

Appendix C

**Traffic Impact Assessment -
GTA Consultants**



12-22 & 24 Rothschild Avenue, Rosebery Proposed Residential Development Transport Impact Assessment

Client // Maville Group Australia Pty Ltd
Office // NSW
Reference // N136700
Date // 25/09/17

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Proposed Residential Development
Transport Impact Assessment

Issue: A 25/09/17

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Reference: N136700
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 the City of Sydney Council for the rezoning of land located at 12-22 Rothschild and 24 Rothschild Avenue (collectively referred to as the site). The planning proposal seeks to amend the current planning controls to permit medium to high-density residential development on the subject site. The planning proposal is for a mixed-use development comprising some 208 residential apartments, 156 square metres of ground level retail and 1,800 square metres of ground-level commercial floor area.

GTA Consultants (GTA) was commissioned by Maville Group Australia in September 2017 to complete a transport impact assessment for inclusion in the planning proposal application.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, 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) and layout
- iii Service vehicle requirements
- iv Pedestrian and bicycle requirements
- v The traffic generating characteristics of the proposed development
- vi Suitability of the proposed access arrangements for the site
- vii The transport impact of the proposed development proposal on the surrounding road network.

1.3 References

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

- o An inspection of the site and its surrounds
- o City of Sydney Council's Local Environment Plan (LEP) 2012
- o City of Sydney Council Development Control Plan (DCP 2012) 2012
- o Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- o Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- o Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- o Guide to Traffic Generating Development, Roads and Maritime Services (Roads and Maritime), 2002
- o Guide to Traffic Generating Developments, TDT 2013/04, Roads and Maritime, May 2013
- o Traffic surveys undertaken by Tracsis as referenced in the context of this report
- o Plans for the proposed development prepared by Cotte Parker Architects, Drawing Number SK2000, SK2001 and SK 2002, Revision P6, dated 19 September 2017
- o Other documents and data as referenced in this report.

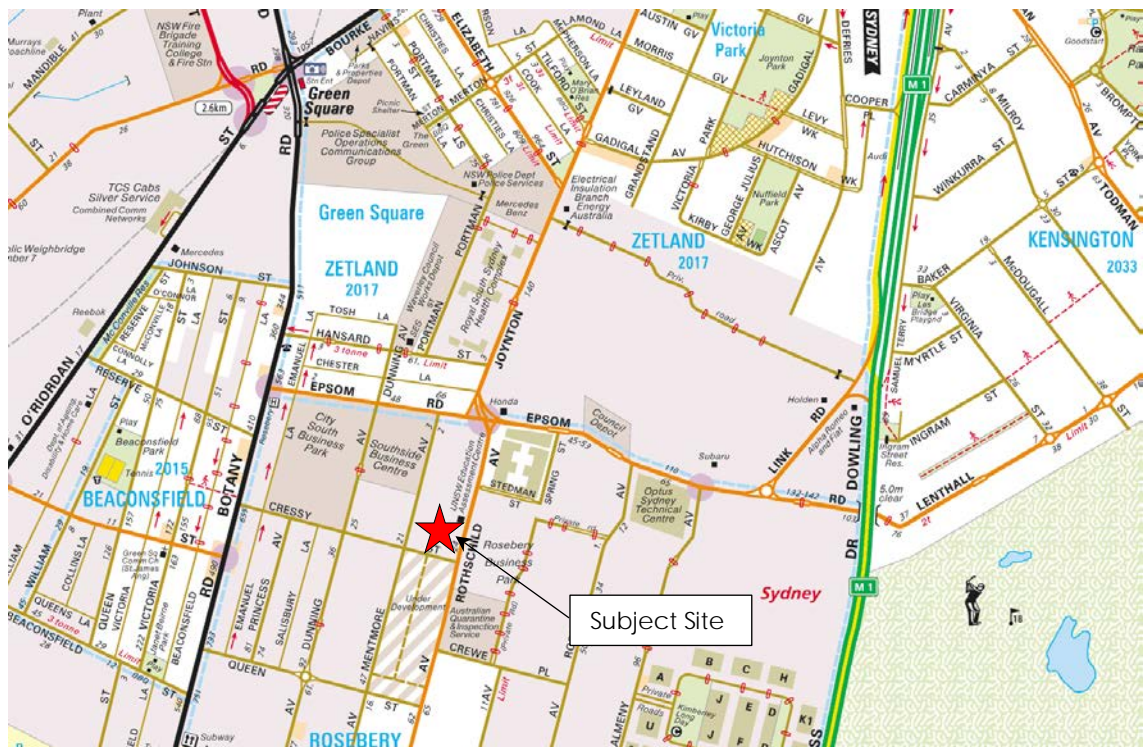
2. Existing Conditions

The subject site is located at 12-22 and 24 Rothschild Avenue, Rosebery and site has frontages to Rothschild Avenue along its eastern boundary, Mentmore Avenue along its western boundary and Cressy Street along its southern boundary. The site has an area of 8,403 square metres and is located within the local government area of City of Sydney.

The site is currently occupied by a commercial building with an off-street car park, which has a boom gate controlled access. Access to the car park is via both Rothschild Avenue and Mentmore Avenue.

The surrounding properties include commercial and residential 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



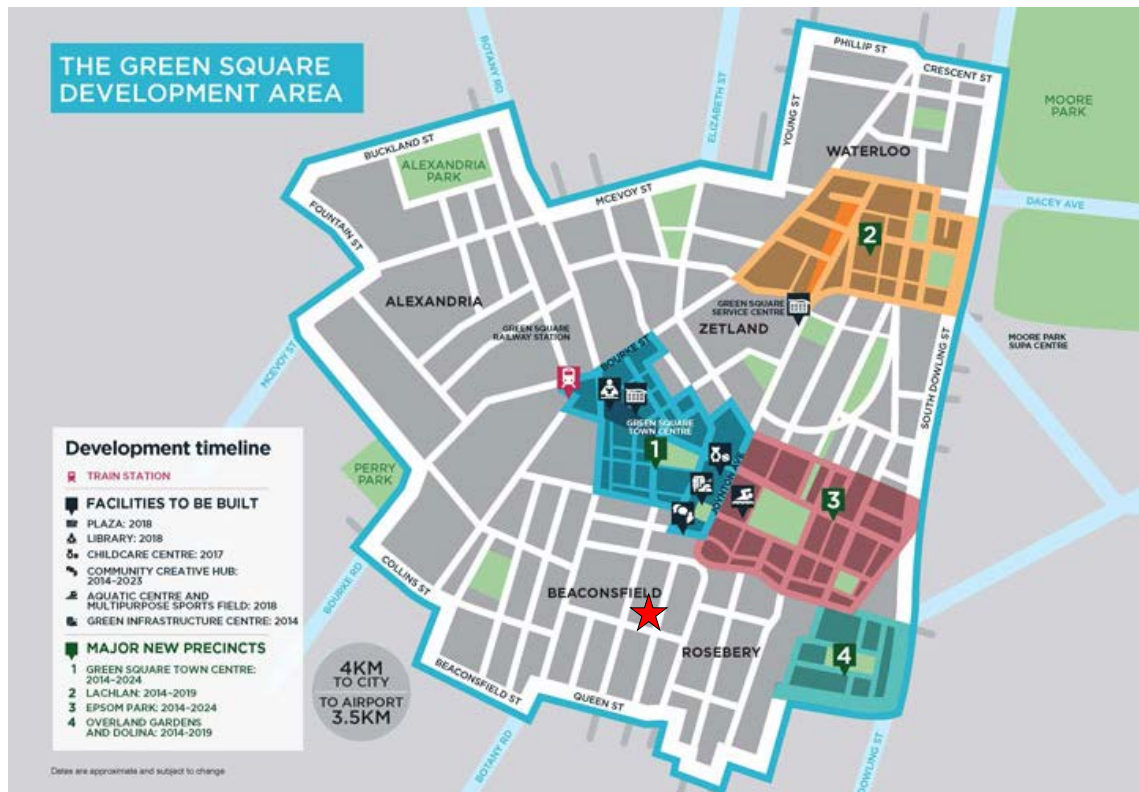
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Green Square Development Area

The Green Square Development Area includes the suburbs of Beaconsfield and Zetland and parts of Rosebery, Alexandria and Waterloo. A significant number of residential apartments are planned within this area over the next four years with a substantial increase in population expected. A new town centre will also be constructed adjacent to Green Square Railway Station approximately 850 metres north of the site.

The Green Square Development Area is shown in Figure 2.2 with the sites relative location within the southern precinct and outside the four key major precincts.

Figure 2.2: Green Square Development Area



Basemap Source: http://www.cityofsydney.nsw.gov.au/_data/assets/image/0006/194685/Green-square-map-large.jpg

The North Rosebery Precinct is located east of the site, on the eastern side of Rothschild Avenue. City of Sydney Council recognises the changing nature of the area from one dominated by industrial and commercial land uses, to be moving towards residential dominant land uses and planning controls have been modified to support this change. As such, this precinct will be characterised by new streets, convenient pedestrian links and generous open space within an appropriate scale and height of the built form.

The new planning guidelines will aim to promote walking and cycling while discouraging through traffic movements along the local road network. Regional roads and intersections will be upgraded to establish clear traffic routes through the area.

2.1 Road Network

2.1.1 Adjoining Roads

Rothschild Avenue

Rothschild Avenue functions as a local road and near the site is aligned in a north-south direction. It is a two-way road configured with a 12-metre wide carriageway, set within an approximately 20-metre wide road reserve with kerbside parking and cycle lanes in either direction. It travels adjacent to the eastern boundary of the site and connects with Epsom Road to the north at a signalised intersection.

Kerbside parking is generally permitted without time restrictions on the western side of the road and is generally restricted to 1P on the eastern side of the road. Rothschild Avenue is shown in Figure 2.3 and Figure 2.4.

Figure 2.3: Rothschild Avenue (looking north)



Figure 2.4: Rothschild Avenue (looking south)



Mentmore Avenue

Mentmore Avenue functions as a local road and near the site is aligned in a north-south direction. It is a two-way road configured with a 12-metre wide carriageway, set within an approximately 20-metre wide road reserve. It travels adjacent to the western boundary of the site and connects with Epsom Road to the north at a priority controlled intersection.

Unrestricted kerbside parking is permitted on both sides of the road. Mentmore Avenue is shown in Figure 2.5 and Figure 2.6.

Figure 2.5: Mentmore Avenue (looking north)



Figure 2.6: Mentmore Avenue (looking south)



Cressy Street

Cressy Street functions as a local road and near the site is aligned in an east-west direction. It is a two-way road configured with a 12.5-metre wide carriageway, set within an approximately 20-metre wide road reserve. It connects Dunning Street to the west (and Botany Road further to the west) with Rothschild Avenue to the west.

Unrestricted kerbside parking is permitted on both sides of the road, as shown in Figure 2.7 and Figure 2.8.

Figure 2.7: Cressy Street (looking east)



Figure 2.8: Cressy Street (looking west)



2.1.2 Surrounding Intersections

The following intersections currently exist near the site:

- Rothschild Avenue/ Stedman Street (unsignalised)
- Rothschild Avenue/ Cressy Street (unsignalised)
- Rothschild Avenue/ Epsom Road/ Joynton Avenue (signalised).

2.2 Traffic Volumes

The existing site is commercial with an off-street car park, which has a boom gate controlled access. The car park has accesses via Mentmore Avenue and Rothschild Avenue. Traffic generation surveys were conducted at the car park access points on Tuesday 20 October 2015 during the following peak periods:

- 7am to 9am
- 4pm to 6pm.

The AM and PM peak hour traffic volumes are summarised in Table 2.1.

Table 2.1: Existing AM/ PM peak hour traffic volumes

Access location	AM peak hour		PM peak hour	
	In	Out	In	Out
Mentmore Avenue	22	1	0	22
Rothschild Avenue	13	1	1	8
TOTAL	37		31	

It is noted that the site has other garages on-site, however these were not surveyed as they appear to be single vehicle loading docks and as such are expected to generate only very low volumes of traffic, generally outside of peak periods.

2.3 Public Transport

Given the site's convenient location it is well serviced by public transport services that are proposed to be further improved with the planned development within the local area.

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

Table 2.2: Public transport provision

Service	Route number	Route description	Location of stop	Distance to nearest stop	Frequency on/ off peak
Bus	343	City to Kingsford	Rothschild Avenue	150 m	5 mins peak/ 20 mins off-peak
	348	Bondi Junction to Wolli Creek			30 mins all day
	M20	Gore Hill to Botany	Epsom Road	250 m	10 mins peak/ 15 mins off-peak
	370	Coogee to Leichhardt via Newtown			10 mins peak/ 20 mins off-peak
	310	City to Eastgardens	Botany Road	400 m	15 mins peak/ hourly off-peak
	309	City to Port Botany			10 mins peak/ hourly off-peak
Train	-	T2 Airport Line	Green Square	850 m	6 mins peak/ 15 mins off-peak

2.4 Pedestrian and Cycling Infrastructure

Well established pedestrian paths are generally provided along both sides of roads near the site. These paths combine to provide adequate facilities to/ from key transport nodes and other local area facilities and destinations.

Figure 2.9 and Figure 2.10 show the Mentmore Avenue and Cressy Street footpaths and are generally representative of the condition of the footpaths in the area.

Figure 2.9: Mentmore Street pedestrian paths (looking north)



Figure 2.10: Cressy Street pedestrian paths (looking west)



It is anticipated that the existing facilities will be improved as more residential and mixed-use developments are constructed as part of the Green Square Development Area. Examples of the urban amenity improvements possible are evident near the site, with the Sweetacres Park (completed as part of the 'Otto' development) providing open space areas, public facilities, park and shared paths.

Sweetacres Park is illustrated in Figure 2.11 and Figure 2.12.

Figure 2.11: Sweetacres Park (looking south from Rothschild Avenue)



Figure 2.12: Sweetacres Park (looking south from Cressy Street)

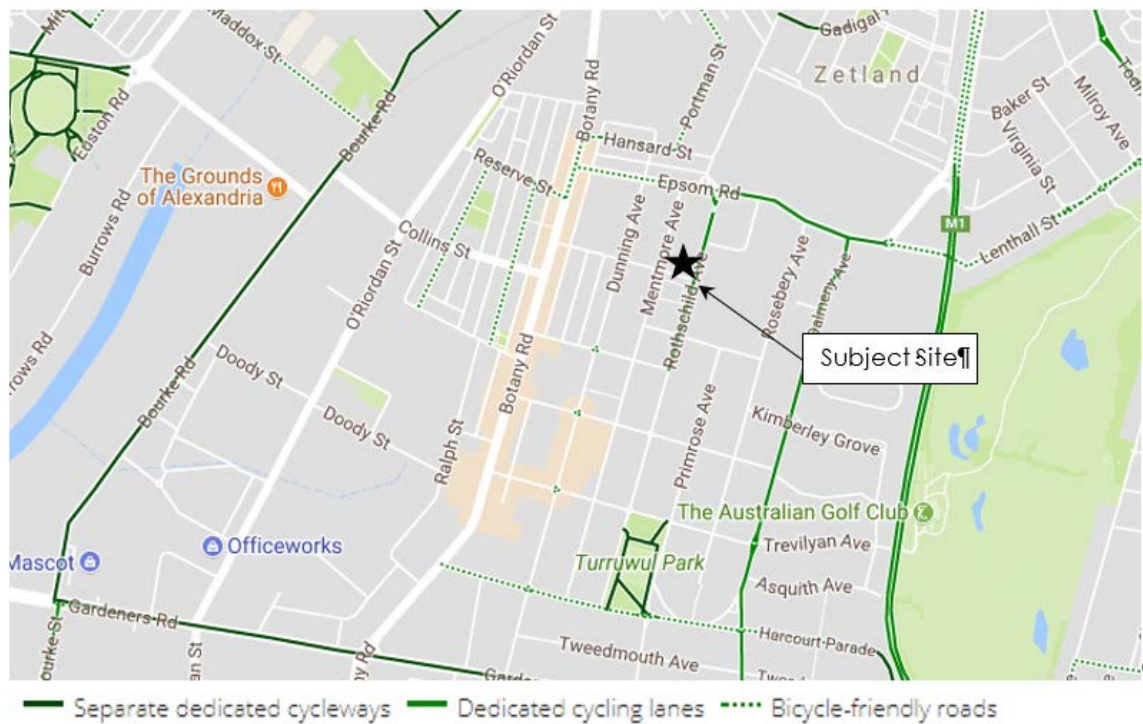


Dedicated cycleways are provided along the site's frontage on Rothschild Avenue as shown in Figure 2.13. This existing cycleway connects with established bicycle paths and on-road cyclist facilities within the broader area, including the Bourke Road cycleway. Overall, the site is well located to provide good connectivity to the local and regional cyclist facilities, as illustrated by Figure 2.14. Bicycle loops and racks are also provided in the immediate vicinity of the site, both along Mentmore Avenue and within Sweetacres Park.

Figure 2.13: Rothschild Avenue (looking north)



Figure 2.14: Local area cycling facilities



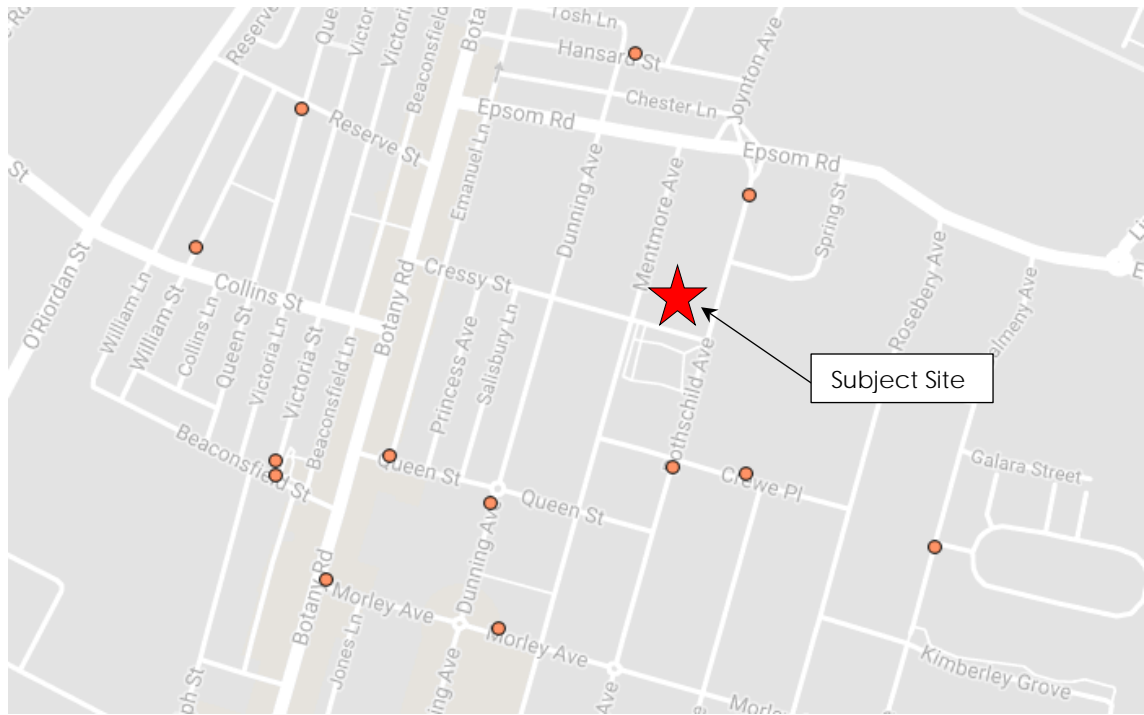
Basemap Source: City of Sydney (accessed August 2017)

2.5 Local Car Sharing Initiatives

The site is also well located with respect to car share facilities, with several GoGet pods located within a short walking distance of the site. Given the extent of residential development in the area, and considering the intention of The Green Square Development Area, it would be expected that the amount of car sharing facilities would increase. Notwithstanding this, GoGet car share pods within a five-minute walk are highlighted below, with all pods in the vicinity illustrated in Figure 2.15.

- Rothschild Avenue (near Epsom Road): 2-minute walk
- Rothschild Avenue (near Primrose Avenue): 3-minute walk
- Crewe Place (near Primrose Avenue): 4-minute walk.

Figure 2.15: Local area car share locations



Source: City of Sydney Council (accessed August 2017)

3. Development Proposal

3.1 Proposed Development

The proposal includes the construction of a mixed-use development with residential apartments, retail and commercial uses as summarised in Table 3.1.

Table 3.1: Development schedule

Use	Number/ size
Studio apartment	9
1-bedroom apartment	74
2-bedroom apartment	102
3-bedroom apartment	23
Total residential dwellings	208
Retail	156 m ²
Commercial	1,800 m ²

The proposed development will include 32 adaptable apartments and two levels of basement car parking accessed from Mentmore Avenue. The car park would be designed to accommodate the number of car parking spaces in compliance with Council's DCP requirements. Furthermore, the design of the car parking layout would comply with design requirements set out in the relevant Australian Standards for off-street parking facilities.

The proposed development yield is subject to further amendments, however, it is not expected that it would vary to the point that it would affect the findings of this assessment. The proposed development will be confirmed in a detailed development application submission.

3.2 Vehicle Access

A single six-metre wide two-way vehicular crossover is proposed on Mentmore Avenue.

3.3 Car Parking

The proposed development will provide a total of 219 car parking spaces. In addition, 19 motorcycle parking spaces are proposed in the basement car park.

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

3.4 Pedestrian Facilities

Pedestrian access to the site is proposed via multiple accesses on Mentmore Avenue and Rothschild Avenue.

The suitability of the proposed pedestrian facilities is discussed in Section 5.2 of this report.

3.5 Bicycle Facilities

The proposed development includes a total of 248 bicycle racks located on basement levels 1 and 2. The proposal does not allow for common shower and change room facilities.

The suitability of the bicycle provisions is discussed in Section 5.3 of this report.

3.6 Loading Areas

There is a single loading area proposed on ground level on the western boundary of the site along Mentmore Avenue. A turntable is proposed to ensure ease of access and manoeuvring for vehicles up to and including an 8.8-metre medium rigid vehicle (MRV) and a Council standard 9.25-metre garbage truck. The loading area accommodates the servicing requirements of the site (such as service vans/ day-to-day repairs) including waste collecting needs and removalists.

The suitability of the proposed loading arrangements is discussed in Section 6 of this report.

4. Car Parking

4.1 Car Parking Requirements

The maximum car parking provision requirements for different development types are set out in the City of Sydney's LEP 2012, Section 7.5 of Division 1 – Car Parking Ancillary to Other Development. Noting that the site is on land in Category C and Category F, the maximum car parking requirements based on the number of dwellings and gross floor area (GFA) are summarised in Table 4.1.

Table 4.1: LEP 2012 car parking requirements (maximum)

Description	Number of dwellings/ GFA	LEP parking rate	LEP parking requirement (maximum)
Studio	9	0.4 per dwelling	4
1-bed	74	0.5 per dwelling	37
2-bed	102	1 space per dwelling	102
3-bed	23	1.2 per dwelling	28
Visitor Parking	208	0.2 for each dwelling up to 30 dwellings 0.125 for each dwelling up to 30 to 70 dwellings 0.067 for each dwelling more than 70 dwellings	20
Subtotal – Residential			191
Retail	156sqm	1 space for each 50sqm of GFA	4
Commercial	1,800sqm	1 space for each 75sqm of GFA	24
Subtotal – Retail/ Commercial			28
Total			219

Based on the above, the maximum number of car spaces permitted as part of the proposed development is 219 parking spaces.

The above maximum permissible car parking spaces is inclusive of accessible car parking spaces. The City of Sydney DCP 2012 requires one accessible parking space per adaptable apartment and one accessible visitor space for every 20 visitor car parking spaces. The proposed development would be required to provide 32 accessible car parking spaces for the proposed adaptable residential units and one accessible visitor car parking space.

4.2 Adequacy of Parking Supply

The proposed development provides 219 on-site parking spaces (inclusive of accessible parking spaces), which is compliant with the maximum permissible parking and minimum requirements for accessible parking.

4.3 Car Share Scheme

City of Sydney's DCP 2012 stipulates that a minimum of one car share space is to be provided per 90 car parking spaces provided. Therefore, three car share spaces should be provided in addition to the maximum number of permissible car parking spaces.

4.4 Motorcycle Parking Provision

City of Sydney's DCP 2012 requires one motorcycle parking space for every 12 car parking spaces be provided. Therefore, up to 19 motorcycle parking spaces would be required (subject to final development plans and parking provision).

4.5 Car Parking Layout Review

The detailed design of the car park is yet to be prepared. The car park and associated elements such as car parking space dimensions, circulation aisles and ramp would be designed in accordance with the relevant Australian Standard for car parking facilities, namely AS2890.1:2004 and AS2890.6:2009.

The car park design would comply with a Class 1A car park facility as specified in the Australian Standard. The Australian Standard indicates that Class 1A car parking facility can be provided for residential developments and employee parking, with generally low turnover long-term parking allowed for in the design. Class 1A car parking space dimensions will be 2.4-metre wide by 5.4-metre long with an aisle width of at least 5.8 metres.

5. Sustainable Transport Infrastructure

5.1 Bicycle End of Trip Facilities

For high density residential developments, DCP 2012 requires bicycle parking to be provided at a rate of one space per dwelling for residential accommodation and one space per 10 dwellings for visitors. Therefore, the proposed development of 208 dwellings requires 208 residential and 21 visitor bicycle parking spaces.

For retail premises (shop, restaurant or cafe), DCP 2012 requires bicycle parking to be provided at a rate of one space per 250 square metres GFA for employees and two spaces plus one per 100 square metres GFA for retail area over 100 square metres for visitors. Therefore, the retail component of the proposed development requires one bicycle space for employees and three bicycle spaces for visitors, resulting in a total of four bicycle spaces for the retail area.

For commercial premises, DCP 2012 requires bicycle parking to be provided at a rate of one space per 150 square metres GFA for employees and one space per 400 square metres GFA for visitors. Therefore, the commercial component of the proposed development requires a total of 15 bicycle spaces for employees and six bicycle spaces for visitors.

The proposal is therefore required to provide a minimum of 227 bicycle parking spaces for the proposed residential, retail and commercial uses. The proposal provides 248 bicycle parking spaces, which exceeds this minimum requirement. Bicycle parking spaces would include Class 1 bike lockers for residents, Class 2 bicycle facilities for retail and commercial staff and Class 3 bicycle racks for visitors. For non-residential uses, DCP 2012 requires the following end of trip facilities:

- One personal locker per each bike
- One shower and change cubicle for up to 10 bike parking spaces
- Two shower/ change cubicles for 11 to 20 or more
- Two additional shower and cubicles for each additional 20 bike parking spaces or part thereof.

The proposed development will therefore be required to provide 24 personal lockers and two shower/ change cubicles.

5.2 Walking and Cycling Network

The site has been designed as three separate buildings and ensures permeability to facilitate pedestrian and cycling access along site frontages along Mentmore Avenue and Rothschild Avenue. The surrounding established network of pedestrian footpaths combine to link the site with the commercial precinct along Botany Road, Green Square Station and other public transport and active travel facilities. On the eastern boundary of the site along Rothschild Avenue, there is a dedicated bicycle lane connecting cyclists to Green Square Station, other public transport and active travel facilities.

5.3 Public Transport

The site is conveniently located close to bus services and active travel options that actively promote sustainable forms of day-to-day transport therefore reducing incentive for car use and as a result, car ownership.

6. Loading Facilities

6.1 Loading Requirements

City of Sydney's DCP 2012 sets out the rates for loading facilities for different development types. A review of these rates and the proposed floor area schedule results in a requirement as summarised in Table 6.1.

Table 6.1: Service vehicle loading requirements

Proposed uses	Size	Minimum provision rates	Minimum required parking
Residential	208 apartments	1 space for the first 50 apartments, 0.5 spaces for every 50 apartments or part thereafter	3 spaces
Retail	156sqm	1 space per 350 m ² GFA, or part thereof, up to 2,000 m ²	0 space
Commercial	1,800sqm	1 space per 3,300 m ² or part thereof, for the first 50,000 m ²	1 spaces
Total			4 spaces

Based on the above, the proposed development is required to provide at least four loading spaces under the DCP 2012.

It is expected that residential development with 208 apartments would require three loading bays. The scale of the retail land use is low and could share loading facility with the residential component. On this basis, three loading bays would be required.

At this stage, it is proposed to provide one loading area for waste collection trucks and removalist vehicles. In addition, utility/ trade vehicles and vans will make use of the vacant visitor spaces or spaces allocated to the commercial tenants/ owners, as arranged by the loading dock manager.

Given the infrequent nature of waste collection, the shared use of the loading area for unloading/ loading activities as well as waste collection is considered acceptable and would be effectively managed by an appropriate loading dock management plan.

The proposed loading facility is considered satisfactory.

7. Traffic Impact Assessment

7.1 Traffic Generation

7.1.1 Design Rates

Traffic generation estimates for the proposal have been sourced from the *Guide to Traffic Generating Developments* (Roads and Maritime, 2002) and *Roads and Maritime's Technical Direction TDT 2013/ 04 Guide to Traffic Generating Developments Updated traffic surveys (TDT 2013/ 04)*.

TDT 2013/ 04 provides updated rates for high density residential flat dwellings (based on 2012 surveys) that are close to public transport services, greater than six storeys and almost exclusively residential in nature. TDT 2013/ 04 indicates that an average AM peak hour trip generation of 0.19 trips per hour per apartment, while the PM peak hour rates are slightly lower at 0.15 trips per hour per apartment.

Furthermore, TDT 2013/ 04 provides updated rates for office blocks (based on 2010 surveys) indicates that an average AM peak hour trip generation of 1.6 trips per 100 square metres GFA, while the PM peak hour rates are slightly lower at 1.2 trips per 100 square metres GFA.

A peak hour traffic generation rate of one vehicle movement per retail car parking space provided has been adopted. It is envisaged that visitors to the retail shop would already be in the neighbourhood or passing by and therefore would not generate any additional vehicle trips. As the number of retail car spaces has not been provided, the maximum DCP 2012 rate of four spaces outlined in Section 4.1 has been adopted.

Estimates of peak hour traffic volumes resulting from the proposal are set out in Table 7.1.

Table 7.1: Traffic generation estimates

Use	Size	Traffic generation rate		Subject site traffic generation	
		AM peak hour	PM peak hour	AM peak hour	PM peak hour
Residential	208 units	0.19 vehicle trips per unit	0.15 vehicle trips per unit	40 trips	31 trips
Retail	4 car spaces	1 vehicle trip per car space	1 vehicle trip per car space	4 trips	4 trips
Commercial	1,800 m ² GFA	1.6 trips per 100 m ² GFA	1.2 trips per 100 m ² GFA	29 trips	22 trips
Total				73 trips	57 trips

Table 7.1 indicates that the site could potentially generate 73 and 57 vehicle trips in the AM and PM peak hours, respectively.

As previously mentioned, the existing site is commercial with an off-street car park with accesses located on Mentmore Avenue and Rothschild Avenue. GTA commissioned traffic surveys in October 2015 that indicate the existing site generates 37 vehicles per hour in the AM peak period and 31 vehicles per hour in the PM peak period.

The proposed development would therefore result in an increase of 36 vehicle trips per hour in the AM peak period and 26 vehicle trips per hour in the PM peak period. This equates to less than one vehicle every minute in addition to existing conditions.

It is further noted the existing uses include tenancies with a total combined floor area of approximately 6,955 square metres. The existing uses on the site are generally commercial in nature. The traffic impact would be worse if the development of the site remains within the current zoning as compared to the proposed residential development by this planning proposal

Under a commercial development scenario, using Roads and Maritime revised traffic generation rate of 1.6 trips per peak hour per 100 square metres for commercial developments (TDT 2013/04), a contemporary commercial development with a floor area of 6,955 square metres would generate approximately 110 vehicle trips per hour. This is about one and a half times the proposed development traffic that would be generated by the proposed residential development.

7.2 Traffic Impact

Based on this assessment and the known significant changes to the local and regional road network as part of The Green Square Development Area, traffic associated with the proposed development is considered to have a negligible impact on the surrounding road network, including the intersections in the immediate vicinity.

7.3 Construction Traffic Impact

A construction traffic management plan should be prepared prior to works commencing on-site.

Construction vehicle access to/ from the site would need to be via Mentmore Avenue and Rothschild Avenue at the western and eastern ends respectively, and restricted to specific work hours to limit the impact on existing uses, especially other residential properties in the vicinity.

8. Conclusion

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

- i The proposed development generates a maximum LEP parking requirement of 219 spaces, for those uses with nominated rates. This includes 32 residential accessible car parking spaces and one visitor accessible car parking spaces. The proposed car parking provision of 219 spaces meets the LEP maximum requirement.
- ii The proposed development is also required to provide three car share spaces in addition to the maximum number of car parking spaces permitted.
- iii The proposed parking layout is consistent with the dimensional requirements as set out in the Australian/New Zealand Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009).
- iv The proposed supply of 248 bicycle parking spaces meets the DCP 2012 minimum requirement.
- v The proposed development is required to provide 24 personal lockers and two shower/change cubicles for non-residential uses.
- vi The proposal provides 19 motorcycle spaces in accordance with DCP 2012.
- vii On-site loading facilities (with turntable) have been designed to allow up to and including an 8.8 metre MRV and a Council standard 9.25-metre garbage truck to enter and exit the site in a forward direction.
- viii The loading/ unloading and waste collection is proposed from a shared loading area, which will be managed by an appropriate loading dock management plan.
- ix The proposed development would result in an increase of 36 vehicle trips per hour in the AM peak period and 26 vehicle trips per hour in the PM peak period.
- x There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development without compromising the safety and operation of the surrounding intersections.
- xi A construction management plan should be prepared for the proposed development prior to commencement of work.

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