

# Mandarin Centre, Chatswood

Planning Proposal

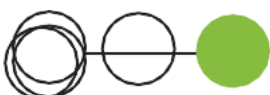
Transport Impact Assessment

Prepared by: GTA Consultants (NSW) Pty Ltd for Capitel Group

on 08/02/2021

Reference: 13S1416100

Issue #: G-Dr



**GTA**consultants

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### Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	17/09/13	Final	Andrew Farran	Rhys Hazell	Brett Maynard	
B	11/12/14	Final – amended	Andrew Farran	Brett Maynard	Brett Maynard	
C	19/02/15	Final – revised car parking provision	Andrew Farran	Brett Maynard	Brett Maynard	
D	16/04/15	Final – amended	Victor Leung Andrew Farran	Andrew Farran	Brett Maynard	
E	12/04/16	Final – revised development yield	Andrew Farran	Brett Maynard	Brett Maynard	
F	13/04/16	Final - Minor edits and document coordination	Andrew Farran	Brett Maynard	Brett Maynard	
G-Dr	08/02/21	Draft – Updated to address agency submissions	Jason Huang Ashish Modessa	Brett Maynard	Brett Maynard	

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# 1. INTRODUCTION

## 1.1. Background

A planning proposal has been lodged with Willoughby City Council for land currently occupied by the Mandarin Centre at 61-65 Albert Avenue, Chatswood. The planning proposal intends to rezone the site for an increase in floor space ratio and height controls to facilitate the development of residential, commercial and retail land uses.

GTA Consultants (GTA) was originally commissioned by Mandarin Developments Pty Ltd and Blue Papaya Ltd in 2013 to complete the transport impact assessment to support the planning proposal and indicative site layout.

Following public exhibition of the planning proposal, submissions were received from Council and Transport for NSW (TfNSW) in November 2020. The key traffic and transport related feedback relates to:

- Vehicle access and loading arrangement
- Council's proposed new lower car parking rates for the CBD
- Consideration of the Chatswood CBD Strategic [Transport] Study, completed subsequent to the transport impact assessment (last updated 2016)
- Green Travel Plan details.

The traffic impact assessment has been updated for resubmission to address the feedback received and minor changes to the planning proposal as a result of ongoing surrounding development activity.

## 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:

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposal
- suitability of the proposed access arrangements for the site
- the transport impact of the proposal on the surrounding road network, including consideration of the Chatswood CBD Strategic [Transport] Study (ARUP, 2020)
- an overview green travel plan outlining the operational travel behaviour goals for the development.

## 1.3. References

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

- Previous inspections of the site and its surrounds
- Willoughby City Council Development Control Plan 2006 (WDCP)
- Willoughby City Council Local Environmental Plan 2012 (WLEP)
- Australian Standard, Parking Facilities AS 2890 Parts 1, 2 and 6.
- ARUP, Future Conditions Report, Chatswood CBD Strategic Study, dated September 2020

- Willoughby City Council, Chatswood CBD Planning and Urban Design Strategy to 2036, dated January 2018
- Willoughby City Council and TfNSW, Planning Proposal Submissions, November 2020
- Urbis, Mandarin Centre, Planning Proposal, February 2020
- Historic traffic and car parking surveys undertaken by GTA as referenced in the context of this report
- other documents and data as referenced in this report.

# 2. STRATEGIC CONTEXT

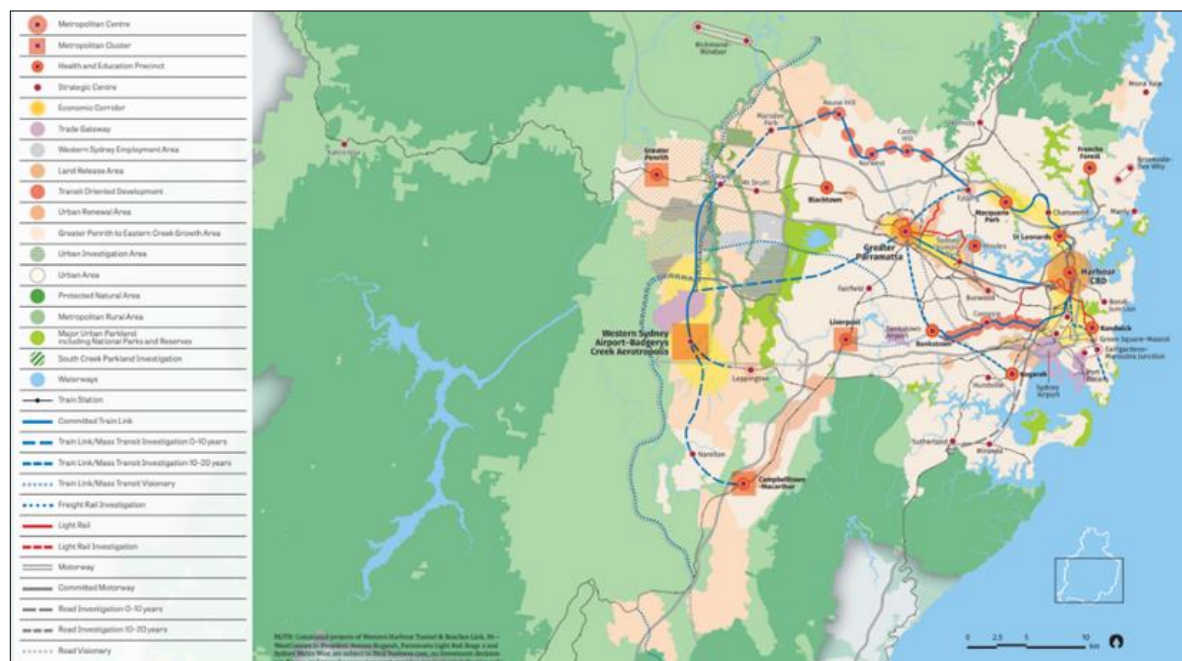
## 2.1. The Greater Sydney Region Plan 2018

The Greater Sydney Commission (GSC) is an independent organisation that leads metropolitan planning for Greater Sydney. It has prepared the Greater Sydney Region Plan which outlines how Greater Sydney will manage growth and guide infrastructure delivery. The plan has been prepared in conjunction with the NSW Government's Future Transport 2056 Strategy and informs Infrastructure NSW's State Infrastructure Strategy.

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 jobs, schools, 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 vision of the three cities from The Greater Sydney Structure Plan 2056 is shown in Figure 2.1.

Figure 2.1: Greater Sydney Structure Plan 2056 – The Three Cities



Source: Greater Sydney Commission

## 2.2. North District Plan

The North District covers Hornsby, Hunters Hill, Ku-ring-gai, Lane Cove, Mosman, North Sydney, Northern Beaches, Ryde and Willoughby local government areas.

This North District Plan is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It is a guide for implementing the Greater Sydney Region Plan, A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning.



The District Plan informs local strategic planning statements and local environmental plans, the assessment of planning proposals as well as community strategic plans and policies. The District Plan also assists councils to plan for and support growth and change, and align their local planning strategies to place-based outcomes.

The vision of the North District will be achieved by:

- Supporting jobs growth in strategic centres.
- Sustaining local centres to provide jobs, services and amenity.
- Providing fast and efficient transport connections to achieve a 30-minute city.
- Creating and renewing great places while protecting heritage and local character and improving places for people.
- Improving walking and safe cycling ways.
- Enhancing the quality and improving access to open space.

## 2.3. Future Transport 2056

Future Transport 2056 provides a 40-year strategy for how transport will be planned, amended and forecasted within NSW, both regional and metropolitan, for the expected 12 million residents. Future Transport 2056 follows from the 2012 Long Term Transport Master Plan which listed over 700 transport projects, the majority of which are completed or in progress. It also ties in with Greater Sydney Region Plan and the subsequent district plans to support the three cities metropolis vision.

Future Transport 2056 is supported by two key documents, Greater Sydney Services and Infrastructure Plan and Regional NSW Services and Infrastructure Plan, which provide guidance and planning for these areas.

From a metropolitan view, Future Transport 2056 and associated plans include the 30-minute city where jobs and services are within 30 minutes of residents with Greater Sydney. Strategic transport corridors to move people and goods are outlined between metropolitan and strategic centres, clusters and surrounds. The Movement and Place framework is also emphasised to support liveability, productivity and sustainability.

## 2.4. Chatswood CBD Planning and Urban Design Strategy to 2036

The Chatswood CBD Strategy aims to establish a strong framework to guide future private and public development as the CBD continues to grow over the next 20 years. It aims to provide capacity for future growth, achieve exceptional design and realise a distinctive, resilient and vibrant CBD. The Strategy will inform changes to Willoughby LEP and DCP.

A draft Strategy was endorsed by Council for community and stakeholder engagement between January and March 2017. Following exhibition and consideration of feedback Council endorsed the Strategy on 26 June 2017 with the consideration of the sun access issue endorsed in October 2017.

The Strategy aims to achieve:

- A reinvigorated commercial core area and economically buoyant CBD, to provide for future employment.
- A sustainable balance between commercial, retail, residential, education, cultural and other uses to ensure on-going vibrancy.
- A compact, walkable CBD.
- A city form and scale to accommodate future growth and change.
- A CBD of exceptional urban design, easy pedestrian linkages and good public domain, where local character and heritage are embraced, and the greening of the centre is achieved.

- Simplified controls for the LEP and DCP in relation to the CBD.

Key to the site, the strategy has developed the following principles to achieve the desired outcome for the broader Chatswood CBD:

1. Promoting office growth - The office market in Chatswood will continue to improve and it is vital that the centre accommodates this.
2. Providing great public places - Key new spaces and links as well as improvements to existing will provide a variety of high quality, interesting spaces for Chatswood into the future.
3. Addressing transport issues - A balanced approach is required to address future transport needs to ensure sustainable outcomes for Chatswood.

The strategy also makes recommendations in terms of maximum height limits and FSR to achieve the vision for Chatswood CBD. Figure 2.2 and Figure 2.3 indicate that the site has a recommended maximum height limit up to the airspace limits (Pans-Ops Plane) and no maximum FSR for commercial uses.

Figure 2.2: Recommended maximum height limits

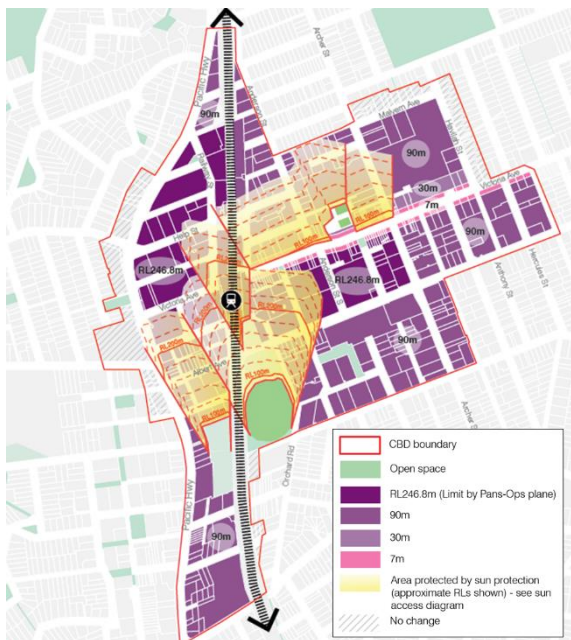
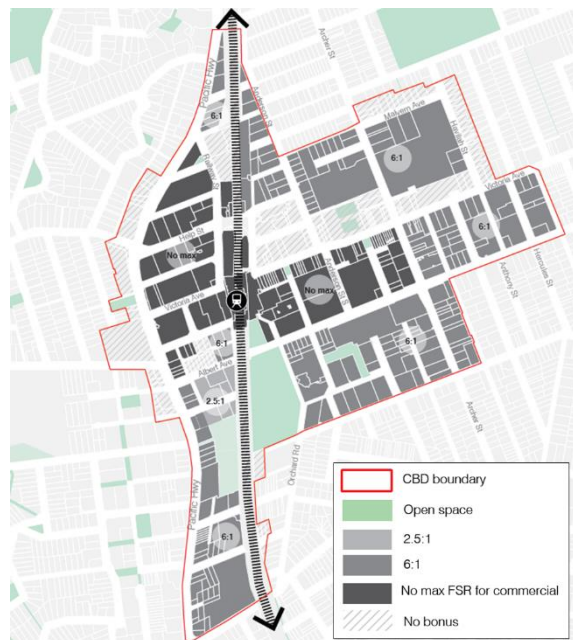


Figure 2.3: Recommended maximum FSR



The Strategy also stresses the importance of Travel Demand Management for the future of Chatswood CBD. This seeks to modify travel decisions so that more desirable transport, social, economic and/ or environmental objectives can be achieved, and the adverse impacts of travel can be reduced. The purpose of travel demand management is to reduce the total amount of travel, minimise the need to expand road systems, reduce the incidents of vehicle crashes, prevent further congestion, reduce air pollution, conserve scarce resources and increase the share of non-car based transport. Increasing the supply of parking can induce a greater number of vehicular trips which increases congestion, impacting negatively on the city environment.

The Strategy indicates the desire for car parking rates in the CBD to be low, to recognise the good accessibility to the surrounding public transport network, as well as to reduce travel demand on the surrounding road network.

# 3. EXISTING CONDITIONS

## 3.1. Location

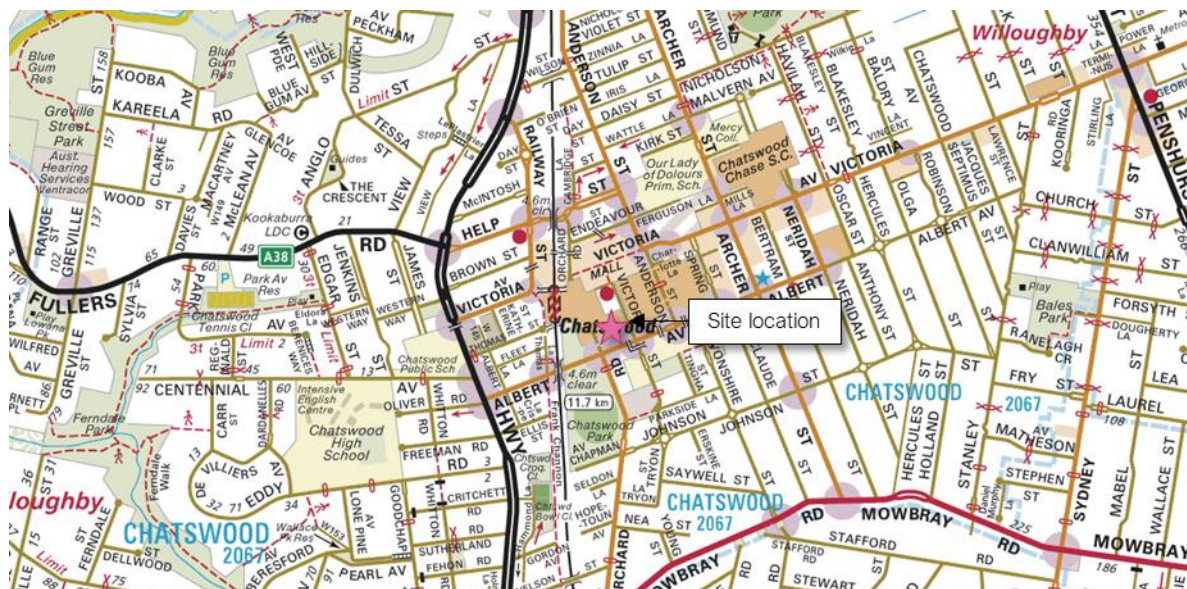
The subject site is located at 61-65 Albert Avenue, Chatswood. The site of approximately 3,520 square metres has a frontage of 75 metres to Albert Avenue and 45 metres to Victor Street and is currently occupied by the Mandarin Centre shopping centre. The site has a land use classification of 'B3 Commercial Core' under Willoughby City Council Local Environmental Plan (LEP) 2012.

The existing Mandarin Centre building comprises 13,044 square metres of retail (shop and food court uses) and entertainment (bowling, cinema uses and the Chatswood Club) land uses set across five levels. These land uses are supported by some 303 car parking spaces provided over three basement levels. Vehicle access to the existing car park is provided via a driveway crossover to Victor Street.

The site is located within Chatswood CBD, with surrounding properties predominantly including retail, commercial and high-density residential uses. The pedestrian-only section of Victoria Avenue is located north of the site, with Westfield Chatswood located directly opposite the site on Victor Street. Several residential properties are located on Victor Street, the largest of which is The Sebel Residences accommodating approximately 200 residential and serviced apartments. Willoughby City Council is also located within this building, north of the site.

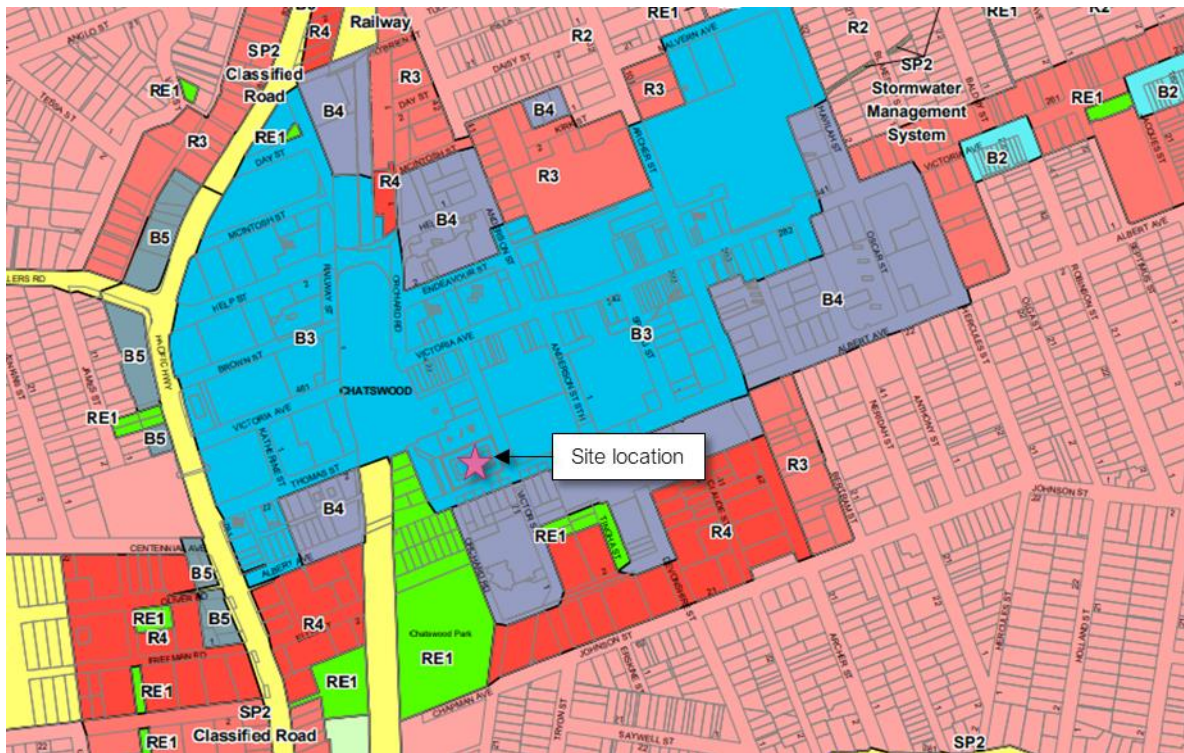
The site location and its surrounding environs is shown in Figure 3.1, with the LEP land use map shown in Figure 3.2.

Figure 3.1: Subject site and its environs



Base image source: Sydney

Figure 3.2: Land use map



Base image source: Willoughby LEP 2012

## 3.2. Transport Network

### 3.2.1. 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. Transport for NSW (TfNSW) is 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.

TfNSW 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 TfNSW, typically no limit in flow and designed to carry vehicles long distance between regional centres.

**Sub-Arterial Roads** – Managed by either Council or TfNSW 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.

### 3.2.2. Surrounding Road Network

The surrounding road network has been summarised in Table 3.1.

**Table 3.1: Road network summary**

Road Name	Classification	Description
Albert Avenue	Local	<ul style="list-style-type: none"> <li>• East-west orientation</li> <li>• Between Stanley Street in the east and Pacific Highway in the west</li> <li>• 40km/h speed zoning</li> <li>• Two-lane, two-way road</li> <li>• Approximately 15m carriageway</li> <li>• Kerbside parking is not permitted within vicinity of the site</li> </ul>
Victor Street	Local	<ul style="list-style-type: none"> <li>• North-south orientation</li> <li>• Starting from Johnson Street in the south and ending in a cul-de-sac northbound</li> <li>• 40km/h speed zoning</li> <li>• Two-lane, two-way road</li> <li>• Approximately 9m carriageway</li> <li>• Kerbside parking is time-restricted on the western side of Victor Street</li> </ul>
Orchard Road	Local	<ul style="list-style-type: none"> <li>• North-south orientation</li> <li>• Two-lane, two-way road</li> <li>• Approximately 7.6m carriageway</li> <li>• Traffic calming measures, such as speed humps provided</li> <li>• North of Albert Avenue, Orchard Road (extension) passes underneath the existing Sage Building and provides back of hour access to properties fronting Victor Street.</li> </ul>

## 3.3. Intersection Operation

GTA completed various peak hour traffic movement counts along the Albert Avenue corridor between Pacific Highway and Victor Street, on the following dates during the earlier stages of planning proposal preparation:

- Thursday 11 September 2014 (AM only)
- Thursday 18 September 2014 (PM only)
- Saturday 13 September 2014 (excl. Victor Street / Albert Avenue intersection)
- Saturday 17 August 2013 (incl. Victor Street / Albert Avenue intersection).

The intersections that were surveyed and subsequently modelled as part of the study included:

- Albert Avenue/ Victor Street
- Albert Avenue/ Orchard Road
- Albert Avenue/ Thomas Lane
- Albert Avenue/ Pacific Highway.

The operation of the key intersections along the Albert Avenue corridor were assessed using SIDRA INTERSECTION<sup>1</sup> (SIDRA), a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the TfNSW, is vehicle delay. SIDRA determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 3.2 shows the criteria that SIDRA adopts in assessing the level of service.

<sup>1</sup> Program used under license from Akcelik & Associates Pty Ltd.

**Table 3.2: SIDRA level of service criteria**

Level of service (LOS)	Average delay per vehicle (secs/veh)	Traffic signals, roundabout	Give way & stop sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 3.3 presents a summary of the historic operation of the study intersections. Traffic models were set up as a network in SIDRA, with models calibrated based on historical SCATS data provided by TfNSW and queues observed on-site.

**Table 3.3: Historic intersection operation**

Intersection	Peak	Degree of saturation (DOS)	Average queue (m)	Average delay (sec)	Level of service (LOS)
Albert Ave/ Victor Street	PM	0.46	41	15	B
	Sat	0.79	81	18	B
Albert Ave/ Orchard Road	PM	0.92	108	17	B
	Sat	0.89	111	14	A
Albert Ave/ Thomas Lane	PM	0.40	61	7	A
	Sat	0.45	76	6	A
Albert Ave/ Pacific Hwy	PM	1.07	516	34	C
	Sat	1.34	269	46	D

Table 3.3 indicates that the Pacific Highway/ Albert Avenue intersection operates at capacity. The intersections closer to the site operate within the relevant theoretical capacities, with intersection Level of Service B or better.

### 3.4. Public Transport

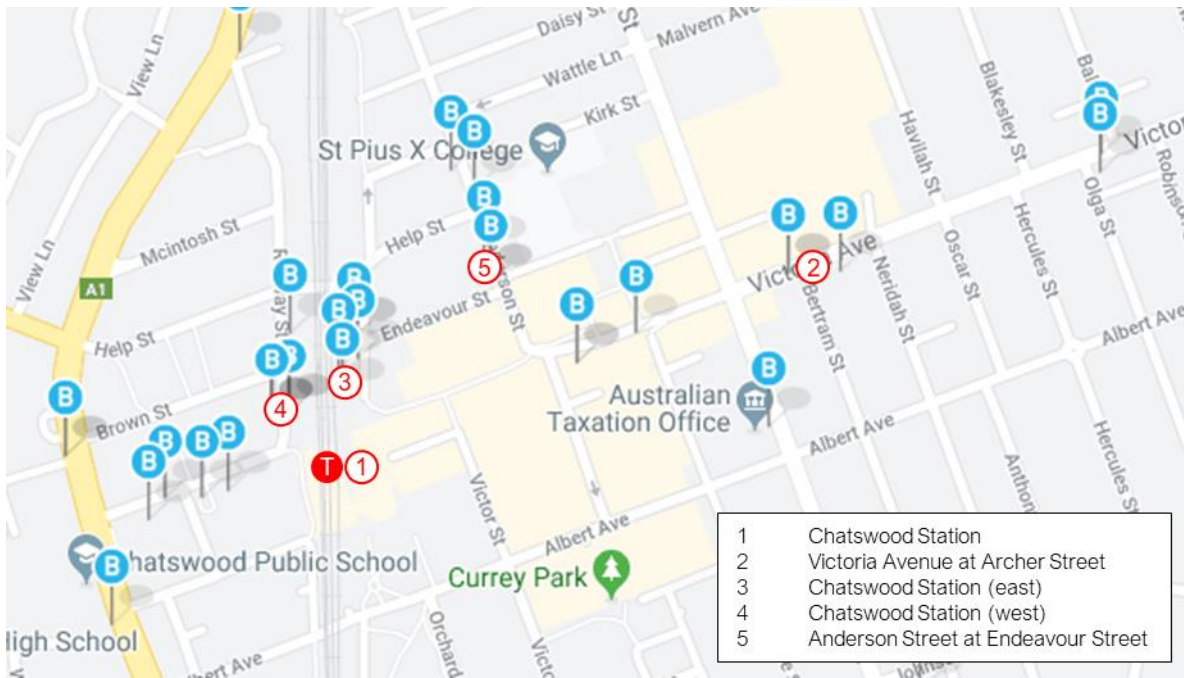
The site is serviced by a range of well-established and frequent public transport services. Chatswood Railway Station and bus interchange is about 150 metres to the north-west and within a two-minute walk. It is serviced by the Northern, North Shore and Western Lines, as well as the intercity Central Coast and Newcastle Line, and provides high frequency services to most of the Sydney Trains network, including Sydney CBD and North Sydney. Sydney Metro Northwest services to Schofields via Norwest, Castle Hill and Epping also currently start and end at Chatswood.

Chatswood Interchange functions as one of the main bus interchanges in the northern suburbs of Sydney, with at least 20 separate bus routes serviced by State Transit and Transdev, servicing key destinations including Sydney CBD, Manly, Lane Cove, Bondi Junction and Macquarie Park.

Chatswood will also form a major node as part of the expanding Sydney Metro, with further expansion to the existing services which currently link Chatswood with Schofields via high frequency turn up and go services. Services will extend south to North Sydney, Sydney CBD and through to Bankstown as part of Metro Stage 2 which is currently under construction. Services operate at four-minute frequencies during peak periods and 10-minutes during non-peak periods.

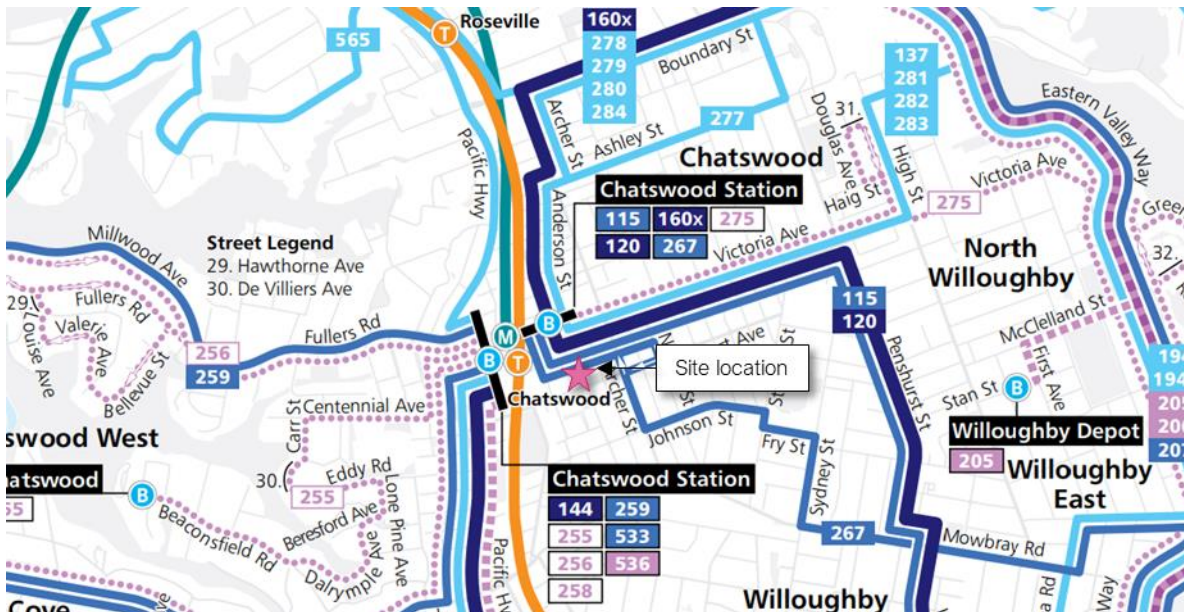
A map outlining the nearby transport infrastructure is shown in Figure 3.3, whilst an overview of the bus network near the site is shown in Figure 3.4.

Figure 3.3: Public transport infrastructure near the site



Base image source: <https://citymapper.com/sydney/bus/stops?name=&coords=-33.794707%2C151.183874> accessed 2 February 2021

Figure 3.4: Bus transport network



Sourced from Transport for NSW: <https://transportnsw.info/document/1697/region-guide-north-shore-west.pdf>

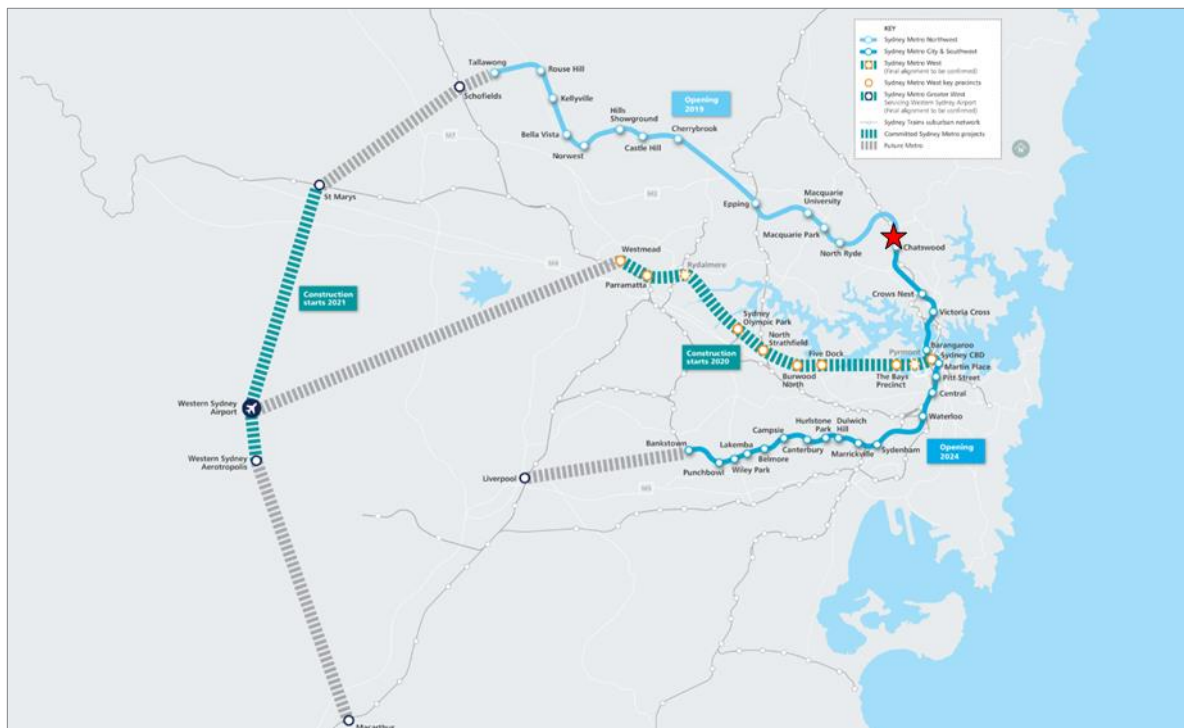
## Sydney Metro Network

A trigger for further growth in Chatswood has been the introduction of Sydney Metro, Australia's biggest public transport project that will operate as a standalone railway covering more than 66 kilometres with 31 new metro stations in its initial stages of Northwest and City & Southwest.

Sydney Metro Northwest is the first stage of the project linking Schofields and Chatswood via Norwest, Castle Hill and Epping with services having commenced in May 2019. Sydney Metro improves travel time, reliability and reduce costs compared with bus and private car travel to key employment areas including Norwest, Macquarie Park, Chatswood, North Sydney and Sydney CBD. The second phase to be completed in 2024 will extend this line to Sydney CBD and the Southwest.

Sydney Metro has (and will continue to) greatly expand to improve the 30-minute coverage for Chatswood with commuters travelling as far west as Schofields by public transport. The 30-minute coverage will also be expanded for areas to the north and south of the metro line including towards Hornsby and Rhodes via The Northern heavy rail line. The existing and future metro lines are shown in Figure 3.5.

Figure 3.5: Existing and future Sydney Metro



Source: <https://www.sydnymetro.info>

## 3.5. Walking and Cycling Infrastructure

Albert Avenue, Orchard Road, Victor Street and Victoria Avenue provide a good level of pedestrian amenity, with provision for wide footpaths on Victor Street close to the site, consistent with pedestrian amenity throughout the commercial core. Pedestrian crossing points are provided at surrounding signalised intersections and ensure pedestrian paths of travel, especially between Chatswood Interchange and the commercial core are convenient and safe. Victoria Avenue between the station and Anderson Street is pedestrian-only and only emergency vehicles are able to access this area.

The site is relatively well serviced by surrounding cycling infrastructure. The existing low speed environment characteristics are considered suitable for moderately experienced cyclists to connect with the existing surrounding cycling infrastructure network.



The existing and proposed cycling network from the Willoughby Bike Plan is shown in Figure 3.6.

Figure 3.6: Surrounding cycling network



Source: [www.willoughby.nsw.gov.au/your-neighbourhood](http://www.willoughby.nsw.gov.au/your-neighbourhood), accessed February 2021

End-of-trip facilities are available near the site as follows:

- four cycle racks in Victor Street pedestrian area – 10 metres from site
- two cycle racks on Victor Street – 50 metres from site
- two cycle racks on Albert Avenue – 70 metres from site
- Cycle lockers at Chatswood Interchange – 80 metres from site.

The majority of these facilities are conveniently located and the high pedestrian activity offers good passive surveillance.

Figure 3.7: Victor Street pedestrian area racks



Figure 3.8: Victor Street racks



### 3.6. Existing Travel Behaviour

Journey to Work data has been sourced from the Australian Bureau of Statistics 2016 census and provides an indication of existing travel patterns from the local area. Figure 3.9 details the catchment of the census data analysed which corresponds to the Australian Bureau of Statistics 2016 Destination Zones (DZN).

Figure 3.9: 2016 destination zones



Base image source: Google Maps

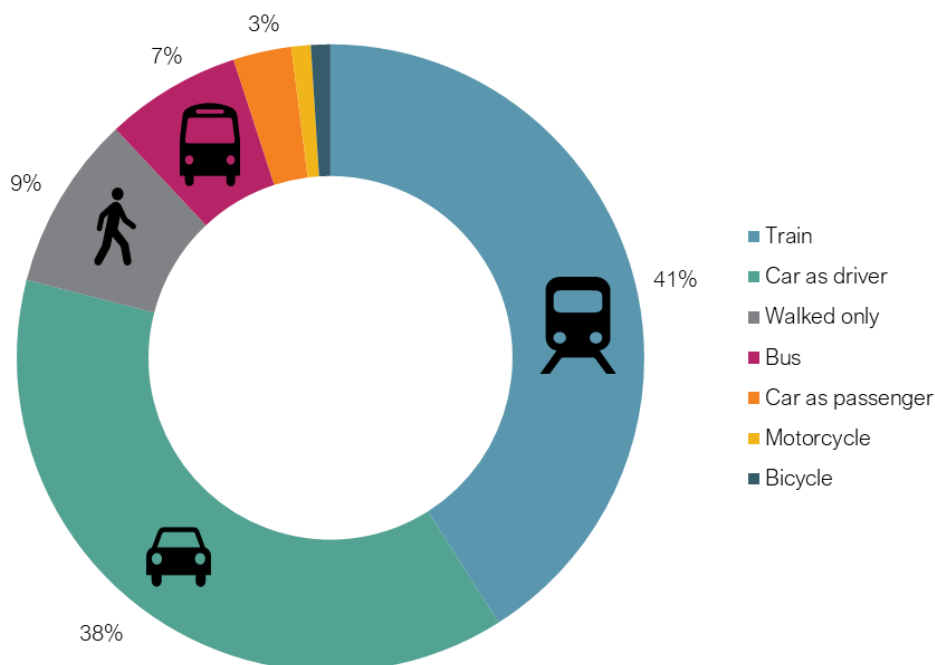
Table 3.4 and Figure 3.9 provide a summary of the existing modes of travel to work for the surrounding area. The results indicate that train travel and driving are the most common transport modes. Bus travel and active travel also feature.

Table 3.4: Existing primary mode of travel

Mode of Travel	Mode Share <sup>[1]</sup>
Train	41%
Car as driver	38%
Walked only	9%
Bus	7%
Car as passenger	3%
Motorcycle	1%
Bicycle	1%
Total	100%

[1] Does not include residents who worked at home or did not go to work.

Figure 3.10: Existing travel mode share



## 3.7. Parking

### 3.7.1. On-Site

The Mandarin Centre currently provides 303 on-site car parking spaces operated by Secure Parking. The car park currently provides free parking for durations up to three hours, with charges applied after this time.

### 3.7.2. On-Street

Most of Victor Street parking spaces is typically occupied, with little to no vacancies during the day time.

### 3.7.3. Off-Street

The site is located close to three publicly available off-street car parks as summarised in Table 3.5.

Table 3.5: Public off-street parking summary

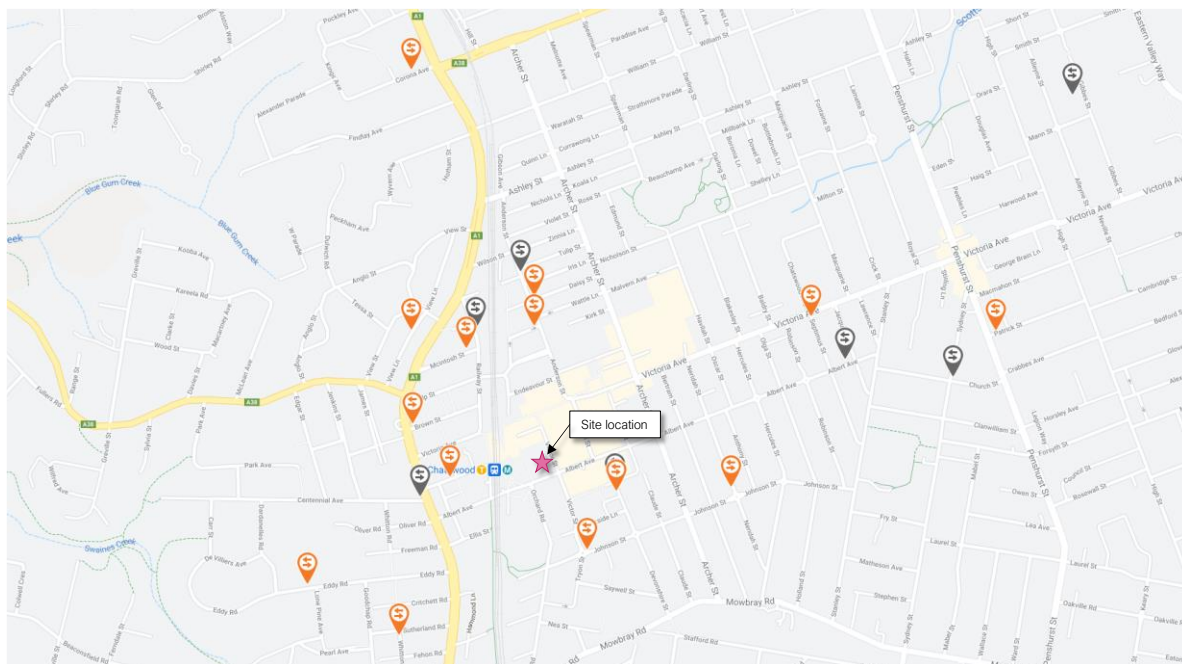
Location	Distance to Site	Approximate Parking Supply
Westfield Chatswood	30 metres	2,800
The Concourse	300 metres	400
Chatswood Chase	550 metres	2,260
<b>TOTAL</b>		<b>5,460 spaces</b>

### 3.8. Local Car Share 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 suburbs due to limited parking availability and the expense involved in parking close to keys CBDs. GoGet offer a viable alternative to the private car for trips where distances are short and are likely to be used by future workers in the proposed commercial building.

GoGet car share pods located near the site are shown in Figure 3.11, with the closest pods on Devonshire Street and Thomas Street. These pods primarily serve the surrounding employment catchment area and encourage use for a variety of purposes.

Figure 3.11: Surrounding GoGet pod locations



Base image source: GoGet, accessed February 2021

# 4. DEVELOPMENT PROPOSAL

## 4.1. Land Use

The planning proposal intends to amend the existing planning controls imposed on the site by allowing shop top housing as a permitted use in the existing B3 Commercial Core zone, together with an increase in the maximum height controls and increase in the maximum floor space ratio.

The amended planning controls are being sought with a view to constructing a mixed use development incorporating residential uses above lower-level retail and commercial uses. In essence it is proposed to generally maintain the existing retail floor areas and provide commercial and residential land uses above. This mixed-use nature has the potential to greatly improve travel behaviour for residents, staff and visitors to the centre through trip containment, while also providing housing close to a significant employment area (being Chatswood CBD).

The indicative development schedule is summarised in Table 4.1.

**Table 4.1: Planning Proposal Schedule**

Use	Dwelling Type	Size
<b>Residential</b>	1 bedroom	80 dwellings
	2 bedroom	70 dwellings
	3 bedroom	8 dwellings
	<b>Sub-Total</b>	<b>158 dwellings</b>
<b>Non-Residential</b>	Retail uses	10,415sq.m NLA
	Supermarket	2,595sq.m NLA
	Commercial	11,085sq.m GFA
	Childcare	860sq.m (6 staff)
	<b>Sub-Total</b>	<b>23,990sq.m</b>

Table 4.1 indicates that the planning proposal anticipates some 158 residential apartments, 23,990 square metres of non-residential floor area (incorporating office, retail, supermarket and entertainment uses).

The current Mandarin Centre comprises 13,044 square metres of retail floor area; therefore the proposal generally maintains this retail area.

## 4.2. Vehicle Access

The plans prepared as part of the Planning Proposal indicate vehicle entry from Victor Street and exit from Orchard Road. In consultation with TfNSW and Council, a number of alternate vehicle access options to the site were identified and are summarised in Table 4.2, prior to selection of the preferred option.

**Table 4.2: Site Vehicle Access Options**

Option	Victor Street	Orchard Road
1	All Vehicle Access	None
2 (preferred and shown on plans)	Entry Only	Exit Only
3	None	All Vehicle Access

The preferred access option provides a balanced traffic movement outcome and supports Council's vision for Victor Street to encourage pedestrian usage and manage vehicle impacts.

### 4.3. Parking and Loading

The planning proposal will provide a maximum of 439 car parking spaces over five basement levels.

A loading area for up to two 8.8 metre Medium Rigid Vehicles (MRV) is provided in the first basement level.

### 4.4. Bicycle Facilities

As this is a planning proposal the indicative layout plans do not contain details of bicycle facilities. Bicycle facilities will be covered in more detail during the Development Application stage.

# 5. CAR PARKING

## 5.1. Council Transport Objectives

The transport requirements of future developments within Willoughby Council area are set out in Part C.3 of the Willoughby Development Control Plan (DCP).

There are 12 standards and guidelines that seek to establish the intent of the DCP Transport Requirements. These are reproduced below:

1. *Minimise the adverse environmental effects of car use within the City;*
2. *Manage the existing and future on- and off-road car parking in a manner that sustains and enhances the economic and environmental qualities of Willoughby;*
3. *Encourage the use of public transport in areas close to transport nodes;*
4. *Encourage alternative modes of transport;*
5. *Ensure that appropriate facilities are provided for bicycles;*
6. *Provide for the safe, convenient, and efficient movement and accommodation of vehicles within the City;*
7. *Ensure that provision is made for a reasonable number of parking spaces for vehicles generated by a development including visitor, employee, service and commercial vehicles;*
8. *Ensure that vehicular movements and parking do not impede pedestrian traffic safety and efficiency;*
9. *Ensure that the design of parking and servicing areas and their access is safe and compatible with the best practice standards;*
10. *Ensure that car parking facilities contribute positively to the public domain;*
11. *Minimise hard surfaces in order to enhance areas for on-site infiltration of stormwater, where relevant; and*
12. *Manage demand for car use by employing the principle of travel demand management. Travel Demand Management is intervention (excluding provision of major infrastructure) to modify travel decisions so that more desirable transport, social, economic and/or environmental objectives can be achieved, and the adverse impacts of travel can be reduced. The purpose of travel demand management is to reduce the total amount of travel, minimise the need to expand road systems, reduce the incidents of vehicle crashes, prevent further congestion, reduce air pollution, conserve scarce resources and increase the share of non-car-based transport. Increasing the supply of parking can induce a greater number of vehicular trips which increases congestion, impacting negatively on the city environment."*

In summary, the Council transport objectives seek to minimise the reliance on private motor vehicle usage by minimising car parking provisions (in appropriate locations), promoting alternate transport modes and leveraging off existing public transport nodes.

## 5.2. Car Parking Requirements

The car parking requirements for different development types are currently set out in Willoughby DCP 2006. A review of the car parking rates and the floor area schedule results in a WDCP parking requirement for the planning proposal as summarised in Table 5.1.

Table 5.1: WDCP 2006 Car Parking Requirements

Description	DCP Parking Rate	No. of Dwellings/ Floor Area	DCP Parking Requirement
Residential Flats within Railway Precincts	1 space/ 1 bedroom	80 dwellings	80
	1 space/ 2 bedroom	70 dwellings	70
	1.25 spaces/ 3+ bedroom	8 dwellings	10
	1 space/ 4 dwellings (visitor parking)	158 dwellings	39
<b>Sub-Total</b>			<b>199 spaces</b>
Supermarket	6 spaces/ 100sq.m NFA	2,595sq.m NLA	155
Retail	1 space/ 25sq.m NFA	10,415sq.m NLA	416
Childcare	1 space/ 2 employees	860sq.m GFA (six staff)	3
Commercial	1 space/ 100sq.m GFA	11,085sq.m GFA	110
<b>Sub-Total</b>			<b>684 spaces</b>
<b>Total</b>			<b>883 Spaces</b>

Note: where the parking spaces required is not a whole number, DCP 2006 states that the number of spaces required is to be rounded down to the nearest whole number.

Table 5.1 indicates that the planning proposal is required to provide up to 883 car parking spaces (199 spaces for residential and 684 spaces for non-residential) to comply with WDCP 2006.

### 5.3. Council Decision Criteria Assessment

WDCP 2006 contains a list of criteria against which development applications are assessed when considering any departures from the DCP car parking rates, and detailed as follows:

- the size and nature of the development, amount of additional floor area relative to the existing floor area and the parking demand generated
- whether a Green Travel Plan has been provided
- encouraging less use of motor vehicles, especially those developments close to railway stations and major public transport routes
- availability and accessibility of other public parking
- accessibility of public transport and the probable transport mode of users
- proximity to bicycle routes
- existing and likely future traffic volumes on the surrounding road network and the nature of this network
- the environmental implications of providing parking with particular regard to vegetation and landscape impacts
- results of a parking survey submitted to Council to justify demand for the proposed use
- the impact of not providing the parking.

The abovementioned decision guidelines relevant to the planning proposal have been considered and discussed below.

#### 5.3.1. Green Travel Plan

Green Travel Plans have also proven to be a successful way of changing travel behaviour for a number of employers throughout Australia and overseas. A Green Travel Plan is a way in which a development is able to manage the transport needs of staff and visitors. The aim of the plan is to reduce the environmental impact of



travel to and from a given site and in association with its operation. In essence, the plan encourages more efficient use of motor vehicles as well as alternatives to single occupant car usage. An overview Green Travel Plan has been provided in Section 6.3.

It should be noted that the proposed development is not reliant on a Green Travel Plan, rather the Green Travel Plan will assist managing travel behaviour, for the following reasons:

- The traffic analysis does not assume any reduction in retail traffic generation from existing Mandarin Centre operation and adopts conservative trip rates for the residential and commercial components.
- The constrained parking provisions are consistent with Council's future vision and direction, as well as other recent and future developments in the area.
- The location of the site in combination with improvements in the public domain and public transport services continue to encourage and support public transport use, with active and ongoing promotion of these by others.

### 5.3.2. Reduction in Motor Vehicle Usage

Encouraging the use of public transport and walking and cycling as modes of transport is central to reducing motor vehicle usage. The site is easily accessible by public transport and is within the Chatswood CBD. There are some existing and proposed on/off-road cycle lanes along the nearby major roads that can service the site. End of trip cycle facilities would be provided.

The proposal is a prime opportunity to promote this vision by encouraging the use of public transport, cycling, and walking and not encouraging an abundance of car parking within this area, and in turn an overuse of motor vehicles.

### 5.3.3. Car Parking Availability

In addition, and as discussed in Chapter 2, the site is located near three off-street public car parks; Westfield Chatswood, The Concourse and Chatswood Chase. These car parks have a capacity in excess of 5,000 car spaces all within an easy walking distance of the site. These car parks have the potential to accommodate additional visitor parking associated with the future site uses, it is noted that the on-site car park within The Mandarin Centre is currently open to at least 12:30am every day and would be capable of accommodating after-hours residential visitor car parking demands.

It is worth noting that ease and availability of public parking is something that is generally not expected in a CBD environment. Visitors to Chatswood are therefore encouraged to seek alternative modes of travel based on a general expectation that on-site parking is not readily available, albeit with knowledge of the surrounding public car parks. Education and information about the services of the other modes is also provided through the use of a Green Travel Plan.

### 5.3.4. Public Transport Availability

The site is located within two minutes walk of Chatswood Interchange which provides access to high frequency bus and train services. As such, the provision of reduced on-site car parking will encourage residents, staff and visitors to use public transport instead of private motor vehicles. This is in-line with the overall objectives of WDCP 2006 to "encourage the use of public transport in areas close to transport nodes"<sup>2</sup>.

This level of public transport accessibility will support a low level of car ownership on the site.

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<sup>2</sup> Willoughby City Council DCP 2006, p. C32

## 5.4. Other Considerations

### 5.4.1. Council Proposed New Parking Rates

In response to the initial planning proposal lodged to Willoughby City Council, Council has agreed that the existing WDCP 2006 rates may be substituted with new car parking rates being investigated for the Chatswood CBD area for select land uses.

Whilst Council has not adopted these new rates, it is expected that future developments will be assessed by Council with consideration of these potential future rates.

The new parking rates better reflect Council's vision for the Chatswood CBD that is less reliant on car-based trips. An overview of the resultant car parking requirement based on the potential new car parking rates for the Chatswood CBD is provided in Table 5.2.

**Table 5.2: Potential New Parking Rates for Chatswood CBD**

Description	Parking Rate	No. of Dwellings/ Floor Area	Parking Requirements
Residential Flats within Railway Precincts	0.5 space/ 1 bed dwelling	80	40
	1 space/ 2+ bed dwelling	78	78
	1 visitor space/ 10 dwellings	158	15
<b>Sub-Total</b>			<b>133 spaces</b>
Retail	1 space/ 300sq.m	13,010sq.m	43
Commercial	1 space/ 400sq.m	11,085sq.m	27
<b>Sub-Total</b>			<b>70 spaces</b>
Childcare	1 space/ 2 employees (DCP 2006)	860sq.m (6 staff)	3
<b>Total</b>			<b>206 spaces</b>

Table 5.2 indicates that the planning proposal would be required to provide 206 car parking spaces (133 spaces for residential and 73 spaces for non-residential) based on the new car parking rates that Council is investigating for Chatswood CBD, which is a significant reduction compared to the current controls in WDCP 2006 (883 spaces).

### 5.4.2. TfNSW Guide (Residential)

Reference has also been made to high density residential car parking rates provided in the TfNSW 'Guide to Traffic Generating Developments' 2002 (GTGD 2002), which is summarised in Table 5.3.

**Table 5.3: Residential Parking Demands**

Type	Number of Dwellings	Car Parking Rate	Car Parking Demand
1-bedroom	80 dwellings	0.4 spaces per dwelling	32
2-bedroom	70 dwellings	0.7 spaces per dwelling	49
3 bedroom	8 dwellings	1.2 spaces per dwelling	10
Residential (visitor)	158 dwellings	1 space per 7 dwellings [1]	23
<b>Total</b>			<b>114 spaces</b>

[1] Visitor parking rate is for stand-alone developments and does not acknowledge potential sharing and efficiencies associated with significant retail parking in the same development.

Table 5.3 indicates that adopting the TfNSW rates, the residential component of the planning proposal is anticipated to generate a residential parking demand of 114 spaces incorporating 91 resident spaces and 23 visitor spaces.

The adoption of the TfNSW car parking rates for the residential component is also consistent with the SEPP 65 car parking requirements which indicates that adopting the TfNSW residential parking rates is appropriate, given the site's proximity to public transport and commercial zoning.

## 5.5. Car Parking Summary

The Mandarin Centre is currently the third largest shopping centre in Chatswood and fourth largest public retail car park. The following considerations should be noted with respect to future parking supply:

- The existing Mandarin Centre car parking (303 spaces) forms part of an overall retail parking supply of close to 6,000 parking spaces. Reducing this retail car parking to 43 spaces could place pressure on other facilities in the short to medium term, with potential unintended traffic congestion consequences.
- Adopting the TfNSW residential parking rates, as previously proposed, still results in a lower car parking provision than the proposed Council rates and should continue to be adopted.
- The residential visitor parking rate proposed by Council is lower than the respective TfNSW rate and reflects contemporary requirements. As such, this should be adopted in conjunction with the TfNSW residential parking rates.
- A reduction in commercial (tenant) parking is consistent with contemporary tenant requirements and directly assists with reducing traffic generation.

On this basis, the applicant proposes a maximum parking provision as summarised in Table 5.4.

**Table 5.4: Proposed Parking Supply (Maximum)**

Type	Dwellings/ Floor Area (sq.m)	Car Parking Rate (Source)	Car Parking Demand
1-bedroom/ studio	80 dwellings	0.4 spaces per dwelling (TfNSW)	32
2-bedroom	70 dwellings	0.7 spaces per dwelling (TfNSW)	49
3-bedroom	8 dwellings	1.2 spaces per dwelling (TfNSW)	10
Residential visitor	158 dwellings	1 space per 10 dwellings (New Council)	15
<b>Sub-total</b>			<b>106 spaces</b>
Retail	13,010sq.m NLA	Existing Parking Provision	303 (maximum)
Commercial	11,085sq.m GFA	1 space/ 400sq.m	27
Childcare	860sq.m (6 staff)	1 space/ 2 employees (DCP 2006)	3
<b>Sub-total</b>			<b>333 spaces (maximum)</b>
<b>Total</b>			<b>439 spaces (maximum)</b>

[1] Visitor parking rate is for stand-alone developments and does not acknowledge potential sharing and efficiencies associated with significant retail parking in the same development.

The planning proposal previously included 546 car parking spaces, therefore presents an opportunity to reduce car parking provision for the development by at least one full basement level.

The applicant will consider whichever car parking rates are applicable at the time of any future Development Application, with the opportunity to reduce retail car parking in consultation with Council (and TfNSW).

## 5.6. Adequacy of Parking Supply

The proposed departure from the WDCP parking requirements is considered appropriate, noting the following:

- The site's location within Chatswood CBD.
- The site's proximity to the Chatswood Transport Interchange.
- ABS data indicates low car parking for residents in high density buildings in the Chatswood area.
- A reduced car parking provision for the retail and supermarket uses is consistent with the assessment completed for the adjacent Metro development.

Based upon the above discussions and analysis, it is evident that an on-site car parking supply of 439 spaces is generally sufficient to cater for the anticipated peak daytime car parking demands generated by the proposal. The planning proposal documentation demonstrates that this provision can be accommodated within the redevelopment.

## 5.7. Motorcycle Parking

WDCP 2006 requires motorcycle parking to be provided at the rate of one space per 25 car parking spaces. Given the car parking requirements outlined above, the planning proposal is required to provide some 18 motorcycle parking spaces based on the above maximum car parking provision (439 spaces), with these able to be accommodated within the basement car parking levels.

## 5.8. Car Parking Layout

The car park layout and site access provisions should be designed in accordance with the requirements of the Willoughby City Council's DCP 2006 and the Australian Standard for Off Street Car Parking (AS2890.1:2004 and AS2890.6:2009).

# 6. SUSTAINABLE TRANSPORT INFRASTRUCTURE

This chapter discusses potential for further measures that could encourage alternative means of travel to the private car and encourage the use of more environmentally sustainable forms of travel.

## 6.1. Bicycle End-of-Trip Facilities

WDCP 2006 contains a guide to bicycle parking facilities for different types of developments as summarised in Table 6.1.

Table 6.1: DCP 2006 Bicycle Parking Guide

Description	Suggested Parking Rate		No. of Dwellings/ Floor Area (sq.m)	Suggested Parking Provision	
	Bicycle Lockers	Bicycle Rails		Bicycle Lockers	Bicycle Rails
<b>Residential</b>	1 per 10 units	1 per 12 units	158 dwellings	16	13
<b>Commercial</b>	1 per 450m <sup>2</sup>	1 per 150m <sup>2</sup>	11,085sq.m	25	74
			<b>Total</b>	<b>41</b>	<b>87</b>

Based on the above, DCP 2006 suggests that the planning proposal incorporate 41 bicycle lockers for residents/ employees and 87 bicycle rails for visitors. The 41 bicycle lockers could be accommodated as bicycle racks within a secure cage facility to improve space efficiency and usage.

There is opportunity to expected the supply of bicycle lockers for residents and commercial staff to further encourage uptake of cycling as a mode of travel given the prime location of the site.

## 6.2. Public and Active Transport Network

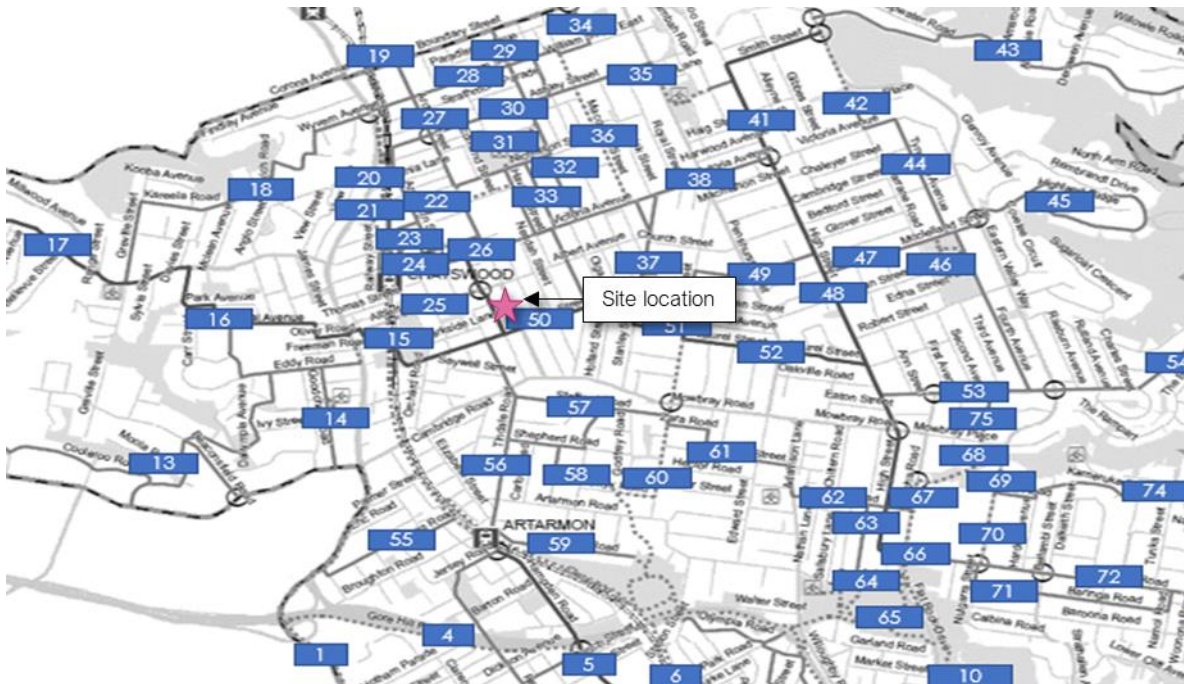
### 6.2.1. Cycle Network

The Willoughby Bike Plan (2017) identified and prioritised 27 proposed cycle routes to be implemented in Willoughby LGA including the following two on-road routes in Chatswood CBD:

- Victoria Avenue between Anderson Street and Havilah Street (Route 26, high priority)
- Johnson Street (Route 50, medium priority).

These proposed routes will improve cycling accessibility in and around Chatswood CBD and are shown in Figure 6.1.

Figure 6.1: Willoughby Bike Plan Proposed Cycle Routes



Source: Modified from Willoughby Bike Plan Review 2012, pg. 63

### 6.2.2. Pedestrian Network

The site is well connected to the existing pedestrian network with pedestrian paths provided on both sides of the roads near the site. The site is close to Chatswood Transport Interchange and Victoria Avenue pedestrian mall, and as such experiences high pedestrian activity. The proposed vehicle access strategy means pedestrians will only interact with vehicles entering the site along Victor Street, reducing the conflict.

### 6.2.3. Public Transport

As discussed previously, the site is easily accessible by public transport with Chatswood Transport Interchange located 100 metres west of the site. The proximity to public transport will increase the use of public transport by residents and employees and discourage the use of private motor vehicles.

## 6.3. Overview 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 proposed development 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.

### 6.3.1. 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:

- Limiting on-site parking provision
- 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.
- Providing free Opal cards to new residents and staff with a nominal initial credit (\$50-\$100) to encourage the initial use/ experience of public transport options.
- 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).
- 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.
- Providing bicycle facilities including secure bicycle parking for staff, bicycle racks/ rails for visitors and shower and change room facilities.
- Encouraging staff that drive to work and park on surrounding roads, as well as residents who travel to similar destinations, to carpool through creation of a carpooling club or registry/ forum.
- Regularly promote ride/ walk to work days.

- Providing a regular newsletter to all residents and staff bringing the latest news on sustainable travel initiatives in the area, including the various initiatives run by Willoughby City Council.
- Encourage tenant businesses (where appropriate) to promote flexible working arrangements and allow travel using active transport outside peak hours.
- Encourage resident and tenant businesses (where appropriate) to consider 'work from home' (WFH) arrangements and reduce the need to travel to work.

### 6.3.2. 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.

### 6.3.3. 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.

### 6.3.4. 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 fewer 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.

### 6.3.5. 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.

# 7. LOADING FACILITIES

## 7.1. Loading Requirements

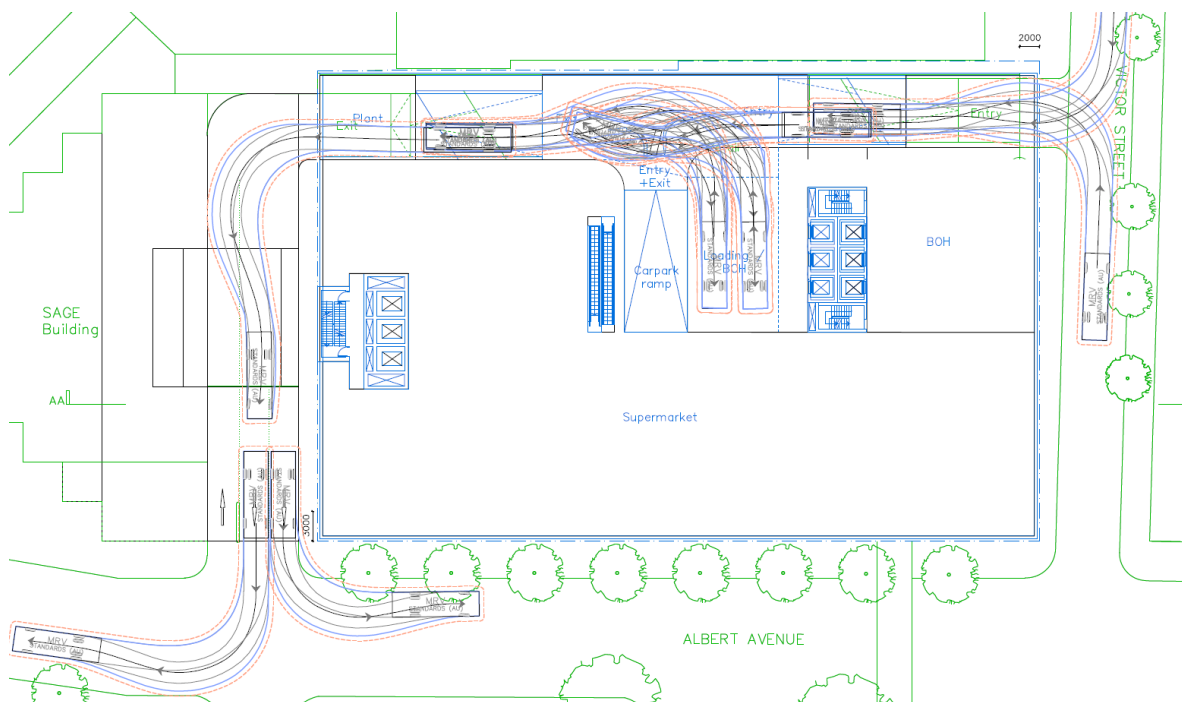
The loading requirements for different development types are contained in WDCP 2006 and indicate that the site should provide loading facilities for the retail and residential land uses.

## 7.2. Proposed Loading Arrangements

A loading facility will be provided on basement level 1, that can accommodate two 8.8 metre MRVs. Refuse will be required to be collected by a private contractor from within the subject site.

The indicative design with separate entry and egress ramps can generally accommodate the swept path requirements of an MRV, with further developed at the Development Application stage required to confirm the egress through the Sage Building.

Figure 7.1: Loading access swept paths



A booking system will be necessary for the shared loading area, where residential and commercial demand is scheduled outside of peak retail demand, which is workable given residential and commercial typically have lower demand for loading/ unloading activities (typically limited to removalist and delivery of large furniture and appliances).

# 8. TRAFFIC ASSESSMENT

## 8.1. Preamble

Vehicle access to the existing Mandarin Centre is currently provided from the site's Victor Street frontage. It was initially proposed to maintain vehicle access from this existing location, however, following consultation with Council it was requested that the vehicle access be relocated to the site's Orchard Road frontage. The rationale for this was to improve the pedestrian amenity along Victor Street by removing vehicle traffic.

Subsequently, plans for the site were modified to show vehicle access from Orchard Road with the revised vehicle access strategy presented to TfNSW. However, upon review of the updated vehicle access strategy TfNSW raised concerns regarding how the additional traffic at the Albert Avenue/ Orchard Road intersection would affect the operation of the Albert Avenue corridor. In this regard, it is noted that TfNSW has previously provided their "in principle" support for vehicle access to the site to be maintained from Victor Street (noting the competing priorities with the Council request).

In this regard it is noted that intersection modelling has previously been completed for each vehicle access scenario, that indicated that adequate capacity exists to accommodate the additional traffic under each option without unreasonably impacting on the operation of the Albert Avenue corridor.

The preferred vehicle access scenario which has been adopted for this planning proposal is for entry to be via Victor Street and egress via Orchard Road/ Albert Avenue intersection.

When considering the traffic impact of the proposed redevelopment of the site it is important to note that only traffic generated by the residential and commercial uses is additional traffic to the network as the retail traffic generation already occurs. Should the anticipated traffic impact be deemed to be excessive, the level of retail car parking could be reduced, having consideration to Council's proposed new parking rates. This would reduce the overall traffic generation of the site, noting that the retail car spaces rather than the retail floor area are generating traffic movements.

Furthermore, in terms of the broader traffic impact there is limited opportunity to improve the capacity of the Pacific Highway/ Albert Avenue intersection without significant works. In this regard, the capacity of the corridor is considered a regional issue rather than an issue that can/ should be resolved as part of the planning proposal for this development (with limited broader traffic impact).

An assessment of the preferred vehicle access option for the weekday PM and Saturday lunchtime peak hour is provided in the following sections. As agreed with TfNSW and Council, the AM peak hour has not been assessed, noting that the majority of surrounding land uses are retail and do not generate as much traffic earlier in the day.

## 8.2. Traffic Generation

### 8.2.1. Retail (Existing Traffic Generation)

The proposal is for the existing retail car parking supply of 303 spaces to be the maximum provision. Therefore, this component of the development will not generate more traffic than it currently does. A summary of the retail traffic generation based on historic traffic counts of the Mandarin Centre car park access is as follows:

- PM Peak Hour: 170 vehicle movements per hour
- Saturday Peak Hour: 264 vehicle movements per hour

It is noted that, due to the constrained parking provision, retail patronage characteristics and surrounding road network, the existing traffic generation (when considering floor area) is lower than might otherwise be if adopting rates from the *Guide to Traffic Generating Developments* (TfNSW, 2002 and 2013). However, simply applying a higher rate would not have regard for these constraints, particularly given that additional vehicles would not be able to access the car park during peak times.

### 8.2.2. Residential (Additional Traffic Generation)

The residential traffic volume estimates have been sourced from the TfNSW Technical Direction (August 2013) and are presented in Table 8.1. Specifically, the “Sydney Average” traffic generation rates for high density residential flat dwellings have been adopted, which are conservatively high when considering public transport accessibility.

**Table 8.1: Residential Peak Hour Traffic Generation**

Peak Hour	No. of Residential Parking Spaces	Traffic Generation Rate (movements per space)	Traffic Generation (vph)
<b>Weekday PM</b>	113 spaces	0.15	17
<b>Saturday Lunchtime [1]</b>		0.19	22

[2] Saturday traffic generation rates are not provided in the Technical Direction and as such the higher AM peak hour rates (0.19 movements per space) has been adopted.

Table 8.1 indicates that the site is anticipated to generate between 17 and 22 additional vehicle movements during each peak hour.

### 8.2.3. Commercial (Additional Traffic Generation)

The commercial traffic volume estimates have also been sourced from the TfNSW Technical Direction (August 2013) and are presented in Table 8.2.

**Table 8.2: Commercial Peak Hour Traffic Generation**

Peak Hour	No. of Commercial Parking Spaces	Traffic Generation Rate (movements per space)	Traffic Generation (vph)
<b>Weekday PM</b>	27 spaces	0.35	10
<b>Saturday Lunchtime</b>		-	-

Table 8.2 indicates that the site is anticipated to generate 10 additional vehicle movements during the weekday PM peak hour.

### 8.2.4. Summary

A summary of the existing, additional and post development traffic volumes anticipated to be generated by the site are provided in Table 8.3.

**Table 8.3: Mandarin Centre Traffic Generation**

Use	Status	Traffic Generation	
		Weekday PM trips	Saturday Lunchtime trips
Retail (existing 303 spaces)	Existing	170	264
Residential (additional 113 spaces)	Additional	17	22
Commercial (27 spaces)	Additional	10	-
<b>Total Traffic Generation</b>		<b>197</b>	<b>286</b>
<b>Additional Traffic Generation</b>		<b>27</b>	<b>22</b>

Table 8.3 indicates that the site is anticipated to generate 197 and 286 vehicle movements during the critical weekday PM and Saturday lunchtime periods, respectively, of which 22 and 27 vehicle movements are additional (or new movements to the network). The additional vehicle movements represent around 10 per cent of the overall traffic generation and equates to one additional vehicle every two to three minutes. Such increase is insignificant and would have negligible impact on the surrounding road network once directional distribution and splits are accounted.

## 8.3. Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

- configuration of the arterial road network in the immediate vicinity of the site
- existing operation of intersections providing access between the local and arterial road network
- distribution of households in the vicinity of the site
- surrounding employment centres, retail centres and schools in relation to the site
- configuration of access points to the site.

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been assumed:

- west via Albert Avenue: 40%
- east via Albert Avenue: 40%
- south via Orchard Road or Victor Street: 20%

The above distributions are generally consistent with the existing turning movement distributions at the Albert Avenue/ Victor Street intersection.

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) for the residential and commercial land uses (i.e. the additional traffic generation) has been assumed to be 50 per cent in/ 50 per cent out in both critical peak periods.

## 8.4. Traffic Impact

In 2020, Arup prepared a Future Conditions transport study<sup>3</sup> that assessed the future traffic and transport (active and public) network impacts of forecasted employment and dwellings documented in the Chatswood CBD Planning and Urban Design Strategy (CCPUDS). The study tested 2026 and 2036 design years using TfNSW strategic modelling as a base, which forecasts and tests scenarios across the Greater Sydney Metropolitan Area.

For the travel zone (TZ 1805) that contains the site, an additional 677 residents and 30 fewer employees is predicted in 2026 based on the TfNSW Strategic and CCPUDS forecasts. By 2036, the population in the travel zone is predicted to increase by 1,907 residents and 290 employees. This is illustrated in Figure 8.1 and Figure 8.2, with the forecasts illustrating a significant increase in residential population and a modest increase in employment within the travel zone, which supports the proposal to provide housing along with commercial within the CBD.

Figure 8.1: 2026 Population and Employment Uplift

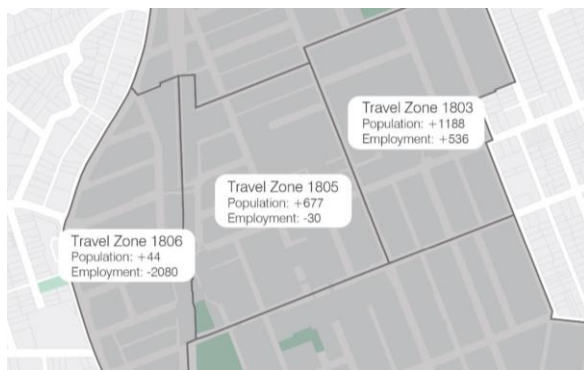
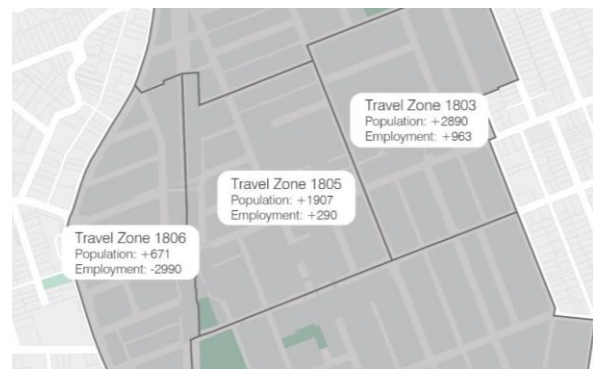


Figure 8.2: 2036 Population and Employment Uplift



The redevelopment of the Mandarin Centre and nearby former Post Office site (at the end of Victor Street) are both expected to contribute towards the population growth as they combined, propose 557 residential dwellings above retail and commercial uses. Combined, the residential component of these two developments will generate between 40 and 60 vehicle movements per hour during the critical weekday PM and Saturday lunchtime periods or only up to one additional vehicle every minute.

It is noted that the Arup study includes future year traffic volume plots that appear to be only weekday AM period volumes (700 two-way vehicle movements per hour along Albert Avenue adjacent to the site). The 2014 traffic surveys suggest at the same location there were 850 and 1,100 two-way vehicle movements per hour in the weekday AM and PM periods, respectively. On this basis, the Arup study suggests traffic conditions will improve in the Chatswood CBD area compared to historic conditions, although it is not possible to understand forecast volumes during the weekday PM peak hour, which is the critical peak period along with Saturday lunchtime for the area given the large presence of retail land uses.

Historically, the Albert Avenue corridor, excluding the at capacity Pacific Highway/ Albert Avenue intersection, has operated within the relevant theoretical capacities, with intersection Level of Service B or better.

Therefore, such additional traffic volumes generated by the planning proposal (20-30 vehicle movements per hour) is not expected to compromise the safety and operation of the surrounding road network. Any reduced retail parking provisions for the proposal will further improve the impacts of the development and will be considered as part of any future development application in consultation with Council (and TfNSW).

<sup>3</sup> Arup, Future Conditions Report, Chatswood CBD Strategy Study, September 2020

# 9. CONCLUSION

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

- The planning proposal generates a WDCP parking requirement of 883 car spaces (684 non-residential spaces and 199 residential spaces).
- Willoughby City Council is considering new parking rates for the Chatswood CBD, which if applied would significantly reduce the requirement to 206 car spaces (73 non-residential spaces and 133 residential spaces).
- A maximum parking supply of 439 car spaces is proposed, based on retaining the existing retail parking supply and adopting reduced parking rates for all other uses, compared with the WDCP. This presents an opportunity to reduce car parking provision for the development by at least one full basement level from that exhibited with the planning proposal.
- The applicant will consider whichever car parking rates are applicable at the time of any future Development Application, with the opportunity to reduce retail car parking in consultation with Council (and TfNSW).
- A loading area is proposed on basement level 1 suitable for up to two 8.8m MRVs, with the design to be further developed at the Development Application stage.
- The WDCP suggests that the planning proposal provide 41 bicycle lockers for residents/ employees and 87 bicycle rails for visitors, with there being opportunity to provide more lockers for residents/ employees to encourage uptake of cycling as a mode of travel.
- The site is expected to generate up to 30 additional vehicle movements in the weekday PM and Saturday lunchtime periods.
- The preferred access arrangement is for vehicles to enter the basement via Victor Street and depart via Albert Avenue, which will aid in distributing traffic across the local road network.
- Historically, there has been adequate capacity in the surrounding road network to accommodate the additional traffic generated by the site, noting that existing congestion at Pacific Highway is largely unaffected by the proposal.
- A review of the Arup Future Conditions transport study suggests there will be fewer vehicle movements near the site in 2026 and 2036 in the weekday AM period than surveyed in 2014. The study did not provide weekday PM period forecasts to consider road network operation further.
- On this basis, the proposed increase in floor space and mixed-use nature of the proposal would have minor traffic impacts on the surrounding road network and can be supported from a traffic and transport perspective.

