



44-52 Anderson Street, Chatswood

Transport Impact Assessment

Prepared for:

Heworth Holdings Group

9 February 2021

JMT
Consulting

PROJECT INFORMATION

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J Milston Transport Consulting Pty Ltd

ABN: 32635830054

ACN: 635830054

T: 0415 563 177

E: josh.milston@jmtconsulting.com.au

W: www.jmtconsulting.com.au

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1 Introduction

1.1 Background

JMT Consulting was engaged by Heworth Holdings Group to prepare a transport impact assessment to support a Planning Proposal for the site at 44-52 Anderson Street, Chatswood. The planning proposal seeks approval for an increase in height and floor space ratio (FSR) to the site consistent with the Chatswood CBD Planning and Urban Design Strategy 2036. The proposed building envelopes provided with the planning proposal will support a total gross floor area (GFA) of approximately 16,000m².

1.2 Site location

The subject site is located at 44-52 Anderson Street, Chatswood and is bounded by O'Brien Street to the north, Anderson Street to the east, Day Street to the south and a pedestrian path to the west. The Chatswood transport interchange is located just over 400m south of the site as shown in Figure 1.



Figure 1 Site location

1.3 Report purpose

This report has been prepared to summarise the traffic and transport implications of the proposal. Specifically the assessment considers the following items:

- Existing transport conditions, including:
 - Surrounding road network
 - Vehicle site access
 - Car parking
 - Loading and servicing arrangements
 - Public transport provision
- Proposed site access arrangements
- Proposed vehicle loading and servicing arrangements
- Proposed parking rates to be adopted as part of a future development application for the site, including indicative parking numbers based on the indicative architecture concept
- Additional traffic movements resulting from the Planning Proposal and impacts to the adjacent road network
- Public transport, walking and cycling measures

2 Existing Transport Conditions

2.1 Existing site uses

The existing site comprises of three separate medium density residential flat buildings consisting of 31 dwellings. On-site parking is provided for these residences, with vehicle access obtained from either O'Brien Street or Day Street.

2.2 Travel behaviours

Travel behaviours for residents and employees within the area surrounding the site¹ been analysed using 2016 Journey to Work Census data. The data demonstrates a high proportion of people travelling to and from Chatswood use public transport, accounting for over half of all trips in the case of residents travelling to work. This reflects the strong availability and accessibility of public transport in this area, which will only improve following the completion of the Sydney Metro network. A high proportion of residents walk to work, which reflects the likelihood that future residents of the site will choose to work in the Chatswood CBD. Only 12% of residents noted that they travelled to work using their own vehicle, demonstrating that the site has a very low car reliance making it suitable for future residential development.

Mode of travel	Proportion of trips	
	<i>Residents travelling to work from Chatswood</i>	<i>Employees travelling into Chatswood for work</i>
Car driver	12%	36%
Car passenger	2%	1%
Bus	4%	9%
Train	49%	41%
Walk	32%	11%
Other	1%	2%
Total	100%	100%

¹ SA1, code 12101139862

2.3 Land zoning

The site is currently zoned R3 (medium density residential) with a maximum building height of 12m. Surrounding land uses generally comprise medium density residential and mixed-use developments. The site is located just to the north of the existing Chatswood Commercial Core as identified in the Willoughby Local Environmental Plan (LEP) 2012.

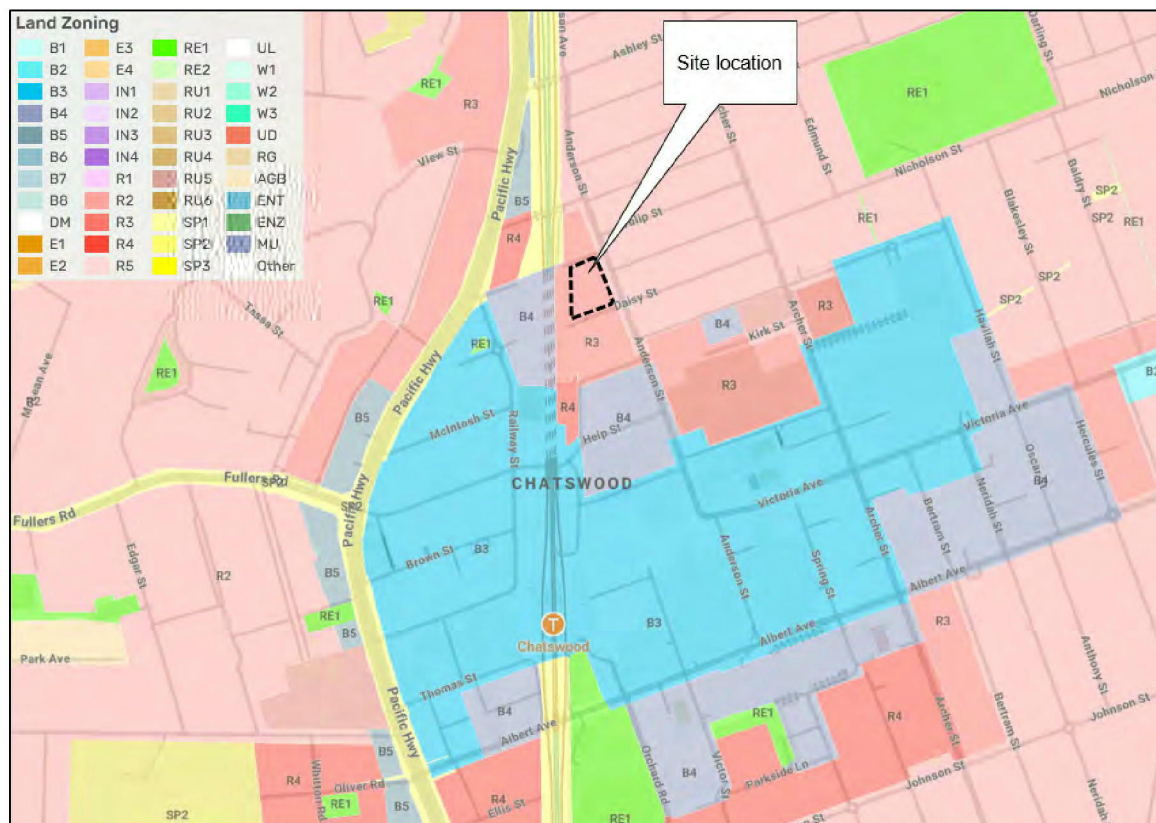


Figure 2 Site location and zoning map

2.4 Road network

To manage the extensive network of roads for which councils are responsible under the Roads Act 1993, Transport for NSW (TfNSW) in partnership with local government established an administrative framework of *State*, *Regional*, and *Local Road* categories. State Roads are managed and financed by TfNSW and Regional and Local Roads are managed and financed by councils.

Regional Roads perform an intermediate function between the main arterial network of State Roads and council controlled Local Roads. Key State and Regional roads which provide access to the site are illustrated in Figure 3 and include the following:

Pacific Highway (State Road)

Pacific Highway is classified State road which serves as a major north-south arterial link, providing connectivity between the Warringah Freeway and M1 Pacific Motorway. The Pacific Highway is situated approximately 150m west of the subject site and is generally configured with a total of six traffic lanes.

Fullers Road (State Road)

Fullers Road is a classified State road that provides east-west connectivity between the Pacific Highway at Chatswood and North Ryde.

Albert Avenue and Archer Street (Regional Roads)

Albert Avenue form part of the regional road network that provide access into the Chatswood CBD. Generally these roads comprise of four lanes of traffic with parking permitted at certain locations and times of day.

Anderson Street (Local Road)

Anderson Street forms the eastern frontage to the site and consists of one travel lane and one parking lane in each direction. There is an existing on-road cycle path on either side of Anderson Street starting from Macintosh Street to Ashley Street where it connects to the cycle path on Ashley Street.



Figure 3 Road network serving the site

2.5 Public transport

The site is located just over 400m or approximately five minute walk away from the Chatswood transport interchange. The Chatswood Interchange provides a number of high frequency public transport services for heavy rail, metro and bus services.

The heavy rail service provides frequent train services for T1 North Shore, Northern, and Western Line. During peak hours, T1 trains travel from Chatswood to the Sydney CBD, northern and western suburbs arrive at the station approximately every two minutes.

A significant number of bus routes service the Chatswood transport interchange which include both local and regional services. Bus stops are available at the interchange itself or on adjacent streets including adjacent to the site on Anderson Street, Victoria Avenue and the Pacific Highway.

The Sydney Metro northwest service commenced operations in May 2019 and provides a connection between Chatswood and Tallawong via Epping. Services operate every five to ten minutes throughout the day and provide a high quality public transport option for people travelling to and from the north-west of Sydney.

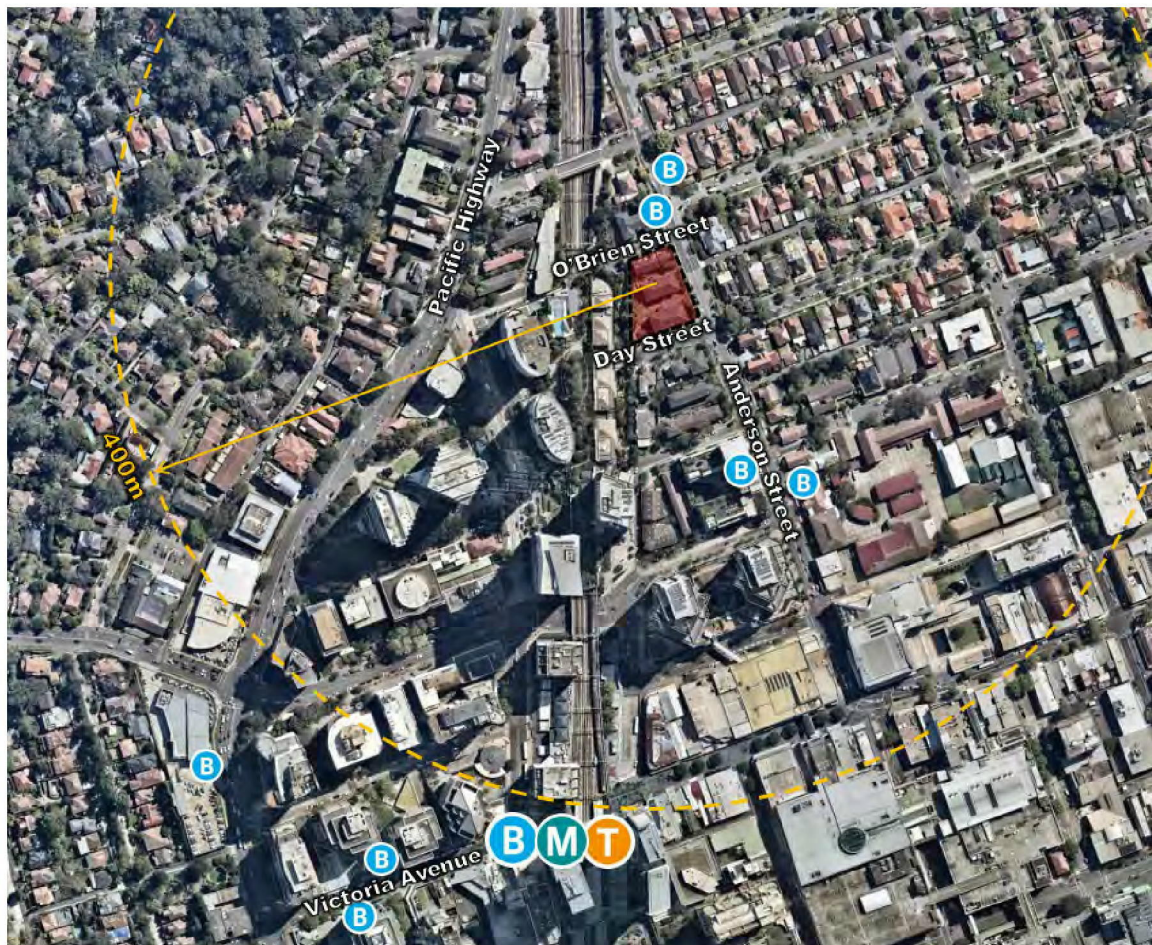


Figure 4 Public transport availability near the site

Sydney Metro is a major public transport infrastructure project currently in the construction phase within proximity of the subject site. The Sydney Metro City and Southwest metro line (currently under construction) will connect to the recently opened Sydney Metro Northwest line at Chatswood station and provide significantly improved connectivity from the southwest and Sydney CBD to Chatswood and the northwest. The expansion of the Sydney Metro network will further enhance public transport accessibility to the site and reduce car reliance for residents and employees of the Chatswood CBD.

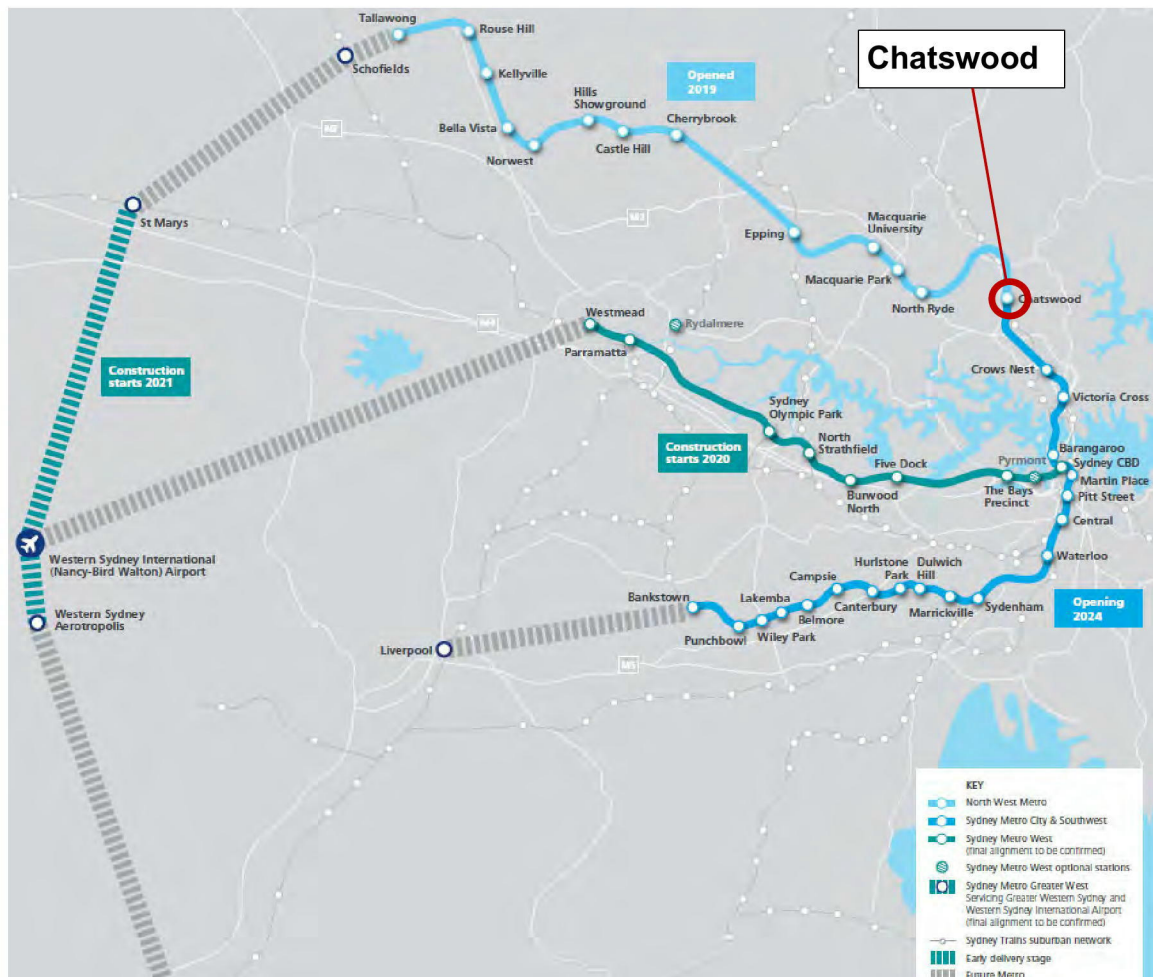


Figure 5 Sydney Metro network

Source: Transport for NSW

2.6 Pedestrian and cycling network

There is a well established network of pedestrian facilities in the vicinity of the site, with paved footpaths provided on both sides of all adjacent roads. The site also benefits from being surrounded by a number of on and off-road bicycle routes as shown in Figure 6 below. This includes an on-road bicycle route along Anderson Street adjacent to the site which provides a connection through to the Chatswood transport interchange.



Figure 6 Existing cycling routes

3 Planning Proposal

3.1 Description of proposal

This planning proposal seeks to rezone the existing land from R3 Medium Density Residential to B4 Mixed Use and increase the maximum building height to 90m with an FSR of 6:1 (including a minimum 1:1 commercial FSR) in accordance with the recommendations outlined in the Chatswood CBD Planning and Urban Design Strategy 2036. The indicative architecture concept prepared by Make Architects facilitates a total of 156 units with an additional 2,687m² commercial space at the lower two levels. The concept scheme includes four levels of basement containing 188 car parking spaces in addition to bicycle and motorcycle parking spaces.

3.2 Vehicle access

Under the indicative architecture concept vehicle access to the site would be provided off Day Street at the south-western end of the site as shown in Figure 7. This access point has been selected to minimise conflicts with pedestrians and general traffic along Anderson Street, as well as to not impact a proposed future enhancement by Council of the Anderson Street cycleway.

The vehicle access would be via a single driveway, facilitating independent two-way traffic movements and allowing access into the basement of the site from which the loading dock and car park can be accessed. This complies with the objectives of Council's 2036 CBD Planning and Urban Design Strategy, which recommends that vehicle entry points to a site are to be rationalised to minimise streetscape impact – with one entry area into and existing a site.

The vehicle access will be designed in accordance with the design requirements set out in the relevant Australian Standard, namely AS2890.1:2004 and AS2890.2:2018. This will be detailed further as part of a future Development Application for the site.

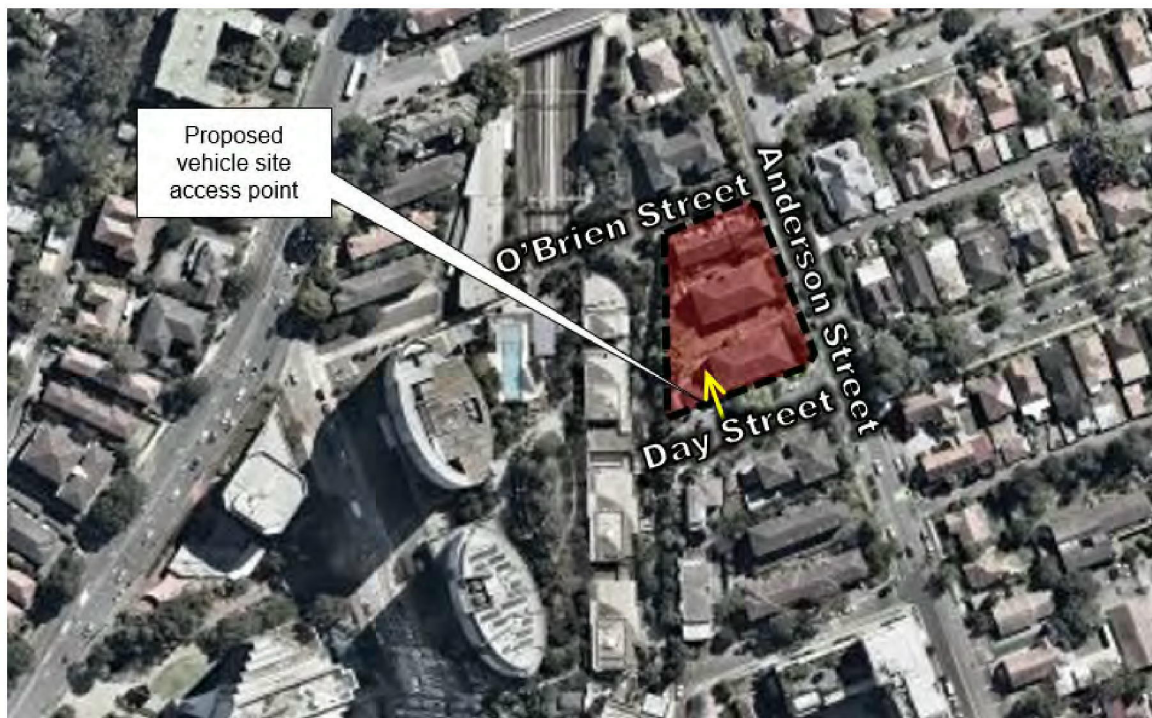


Figure 7 Proposed vehicle site access point

3.3 Car park design

As part of the indicative architecture concept developed for the Planning Proposal a basement car park has been designed to facilitate the future development. The car park and associated elements such as car parking space dimensions, circulation aisles and ramp would be designed in accordance with the relevant Australian Standard for car parking facilities, namely AS2890.1: 2004 and AS2890.6:2009.

Car parking spaces have been designed to comply with a Class 1A car park facility as specified in the Australian Standard (generally low turnover long term parking) with 2.4m wide spaces and aisle widths of 5.8m.

The final design of the car park will be carried out at the Development Application stage of the project.

3.4 Parking provision

3.4.1 Car parking

The potential on-site car parking for the development, based on the development yields envisaged under the indicative architecture concept, is summarised in Table 1. The final car parking requirements for the site will be confirmed at the Development Application (DA) stage of the project.

Table 1 Potential on-site car parking

Land Use	Type	No. of units / GFA	Parking rate	No. of spaces
Residential	1 bed	31	1 / unit	28
	2 bed	94	1 / unit	96
	3 bed	31	1.25 / unit	32
	Sub-Total	156	n/a	164
	Visitor		1 / 10 units	16
Commercial		1869	1 / 400m ² GFA	5
Retail		775	1 / 300m ² GFA	3
Total				188

Car parking rates for the commercial and retail components of the site have been significantly reduced compared to that recommended in the Willoughby Council DCP. This has been proposed to reduce the traffic generation associated with the development and are consistent with the suggested rates provided by Council as part of consultation undertaken for this Planning Proposal.

For the residential component car parking rates have been selected to align with those in the Willoughby Council DCP. As the site is located in close proximity to the Chatswood transport interchange, with good access to local employment and services, the majority of residents will either walk or use public transport to travel to work.

Rates of car ownership for residents of Chatswood have been steadily increasing over the past 15 years, rising between 2001 and 2016. At the same time however private vehicle use for journey to work trips has decreased. This trend, as shown in Figure 8, indicates that car ownership does not necessarily lead to car usage in the busy commuter peak periods for areas well served by public transport such as Chatswood, particularly given that the subject site is located

close to the Chatswood transport interchange. It can therefore be applied that the majority of cars within the development will only generate trips occasionally and be generally on a discretionary basis - mostly outside of commuter peak periods and will not impact the operation of the road network during the busiest times of the day.

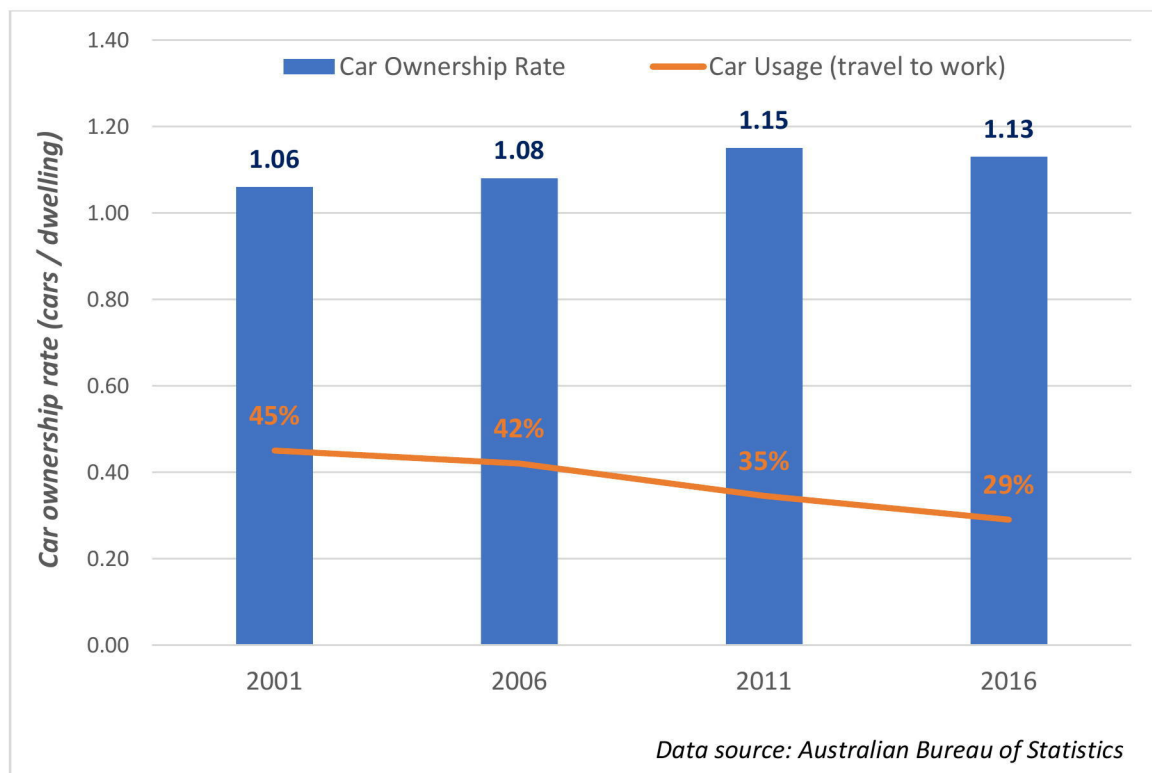


Figure 8 Car ownership vs car usage - residents of Chatswood

A further benefit of providing residential parking rates consistent with Council's DCP is that it will reduce the instances of residents using nearby on-street parking resulting in flow on impacts to local streets. The parking provision proposed is considered sufficient to fully meet the future demands of residents of the site.

3.4.2 Motorcycle parking

The Willoughby Council DCP requires that motorcycle parking be provided at a rate of one space per 25 car parking spaces. It is proposed to comply with this requirement, with the final number of motorcycle parking spaces to be confirmed at the Development Application (DA) stage once the design is finalised. Based on the indicative architecture concept prepared for the Planning Proposal, approximately 8 motorcycle parking spaces would be provided.

3.4.3 Bicycle parking

The Willoughby Council DCP outlines minimum bicycle parking requirements for new developments. Table 2 below summarises the potential bicycle parking provision based on the indicative architecture concept prepared for the Planning Proposal. This will be confirmed at the DA stage of the development.

Table 2 Potential bicycle parking requirements

Land Use	No. of units / GFA	Bicycle parking rate		Bicycle parking requirement	
		Lockers	Rails/ Racks	Lockers	Racks
Residential	156	1 / 10 units	1 / 12 units	16	13
Commercial	1869	1 / 600m ²	1 / 2500m ²	4	1
Retail	818	1 / 450m ²	1 / 150m ²	2	6
Total				22	20

3.4.4 Car share

The installation of car share parking to replace general off-street parking is optional and at the discretion of the developer. This will be detailed during later stages of planning for the site.

3.5 Loading dock

The indicative architecture concept includes an on-site loading dock which can accommodate up to two Medium Rigid Vehicles (MRVs) parked at any one time. This loading provision is considered suitable to accommodate the needs of the site based on the indicative development yields associated with the indicative architecture concept.

The loading dock is located in the basement of the building and has been designed to comply with the objectives of Council's 2036 CBD Planning and Urban Design Strategy, notably:

- All vehicles are to enter and exit the site in a forwards direction
- All commercial and residential loading / unloading is to occur on-site and not in public streets
- Floor space at ground level is to be maximised, with supporting functions such as car parking and loading located in basement levels
- The design does not rely on a mechanical solution (e.g. turntable) for loading and unloading, with vehicles able to efficiently manoeuvre within the site.

The loading dock has been designed in accordance with the requirements outlined in the relevant Australian Standard (AS2890.2, 2018). Vehicle swept paths have been developed to confirm the suitability of the indicative architecture concept to accommodate the movement of MRVs within the basement of the building, with these swept paths provided in Appendix A of this document.

The final design of the loading dock will be carried out at the Development Application stage of the project.

4 Transport Assessment

4.1 Travel demand analysis

Recent surveys undertaken by the TfNSW of high density residential developments indicates a person trip generation rate of approximately 0.60 trips / dwelling. The equivalent trip generation rate for commercial/retail uses was found to be 2.26 trips per 100m² GFA in the AM peak hour and 1.73 trips per 100m² GFA in the PM peak hour. Applying these rates to the yields possible under the planning proposal results in the following total development trips:

Table 3 Development trip generation

Use	Yield	Quantum	Trip rate (per unit / 100m ²)		Number of trips	
			AM peak hour	PM peak hour	AM peak hour	PM peak hour
Residential	156	units	0.6	0.6	94	94
Retail/Commercial	2687	m ² GFA	2.26	1.73	61	46
Total trips					155	140

Based on the existing travel behaviours of residents and employees of Chatswood, existing and future public transport services, as well as the proposed parking rates for the different uses forecast mode shares have been developed. These mode shares, along with the forecast trip generation noted in Table 3, have been used to estimate the number of trips by mode to and from the site. This is summarised in the table below.

Table 4 Trip generation by mode

Travel mode	Residential trips			Retail/Commercial trips			Total	
	Mode share	AM peak hour	PM peak hour	Mode share	AM peak hour	PM peak hour	AM peak hour	PM peak hour
Car driver	10%	9	9	20%	12	9	22	19
Car passenger	2%	2	2	2%	1	1	3	3
Bus	4%	4	4	10%	6	5	10	8
Train / Metro	51%	48	48	51%	31	23	79	71
Walk	32%	30	30	15%	9	7	39	37
Other	1%	1	1	2%	1	1	2	2
Total	100%	94	94	100%	61	46	155	140

4.2 Traffic generation

The traffic generated by the site has been calculated based on the development yields associated with the indicative architecture concept prepared for the Planning Proposal. The traffic generation forecasts take into consideration:

- Traffic generation from the high density residential and commercial uses, based on traffic generation rates noted for similar sites in the Chatswood CBD as outlined in the TfNSW *Guide to Traffic Generating Developments* document (TDT 2013/04a); and
- Existing traffic generation from the 31 medium density residential apartments on the site.

Given the small amount of retail this is considered ancillary to the site's main uses and will not generate traffic movements to the site.

A breakdown of the traffic generation calculations are shown in Table 5. The site is estimated to generate a net increase of no more than 29 car trips during the busiest hour of the day.

Table 5 Forecast traffic generation

Use	Number	Unit	Rate (per unit or 100m ² GFA)		Vehicle trips	
			AM peak hour	PM peak hour	AM peak hour	PM peak hour
Future Residential	156	Units	0.14	0.12	22	19
Future Commercial	1869	m ² GFA	1.03	0.84	19	16
Existing site	31	Units	0.4	0.4	-12	-12
Net trips generated					29	23

4.3 Road network impacts

As noted in Section 4.2 the site may generate up to 29 additional traffic movements during the AM peak hour, which is equivalent to one vehicle every two minutes. This level of traffic generation would have minimal impacts on the adjacent road network and not warrant any infrastructure upgrades. Measures are to be implemented on the site to manage traffic impacts arising from the proposal, including:

- Constrained parking provision for retail and commercial uses, well below the recommended parking rates in the Willoughby Council DCP;
- Bicycle parking and car share to be provided on site
- Green travel plan to be prepared (see Section 4.6) which promotes public transport, walking and cycling by site users.

It is also important to recognise that the site at 44-52 Anderson Street was considered as part of a broader strategic transport strategy undertaken to support the Chatswood CBD Planning and Urban Design Strategy (CCPUDS). The strategic transport study, undertaken by Arup on behalf of Willoughby City Council, considered potential new development within the Chatswood CBD consistent with the planning controls proposed in the CCPUDS. This included a Floor Space Ratio (FSR) of 6:1 for the subject site, consistent with the controls included as part of this Planning Proposal.

Detailed traffic analysis was undertaken to support the strategic transport study utilising Transport for NSW's Strategic Travel Model. This analysis was undertaken for both the future years 2026 and 2036, taking into consideration the level of development envisaged in the CBD as permissible under the proposed planning controls. The study concluded that "*most links are operating with a LoS C or better*" and "*generally internal links within the CBD have acceptable Levels of Service*".

As indicated in Figure 9, Anderson Street adjacent to the subject site is forecast to operate at between 39% and 71% of its capacity in the future year 2036 following the full development of the CBD. Importantly the strategy did not identify that the future development planned for the Chatswood CBD would have a detrimental impact on the road network.

Therefore it can be concluded that, given the site's location within the Chatswood CBD, the road network impacts arising from the Planning Proposal would be acceptable.

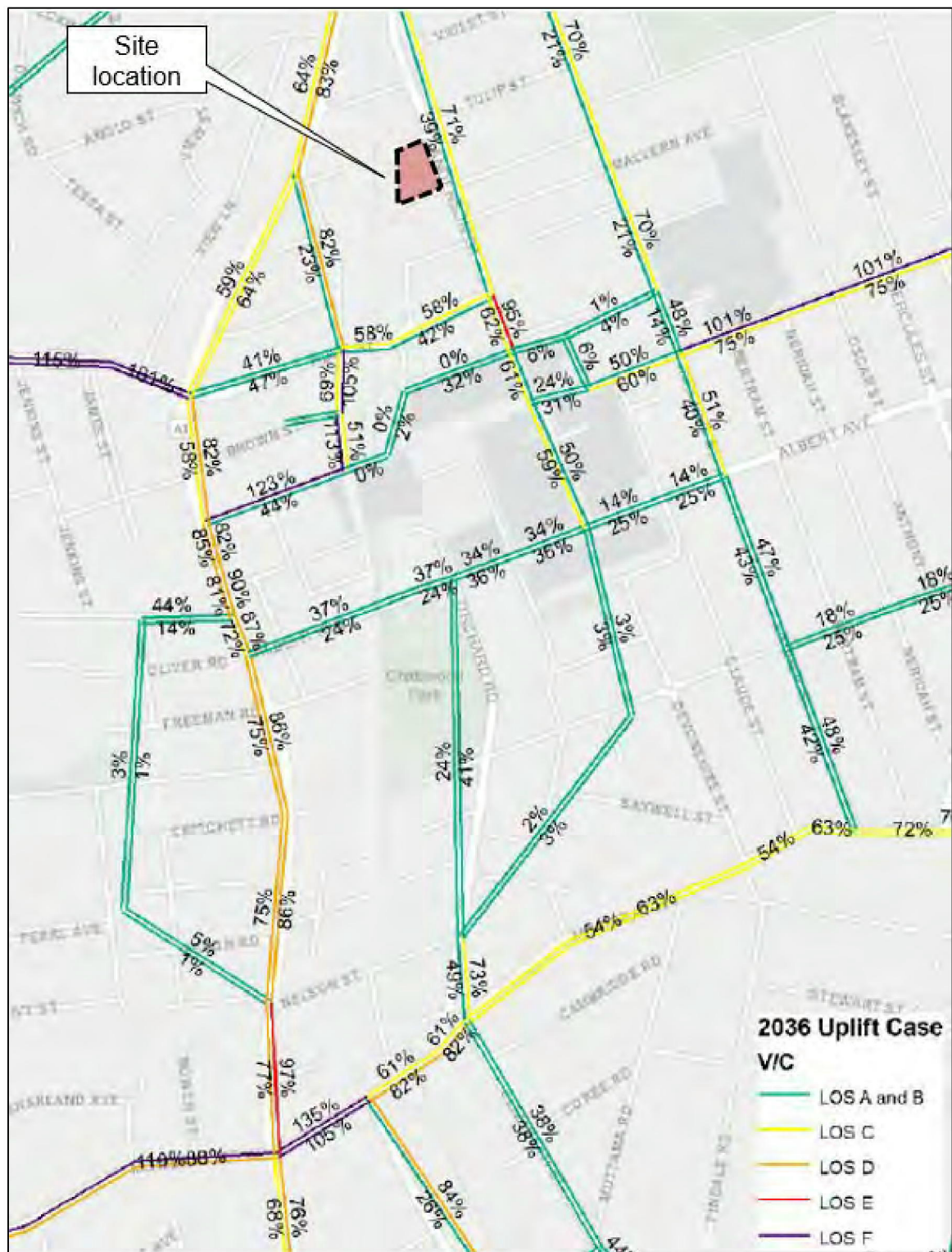


Figure 9 Future (2036) road network performance

Image source: Chatswood CBD strategic transport study (2020), modified by JMT Consulting

4.4 Public transport

The travel demand analysis undertaken in Section 4.1 indicates that the proposal may generate approximately 80 train/metro trips and 10 bus trips during the morning peak hour. This increase represents less than 2% of the expected growth in public transport trips associated with the development of the Chatswood CBD up to the year 2036. A detailed public transport assessment was undertaken as part of the Chatswood CBD strategic transport study and concluded that the heavy rail and metro lines will have capacity to support the anticipated level of growth in travel demand to and from the Chatswood CBD up to at least the year 2036.

4.5 Cycling

As part of the future development of the site bicycle parking spaces will be provided for staff, residents and visitors. Based on the indicative architecture concept approximately 22 lockers and 20 bicycle racks would be provided, however this will be confirmed at the DA stage of the project.

It is noted that Council are currently investigating upgrading the existing cycleway along Anderson Street adjacent to the site. This would take the form of a separated bi-directional cycleway on the western side of Anderson Street including a potential widening of Anderson Street to support provision of acceptable widths for kerbside parking, bicycle lanes and traffic lanes. The indicative architecture concept, by providing for vehicle access from Day Street and no vehicle access from Anderson Street, ensures that any future cycleway would not be impacted by the development of the site.

4.6 Green travel plan

This report includes a preliminary Green Travel Plan (GTP) identifying some key items that could be included in a more detailed plan to be completed in the DA stage of planning.

4.6.1 Background

A Green Travel Plan (GTP) is a package of measures put in place by the development occupants to try and encourage more sustainable travel. It is a means for a development to demonstrate a commitment and take a pro-active step towards improving the environmental sustainability of its activities.

More generally, the principles of a GTP are applied to all people travelling to and from a site. Government authorities are placing increasing emphasis on the need to reduce the number and lengths of motorised journeys and in doing so encourage greater use of alternative means of travel with less negative environmental impacts than the car.

4.6.2 Objectives

The main objectives of the GTP are to reduce the need to travel and promotion of sustainable means of transport. The more specific objectives include:

- High mode share for public transport, cycling and walking to work journeys;
- Ensuring adequate facilities are provided at the site to enable the tenants and visitors of the development to commute by sustainable transport modes;
- Reduce the number of car journeys associated with business travel;
- Facilitate the sustainable and safe travel of occupants; and
- Raise awareness of sustainable transport amongst residents of the development.

4.6.3 Potential measures

A suite of potential measures is described below to be implemented as part of the GTP, which can be developed further as the proposal progresses towards a Development Application.

Table 6 List of potential GTP measures

Action	Responsibility
Cycling	
Provide sufficient cycle parking to meet needs, which is easily accessible and secure	Developer
Provide adequate cycle parking facilities for visitors	Developer
Ensure cycle parking is clearly visible or provide signage to direct people to cycle bays	Building manager
Produce a map showing cycle routes and bike stands in the area	Building manager
Walking	
Produce a map showing safe walking routes to and from the site with times, distances to local facilities, such as shops and bus stops	Building manager
Public Transport	
Develop a map showing public transport routes in the area	Building manager
Put up a noticeboard with leaflets and maps showing the main public transport routes to and from the site	Building manager
Carshare / Carpooling	
Put a poster on the noticeboard where residents would register their interest in carpooling by indicating their work location	Building manager
Develop a map showing car-share spots in the area	Building manager

Action	Responsibility
General actions	
Promotion including: <ul style="list-style-type: none">• An events calendar. Best in conjunction with statewide events such as National Bike Week and Bike2Work Day, National Walk to Work Day.• Display boards in prominent locations to show public transport maps and timetables.	Building manager

4.6.4 Monitoring and review

In order for the GTP to be effective, it must be reviewed on a regular basis. It is important to ensure that the GTP is meeting its objectives and having the intended impact on car use and transport choices. The GTP should be reviewed periodically by undertaking resident and other users of the building travel surveys. It is recommended that the mode shares are first reviewed at least 18 months after occupation, to allow activity levels to settle at the site.

5 Summary

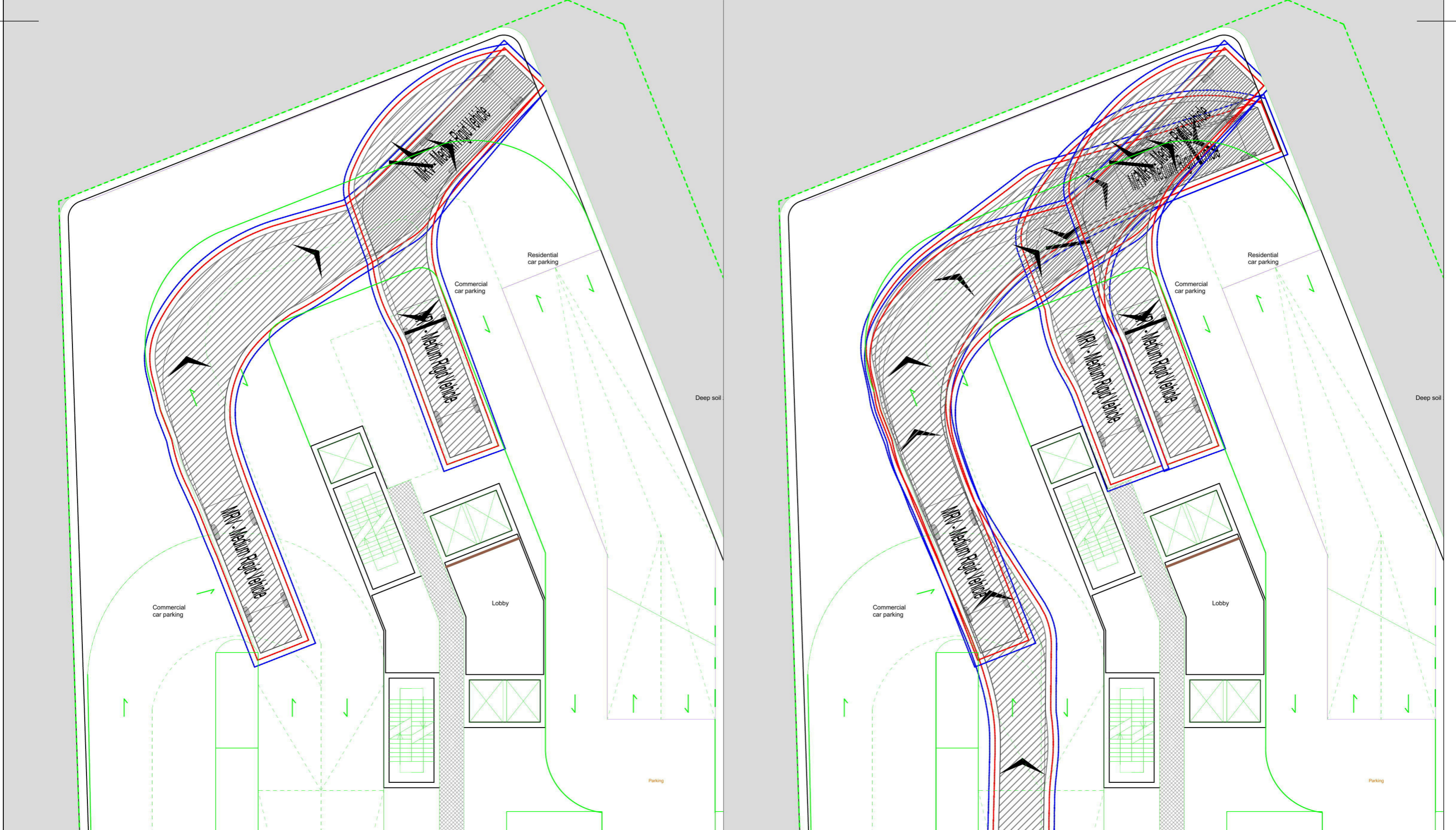
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Key findings of the assessment are as follows:

- Under the indicative architecture concept vehicle access would be provided off Day Street to minimise conflicts with pedestrians and general traffic along Anderson Street, as well as to not impact a proposed future enhancement by Council of the Anderson Street cycleway.
- The indicative architecture concept includes a loading dock located within the basement of the building, with the design not reliant on a mechanical solution (e.g. turntable) for loading and unloading and still facilitating vehicle entry and exit in a forwards direction.
- The indicative architecture concept contemplates 188 off-street parking bays which is consistent with the current Willoughby Council DCP parking rates for residential uses and significantly below the DCP rates for commercial and retail uses.
- The site is located in close proximity to various public transport facilities, including Chatswood transport interchange and nearby bus stops, thus any future development is not expected to not generate significant traffic impacts.
- Analysis indicates that the potential increase in traffic as a result of the Planning Proposal is an additional 29 vehicles in the AM peak hour and 23 vehicles in the PM peak hour. This increase in traffic has been considered as part of the broader Chatswood CBD strategic transport study which considered all potential new developments in the CBD. The study did not identify that the future development planned for the Chatswood CBD would have a detrimental impact on the road network.
- Secure bicycle parking would be provided as a component of any future proposed development, in line with rates specified in the Willoughby Council DCP.
- Travel demand management measures have also been suggested to improve the mode share of public transport and active transport. These items should be considered further at detailed design stage.

In the above context, the traffic and transport impacts arising from the proposal are considered acceptable.

Appendix A: Vehicle Swept Path Analysis



Client
Heworth Holdings Group

Date
02.02.21

Job Title
44-52 Anderson Street
Chatswood

Job No
2070

Drawing Title
Turning Paths
Loading Dock

Drawing No
SKT03

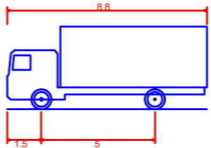
Drawing Status
For PP Submission

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Scale at A3
1:200

Vehicle type(s)



MRV - Medium Rigid Vehicle
Overall Length 8.800m
Overall Width 2.500m
Overall Body Height 3.633m
Min Body Ground Clearance 0.428m
Track Width 2.500m
Lock to Lock Time 4.00 sec
Curb to Curb Turning Radius 10.000m