St Leonards South NSW - Area 1, 2 & 4 (St Leonards Village)

Traffic Impact Assessment

Prepared for: Evergreen

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Date: 30 June 2022

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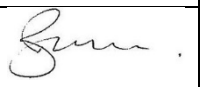
Revision

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	16/02/22	Final	Mario Dizon Jr Ashish Modessa	Rhys Hazell	Rhys Hazell	Rhys Hazell
B	18/02/22	Final – updated to include minor amendments	Mario Dizon Jr Ashish Modessa	Rhys Hazell	Rhys Hazell	Rhys Hazell
C	22/04/22	Final – for DEP submission	Ashish Modessa	Rhys Hazell	Rhys Hazell	Rhys Hazell
D	30/06/22	Final	Ashish Modessa	Rhys Hazell	Rhys Hazell	

Executive Summary

A development application is to be lodged with Lane Cove Council (Council) for a proposed residential development within the St Leonards South Transit-Oriented Development Precinct on land bound by Canberra Avenue to the east, Marshall Avenue to the north, and Holdsworth Avenue to the west. The proposed development, known as St Leonards Village, incorporates a total of 232 apartments, with a combined nett saleable area of 21,770 square metres across three separate buildings.

It is within an R4 – High Density Residential Zone land use classification with the surrounding properties including a range of residential dwellings, from low density detached dwellings through to high density apartments. Other land uses, including a health services facility, mixed use buildings, institutional and commercial developments are also prominent.

St Leonards CBD is a well-established commercial, health and education precinct, with Royal North Shore Hospital, North Shore Private Hospital and TAFE NSW Northern Sydney Institute located north of the site and within an accessible walk.

A single two-way vehicle crossover is proposed along Canberra Avenue to provide access to the basement car park and on-site loading dock. No vehicle crossovers are proposed on Holdsworth Avenue and Marshall Avenue. Overall, the proposal will reduce the number of vehicle crossovers along the site frontages from 10 to one, thus providing opportunity for increased kerbside car parking and improving amenity generally.

The proposal will provide a total of 309 on-site car parking spaces, including 273 residential spaces and 36 visitor spaces. The resident provisions comply with the minimum DCP 2010 parking requirements, with the proposed visitor provision considered appropriate to accommodate the expected demand, recognises the site's location within St Leonards CBD and strikes a positive balance between expected demand, user behaviour and transition away from private vehicle travel.

There are three on-site loading bays proposed in accordance with Lane Cove Council DCP 2010 requirements suitable for access by all vehicles up to and including 6.4 metre small rigid vehicles. 8.8 metre medium rigid vehicles can also practically access the loading area if necessary.

The proposed car parking layout is expected to operate satisfactorily, subject to further design development, with vehicle swept paths confirming appropriate design included in Appendix A. Several opportunities have been identified to improve the on-street environment along the site frontages. These improvements intend to benefit the local environment generally while also maintaining appropriate safety and sightlines for site generated traffic.

A site-specific Green Travel Plan (GTP) is recommended prior to occupation to promote more sustainable and environmentally friendly travel choices for residents noting there are a range of "non-car" transport options available near the site.

Lane Cove Council has undertaken modelling of the St Leonards South Precinct using AIMSUN modelling software to understand the traffic impacts of 2,400 dwellings forecasted within the precinct. It is understood that Council is in the process of updating the modelling based on revised lower dwelling forecasts. The proposed 232 dwellings is less than that assumed in the AIMSUN traffic model (approximately 265 dwellings). On this basis, it is appropriate to conclude that the traffic impacts of the proposal have already been considered as part of the Council's AIMSUN modelling, with no additional impacts expected.

An overview and preliminary assessment are provided to understand the necessary construction traffic and pedestrian management initiatives to be implemented as part of the construction of the proposed development. The appointed contractor will be required to prepare a more detailed Construction Traffic Management Plan (CTMP).

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1. Introduction

1.1 Background

A development application is to be lodged with Lane Cove Council (Council) for a proposed residential development within the St Leonards South Transit-Oriented Development Precinct on land bound by Canberra Avenue to the east, Marshall Avenue to the north, and Holdsworth Avenue to the west. The proposed development, known as St Leonards Village, incorporates a total of 232 apartments, with a combined nett saleable area of 21,770 square metres across three separate buildings.

The desired future character of the St Leonards South Precinct, as detailed in Lane Cove Council Development Control Plan (DCP) – Locality 8 – St Leonards South, is to provide a liveable, walkable, connected and safe precinct that builds upon the transit and land use opportunities of St Leonards Railway Station and future Metro and commercial core and health precinct. The DCP objectives of the precinct have been reproduced below:

- encourage community interaction, walking, cycling and use of public transport
- achieve design excellence, as well as providing suitable transition and interfaces to adjoining zones and open space
- provide a variety of housing (including affordable housing) that is sustainable, provides housing choice and meets the needs of residents including access to community facilities
- minimise traffic impacts within the precinct and to/ from Pacific Highway and River Road
- facilitate a new, accessible network for pedestrians, cyclists and families that integrates and connect to functional community infrastructure and open space
- create an accessible, well-designed public open space network that provides a variety of recreation spaces (active and passive) and communal open space that is functional and shared by residents
- create a low carbon precinct that delivers sustainable and efficient buildings that provide energy water and waste efficiency.

Evergreen commissioned Stantec to undertake a transport impact assessment for the proposal.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the 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
- identify green travel and construction traffic management overview and initiatives
- the transport impact of the proposal on the surrounding road network.

1.3 References

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

- an inspection of the site and its surrounds
- Lane Cove Council Development Control Plan (DCP) 2010
- Lane Cove Council Local Environmental Plan (LEP) 2010
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004

- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2018
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- Architectural plans for the proposed development prepared by Rothelowman, Development Application set dated 29 June 2022
- Landscape plans for the proposed development prepared by Arcadia dated February 2022
- other documents and data as referenced in this report.

2. Existing Conditions

2.1 Site Location

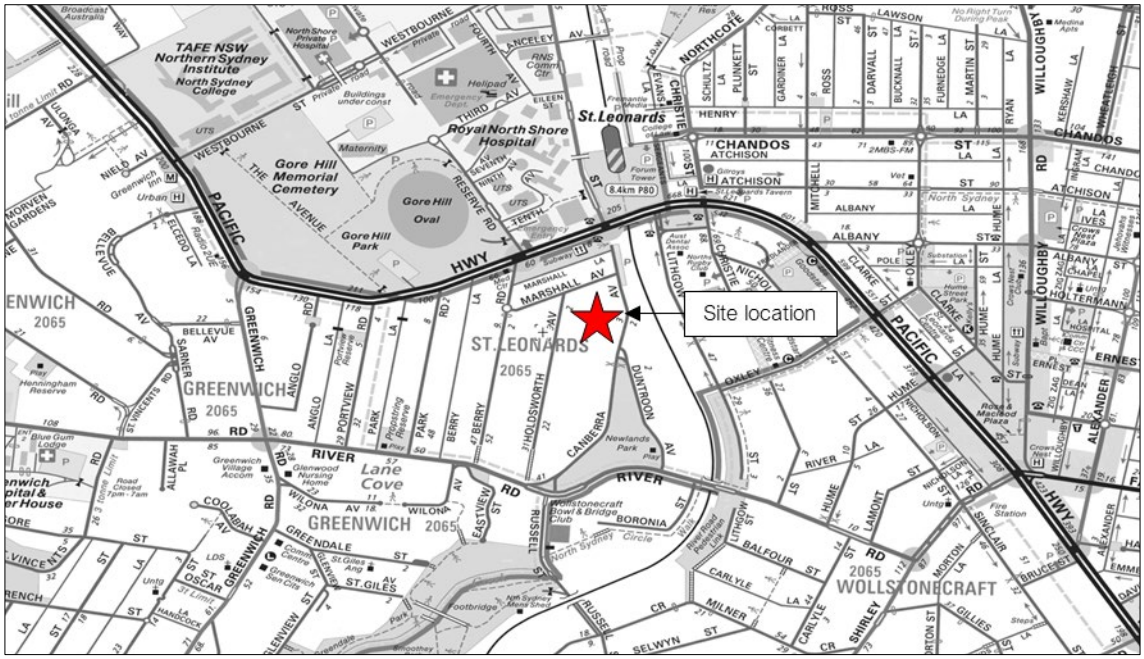
The site is bound by Canberra Avenue, Marshall Avenue and Holdsworth Avenue in St Leonards. The subject site encompasses different addresses in areas, namely:

- Area 1: 1-5 Canberra Avenue and 4 Marshall Avenue
- Area 2: 6-8 Marshall Avenue and 2 Holdsworth Avenue
- Area 4: 4-8 Holdsworth Avenue.

It is within an R4 – High Density Residential Zone land use classification with the surrounding properties including a range of residential dwellings, from low density detached dwellings through to high density apartments. Other land uses, including health services facility, mixed use buildings, institutional developments and commercial developments are also prominent to throughout.

St Leonards CBD is a well-established health and education precinct, with Royal North Shore Hospital, North Shore Private Hospital and TAFE NSW Northern Sydney Institute located north of the site and within an accessible walk.

The site location and its surrounding environs is shown in Figure 1 to Figure 3 with the LEP land use map in Figure 4.



Base image source: http://www.street-directory.com.au/, accessed December 2021

Figure 1: Subject site and its surrounding environs

Figure 2: Site Location of Areas 1,2 and 4

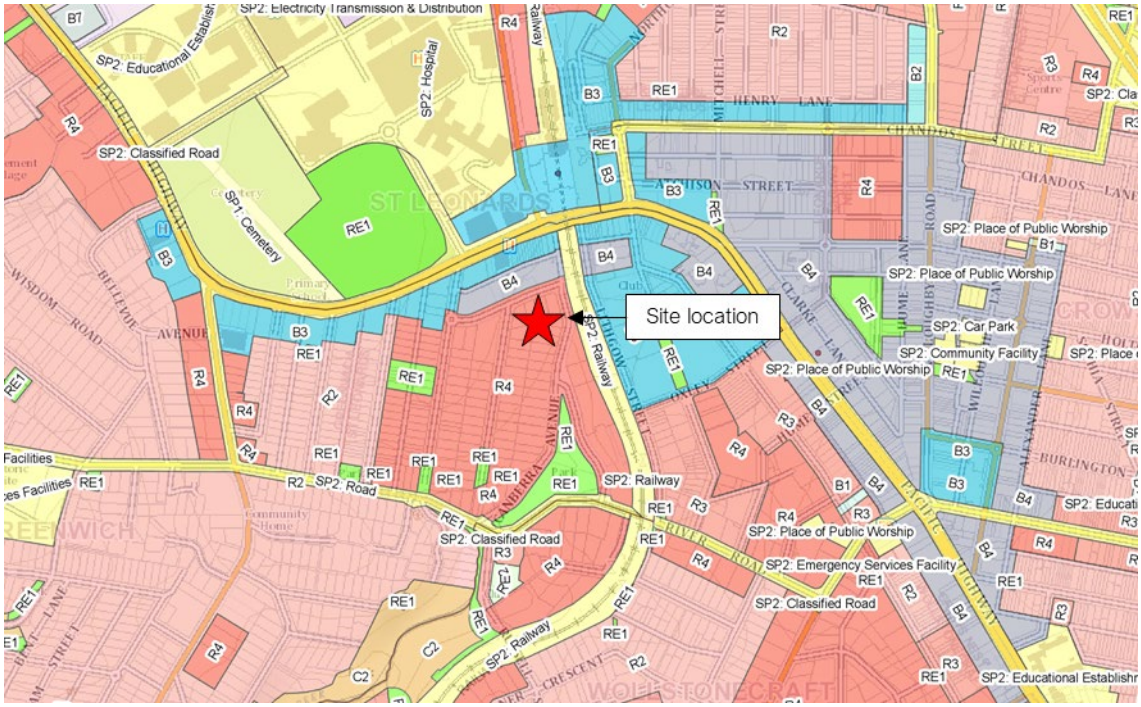
Area Plan

Owned or controlled by the Principal

- **St Leonards South Area 1****
- **St Leonards South Area 2**
- **St Leonards South Area 4**

****excludes one dwelling located in 2 Marshall Ave St Leonards**

Figure 3: St Leonards South Precinct Overall Development Plan



Base image source: www.planningportal.nsw.gov.au/spatialviewer/, accessed December 2021

Figure 4: Land use map

2.2 Transport Network

2.2.1 Road Hierarchy

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

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

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

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

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

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

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

2.2.2 Surrounding Road Network

Pacific Highway

The Pacific Highway is a State Road functioning as the key north-south road between North Sydney and Hornsby. It is generally configured with two to three lanes in each direction near the site and set within an 18-metre-wide carriageway. The Pacific Highway has a posted speed limit of 60km/h. Kerbside parking is generally permitted in sections on each side of the road through St Leonards CBD with restrictions generally in place during weekday clearway/ Transit Lane periods.

River Road

River Road is an east-west regional road connecting Pacific Highway (State Road) with Bridge Road (local road). It is generally configured with one to two traffic lanes in each direction with kerbside parking permitted in specific locations. Additional dedicated turn bays are also provided at key intersections along its length, including at Canberra Avenue south of the site. River Road has a speed limit of 50km/h.

Berry Road and Holdsworth Avenue

Berry Road and Holdsworth Avenue are local roads that provide access to the St Leonards South Precinct from Pacific Highway and Marshall Avenue to the north. They are north-south orientated providing one traffic lane and one parking lane in each direction west of the site. They are both no through roads with no connection to River Road at the southern end. They have a speed limit of 50km/h.

Marshall Avenue

Marshall Avenue is a local road connecting Canberra Avenue and Berry Road north of the site. It is aligned in an east-west direction with kerbside parking on both sides of the carriageway. The roundabout controlled intersection at Holdsworth Avenue in the north-west corner of the site was installed in 2018 and also provides access to the residential development to the north. Marshall Avenue has a speed limit of 50km/h.

Canberra Avenue

Canberra Avenue functions as a local road and provides access between the St Leonards South Precinct and River Road to the south where left turns are permitted. It is a two-way road aligned in a north-south direction along the eastern boundary of the site. Parking is generally permitted on both sides of the carriageway with sections of no stopping where necessary. Canberra Avenue has a speed limit of 50km/h. The St Leonards South Landscape Masterplan and the Contributions Plan have identified the closure and landscaping of the southern portion of Canberra Avenue adjoining Newlands Park to expand the parkland.

Duntroon Avenue

Duntroon Avenue is a local road that provides an alternate link between the St Leonards South Precinct and River Road via Canberra Avenue. A ‘seagull’ intersection layout is provided at River Road with all turns permitted. It is a two-way road aligned in a north-south direction with kerbside parking permitted on the eastern side. Duntroon Avenue has a speed limit of 50km/h.

2.2.3 Surrounding intersections

The following key intersections are located near the site:

- Pacific Highway/ Berry Road (signalised)
- Berry Road/ Marshall Avenue (roundabout)
- Marshall Avenue/ Holdsworth Avenue (roundabout)
- Canberra Avenue/ Marshall Avenue (priority controlled)
- Canberra Avenue/ Duntroon Avenue (priority controlled)
- Canberra Avenue/ River Road (priority controlled, left turns permitted)
- River Road/ Duntroon Avenue (priority controlled).

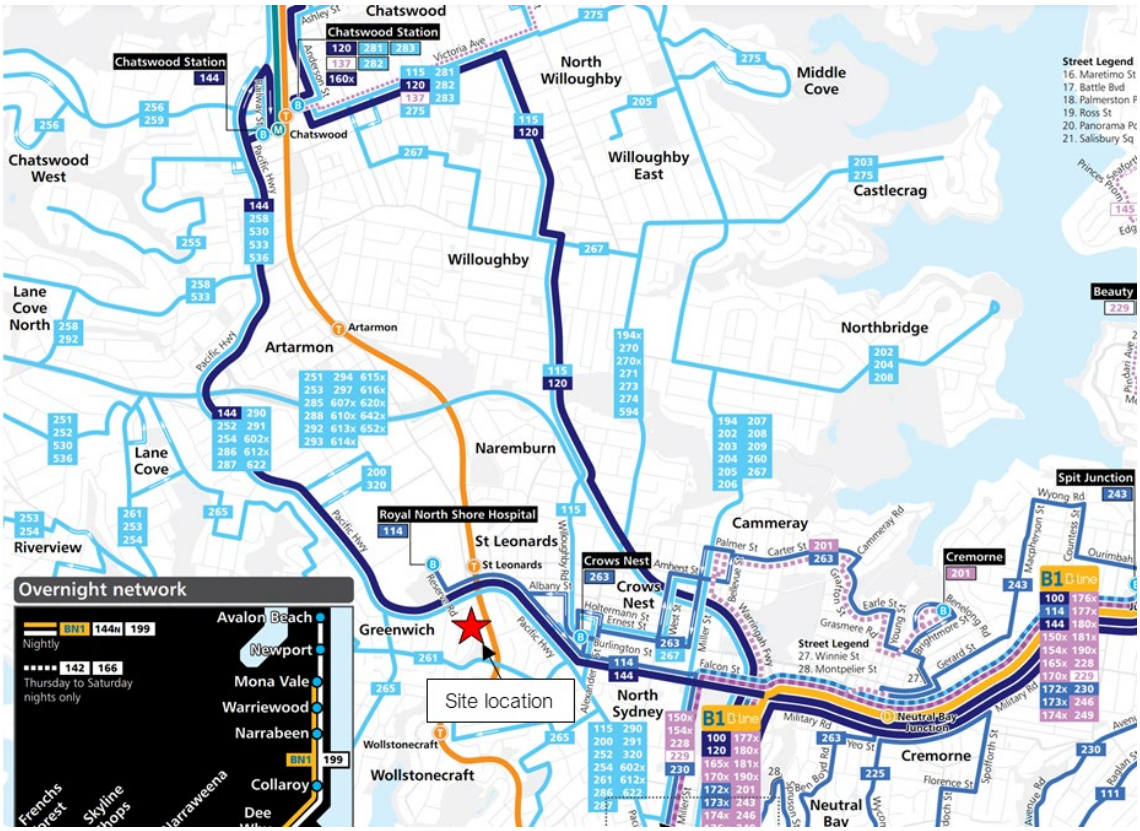
2.3 Public Transport

2.3.1 Existing Public Transport

The site is serviced by a range of well-established and frequent public transport services. The nearest bus stops along Pacific Highway are an approximate 200 to 300 metre walk from the site. These bus services provide connections to Gladesville, Lane Cove, Chatswood, North Sydney, Gore Hill, Bella Vista, Castle Hill, Denistone East and Sydney CBD. These bus routes provide frequent services during the weekday peak hour periods.

St Leonards Railway Station is approximately 200 metres to the north and within a five-minute walk. It is serviced by the Northern, North Shore and Western Lines and the intercity Central Coast and Newcastle Line and provides high frequency services to key destinations such as Hornsby, Chatswood, North Sydney, Sydney CBD, Strathfield and Parramatta.

A review of the public transport services available near the site is indicatively shown in Figure 5.

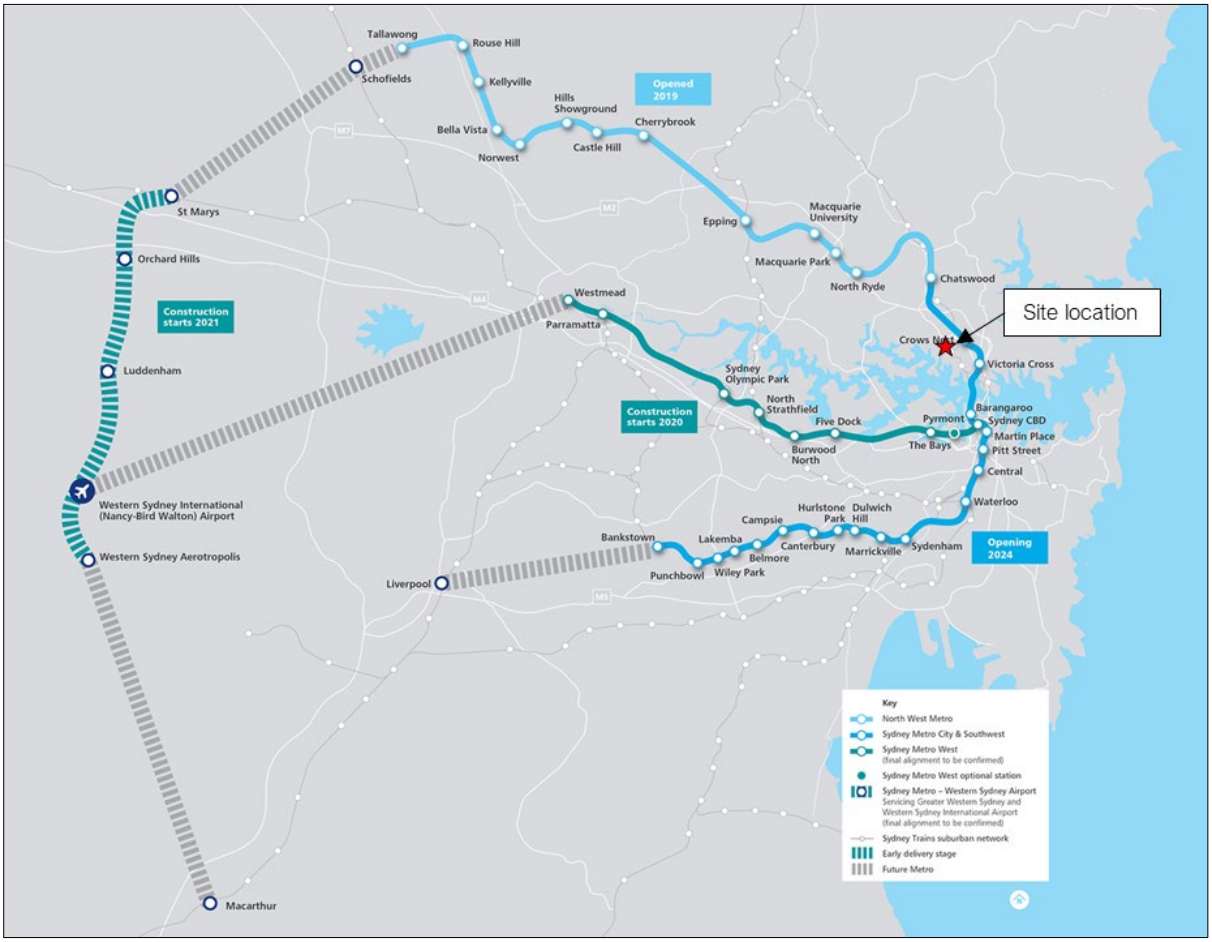


Base image source: Transport for NSW, accessed December 2021

Figure 5: Surrounding public transport network

Sydney Metro Northwest services also 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 four-minute turn up and go services. Services will extend south to North Sydney, Sydney CBD and through to Bankstown as part of Sydney Metro City and Southwest Line, which is expected to be operating in 2024. A new station is to be provided at Crows Nest, within an 800 metres catchment of the site, providing further public transport opportunities for the area.

The existing and future Sydney Metro network is shown in Figure 6.



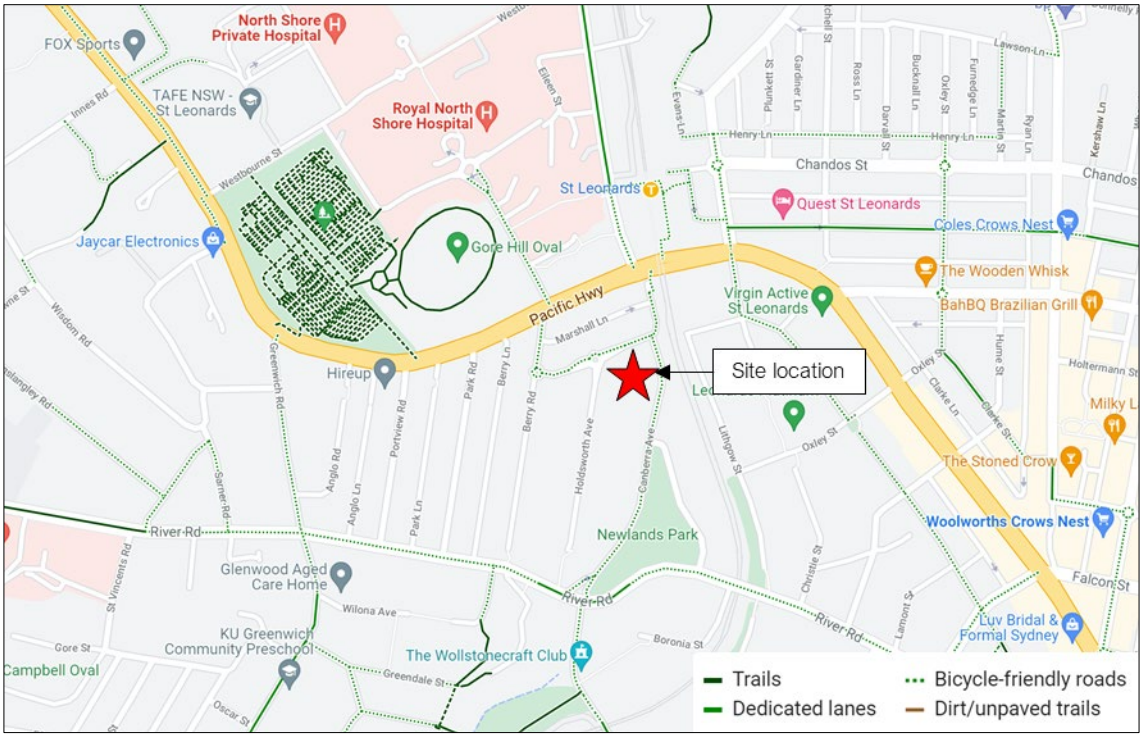
Base image source: Sydney Metro, accessed December 2021

Figure 6: Sydney Metro Overview

2.4 Walking and Cycling Infrastructure

The site is currently well supported by established walking infrastructure, with Pacific Highway, Canberra Avenue, Marshall Avenue, Holdsworth Avenue, and Berry Road all providing a good level of pedestrian amenity by way of quality footpaths on both sides. Pedestrian crossing points are provided at signalised intersections on Pacific Highway and provide access between St Leonards South Precinct, Royal North Shore Hospital and St Leonards Railway Station.

The site is relatively well serviced by surrounding roads which are either bicycle-friendly roads or roads that have dedicated bicycle lanes. The existing low speed residential characteristics of the local roads surrounding the site are considered suitable for moderately experienced cyclists to connect with the existing surrounding cycling infrastructure network. A map showing the existing surrounding cycling network is included in Figure 7.



Base image source: Google Maps, accessed December 2021

Figure 7: Surrounding cycling network

2.5 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 Sydney CBD and inner ring CBD's and town centres. GoGet offer a viable alternative to the private car for trips where distances are short and are likely to be of benefit to future residents of the proposed development.

GoGet car share pods located close to the site are shown in Figure 8 with the closest pods located adjacent to the site on Canberra Avenue and Marshall Avenue.

Base image source: GoGet, accessed December 2021

Figure 8: Surrounding GoGet pod locations

3. Development Proposal

The St Leonards Village proposal includes construction of a residential development comprising 234 apartments, as summarised in Table 3.1.

Table 3.1: Proposed development schedule

Description	No. of apartments
1-bedroom	46
2-bedroom	131
3-bedroom	40
4-bedroom	15
Total	**232**

The proposed site layout plan is shown in Figure 9 and includes a minimum of 1,300 square metres of public open space that will front Marshall Avenue and a communal open green spine, consistent with the St Leonards South Precinct DCP.

Base image source: Arcadia St Leonards Village Development Application, February 2022

Figure 9: Proposed site layout plan

A single two-way vehicle crossover is proposed along Canberra Avenue to provide access to the basement car park and on-site loading dock. The crossover is designed to accommodate access by all vehicles up to 8.8 metre medium rigid vehicles. No vehicle crossovers are proposed on Holdsworth Avenue and Marshall Avenue. Overall, the proposal will reduce the number of vehicle crossovers along the site frontages from 10 to one, thus providing opportunity for increased kerbside parking.

The proposal includes a total of 309 on-site car parking spaces, including 273 residential spaces and 36 visitor spaces. 82 bicycle spaces and 23 motorcycle spaces are also provided.

There are three on-site loading bays proposed suitable for vehicles up to 6.4 metre small rigid vehicles with provision for access by 8.8 metre medium rigid vehicles if required.

4. Parking Assessment

4.1 Car Parking

The car parking requirements for different development types are set out in Lane Cove Council DCP 2010. As shown in Figure 10, the subject site is within the Railway Precinct as it is within 400 metres of St Leonards Railway Station.

Base image source: Lane Cove DCP 2010 Part R, accessed December 2021

Figure 10: St Leonards Railway station catchment

Table 2 of Part R DCP 2010 specifies the minimum off-street parking rates within the Railway Precinct, with Table 4.1 specifying those applicable to the proposal.

Table 4.1: DCP 2010 minimum parking requirements

Use	Description	No. Apartments	Parking Rate	Parking Requirement
Residential	1 bed	46	0.5 spaces/ dwelling	23
	2 bed	131	0.9 spaces/ dwelling	118
	3 bed	40	1.4 spaces/ dwelling	56
	4 bed	15	2 spaces/ dwelling	30
			Sub-total	**227 spaces**
	Visitor	232	0.2 spaces/ dwelling	46
			Total	**273 spaces**

Based on DCP 2010, the proposed development is required to provide a minimum of 273 car parking spaces, with 227 residential spaces and 46 visitor spaces.

DCP 2010 also requires one accessible space to be provided for each adaptable dwelling. On the basis that 20 per cent of the apartments will be adaptable, 46 resident spaces are required to be accessible. In addition, one space for every ten visitor spaces is required to be accessible, which equates to five accessible visitor spaces.

4.1.1 Adequacy of Car Parking Supply

The development proposes 309 car parking spaces, with 273 spaces for residents and 36 spaces for visitors.

Resident Parking

The resident provisions comply with the minimum DCP 2010 parking requirements. The proposed resident parking supply considers the market demand for premium residential apartments in the inner ring suburbs of Sydney where residents are largely owner occupiers, and also largely 'downsizers' nearing or already in retirement. Car ownership rates tend to be slightly higher in this demographic with a more balanced use across the day rather than limited to peak period trips. The proposed parking provision would also ensure that the already high demand for on-street parking is not intensified any further.

Visitor Parking

It is recognised that as developments increase in size the relationship between apartments and visitor parking demand changes. It is important to establish the correct quantum of visitor parking in any residential development thereby avoiding the potential for underutilisation and misuse by residents. As such, the proposal includes a strategy to ensure an appropriate quantum of visitor parking is able to be implemented.

For context, a comparison of various relevant Council DCP visitor parking rates for similar precincts across Sydney has been made and summarised in Table 4.2. Adopting such rates would naturally limit the likelihood of improper use by residents while recognising the diverse range of visitor trip purposes and time of day demand.

Table 4.2: Residential visitor parking rate comparison

Location/ Guidance	Rate (spaces/ dwelling)	Requirement (spaces)
Penrith City Centre	No visitor parking	0
Epping Town Centre	1 space per 10 dwellings	23
Wentworth Point	1 space per 10 dwellings	23
Marrickville DCP Parking areas 1 and 2	Area 1 – No visitor parking Area 2 – 1 per 10 dwellings	0-23
Leichhardt DCP	Min. 1 space per 11 and max. 1 per 8 dwellings	21-29
Rhodes West DCP	Max. 1 space per 20 dwellings	0-12
Ryde DCP (Macquarie Park corridor)	Max. 1 space per 10 dwellings	0-23
Gosford Alive (Gosford CBD)	1 space per 7 dwellings	33
TfNSW Guide to Traffic Generating Developments (2002) Metropolitan CBD locations	1 space per 7 dwellings	33

Based on the above, the DCP rate of one visitor space per five dwellings (or 46 visitor spaces) is high when considering the site's strategic location in St Leonards CBD.

The proposal includes provision of 36 visitor spaces, equating to a rate of one visitor space per 6.5 dwellings. This rate is higher than most of the comparable centres detailed above, and very similar to the TfNSW Guide 2002 requirement of one visitor space per seven dwellings. There is clear opportunity to justifiably reduce this further based on the above and to ensure an equitable quantum of visitor parking that caters to the expected demands is delivered as part of the development.

Overall, the proposed 36 visitor spaces are considered appropriate to accommodate the visitor parking demands and recognises the site's location within St Leonards CBD and strikes a positive balance between expected demand, user behaviour and transition away from private vehicle travel.

4.2 Other Parking Requirements

Other parking requirements are also set out in DCP 2010 and summarised in Table 4.3.

Table 4.3: Other Parking requirements

Other Parking	Size/ no. apartments	DCP 2010 Parking Rate	Parking Requirement
Car Wash	232 apartments	1 space/ 50 dwellings	5 spaces
Bicycle Parking		Residents: 1 space/ 4 dwellings Visitors: 1 rack plus 1 rack/ 10 dwellings	Residents: 58 spaces Visitors: 24 spaces
Motorcycle Parking	273 car spaces	1 space/ 15 car spaces	18 spaces

Based on the above, the proposed development is required to provide up to five car wash spaces, 82 bicycle parking spaces, and 18 motorcycle parking spaces. The proposed 82 bicycle spaces, five car wash spaces and 23 motorcycle spaces comply with the minimum DCP requirements, with equitable distribution across the basement car park ensuring practical daily use by residents.

4.3 Loading Facilities

DCP 2010 requires one removalist truck space vehicle space per 100 residential apartments. Based on these rates, the proposed development is required to provide up to three on-site loading bays.

The proposal includes three loading bays and therefore complies with DCP 2010 requirements. The three small rigid vehicle bays (and practical use of the space by medium rigid vehicles) are considered appropriate to cater for occasional removalist demand as well as waste collection, online grocery deliveries and ancillary deliveries. Council has also confirmed that waste collection would be completed by their waste contractor who would use the smallest truck used for domestic waste collection, being a 6.64-metre-long rear loader with a 2.6 metre height clearance requirement.

4.4 Car Parking Layout Review

The basement car park and loading dock layout have been reviewed against the requirements of DCP 2010 and the Australian Standard for Off Street Car Parking (AS2890.1:2004, AS2890.2:2018 and AS2890.6:2009). This assessment included a review of the following:

- site access driveway
- bay and aisle width
- adjacent structures
- turnaround facilities
- circulation aisles and ramps
- ramp grades
- height clearances
- internal queuing
- parking for persons with disabilities.

Vehicle swept paths are included in Appendix A, with design comments as part of the review included below:

- The basement car park is accessed via Canberra Avenue, with the loading area located near the entrance.

- A height clearance of 4.5 metres is targeted for the loading dock and associated manoeuvring areas, however a lower clearance could be supported subject to detailed design, confirmation of the largest service vehicles (including waste trucks) and certifier agreement.
- Visitor parking is generally provided on level 0 and basement level 1 and appropriately separated from resident parking.
- 18 small car spaces are provided that will be allocated to specific apartments.
- Accessible parking spaces are provided for visitors and associated with the adaptable apartments.
- Enclosed garages are also provided in the car park for duplex/ terrace houses and select apartments.
- Motorcycle parking is appropriately dispersed throughout the car park.

The car park is laid out in a simple and clear manner with circulation paths logical. Visitors will have a clear understanding, with the provision of signage and wayfinding to ensure use of the visitor car spaces. Resident parking areas will be obvious and users familiar with the car park layout and circulation. The loading dock is appropriately separated from car parking area and clear of travel paths, with convenient access to lefts, as required.

While it is acknowledged that DCP 2010 does not strictly permit small car spaces in private car parks, it does recognise the benefits of them in public car parks. In including provision for small car spaces, the proposal recognises the sites' location in inner Sydney where space is constrained and car size typically smaller than average. This design approach is therefore considered practical and appropriate.

It is also recognised that 227 residential spaces comply with the minimum DCP requirements and are standard car spaces with the 18 small car spaces making efficient use of the available space in the basement car park. The small car spaces also account for six per cent of the total parking supply, below the 10 per cent permitted in public car parks.

4.5 Transport Improvements

The proposed development offers several opportunities to improve the on-street environment along the site frontages. These improvements intend to benefit the local environment generally while also maintaining appropriate safety and sightlines for site generated traffic. Overall, the following transport improvements are incorporated into the proposal:

- Replace seven existing unrestricted kerbside parking spaces along the Canberra Avenue site frontage with 'No Parking' restrictions to ensure appropriate sight lines at the proposed site access driveway. This area would also then be able to facilitate any such demand associated with taxis/ ride share drop-off and pick-up.
- Provide kerbside space equivalent to minimum two spaces along the Marshall Avenue and Holdsworth Avenue frontages for the purposes of taxis/ ride share drop-off and pick-up. This could be signposted as 'no parking'. This would benefit future residents and the general public accessing the open space.
- Consider modifying unrestricted on-street parking to limit all day parking opportunities with the exception of existing residents already part of the resident parking scheme.
- Provide appropriate systems, infrastructure and space in the basement car park (and allowance for substation capacity or alternate energy storage) for the future installation of vehicle charging facilities by residents on an as needs basis.

5. Green Travel Initiatives

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

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

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

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

A site specific GTP would promote more sustainable and environmentally friendly travel choices for residents. As discussed, there will be a range of "non-car" transport options available near the site.

The key objectives of GTPs are to:

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

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

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

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

- Provide a Travel Access Guide (TAG) which would be provided to all residents 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.
- Provide public transport information boards/ apps to inform visitors of alternative transport options.
- Provide a car sharing pod(s) on-site or nearby and promote the availability of car sharing pods as an alternative to owning more than one private vehicle for occasional trips that require the use of private vehicles.
- Provide bicycle facilities including secure bicycle parking for residents and bicycle racks/ rails for visitors.

With the successful implementation of a Green Travel Plan, there is a real opportunity to limit single occupancy car trips given the site's key location within St Leonards.

6. Traffic Assessment

Lane Cove Council has undertaken modelling of the St Leonards South Precinct using AIMSUN modelling software to understand the traffic impacts of 2,400 dwellings forecasted within the precinct. It is understood that Council is in the process of updating the modelling based on revised lower dwelling forecasts.

The peak hour traffic generation rates for residential developments in the St Leonards South Precinct were 0.14 trips per dwelling in the AM peak and 0.07 trips per dwelling in the PM peak as agreed with Transport for NSW. This was also highlighted in the TEF Consulting 2017 review and assessment of cumulative traffic impacts of current and approved proposals within the St Leonards South Precinct.

Overall, the modelling indicated that the level of service remained essentially the same for all models compared to a pre-development base. That said, the following minor infrastructure changes for the St Leonards South Precinct were recommended:

- Marshall Avenue/ Berry Road intersection upgrade from a roundabout to a priority controlled (Give-Way) intersection to mitigate queuing issues extending on Berry Road south of Pacific Highway preventing vehicles from Marshall Avenue to exit.
- Provision of a new road connection between Park Road and Berry Road.

The proposed development (Area 1, 2, and 4) has a total site area of 6,728 square metres which accounts for approximately 11 per cent of the total minimum site area of the St Leonards South Precinct (60,900 square metres). This would indicate a dwelling yield of approximately 265 dwellings based on the original assumption of 2,400 dwellings for the entire precinct.

The proposed development comprises of 232 dwellings which is lower than that assumed in the AIMSUN traffic model.

Adopting the traffic generation rates used for the AIMSUN modelling suggests that the proposal could generate 32 and 16 vehicle trips per hour in the AM and PM peak hours respectively.

On this basis, it is appropriate to conclude that the traffic impacts of the proposal have already been considered as part of the Council's AIMSUN modelling, with no additional impacts expected.

7. Construction Traffic Management Overview

7.1 Introduction

This section sets out an overview and preliminary assessment of the construction traffic and pedestrian management initiatives to be implemented as part of the construction of the proposed development.

The appointed contractor(s) will be required to prepare a more detailed Construction Traffic Management Plan (CTMP), providing traffic and pedestrian management measures to be implementing during the construction of the proposed development. This CTMP will include, but not be limited to:

- Construction vehicle access routes.
- Construction site access and circulation arrangements.
- Construction personnel parking provisions and management measures.
- Construction traffic volumes.
- Impact of construction activities on the surrounding transport network with consideration of pedestrians, cyclists, public transport, road network and nearby construction sites.
- Mitigation and management measures to minimise the impact during construction.

Traffic Guidance Schemes (previously referred to as Traffic Control Plans) would be prepared to accompany the detailed CTMP to appropriately manage traffic and pedestrians near the work site.

The overall principles of traffic management during construction include:

- Minimising the impact on pedestrian movements.
- Maintaining appropriate public transport access.
- Minimising the impact to existing traffic on adjacent roads and intersections.
- Maintaining access to/ from any adjacent properties.
- Restricting construction vehicle movements to designated routes to/ from the site.
- Managing and controlling construction vehicle activity near the site.
- Ensuring construction activity is carried out in accordance with Council's approved hours of works.

7.2 Construction Details

7.2.1 Description of Works

The construction works include the demolition of existing residential standalone dwellings and construction of a multi high density residential development.

The duration of the works will be determined as part of detailed programming completed prior to issue of any Construction Certificate(s).

Given the extent of the site, it is expected that site sheds, concrete pump, crane and material handling can be largely contained on-site. Site plans will be prepared prior to issue of any Construction Certificate.

7.2.2 Anticipated Work Hours

Construction will be carried out during the approved hours of work as defined in any future development consent, with these expected to be:

- 7am to 6pm Monday to Friday
- 8am to 3pm Saturdays
- No work Sundays or public holidays.

The appointed contractor will be responsible for instructing and controlling all subcontractors regarding the hours of work. Any work or deliveries required outside the approved construction hours will be subject to specific prior approval from Council.

7.2.3 Construction Workers

It is anticipated that there will be approximately 300 workers on-site throughout construction.

No worker parking will be provided on-site. Notwithstanding, workers would be advised to use public transport where possible, with appropriate tool/ equipment drop-off arrangements provided. Given the anticipated work hours, workers will tend to arrive/ depart the site outside of the peak hours.

7.3 Site Access

Construction vehicle site access will be dependent on the site layout proposed by the appointed contractor, noting the site has three road frontages.

Appropriate haulage routes should be provided within the construction site to allow all construction vehicles to enter, manoeuvre through and exit the sites in a forward direction. Accredited traffic controllers will be positioned at the site accesses and any on-street works zones to manage construction vehicles entering and exiting the site. Traffic signs will be provided at the site accesses to warn general traffic of trucks turning and the presence of traffic controllers, where provided.

7.4 Anticipated Truck Movements

It is anticipated that the construction works would generate approximately six trucks per hour, with potential minor increases during concrete pour activities. Based on this, the anticipated construction traffic volumes would not be expected to impact the surrounding road network.

7.5 Designated Truck Routes

The movement of all construction vehicles will be restricted to designated routes and confined to the regional road network. Designated routes have been identified with the aim of minimising impacts on the local road network.

The directional distribution and assignment of traffic generated by the construction works will be influenced by several factors, most notably the origin/ destination of materials, site access points and the configuration of the regional road network.

The approach and departure routes are primarily expected to be to/ from Pacific Highway and dependent on the proposed locations on construction vehicle site accesses and any on-street works zones. Any works zone on Canberra Avenue (potentially Marshall Avenue as well) would require construction vehicles to use River Road in order to approach and depart the works zone in a forward direction and not necessitate the need for U-turns on public roads.

The designated truck routes will be included in the detailed CTMP based on the proposed construction site layout.

7.6 Transport Impacts

7.6.1 Pedestrian and Cyclist

Most works will occur on site; therefore, construction activity is not expected to greatly affect pedestrians and cyclists along the site frontages, with the exception of works associated with upgrading footpaths, removal and construction of vehicular access driveways. Pedestrian and cyclist control may be required when construction vehicles are entering and exiting the site, with the detailed CTMP to include measures to control and maintain pedestrian access at all times.

7.6.2 Public Transport

Construction activities will not impact existing bus services near the site.

7.6.3 Cumulative Construction Traffic Impact

It is expected there will be numerous construction sites within the precinct. The detailed CTMP will need to consider other construction works occurring at the same time to understand the cumulative impact and coordinate mitigation measures accordingly.

7.7 Emergency Access

Emergency vehicle access to the site will be maintained at all times. Liaison with police and emergency services will be maintained as required throughout construction and a 24-hour contact would be made available for 'out-of-hours' emergencies.

Emergency protocols would include a requirement for the appointed contractor to assist with emergency access. Thus, there will be no adverse impacts to the provision of existing emergency vehicle access to other neighbouring properties as a result of construction activity.

8. Conclusion

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

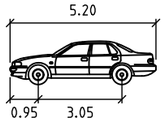
1. A Development Application is to be submitted to Lane Cove Council for a proposed multi high density residential development known as the St Leonards Village. The proposed development includes 232 apartments across three building footprints namely Area 1 (1-5 Canberra Avenue and 4 Marshall Avenue), Area 2 (6-8 Marshall Avenue and 2 Holdsworth Avenue), and Area 4 (4-8 Holdsworth Avenue).
2. The site layout and public open space provisions are consistent with the intent of the St Leonards South Precinct DCP 2010.
3. The site has access to regular bus services travelling along Pacific Highway, frequent train services at St Leonards Railway Station and future services at Crows Nest Metro Station.
4. The proposal generates a minimum Lane Cove DCP parking requirement of 227 residential parking spaces with the proposed 273 spaces complying with this requirement.
5. The proposed 36 visitor spaces are considered appropriate to accommodate the visitor parking demands and recognises the site's location within St Leonards CBD and strikes a positive balance between expected demand, user behaviour and transition away from private vehicle travel.
6. The provision of three loading bays complies with the Lane Cove DCP requirements and provides for on-site waste collection, removalist and online grocery deliveries.
7. It is expected that the proposed parking layout will be consistent with the dimensional requirements as set out in the Australian/New Zealand Standard for Off Street Parking subject to further design development.
8. Recommendations to improve sight lines at the Canberra Avenue site access driveway are important with such measures also facilitating taxi and ride share drop-off and pick-up activity. Other measures to limit all day parking are also important in an area that already experiences relatively high demand for on-street parking.
9. The proposal is expected to generate similar traffic volumes to that already assessed in the Lane Cove Council AIMSUN model for the St Leonards South Precinct. Overall, the surrounding road network is expected to continue to operate satisfactorily following full development of the site.

Appendix A Swept Path Assessment

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



B99 6.3mR

	meters
Width	: 1.94
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

ARCHITECTURAL BASE IN BLUE
DRAWING TP01.03
REVISION A
BY ROTHELOWMAN
DATED 29.06.2022

Stantec

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED M.RIMAC	DESIGN CHECK H.OBERMAIER
APPROVED BY R.HAZELL	DATE ISSUED 30 JUNE 2022

SCALE A3 0 1.25 2.5 5 1:250

CAD FILE NO. 301350653-01-P7(ACCESS).DWG

ST LEONARDS VILLAGE
BASEMENT 1

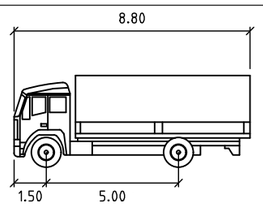
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 301350653-01-01 SHEET 01 OF 02 ISSUE P7

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



MRV

	meters
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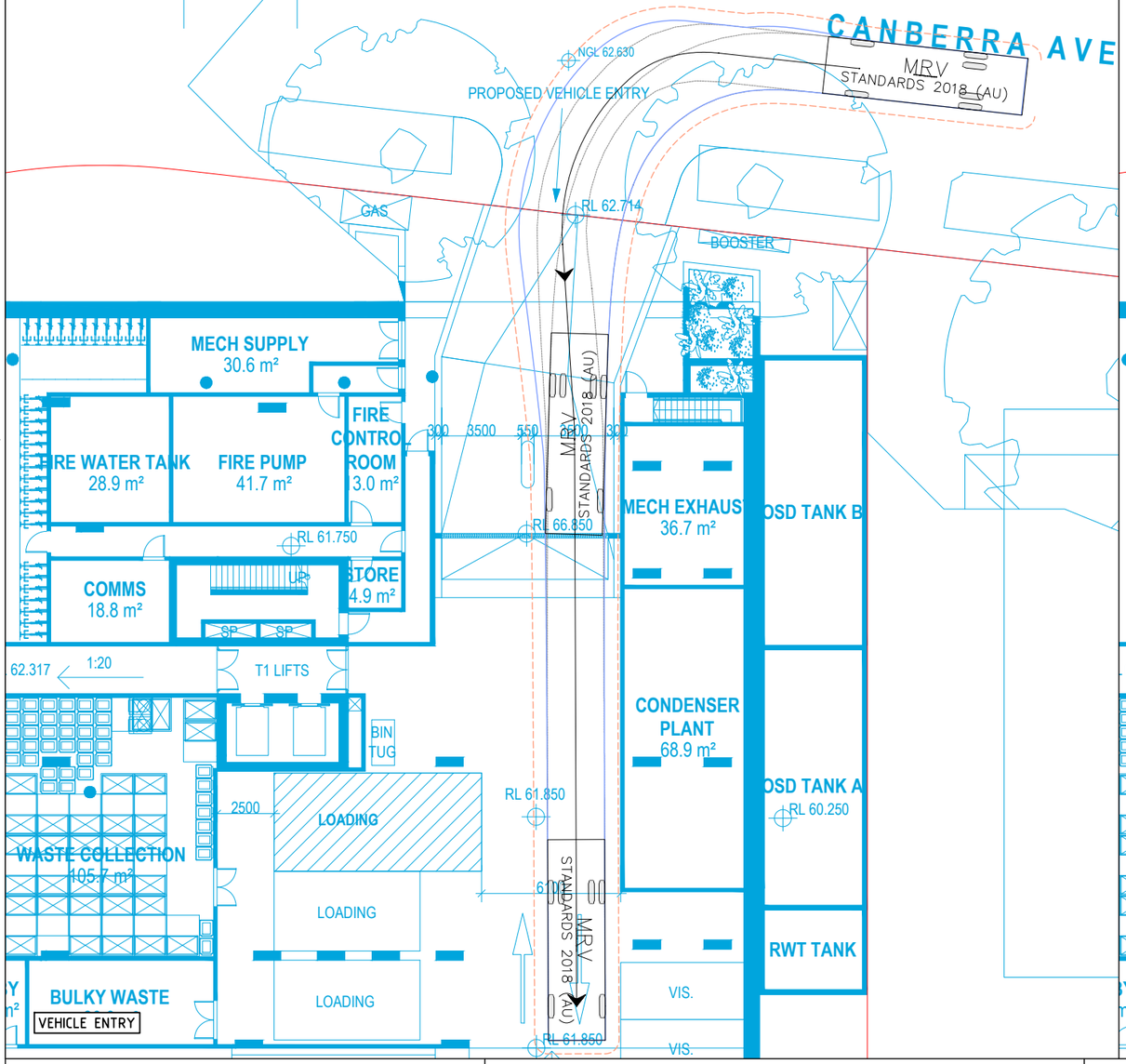
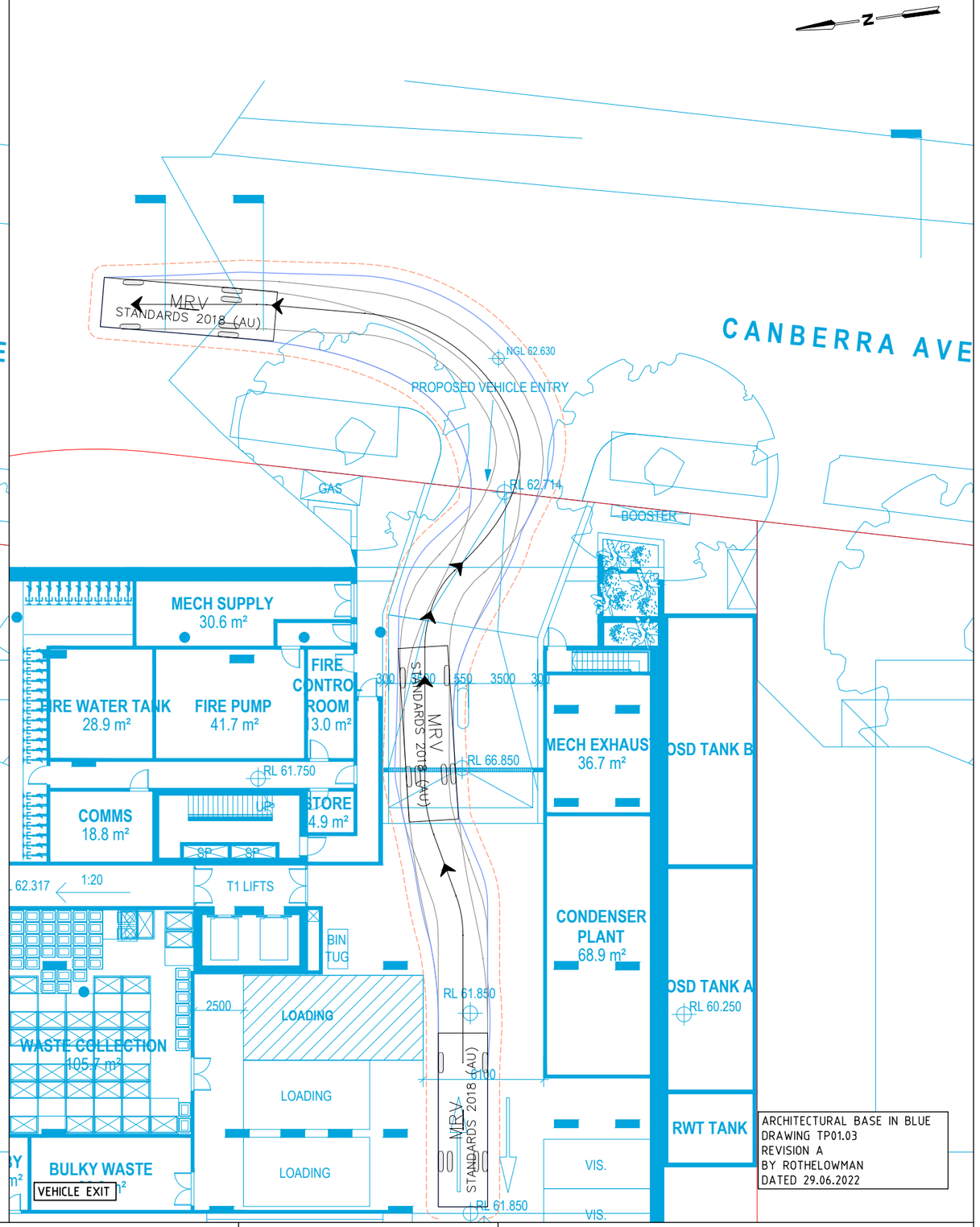
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 34.0





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DESIGNED M.RIMAC	DESIGN CHECK H.OBERMAIER
APPROVED BY R.HAZELL	DATE ISSUED 30 JUNE 2022

SCALE A3 0 1.25 2.5 5 1:250

CAD FILE NO. 301350653-01-P7(ACCESS).DWG

ST LEONARDS VILLAGE
BASEMENT 1
LOADING DOCK
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 301350653-01-02 SHEET 02 OF 02 ISSUE P7

Design with
community in mind

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