Legacy Property

253-267 Pacific Highway North Sydney

Traffic and Transport Assessment

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Job number 257656

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ARUP

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1 Introduction

Legacy Property engaged Arup to carry out a traffic and transport assessment for a new mixed use development at 253-267 Pacific Highway, North Sydney. The proposed development will consist of residential apartments, commercial and retail space across 19 levels. 40 parking spaces are proposed on the site over two basement levels.

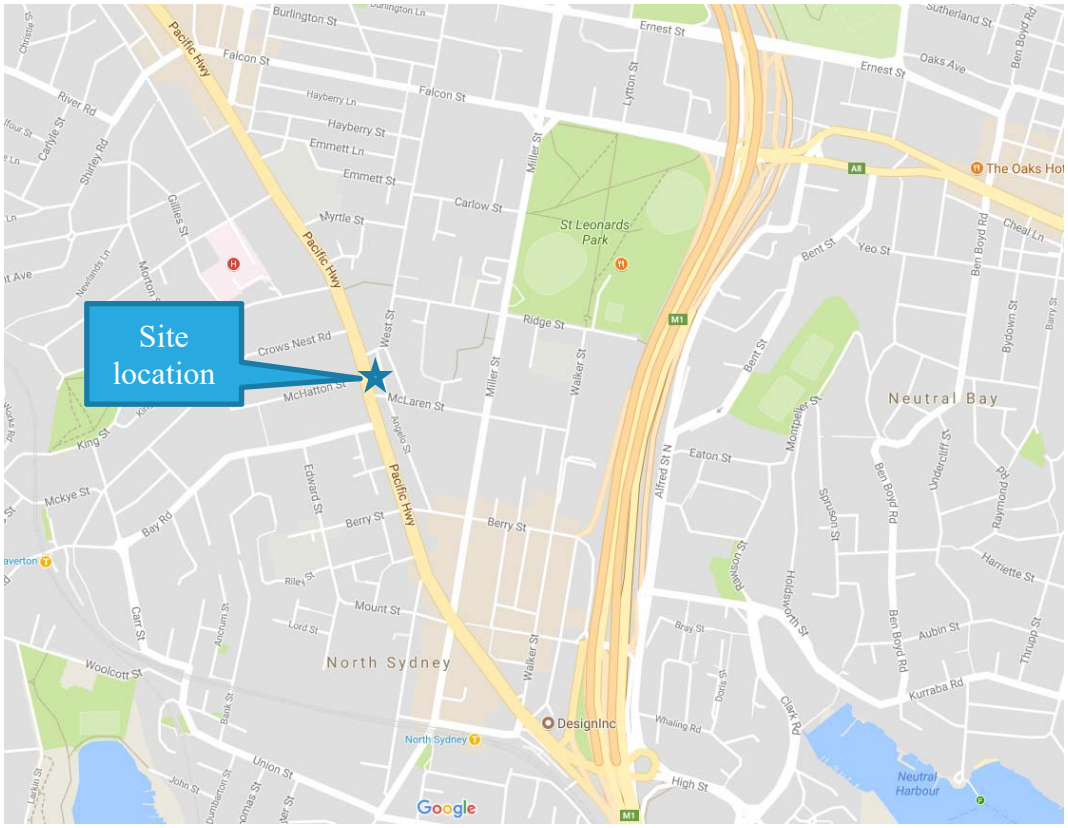

Figure 1: Subject Site Location

This traffic and transport report is structured as follows:

- Existing Conditions
- Proposed Development
- Future Context
- Transport Assessment
- Summary

2 Existing Conditions

2.1 Site Location

The proposed development site is located in the North Sydney Centre and is bounded by West Street to the north, McLaren Street to the south, Church Lane to the east, and Pacific Highway to the west.

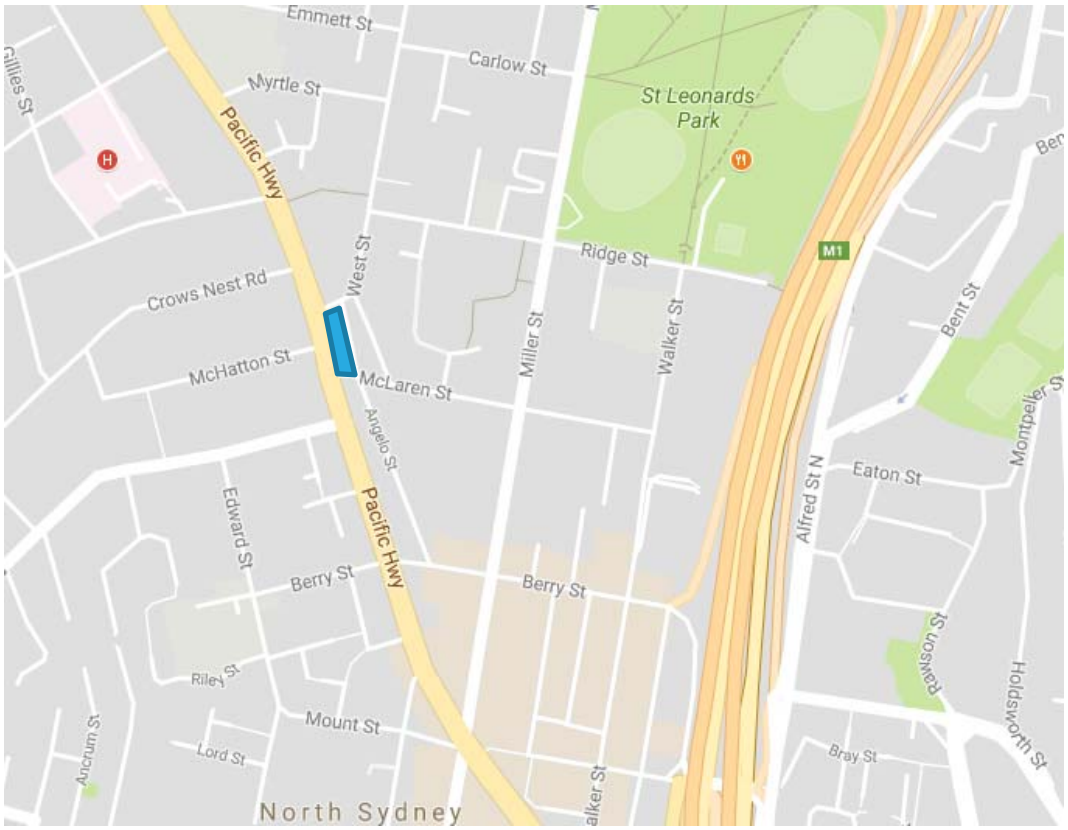

Figure 2: Site location

2.2 Existing Road Network

The development site is in close proximity to two high-capacity roads (the Pacific Highway and the Warringah Freeway). In addition, Miller Street is the main arterial route running through the North Sydney CBD area.

In the vicinity of the site, McLaren Street is a two-way road running parallel to Berry Street between the Pacific Highway and Walker Street. Adjacent to the development, a one-way (southbound) local access road runs parallel to Pacific Highway and provides access to the development site as well as residential properties along Church Street. Vehicles can only turn left out onto McLaren Street from Church Lane.

McLaren Street forms a three-arm signalised intersection with the Pacific Highway to the south. West Street is limited to left-in and left-out from the Pacific Highway and provides access to Falcon Street to the north.

2.3 Public Transport Network

The public transport network in the vicinity of the site consists of bus and rail services. A large number of bus routes within a 5 minute walk of the site (along the Pacific Highway) with additional services available from Miller Street while T1 northern line train services are available from North Sydney Train Station (10 minutes by foot). The 15, 30 and 45 minute journey time catchment of the site by public transport is presented in Figure 3.

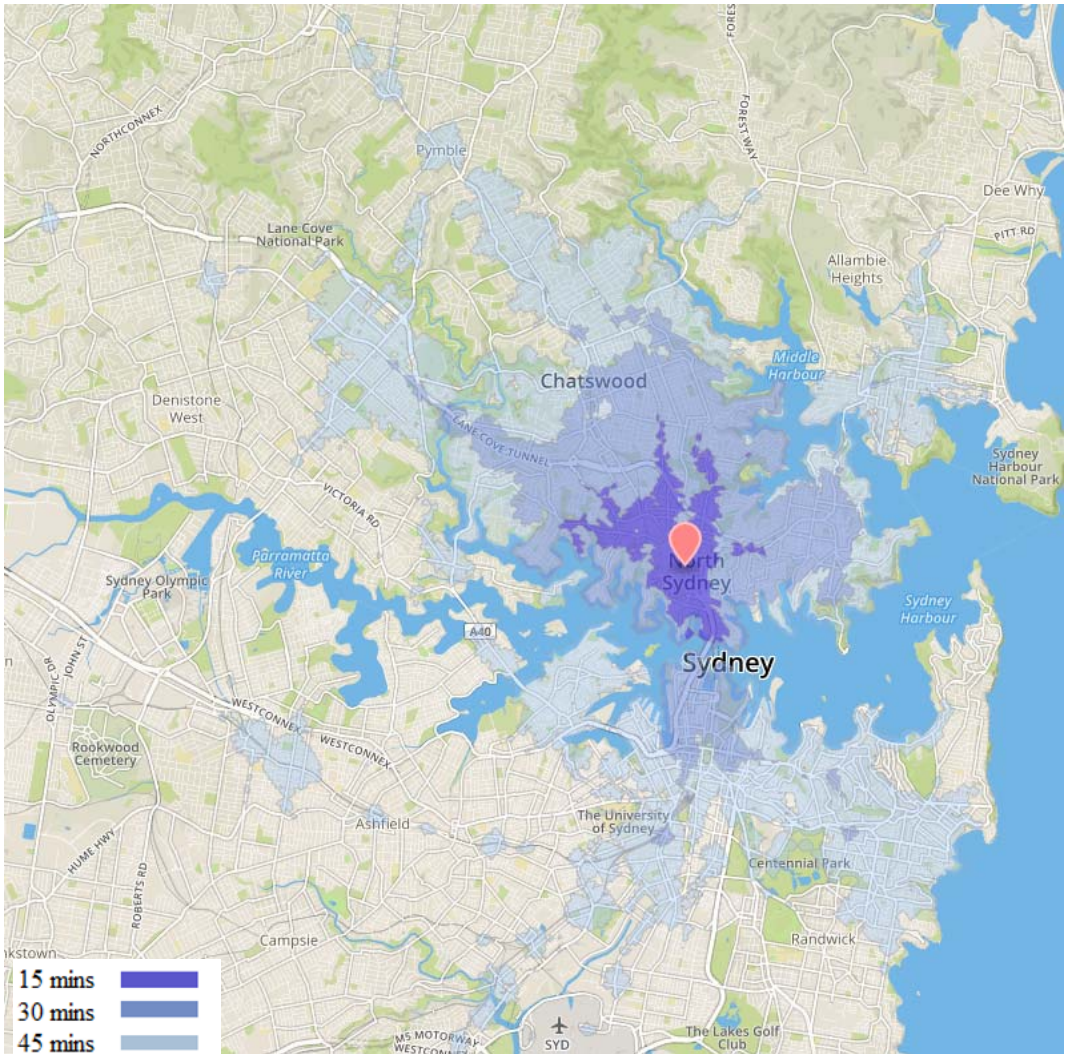

Figure 3: Public transport catchment

2.4 Pedestrian and Cycle Network

The pedestrian network generally consists of the footpaths running along both sides of the roads along the surrounding road network. Pedestrian crossings are provided on the south and east arms for the McLaren Street/Pacific Highway intersection.

North Sydney train station is approximately 10 minutes walk away from the development site, while the nearest bus stop is located on Pacific Highway, just under 5 minutes by foot from the development site.

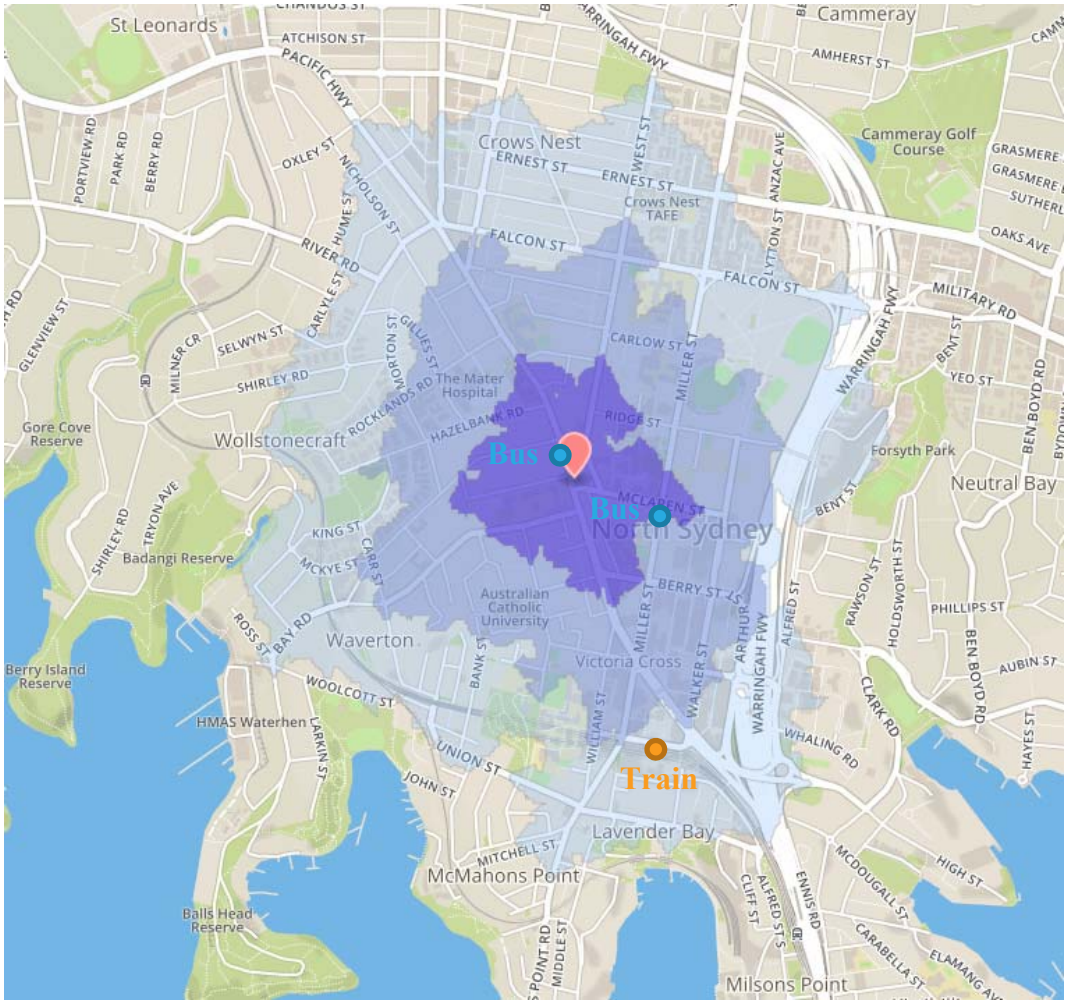

Figure 4: Walk catchment

North Sydney is served by a network of local and regional bicycle routes as shown in Figure 5 below.

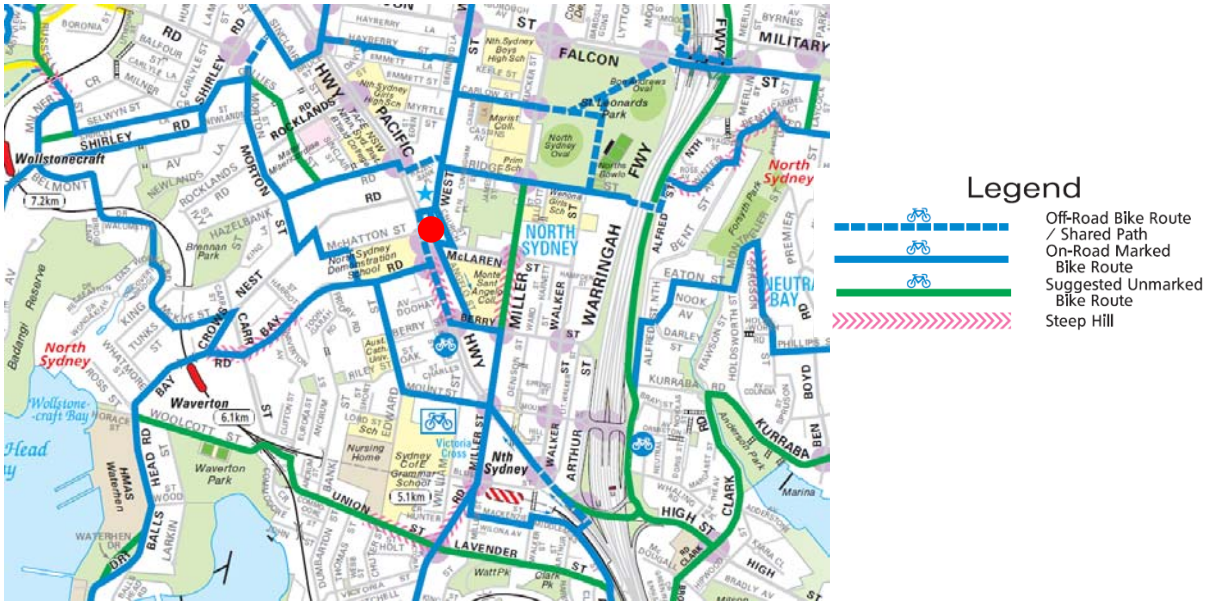

Figure 5 Existing bicycle network

2.5 Mode Split

The Bureau of Transport Statistics 'Journey to Work' explorer has been used to estimate the mode split of residents in the area and is presented in Figure 6. The data is based on 2011 Census data.

The data shows that approximately 39% of residents travel to work by public transport (train and bus), with 29% of driving to work and 25% walking.

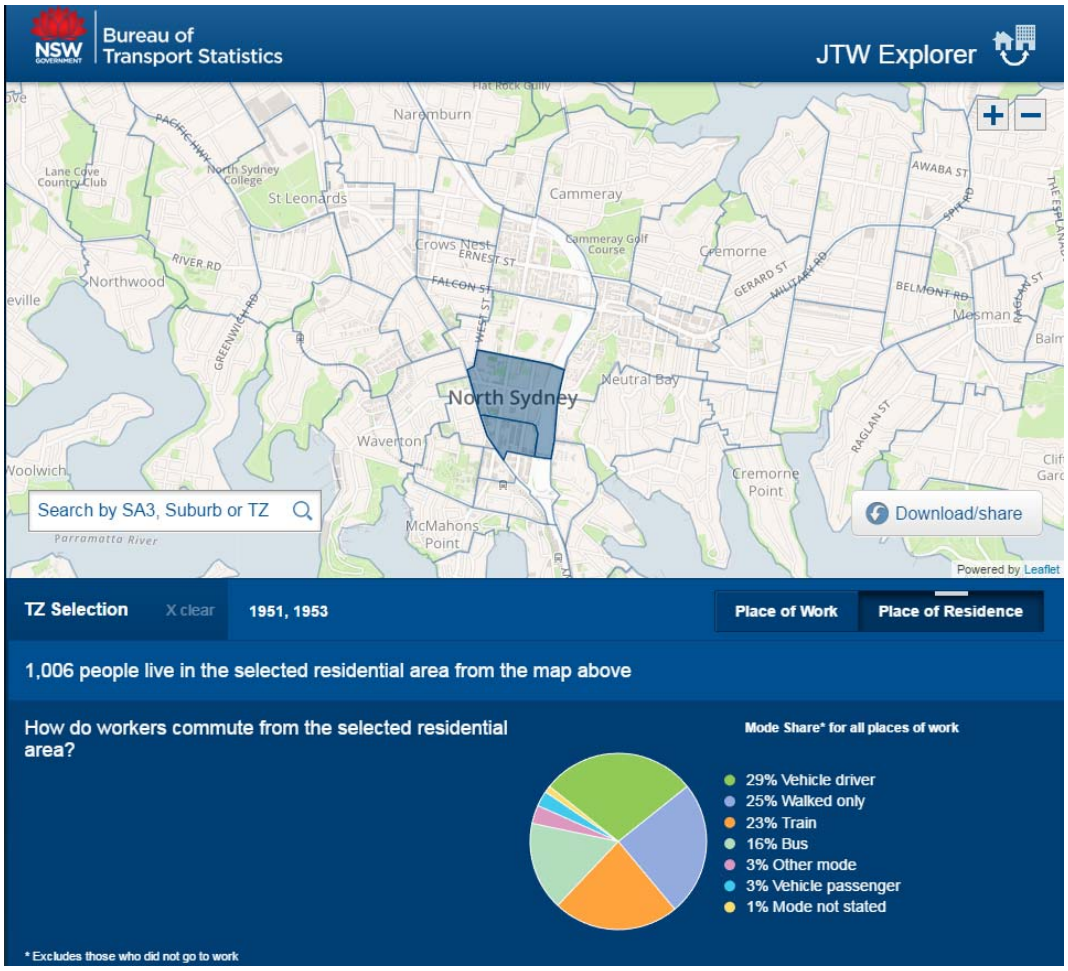

Figure 6: Mode Split

2.6 Existing Traffic Flows

Arup previously conducted traffic counts in 2014 to understand the level of traffic movements in and around the local area. Current traffic volumes in the streets surrounding the development site are summarised in Table 1 below.

Table 1: Existing traffic volumes

Street	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
McLaren Street	299	131	244	64
Pacific Highway	908	1,470	973	1,069

2.7 Sydney Metro & Victoria Cross Metro station

Sydney Metro is the next major rail project identified in Sydney's Rail Future. Sydney Metro scope has been developed to meet the Project objectives and deliver key elements of Stages 4 and 5 of Sydney's Rail Future.

In June 2014 the NSW Government announced the Sydney Metro concept, including the Sydney Harbour Crossing and Western Extension to Bankstown proposals. The project would extend rapid transit under Sydney Harbour, through the central business district (CBD) of Sydney and west to Bankstown, with capacity to run up to 30 trains per hour in each direction through the city on the new line.

The Project represents a major increase in the capacity of Sydney's rail network, providing a 60 per cent increase in the number of trains in the peak periods and catering for an extra 100,000 customers per hour. Sydney Metro will significantly improve reliability across the rail network by addressing current and emerging constraints such as train crowding, platform and station crowding, and network complexity.

The NSW Government has announced a new station would be constructed in North Sydney, known as Victoria Cross, as part of the Sydney Metro project. The station is located beneath Miller Street (to the north of the Pacific Highway) between McLaren Street and south of Berry Street. Station access and entry is via the pedestrian plaza opening to Miller, Denison and Berry streets. Residents of the proposed development will benefit from the future northern access point into Victoria Cross station located at the corner of Miller Street and McLaren Street.

Key employment centres will be easily accessible from Victoria Cross station, with 9 minutes travel time to Central Station and 5 minutes travel time to Martin Place metro station. The station includes:

- new bike parking near the corner of Miller and Berry streets
- new kiss and ride bays on Berry Street
- existing bus stops close to the station retained on Miller Street
- wayfinding signage and Sydney Metro information within the North Sydney CBD
- a traction substation integrated into the station building (partially underground)
- a services building on Miller Street to the north of the station providing station and tunnel services
- enhancement of pedestrian infrastructure around the station. This is being investigated further in consultation with Roads and Maritime Services and North Sydney Council.

The new metro station entrance on McLaren Street is located 250m away (approximately 3 minute walk) of the proposed development, and will be operational from 2024.

Figure 7: Victoria Cross metro station

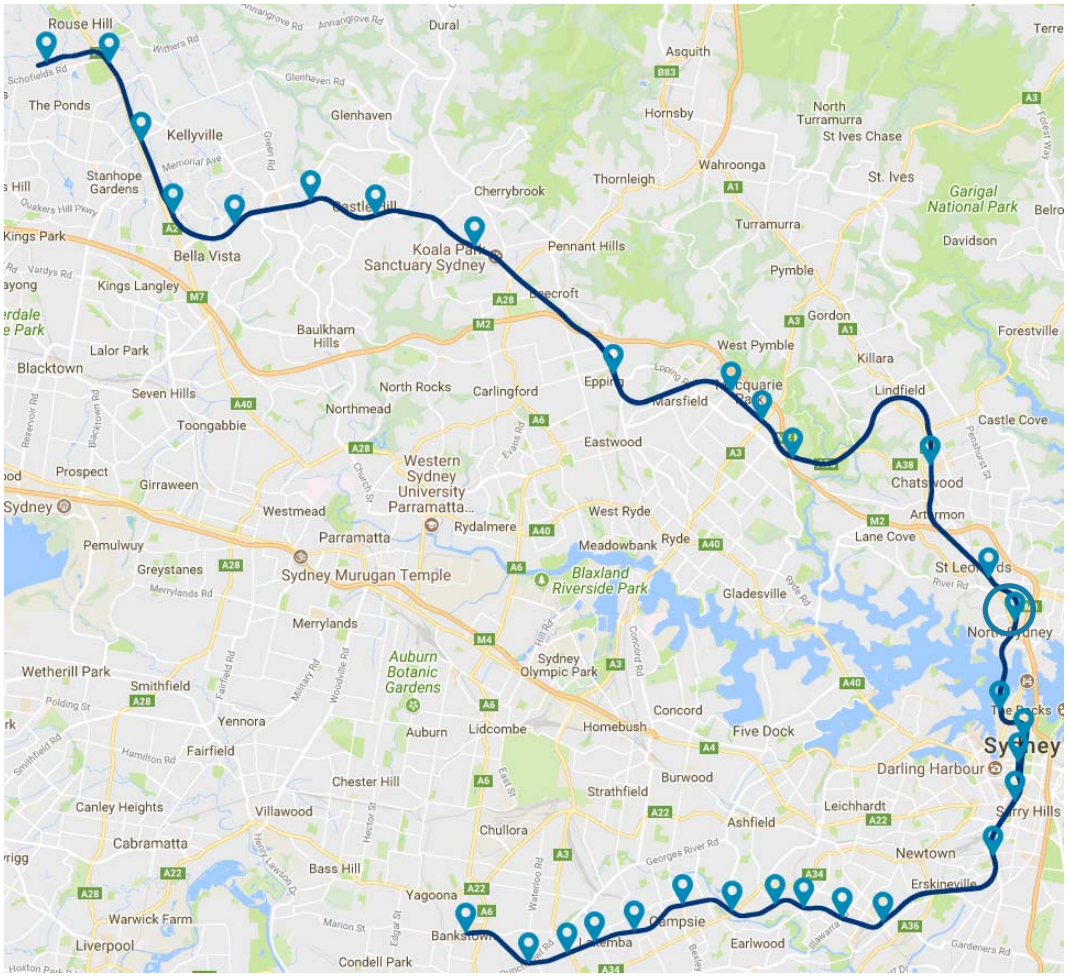

Figure 8: Sydney Metro map

3 Proposed Development

3.1 Development yields

The proposed development will consist of residential apartments across 19 levels, providing 89 apartments and podium ancillary commercial and retail uses with approximately 1608 sqm GFA. 40 parking spaces are proposed on the site over two basement levels. The proposed apartment schedule for the residential apartment mix is outlined below in Table 2.

Table 2: Apartment schedule

Unit type	Number of units
Studio	3
1-bedroom	20
2-bedroom	64
3-bedroom	2
Total	**89**

3.2 Vehicular access

The main vehicular access to the development will be Church Lane. The laneway is relatively narrow, with the current site boundary providing less width in the central section of the site. The development will consider maintaining a consistent width along Church Lane as presented in Figure 9.

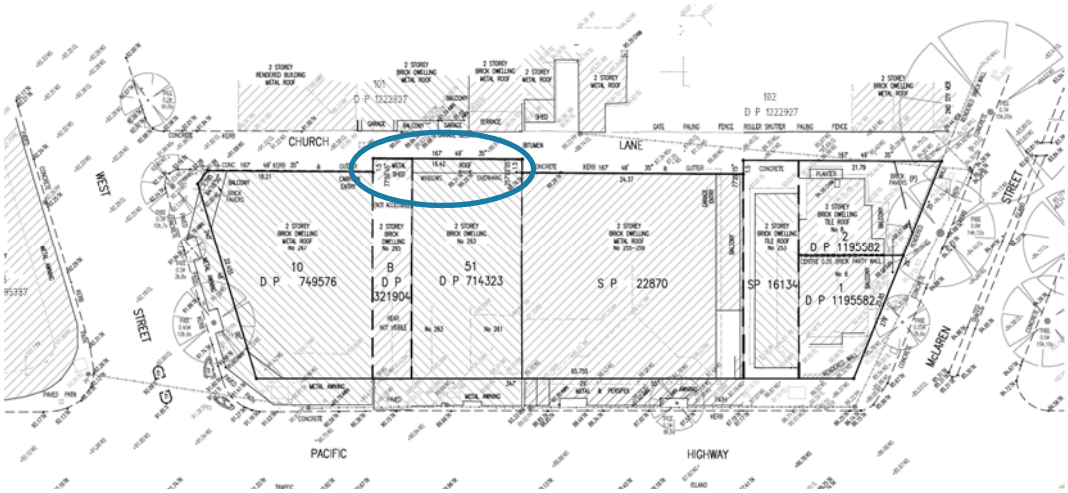

Figure 9: Existing external road layout

3.3 Cycle parking

For residential developments, the North Sydney Development Control Plan 2013 requires that a minimum of 1 resident space per dwelling and 1 visitor space per 10 dwellings be provided with the following exception:

'where an apartment in a residential building has a basement storage area on title that is large enough to accommodate a bike and being no smaller than a Class 1 bike locker, then additional bike parking for that apartment is not required'.

3.4 Car parking

The maximum residential car parking rate, as set out in Table B-10.2 of the North Sydney Development Control Plan 2013 (and as amended in 2015), permits only maximum parking rates as shown in Table 3 for residential and retail development in zones noted as B4 (development is located in Zone B4).

The proposed parking provision of 40 spaces is well below the maximum allowable number of spaces permitted under Council's DCP of 80 spaces. This number of spaces is considered appropriate to meet the parking needs of the development while also minimising the impact on the adjacent road network by reducing traffic generation.

Table 3: Proposed Parking Provision

Apartment schedule	**No.**	**DCP Parking Rate (maximum rate)**		**Proposed Provision**	
		Parking rate	**No. spaces**	**Parking rate**	**No. spaces**
Studio	3	0 / unit	0	0 / unit	0
1 bedroom	20	0.5 / unit	10	0.30 / unit	6
2 bedroom	64	1.0 / unit	64	0.5 / unit	32
3 bedroom	2	1.0 / unit	2	1.0 / unit	2
Sub-Total - Residential					***40***
Retail / Commercial	1608 m^2	1 / 400 sqm GFA	4	0	0
Total			**80**		**40**

3.5 Service area

The North Sydney Development Control Plan 2013 requires that for developments with more than 60 dwellings, that at least two Medium Rigid Vehicle (MRV) bays or one Heavy Rigid Vehicle (HRV) be provided.

It is proposed to provide one HRV bay within the site boundary along the laneway (see Figure 10). HRV's will need to reverse into the space from within the laneway and exit the site from street level in a forward direction. MRV's may be able to reverse within the boundary.

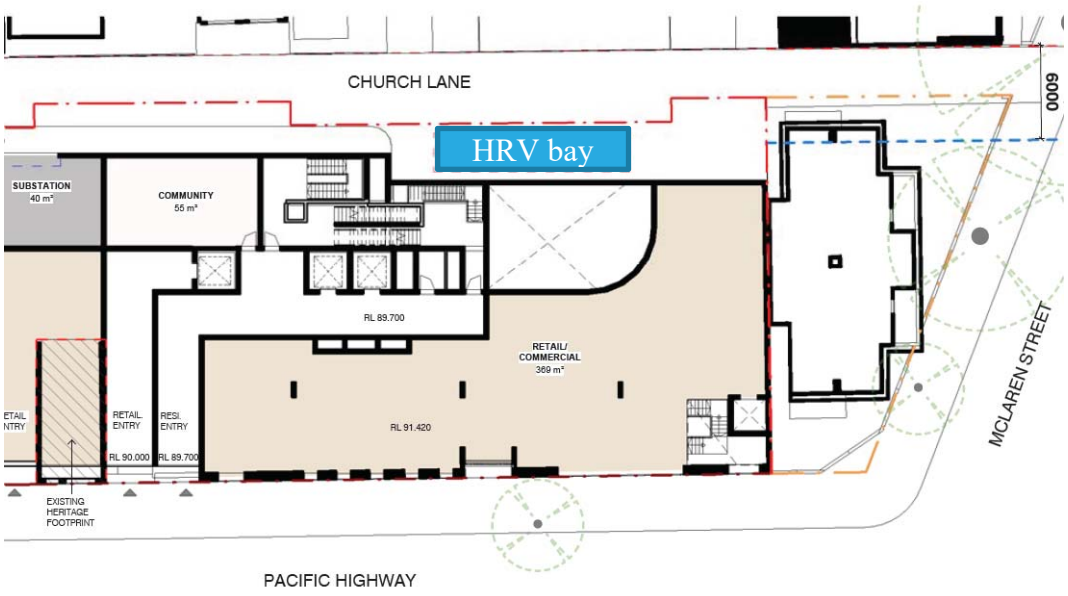

Figure 10: Proposed HRV bay

4 Transport Assessment

4.1 Vehicle trip generation

Recent surveys undertaken by Roads and Maritime Services of high density residential developments in key centres such as St Leonards has one of the lowest traffic generation rates during peak hours. For every 100 residential car parking spaces, only 10 car trips are generated during the AM peak hour and 5 car trips during the PM peak hour. This residential development would be considered to be reasonably similar to the proposed development in terms of its location and proximity to public transport.

On the basis of providing 40 car parking spaces for the residential development, the development is estimated to generate only 4 vehicle trips during the AM peak hour and 3 vehicle trips during the PM peak hour. The residential community uses may generate a small number of additional vehicle trips in the PM peak hour. This is a relatively minor addition of traffic considered in the context of the surrounding traffic flows.

It is anticipated that no further traffic would be generated from the commercial and retail uses given no parking will be allocated for this use. On-street parking in the area is quite constrained and often provides little opportunity for passing car trade.

In addition, given the proximity of the residential development to significant levels of employment in North Sydney, the estimated vehicle trip generation is further supported. Further, the opening of the Sydney Metro from 2024 which will increase the alternative transport options available to the future residents.

4.2 Person trip generation

Using the residential development at St Leonards described above, the person trips generated by the development are 0.64 per unit during the AM peak hour and 0.54 per unit during the PM peak hour. This equates to a development person trip generation of 51 trips during the AM peak hour and 43 trips during the PM peak hour. The mode split for the development is estimated as presented in Table 4.

Table 4: Mode Share and peak period person trips

Mode Share		AM Peak Trips	PM Peak Trips
Car Driver	8%	4	3
Car Passenger	6%	3	3
Train / metro	31%	16	13
Bus	16%	8	7
Walk	35%	18	15
Cycling/Other	4%	2	2
Total	**100%**	**51**	**43**

4.3 Public transport

The development is forecast to generate demand for 16 trips by train/metro and 8 trips by bus during the AM peak hour. As shown in Figure 11, the distance to the train station approximately 800m, while the bus stops on Miller Street are approximately 250m away.

The new metro station entrance on McLaren Street is located 250m away (approximately 3 minute walk) of the proposed development, and will be operational from 2024.

There are a high number of bus services serving the stops on the Pacific Highway during the morning peak period, while trains operate at a 3-minute frequency through North Sydney. Once operational, the Sydney Metro is expected to operate at a 4-minute frequency.

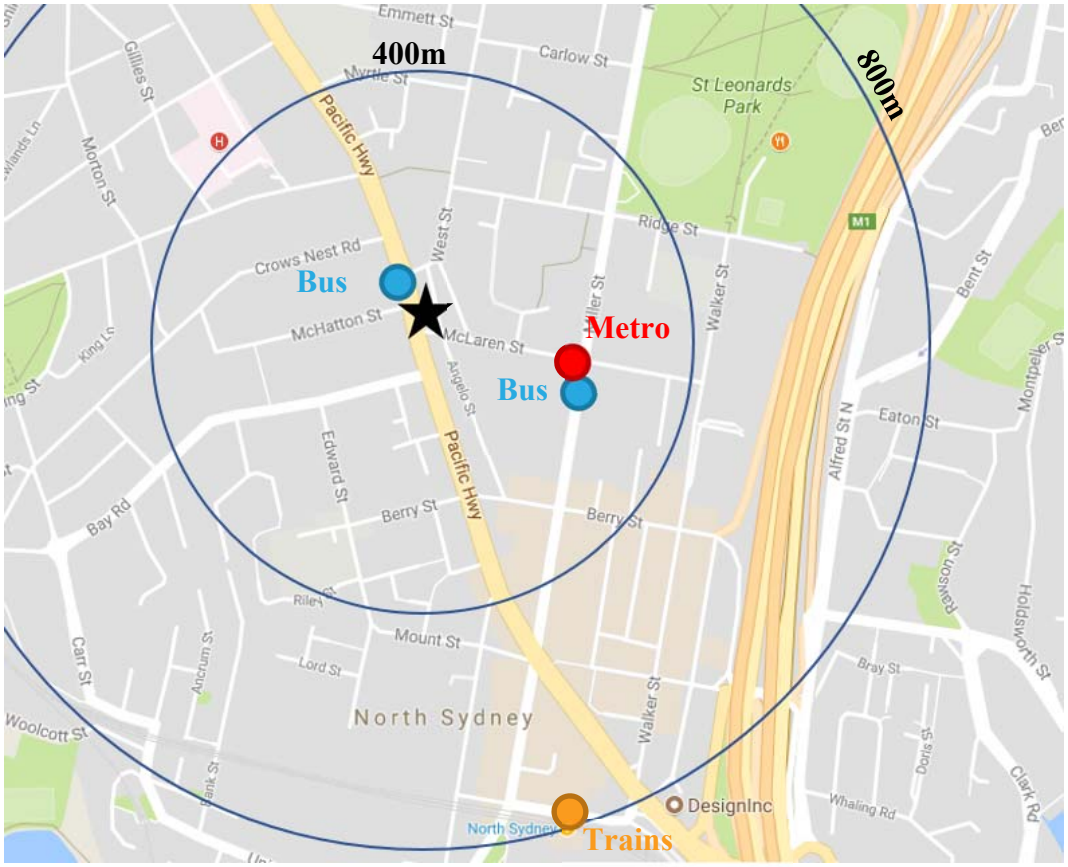

Figure 11: Distance to public transport stops

4.4 On-site car parking

The proposed residential parking provision of 40 spaces is well below the maximum allowable number of spaces permitted under Council's DCP of 80 spaces. This number of spaces is considered appropriate to meet the parking needs of the development while also minimising the impact on the adjacent road network by reducing traffic generation.

It is important to note that the actual supply of parking will have an influencing factor on traffic generation. Though this statement may seem obvious, current guidance does not correlate these two factors. Arup recently undertook research which considered the influencing factors that contribute to the level of traffic generated by high density residential developments. The research specifically considered how the provision of on-site parking and site location may influence traffic generation rates.

Key findings of the research were that the rate at which parking is provided within residential developments was found to influence the overall level of traffic generated by that development. Figure 12 shows the relatively positive correlation between peak hour traffic generation and parking provision.

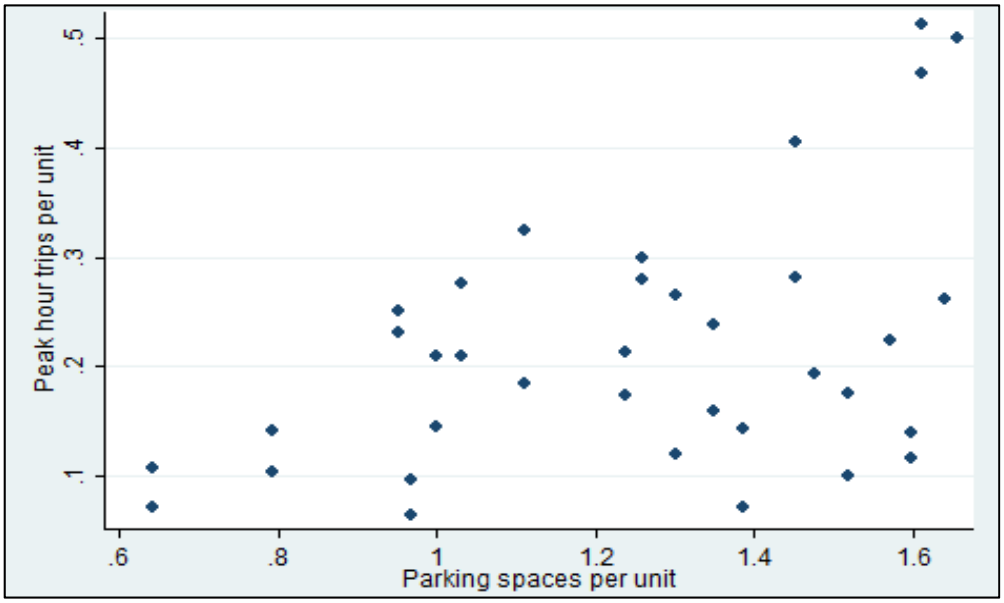

Figure 12: Correlation between peak traffic generation and parking spaces per unit

This strategy proposes car parking to be provided at rates lower than the maximum rates recommended by the North Sydney Council DCP.

5 Summary

Legacy Property engaged Arup to carry out a traffic and transport assessment of their proposed high density mixed use development at 253-267 Pacific Highway. Key findings of the study are as follows:

- The proposed residential parking provision of 40 spaces is well below the maximum allowable number of spaces permitted under Council's DCP of 64 spaces.
- On the basis of providing 40 residential car parking spaces for the 89 units, the development is estimated to generate only 4 vehicle trips during the AM peak hour and 3 vehicle trips during the PM peak hour.
- No parking is being provided for the retail uses, which will be mainly walk-up in nature.
- The future Victoria Cross Metro Station will significantly improve the accessibility of the development by foot and by public transport.
- Service bays are proposed in accordance with the requirements set out in the DCP; and
- Secure bicycle parking or relevant storage is to be provided as a component of the proposed development.

In summary, the proposed development is considered to have a minimal impact on the local transport network.