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**ATTACHMENT 4**  
**TRANSPORT IMPACT**  
**ASSESSMENT ADDENDUM**  
**GTA CONSULTANTS**

# LETTER

## Transport Engineering

REF: N149710

DATE: 24 February 2020

Capitel Group  
Level 7 66 Hunter St  
SYDNEY NSW 2000

Attention: Alka Parti

Dear Alka

**RE: MANDARIN CENTRE, CHATSWOOD – PLANNING PROPOSAL**

### Background

This letter has been prepared in response to the pre-gateway review and specifically the Department of Planning, Industry and Environment (DPIE) assessment and recommendation report issued in late August 2019 following submission of an amended Planning Proposal on 20 April 2018 (reference PGR\_2016\_WILLO\_002\_00) for the redevelopment of the Mandarin Centre, Chatswood.

It is important to note that this follows the original DPIE decision to defer the October 2016 submission to allow Council time to release the Chatswood CBD Planning and Urban Design Strategy. The strategy was ultimately endorsed by Council and finalised in January 2018 with DPIE also partially endorsing it on 9 August 2019.

It is understood that although Willoughby City Council does not generally support the proposal, this primarily relates to the current planning controls that prohibit residential land uses on the site. DPIE has however shown overarching support, particularly with respect to potential improvements to local connectivity and amenity, and enabling the delivery of essential affordable housing. With this in mind, DPIE is seeking further details on sustainable transport initiatives to ensure the proposal further strengthens the trend toward public and active travel modes and to minimise the traffic effects of the proposal.

The following sets out an assessment of key transport matters including sustainable travel initiatives and the changing nature of the Chatswood CBD. This letter should be read in conjunction with the previous GTA report<sup>1</sup> and subsequent addendum letter<sup>2</sup> that considered all transport matters relevant to the proposal.

In this regard it is important to recognise not only the changing Chatswood CBD but also the Willoughby City Council response to this, including adoption of the Planning and Urban Design Strategy. State Government planning is also key with the Greater Sydney Region Plan and the North District Plan released subsequent to the Planning Proposal submission. An overview of each is included below with each important in achieving, inter alia, sustainable transport outcomes for all.

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<sup>1</sup> Mandarin Centre Planning Proposal, Transport Impact Assessment, GTA Consultants, Revision F, 13 April 2016.

<sup>2</sup> Mandarin Centre, Chatswood, Transport Impact Assessment Addendum, GTA Consultants, 13 April 2018

## Planning Context

### The Greater Sydney Region Plan 2018

The Greater Sydney Commission (GSC) is an independent organisation that leads metropolitan planning for Greater Sydney. The GSC has prepared the Greater Sydney Region Plan which outlines how Greater Sydney will manage growth and guide infrastructure delivery.

The GSC's vision is to create three connected cities; a Western Parkland City west of the M7, a Central River City with Greater Parramatta at its heart and an Eastern Harbour City. By integrating land use, transport links and infrastructure across the three cities, more people will have access within 30 minutes to job, school, hospitals and services.

The Greater Sydney Region Plan is a 20-year plan with a 40-year vision and has four key focuses; infrastructure and collaboration, liveability, productivity and sustainability.

### The North District Plan 2018

The vision for Greater Sydney as a metropolis of three cities – the Western Parkland City, the Central River City and the Eastern Harbour City and a 30-minute city – means residents in the North District will have quicker and easier access to a wider range of jobs, housing types and activities. The vision will improve the District's lifestyle and environmental assets.

The North District Plan forms a large part of the Eastern Harbour City. The District's strategic centres of Macquarie Park, Chatswood and St Leonards are part of the State's greatest economic asset – the Eastern Economic Corridor – which contributed two-thirds of NSW's economic growth in the 2015-16 financial year.

The Plan puts emphasis on delivering on major transport and health investments, several of which have recently been delivered or under are construction across the District. This includes Northern Beaches B-Line and Sydney Metro Northwest, with Sydney Metro City and Southwest set to transform rail services right across Sydney.

Overall, the Planning Proposal aligns well with the objectives of the North District Plan, with a focus on the public domain and recognising the need to improve connectivity to walking, cycling and public transport infrastructure as a means to further to encourage travel by means other than private vehicle.

### Sydney Metro City & Southwest

Sydney Metro is Australia's biggest public transport project. From the north west, metro rail is being extended under Sydney Harbour, through new underground city stations and beyond to the south west. In 2024, Sydney will have 31 metro railway stations and a 66-kilometre standalone metro railway system, revolutionising the way Australia's biggest city travels.

Of specific relevance to Chatswood Station are the following project features:

- An air-conditioned metro train every four minutes in the peak
- Improved CCTV surveillance, platform screen doors, platforms level with train floors, minimal gaps between platforms and trains
- New or upgraded concourses and new station entries
- Improved station interchange facilities
- Less time spent waiting due to higher frequency services
- Reduced travel times to key employment and education precincts

- New, direct and fast services to Martin Place, Barangaroo, North Sydney, Chatswood and Macquarie Park

On this basis, it can be expected that travel to Chatswood by rail will increase, with the Chatswood CBD further reducing reliance on private car travel on an increasingly congested local and arterial road network.

## Sustainable Transport

### Travel Plan Framework

Transport is a necessary part of life which has effects that can be managed. The transport sector is one of the fastest growing emissions sectors in Australia and therefore a robust travel plan provides an opportunity for reducing greenhouse gases, and for managing traffic congestion (which has adverse economic, health and social outcomes). 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 strong and prosperous communities.

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

### What is a Green Travel Plan?

A green travel plan (GTP) is a package of actions and strategies aimed at encouraging sustainable modes of transport such as walking, cycling, public transport and higher-occupancy car use for travel. The GTP for the Mandarin Centre will aim to mitigate travel by private car to allow people to carry out their daily business in a more sustainable manner. This includes:

- measures which encourage reduced car use (disincentives or 'sticks')
- measures which encourage or support sustainable travel (such as active transport, public transport and multi-occupant vehicle use)
- reduce the need to travel or make travelling more efficient (incentives or 'carrots').

A GTP would allow all users (visitors, residents, staff) to achieve the above outcomes by providing flexibility around how and when they travel. This is especially important in well planned precincts and town centre environments which attract a high number of visitors for a variety of reasons. As part of the proposal, a GTP would be implemented post-opening, which would tie in with the broader CBD to ensure consistency.

The GTP would seek to understand the existing public transport, cycling and walking catchments to identify gaps (if any) in the network for improvement. Similarly, opportunities would also be identified to provide better connectivity between the site and other key centres. The GTP would also understand the origins and destinations of staff and visitors to understand what targeted actions would bring about the most benefit. This would occur using travel surveys, either by physical means such as interviews or by electronic means such as email/ online survey forms. Future travel conditions, including expected mode shares for different scenarios would be considered prior to the development of key actions.

Implementation of a GTP will benefit from the established pedestrian and cycling network throughout Chatswood CBD as well as high frequency rail and bus services. Significantly, this includes Sydney Metro services, with Stage 1 northwest services already running and Stage 2 CBD and southwest expected to commence services in 2024. It will revolutionise the way the people of Sydney travel, with Chatswood a key transport interchange in the network. The travel plan will seek to:

- advise all users on the wider travel choices available to them and encourage use of sustainable travel modes
- aim to reduce congestion on the surrounding Chatswood CBD road network by causing a mode shift away from private vehicles, or at the very least encourage higher vehicle occupancy to reduce private vehicle trips.
- Identify any wayfinding and public transport information (such as screens with 'next train/ bus' times) that would be beneficial for the Mandarin Centre's interface with the adjacent public transport, walking and cycling networks.

### Site Specific Measures

The location of the site, in terms of its proximity to a wide range of sustainable transport including frequent bus and rail services through Chatswood Interchange is a key consideration for development of the site.

A GTP will put in place measures to raise awareness and further influence the travel patterns of people living, working or visiting the site 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:

1. Limiting on-site parking provision.
2. Providing a Travel Access Guide (TAG) which would be provided to all residents and staff and publicly available to all visitors. The document would be based on facilities available at the site and include detail on the surrounding public transport services and active transport initiatives. The TAG would be updated as the surrounding transport environment changes.
3. Providing public transport information boards/ apps to inform residents, staff and visitors of alternative transport options (the format of such information boards would be based upon the TAG).
4. Providing car sharing pod(s) on-site or nearby and promoting the availability of car sharing pods for trips that require the use of private vehicles.
5. Providing bicycle facilities including secure bicycle parking for staff, bicycle racks/ rails for visitors and shower and change room facilities.
6. Encouraging staff that drive to work and park on surrounding roads to car-pool through creation of a car-pooling club or registry/ forum.
7. Regularly promoting ride/ walk to work days.
8. Providing a regular newsletter to all residents and staff bringing the latest news on sustainable travel initiatives in the area.

### Travel Access Guide

A Travel Access Guide (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 (or app) showing the site location and nearby transport modes highlighting available pedestrian and cycle routes. The information is usually presented as a brochure (or app) to be included in a welcome pack or on the back of company stationery and business cards.

## 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.

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.

## Monitoring of the GTP

There is no standard methodology for monitoring the GTP, but it is suggested that appropriate monitoring is adopted to ensure that it is achieving the desired benefits and modify if required. It will not be possible at this stage to identify what additional modifications might be made as this will be dependent upon the prevailing circumstances 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 should be appointed to ensure the successful implementation of the GTP. This could be the building manager or a member of the body corporate, noting that an integrated approach for the residential, commercial and retail components of the development is required.

## Travel Plan Summary

The proposed redevelopment of the Mandarin Centre would be able to develop and utilise a robust travel plan to actively promote increased use of sustainable transport modes. Although it is difficult to predict what measures and targets might be achievable in the context of a changing local landscape, the above measures provide a framework for the site and implementation of a future travel plan.

## **Traffic Impacts**

DPIE issued a Partial Endorsement for the CBD Strategy, but only where it applies to the CBD Core and subject to the following condition:

*3. That any planning proposal for the CBD Core area do not result in significant traffic or transport impacts, as sites in this part of the CBD are highly accessible to Chatswood rail and bus interchange.*

The transport assessment included a detailed breakdown of anticipated traffic generation associated with the proposal. Overall, Saturdays would generate most traffic (as a result of retail activity) with up to 315 vehicle trips, more than the anticipated 240 trips on a typical weekday evening and significantly more than weekday mornings. These volumes are generally moderate in the context of the surrounding road environment, and are able to be accommodated in Chatswood CBD. This is supported by not only the SIDRA Intersection network modelling prepared for the Mandarin Centre Planning Proposal (previously reviewed by Roads and Maritime Services), but also through the Aimsun traffic model

prepared by GTA Consultants as part of the redevelopment of Chatswood Chase<sup>3</sup>. Roads and Maritime Services endorsed the Aimsun model as part of the approved redevelopment, with an amending DA submitted in late 2019 proposing less additional retail GFA than that approved. Roads and Maritime has also endorsed the amending DA.

Importantly, the Aimsun model included future traffic generated by a redeveloped Mandarin Centre (and other known developments), and with the existing centre historically generating about 265 vehicle trips on a Saturday lunchtime, the estimated 80 additional trips (or 30 per cent increase) would not result in a significant change to traffic conditions in the vicinity generally.

It is also recognised that the Mandarin Centre is and will remain a secondary retail centre when measured against Westfield and Chatswood Chase. As such, visitors to Mandarin Centre are also likely to visit other centres as part of the same trip (and vice versa) thereby increasing the proportion of linked trips. This is also true of other smaller shopping centres and retail arcades such as Lemon Grove.

Based on the above, it is evident that the proposed development would not present significant traffic impacts, with sustainable transport initiatives proposed to further encourage active and sustainable travel modes.

## Summary

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

- The Mandarin Centre Planning Proposal aligns well with the objectives set out in the North District Plan and the Greater Sydney Region Plan generally, as well as good transport planning practice for CBD centres.
- The surrounding environment and infrastructure for public transport, walking and cycling encourages the use of these modes, with further improvements anticipated through delivery of the Sydney Metro City and Southwest (and associated interchange/ public domain works), as well as ongoing cycleway, footpath and streetscaping improvements progressively being delivered by Council.
- Conversely, the surrounding arterial road network will remain constrained, increasing the competitiveness of public transport, walking and cycling for access to the Mandarin Centre.
- A tailored framework of measures will allow Mandarin Centre to develop and utilise an appropriate travel plan.
- The green travel initiatives contained in the travel plan will increase residents, staff and visitor awareness of convenient and inexpensive transport options to support change in travel behaviour.
- The anticipated traffic generation associated with the proposal suggested up to 240 trips and 315 vehicle trips on weekday evenings and Saturdays.
- Future traffic generation supported by Aimsun modelling in a recent GTA report for Chatswood Chase suggested historically up to 265 vehicle trips were made during a Saturday peak period for the Mandarin Centre. With an addition of 80 vehicle trips result in an insignificant change to the vicinity generally
- The Mandarin Centre is located in the heart of the Chatswood CBD, with the CBD retail offering anchored by Westfield and Chatswood Chase. The Mandarin Centre will remain a secondary retail centre, presenting a proportion of linked trips and contributing to the overall CBD parking supply.

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<sup>3</sup> Chatswood Chase Development Application Transport Impact Assessment, GTA Consultants, 3 August 2018.

- It is not expected the proposed development would present significant traffic impacts, with sustainable transport initiatives to further encourage active and sustainable travel modes.
- On this basis, the planning proposal complies with the DPIE endorsement of the Chatswood CBD Planning and Urban Design Strategy in that it does not result in significant traffic or transport impacts and leverages the site's highly accessible location, both from a public transport perspective as well as co-location within the broader retail and commercial precinct.

I trust this provides the information you require. Naturally, should you have any questions or require any further information, please do not hesitate to contact me on (02) 8448 1800.

Yours sincerely

GTA CONSULTANTS



Brett Maynard  
Director



Reference: #N149710

13 April 2018

Capitel Group  
Level 7 66 Hunter St  
SYDNEY NSW 2000

**Attention: Alka Parti**

Dear Alka

**RE: MANDARIN CENTRE, CHATSWOOD  
TRANSPORT IMPACT ASSESSMENT ADDENDUM**

A Planning Proposal was previously lodged with Willoughby City Council for the Mandarin Centre site located at 61-65 Albert Avenue, Chatswood. The Planning Proposal intended to rezone the site for an increase in floor space ratio and height controls to facilitate the development of residential and retail land uses. It is now understood that an amended land use scheme, incorporating commercial uses, is being sought as part of an amended Planning Proposal application.

The following sets out an assessment of the transport impacts as a result of the amended land use scheme. This addendum should be read in conjunction with the GTA Report 'Mandarin Centre Planning Proposal: Transport Impact Assessment', dated 13 April 2016.

**Development Proposal**

Table 1 outlines the change between the previous and amended development schemes.

**Table 1: Amended and Previous Development Scheme Comparison**

Use	Description	Previous Scheme	Amended Scheme	Difference
Apartments	Studio	5 dwellings	0 dwellings	-5 dwellings
	One-bedroom	166 dwellings	80 dwellings	-86 dwellings
	Two-bedroom	102 dwellings	70 dwellings	-52 dwellings
	Three-bedroom	12 dwellings	8 dwellings	-4 dwelling
	<b>Apartments Sub-Total</b>	<b>285 dwellings</b>	<b>158 dwellings</b>	<b>-127 dwellings</b>
Retail		13,445sqm [1]	13,010sqm NLA [1]	-435sqm
Commercial		0sqm	10,120sqm NLA	+10,120sqm
Childcare/Education		0sqm	860sqm GFA	+860sqm
Car Parking Spaces		546 spaces	546 spaces	No change
Bicycle Parking Spaces		59 lockers / 114 rails	62 lockers / 104 rails	+3 lockers / -10 rails

[1] Includes 2,595sqm supermarket.

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Level 25, 55 Collins Street  
MELBOURNE VIC 3000  
PO Box 24055  
MELBOURNE VIC 3000  
t// +613 9851 9600

[www.gta.com.au](http://www.gta.com.au)

As outlined in Table 1, the amended development scheme represents a decrease in the number of dwellings (-127 dwellings), with a marginal decrease to retail floor area (-435sqm). The amended development has introduced 1,120sqm of commercial land use and 860sqm of childcare/educational facilities. There is no change in the amount of car parking provided, however there is a moderate increase (+3 lockers) in the provision of bicycle lockers and a decrease in the provision of bicycle rails (-10 rails).

## Transport Context – CBD Strategy

Since the preparation of the GTA Report (April 2016) Willoughby City Council has released CBD Strategy (January 2018). The Strategy establishes a framework to guide future development in the Chatswood CBD for the next 20 years. The vision for the CBD Strategy sets out seven guiding principles, including “sustainable and active transport”.

The key items relating to transport are provided in Section 3.1 of the strategy and have been reproduced below:

### *“Traffic and Transport*

*The CBD Strategy employs a Travel Demand Management approach seeking to modify travel decisions to achieve more desirable transport, social, economic and environmental objectives. A new CBD Transport Strategy will build on the approach. In addition, site specific traffic and transport issues are to be addressed as follows:*

- a) Vehicle entry points to a site are to be rationalised to minimise streetscape impact, with one entry into and exiting a site. To achieve this objective loading docks, including garbage and residential removal trucks, are to be located within Basement areas.*
- b) In order to facilitate rationalisation of vehicle entry points on neighbouring sites, all development sites are to provide an opportunity within Basement levels to provide vehicle access to adjoining sites when they are developed.*
- c) All vehicles are to enter and exit a site in a forward direction. In this regard vehicle turntables should be provided where necessary.*
- d) All commercial and residential loading and unloading is required to occur on-site and not in public streets.*
- e) Car parking should be reduced by utilising RMS car parking rates for sites close to public transport, as well as reciprocal parking and car share strategies.”*

This Planning Proposal has been prepared having regard for the transport recommendations of the strategy.

## Car Parking Requirements

### **DCP Parking Requirements**

The car parking requirements for different development types are set out in Willoughby DCP 2006. A review of the car parking rates and the floor area schedule results in a DCP parking requirement for the amended development schedule as summarised in Table 2.

**Table 2: Amended DCP Car Parking Requirements**

Description	Use	Size	DCP Parking Rate	Statutory Parking Requirement	
Apartments	Dwelling (Residents)	One-bedroom	80 dwellings	1 space/1 bedroom	80 spaces
		Two-bedroom	70 dwellings	1 space/2 bedroom	70 spaces
		Three + bedrooms	8 dwellings	1.25 space/3+ bedroom	10 spaces
	Dwelling (Visitors)		158 dwellings	1 space per four dwellings	39 spaces
<b>Sub-total</b>				<b>199 spaces</b>	
Supermarket		2,595sqm	6 spaces/100sqm NFA	155 spaces	
Retail		8,853sqm [1]	1 space/25sqm NFA	354 spaces	
Childcare/education		860sqm [2]	1 space/ 2 employees	3 spaces	
Commercial/Office		10,120sqm	1 space/110sqm	92 spaces	
<b>Sub-total</b>				<b>604 spaces</b>	
<b>Total (amended scheme)</b>				<b>803 spaces</b>	
<b>Total (previous scheme)</b>				<b>952 spaces</b>	
<b>Difference</b>				<b>149 spaces</b>	

[1] The DCP car parking requirement has been determined by factoring the NLA by 85% as per the requirements of the DCP.

[2] Assume 6 employees for the child care use.

Based on DCP parking requirements, Table 2 indicates that the amended development scheme is theoretically expected to provide 803 car parking spaces. As such, there will continue to be a shortfall of car parking provided on the site compared to the DCP parking requirements (261 spaces = 803-542).

It is noted that the DCP 2006 parking rates are neither minimum or maximum rates and any departure from these rates requires justification. In this respect an updated empirical assessment of car parking demand is provided below (and adopts the same car parking rates as per the previous assessment).

### Empirical Assessment

An updated empirical car parking demand assessment is presented in Table 3. The empirical assessment is based on the following car parking rates:

- Residential: RMS 'Guide to Traffic Generating Developments' (October 2002)
- Retail: 2.6 spaces per 100sqm as previously required by Council
- Commercial: Applying the DCP parking rate
- Child Care: Applying the DCP parking rate

The adopted rates for the retail and residential uses are consistent with those adopted for the previous scheme.

**Table 3: Site Generated Parking Demands**

Use	Description	Size	Car Parking Rate	Car Parking Demand
Apartment	One-bedroom	80 dwellings	0.4 spaces per dwelling	32 spaces
	Two-bedroom	70 dwellings	0.7 spaces per dwelling	49 spaces
	Three-bedroom	8 dwellings	1.2 spaces per dwelling	9 spaces
	Visitor	158 dwellings	1 space per 7 visitors	22 spaces
<b>Sub-total Demand</b>				112 spaces
Retail		13,010sqm	2.6 spaces per 100sqm	338 spaces
Commercial		10,120sqm	1 space/110sqm	92 spaces
Childcare/Education		860sqm	1 space per 2 employees [2]	3 spaces
<b>Sub-total Demand</b>				433 spaces
<b>Total Demand</b>				545 spaces
<b>Total Supply</b>				546 spaces
<b>Car parking surplus</b>				1 space

[1] The site generated parking demand for retail has been determined by applying the existing car parking rate (spaces per 100sqm) to the future floor area, noting the retail floor area remains largely unchanged.

[2] It is assumed parking is only provided to the employees.

As outlined in Table 3, the amended development will generate a parking demand of 545 spaces, including 112 spaces for residential use and 433 spaces for retail and commercial use.

The proposed car parking supply of 546 car parking spaces (91 car spaces across 6 levels) is consistent with the predicted demand.

### Other Considerations

As detailed in the GTA Report (April 2016) the subject site is located adjacent to the Chatswood Transport Interchange and accordingly, has high public transport accessibility.

Therefore, there may be opportunities to reduce the overall car parking provision by adopting a travel demand management approach consistent with the recommendations of the CBD Strategy. This could be complemented with enhanced end of trip facilities for cyclists/pedestrians.

Furthermore, the overall car parking provision could be reduced by exploring opportunities to share car parking between uses that peak at different times throughout the day (such as residential visitors and retail uses).

The above considerations would be explored further as part of the detailed development application process.

### Sustainable Transport Infrastructure

#### Bike Parking

The bicycle parking requirements for different land uses are set out in Willoughby DCP 2006. The DCP bicycle parking requirement for the amended development schedule is summarised in Table 6.

**Table 4: Amended DCP 2006 Bicycle Parking Guide**

Use	Size	DCP Parking Rate		DCP Parking Provision	
		Bicycle Lockers	Bicycle Rails	Bicycle Lockers	Bicycle Rails
Residential Dwellings	158 dwellings	1 per 10 dwellings	1 per 12 dwellings	16	13
Commercial	10,120sqm	1 per 600sqm	1 per 2500sqm	17	4
Retail	13,010sqm	1 per 450sqm	1 per 150 sqm	29	87
Childcare/Education	860sqm	No rate specified	No rate specified	-	-
<b>Total</b>				<b>62</b>	<b>104</b>

Based on the above, DCP 2006 suggests that the amended Planning Proposal incorporate 62 bicycle lockers and 104 bicycle rails for residents/employees. At a minimum, it is proposed to provide bicycle parking in accordance with the DCP bicycle parking requirements.

### Loading Facilities

A loading and back of house area is proposed on Basement Level 1. The loading area will be designed such that loading vehicles are able to enter and exit in a forward direction. Providing the loading area underground and allowing for forward in and forward out movements is consistent with the recommendations of the CBD Strategy.

### Traffic Impact

#### Vehicle Access

It is not proposed to alter the proposed vehicle access options as part of the amended Planning Proposal application (these options include a combination of vehicle access arrangements to Victor Street and Orchard Road). Indeed, the provision of part or full access via Orchard Road is consistent with the recommendations of the CBD Strategy.

#### Traffic Generation

An updated traffic generation assessment for the amended Planning Proposal is presented below. The traffic generation rates previously adopted for the retail and residential uses have been maintained.

#### Residential

Residential traffic generation estimates have been sourced from the RMS Technical Direction (August 2013) and are as follows:

- AM Peak hour: 0.19 movements per space
- PM Peak hour: 0.18 movements per space
- Saturday Lunchtime: 0.19 movements per space

It is reiterated that the residential traffic generation rate is considered conservative, noting that the average RMS rate has been adopted which does not specifically take into account the sites attributes (CBD location, public transport access, etc.). In this respect, the RMS residential traffic generation rate was derived from surveys at 8 existing residential sites in metropolitan Sydney, including one site at Chatswood. The surveys of the Chatswood site indicate peak hour traffic generation rates 25% less than the adopted RMS rate.

### Retail

The existing 'per space' traffic generation rate for the existing centre has been applied to the retail spaces (and surplus spaces), as follows:

- AM Peak hour: 0.16 movements per space (=48/303)
- PM Peak hour: 0.56 movements per space (=170/303)
- Saturday Lunchtime: 0.87 movements per space (=264/303)

### Commercial

The commercial traffic generation estimates have been sourced from the data that informs the RMS Technical Direction (August 2013). Given that the commercial car parking provision is lower than a traditional office use, it is considered appropriate to adopt a 'per space' traffic generation rate than a traditional 'per floor area' rate.

In this respect, GTA has collated the 'per space' traffic generation data for each of the inner and middle ring office sites surveyed as part of the RMS Guide (this excludes sites at Liverpool and Bella Vista). The full dataset is attached and indicates the following peak hour traffic generation rates:

- AM Peak hour: 0.44 movements per space
- PM Peak hour: 0.36 movements per space

### Child Care

The DCP car parking requirement for the child care land use assumes that only employee car parking spaces are provided (Chatswood CBD specific rate). It is therefore assumed that parents dropping off and picking up children are already in the precinct (i.e. employees and residents) and will not generate any additional traffic movements.

Therefore, for the purpose of this assessment a peak hour traffic generation rate of 0.5 movements per space has been adopted for the childcare use. The child care centre use is not expected to generate traffic on weekends.

### Summary

On this basis, Table 5 provides a summary of the anticipated peak hour traffic generation for each of the land uses proposed as part of the amended Planning Proposal.

**Table 5: Traffic Generation Estimate**

Land Use	No. of Car Spaces	Peak Hour Traffic Generation Rate (per space)			Resultant Peak Hour Traffic Generation		
		Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
Residential	112	0.19	0.15	0.19	21	17	21
Retail	338	0.16	0.56	0.87	54	189	294
Commercial	92	0.44	0.36	0	40	33	0
Child Care	3	0.50	0.50	0	2	2	0
<b>Total</b>	<b>545</b>	-	-	-	<b>117</b>	<b>241</b>	<b>315</b>

Table 5 indicates that the amended Planning Proposal is anticipated to generate 117, 241 and 315 movements during the weekday AM, weekday PM and Saturday lunchtime peak hours, respectively.

A summary of the forecast traffic generation for the previous and amended Planning Proposal schemes is presented in Table 6.

**Table 6: Comparison of Traffic Generation**

Scenario		Peak Hour		
		Weekday AM	Weekday PM	Saturday
Previous Planning Proposal	Existing	48	170	264
	Total	93	226	344
	Additional	+45	+56	+80
Amended Planning Proposal	Existing	48	170	264
	Total	117	241	315
	Additional	+69	+71	+51
<b>Difference</b>	<b>Additional</b>	<b>+24</b>	<b>+15</b>	<b>-29</b>

Table 6 indicates that the amended Planning Proposal is anticipated to generate 69, 71 and 51 additional movements during the weekday AM, weekday PM and Saturday lunchtime peak hours, respectively (or new movements to the network).

When compared to the previous scheme, this represents an increase of 24 and 15 movements during the weekday AM and weekday PM peak hours and a decrease of 29 movements during the Saturday lunchtime peak hour.

#### Traffic Generation Comparison

A summary of the overall existing and post development traffic volumes at key locations surrounding the subject site is provided in Table 7. It is noted that the additional traffic volumes presented below refer to the subject site only (and do not include consideration of the adjacent developments).

**Table 7: Traffic Volume Comparison**

Intersection	Peak Hour	Traffic Volumes			Percentage Change
		Existing	Additional	Post-Development	
Albert Avenue (east of Victor Street)	PM	969	29	998	3%
	Sat	1,391	20	1,411	1%
Albert Avenue (west of Orchard Road)	PM	1,047	29	1,076	3%
	Sat	1,191	20	1,211	2%
Pacific Highway (north of Albert Ave)	PM	4,706	18	4,724	<1%
	Sat	4,068	12	4,080	<1%
Pacific Highway (south of Albert Ave)	PM	4,487	12	4,499	<1%
	Sat	3,849	9	3,858	<1%

Table 7 indicates that the additional traffic volumes generated by the amended Planning Proposal to the surrounding roads will continue to be low compared to existing volumes on these roads. The additional traffic volumes along each road section will continue to be generally less than 3% of existing volumes.

The additional traffic generated by the amended Planning Proposal will be approximately 1 additional vehicle every minute during each of the peak hours.

### **Intersection Operation**

The GTA Report (April 2016) assessed the impact of the additional traffic generated by the Planning Proposal onto the surrounding road network using SIDRA INTERSECTION software. The assessment considered the three vehicle access options.

The assessment for each of the vehicle access options identified that the Saturday peak hour was the more critical (in terms of Level of Service and Degree of Saturation) than the weekday peak hours for each intersection. The amended Planning Proposal scheme is anticipated to generate less traffic during the Saturday peak hour and as such, slightly improved intersection operations could be expected for each of the options during the critical peak hour.

### **Summary**

Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the amended Planning Proposal could not be expected to compromise the safety or function of the surrounding road network.

Consistent with the previous application, should the Planning Proposal be approved, further analysis would be undertaken as part of the Development Application stage, in consultation with Council and RMS, to determine the most appropriate strategy.

Consistent with the previous findings, the analysis considers that there would be negligible benefit to the road network operation in providing a widened Victor Street carriageway (i.e. left turn at Victor Street).

### **Conclusion**

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

- i The amended Planning Proposal generates a DCP parking requirement of 803 spaces.
- ii An empirical car parking demand assessment indicates a peak parking demand of 545 spaces could be expected.
- iii The proposed indicative supply of 546 spaces is considered to be appropriate. Indeed, there may be an opportunity to reduce the overall car parking provision as part of the development application process.
- iv DCP 2006 suggests that the Planning Proposal incorporates 62 bicycle lockers for residents/employees and 104 bicycle rails for visitors.
- v The site is expected to generate up to 69 (+24 compared to the previous proposal), 71 (+15) and 51 (-29) additional vehicle movements in the weekday AM and PM and Saturday lunchtime peak hours, respectively.
- vi On the basis of the traffic and access analysis, the amended Planning Proposal scheme would have acceptable traffic impacts of the surrounding road network.



Naturally, should you have any questions or require any further information, please do not hesitate to contact me in our Melbourne office on (03) 9851 9600.

Yours sincerely

**GTA CONSULTANTS**



**Andrew Farran**  
**Associate**

encl.

# Attachment 1

## Office Traffic Generation Rate

Sydney Metro Area		Spaces	Traffic Generation (Raw Data)			Peak Demand	Traffic Generation (assuming 100% parking demand)		
			AM	PM	Daily		AM	PM	Daily
OB1	100 Arthur Street, North Sydney (Inner Ring)	136	0.32	0.24	1.31	93	0.47	0.35	1.92
OB2	9 Help Street, Chatswood (Inner Ring)	142	0.30	0.35	1.54	115	0.37	0.43	1.90
OB3	4 Dawn Fraser Avenue, Sydney Olympic Park (Middle Ring)	798	0.20	0.16	1	407	0.39	0.31	1.96
OB4	33 Macmahon Street, Hurstville (Middle Ring)	66	0.41	0.26	1.95	44	0.61	0.39	2.93
OB5	16 Giffnock Avenue, Macquarie Park (Middle Ring)	269	0.29	0.21	1.67	165	0.47	0.35	2.72
OB6	1 Smith Street, Parramatta (Middle Ring)	252	0.25	0.23	1.17	186	0.34	0.31	1.59
	AVERAGE (Inner and Middle Ring)		0.29	0.24	1.44		0.44	0.36	2.17
OB7	13-15 Moore Street, Liverpool (Outer Ring)	28	0.32	0.29	1.86	14	0.64	0.57	3.72
OB8	10-12 Lexington Drive, Bella Vista (Outer Ring)	83	0.22	0.07	0.9	25	0.72	0.24	2.99
	AVERAGE (All)		0.29	0.23	1.43		0.50	0.37	2.43