pedestrianised areas through the site. Bicycle parking for visitors would likely be located within the courtyard to encourage usage and convenience when arriving and departing the site by bicycle.

The indicative overview of pedestrian connectivity to, from and within the Charing Square Precinct is shown in Figure 5.1.

As mentioned in Section 2.5, Council is proposing to improve the streetscape on streets around Bondi Junction. With regard to the 94 Carrington Road site, Bronte Road north of Birrell Street is proposed to be upgraded to improve cyclist amenity as well as improving the streetscape to encourage other active travel modes. This presents an opportunity to extend such amenity south

of Birrell Street to Victoria Street to provide a continuous connection from the site and surrounds to Bondi Junction.

Figure 5.1: Pedestrian connectivity around the site

Base image source: Roberts Day, Charing Square Urban Design Report, dated January 2019

5.3 Public transport

The proposal will maintain the current public transport level of service, with bus routes along Bronte Road and Carrington Road, and the site being within walking and cycling distance of Bondi Junction railway station. The proposed site accesses and pedestrian links would allow for good connection to the existing bus stops along Bronte Road and Carrington Road.

6. Traffic Impact Assessment

6.1 Traffic generation

6.1.1 Existing traffic generation

Robin Hood Hotel Bottle shop

As outlined in Section 2.1 the peak operation of the existing drive thru bottle shop is predominately Friday and Saturday evenings which does not typically coincide with the surrounding road network commuter peak periods. To assess the current impact on the surrounding road network peaks a survey of the bottle shop was undertaken on Tuesday 15 May 2018. Vehicle in and out counts at the existing drive thru where collected to understand typical traffic generating characteristics. The survey results are shown in Table 6.1.

Table 6.1: Existing bottle shop traffic generation

Time	In	Out	Total
5:45pm-6:00pm	5	5	10
6:00pm-6:15pm	4	2	6
6:15pm-6:30pm	3	5	8
6:30pm-6:45pm	3	3	6
Total	**15**	**15**	**30**

As illustrated in Table 6.1, the bottle shop generated 30 vehicle movements per hour on a typical weekday evening peak period. The drive thru bottle shop only opens at 10am and therefore would not generate any traffic during the morning peak period.

Retail

In addition to the drive thru bottle shop, there are three 50 square metre GFA retail premises located on the site. To determine the expected traffic generation associated with the retail premises the traffic generation rate applicable to speciality retail sourced from the Roads and Maritime Guide 2002 has been used to calculate the likely existing traffic generation. This represents 4.6 vehicle movements per 100 square metres of gross leasable floor area (GLFA) in the PM peak hour. The traffic generation rate for speciality retail is generally much less in the AM peak hour and as such, a 50 per cent reduction factor on the PM peak rate has been assumed for the AM peak resulting in a rate of 2.3 vehicle movements per 100 square metres of GLFA.

Based on the rates specified in the Roads and Maritime Guide, it is estimated the existing retail space on the site currently generates around three and five vehicle trips in the AM and PM peak hours respectively.

Existing traffic generation summary

Table 6.2 summarises the existing traffic generation of the site.

Table 6.2: Existing site traffic generation

Use	Traffic generation estimates (vehicle movements per hour)	
	AM peak hour	PM peak hour
Drive thru bottle shop	0	30
Retail	3	5
Total	**3**	**35**

As shown in Table 6.2, the existing uses on the site are estimated to generate around three and 35 vehicle trips in the AM and PM peak hours respectively.

6.1.2 Proposed traffic generation

Traffic generation estimates for the proposed development have been sourced from Roads and Maritime Guide 2002 and Technical Direction: Updated Traffic Surveys (TDT 2013/ 04).

Residential

TDT 2013/ 04 provides updated rates for high density residential flat dwellings that are close to public transport services. TDT 2013/ 04 indicates an average AM peak hour trip generation for Sydney of 0.19 vehicle movements per apartment. PM peak hour rates are slightly lower at 0.15 vehicle movements / hour.

For the purpose of this assessment the residential component has been defined as high density residential flat dwellings. This is due to the sites location being along a key bus route that provides frequent services during all times of the day particularly during the AM and PM peak periods, the TDT 2013/ 04 rates are considered the most relevant.

Retail

The proposal also includes ground level retail which would mostly comprise of specialty retail shops and restaurant/ cafes. As discussed in Section 6.1.1, the Roads and Maritime Guide 2002 specifies a traffic generation rate of 4.6 vehicle movements per 100 square metres of GLFA in the PM peak hour. Assuming a 50 per cent reduction in the morning peak hour, this presents a traffic generation rate of 2.3 vehicle movements per 100 square metres GLFA in the AM peak hour.

Commercial

The commercial traffic generation rates have been sourced from the TDT 2013/ 04 which result in a rate of 1.6 and 1.2 vehicle movements per 100 square metres GFA.

Proposed traffic generation summary

Having consideration to the different uses and the site's location, Table 6.3 sets out traffic generation estimates the AM and PM peak hour periods.

Table 6.3: Estimated development traffic generation

Use	Size	Design Generation Rates		Traffic Generation Estimates (vehicle movements per hour)	
		AM Peak	PM Peak	AM Peak	PM Peak
Residential	29 units	0.19 trips / dwelling	0.15 trips / dwelling	6	4
Retail	801 sqm GFA	2.3 trips / 100 sqm GLFA	4.6 trips / 100 sqm GLFA	14	28
Commercial	482 sqm GFA	1.6 trips / 100 sqm GFA	1.2 trips / 100 sqm GFA	8	6
Total				**28**	**38**

Assumes GLFA is 75 per cent of GFA

Table 6.3 indicates the proposed development is expected to generate around 28 and 38 vehicle movements per hour in the AM and PM peak hours respectively. It is expected that the majority of the 35 car parking spaces will be allocated to the residential component of the development. As such, most other site generated traffic would either occur to/ from surrounding on-street car parking or be offset by active and/ or public transport trips given that no onsite parking is allocated to these uses.

6.1.3 Net change in traffic generation

Based on the existing traffic generation of the current uses, the proposed development is expected generate a net increase of some 25 trips in the AM peak hour and three trips in the PM peak hour.

It should be noted that existing traffic volumes relating to the drive thru bottle shop on peak nights such as Fridays and Saturdays are significantly higher than on Tuesday nights which was surveyed to understand typical conditions. As such, the existing traffic impact that currently occurs on Friday and Saturday nights would be removed because of the proposed development.

6.2 Traffic impact

Observations along Carrington Road, south of Victoria Street, indicate that northbound queuing currently extends past the existing driveways to the site during peak periods. Vehicles queued are generally able to clear the intersection of Carrington Road, Bronte Road and Victoria Street in a single phase. As such, departing vehicles will be required to find safe gaps in the general traffic flows, with any delays experienced expected to be contained internally to one or two vehicles, which is minimal internal queuing.

The proposed development would result in a significant reduction to traffic generated on Friday and Saturday evenings, improving the amenity of the area during those times. The traffic generated by the proposed development would have a minimal increase in the typical AM and PM peak periods.

Against existing traffic volumes near the site, the additional traffic generated by the proposed development in the AM peak hour is not expected to compromise the safety or function of the surrounding road network.

The proposed access arrangements will consolidate the existing four driveways to one access point on Carrington Road, this will improve road safety by reducing the number of conflict points.

7. Overview Green Travel Plan

7.1 Introduction

As specified in the DCP 2012, Council requires a green travel plan (GTP) to be prepared as part of the development application to promote sustainable travel. As such, a GTP applicable to residents and staff working on the site would be prepared prior to the occupation of the development. The section below provides a framework for the implementation of such a travel plan.

7.1.1 Travel plan framework

Transport is a necessary part of life, but it has economic, public health and environmental consequences. The transport sector is one of the fastest growing emissions sectors in Australia, and therefore is one of the key opportunities for reducing greenhouse gases. As well as delivering better environmental outcomes, providing a range of travel choices with a focus on walking, cycling and public transport will have major public health benefits and will ensure a strong and prosperous community.

The physical infrastructure being provided as part of the development is only part of the solution. A green travel plan will ensure that the transport infrastructure, services and policies both within and external to the site are tailored to the users and co-ordinated to achieve the most sustainable outcome possible.

7.1.2 What is a Green Travel Plan?

A green travel plan is a package of measures aimed at promoting sustainable travel and reducing reliance on the private car. It is not designed to be 'anti-car' however will encourage and support people's aspirations for carrying out their daily business in a more sustainable way. Travel plans can provide both:

- measures which restrict car use (disincentives or 'sticks')
- measures which encourage or support sustainable travel, reduce the need to travel or make travelling more efficient (incentives or 'carrots').

The travel plan would promote the use of transport, other than the private car, provide choice for staff to travel to and from the site, which is more sustainable and environmentally friendly.

Indeed, there are a range of "non-car" transport options that are available at the site which have been described in this report.

Given the developments aim to reduce private travel to the site, the implementation of a green travel plan would be beneficial.

7.2 Key objectives

The aim of the green travel plan is to bring about better transport arrangements for living and working at the site. The key objectives of the Travel Plan are:

- to encourage walking
- to encourage cycling
- to encourage the use of public transport

- to reduce the use of the car, in particular single car occupancy
- where it is necessary to use the car, encourage more efficient use.

It is the intention therefore that the travel plan will deliver the following benefits:

- enable higher public and active travel mode share targets to be achieved
- contribute to greenhouse gas emission reductions and carbon footprint minimisation
- contribute to healthy living for all
- contribute to social equity and reduction in social exclusion
- improve knowledge and contribute to learning.

7.3 Site specific measures

The location of the site, in terms of its proximity to a wide range of sustainable transport including Bondi Junction Station and the bus routes along Bronte Road and Carrington Road, is a key attribute in the justification of the development. The GTP will then put in place measures to raise awareness and further influence the travel patterns of those people living, working or visiting the development with a view to encouraging modal shift away from cars.

The following potential measures and initiatives could be implemented to encourage more sustainable travel modes:

i Limiting onsite car parking provisions to residential uses.
ii Create internal pedestrian and cyclist connections to the broader Charing Square Precinct to encourage cycling and walking.
iii Provide a Travel Access Guide (TAG) which would be given to all residents and staff and available to all visitors. This document would be based on facilities available at the site would detail surrounding public transport services and active transport facilities. The TAG would be updated as the surrounding transport environment changes.
iv Providing public transport information boards to make residents, staff and visitors more aware of the alternative transport options available (the format of such information boards would be based upon the TAG).
v Providing a car sharing pod on site or nearby and promoting the availability of car sharing pods for trips that require the use of private vehicles.
vi Providing bicycle facilities including secure bicycle parking for staff, bicycle racks/ rails for visitors and shower and change room facilities.
vii Encouraging staff working on site that drive to work and park on surrounding roads to carpool together by creating a Carpooling club or registry/ forum.
viii Regularly promoting ride/ walk to work days.
ix Providing a regular newsletter to all residents and staff members bringing the latest news on sustainable travel initiatives in the area.

7.3.1 Travel Access Guide

A TAG provides information to residents, staff and visitors on how to travel to the site using sustainable transport modes such as walking and public transport. The information is presented visually in the format of a map showing the site location and nearby transport modes highlighting available pedestrian and cycle routes. The information is usually presented as a brochure to be included in a welcome pack or on the back of company stationery and business cards.

7.3.2 Information and communication

Several opportunities exist to provide residents, staff and visitors with information about nearby transport options. Connecting residents, staff and visitors with information would help to facilitate journey planning and increase their awareness of convenient and inexpensive transport options which support change in travel behaviour. These include:

- Transport NSW provides bus, train and ferry routes, timetables and journey planning through their Transport Info website: http://www.transportnsw.info.
- Council provides a number of services and a range of information and events to encourage people of all levels of experience to travel by bicycle: http://www.waverley.nsw.gov.au/environment/sustainable_transport/cycling .

In addition, connecting residents, staff and visitors via social media may provide a platform to informally pilot new programs or create travel-buddy networks and communication.

7.3.3 Monitoring of the GTP

There is no standard methodology for monitoring the GTP, but it is suggested that it be monitored to ensure that it is achieving the desired benefits and modify it if required. It will not be possible at this stage to state what additional modifications might be made as this will be dependent upon the particular circumstances prevailing at that time.

The GTP should be monitored on a regular basis, e.g. yearly, by carrying out travel surveys. Travel surveys will allow the most effective initiatives of the GTP to be identified, and conversely less effective initiatives can be modified or replaced to ensure the best outcomes are achieved. It will clearly be important to understand people's reasons for travelling the way they do: - any barriers to changing their behaviour, and their propensity to change.

To ensure the successful implementation of the GTP, a Travel Plan Coordinator (TPC) should be appointed to ensure the successful implementation of the GTP. This could be the building manager or a member of the body corporate.

7.4 Summary

The proposed development should be required to develop and utilise a travel plan to increase the use of sustainable transport. Although it is difficult to predict what measures might be achievable until the proposed development is occupied, the above measures provide a framework for the development and implementation of a future travel plan for the site.

8. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i The proposed development generates a DCP parking requirement of between 0 and 57 car parking spaces.

ii The proposed development should provide three accessible car parking spaces for residential use and 12 motorcycle spaces.

iii The proposed supply of 35 spaces (including three accessible spaces) and 15 motorcycle spaces therefore meets the DCP requirement.

iv The site should provide at least 41 bicycle spaces, with 29 spaces for residents, three for visitors, five for retail and four for commercial.

v Loading is proposed to occur on-street within existing and potential loading zones, which is considered acceptable for the size of the proposed development.

vi The proposed development would result in a significant reduction to traffic generated on Friday and Saturday evenings, improving the amenity of the area during those times. The traffic generated by the proposed development would have a minimal increase in the AM and PM peak periods.

vii The additional traffic generated by the proposed development is not expected to compromise the safety or function of the surrounding road network.

viii The proposed access arrangements will consolidate the existing four driveways to one access point on Carrington Road, this will improve road safety by reducing the number of conflict points.

ix The consolidation of driveways also provides an opportunity for a potential increase in on-street parking along the frontage of the site.

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