



# Transport Access Program

# **Pymble Station Upgrade**

## Supporting Studies



*Artist's impression of the proposed Pymble Station Upgrade, subject to detailed design*

# PYMBLE STATION

## Transport Access Program Traffic, Transport and Access Assessment

Prepared for:  
Transport for New South Wales

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## BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Transport for New South Wales (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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## DOCUMENT CONTROL

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## EXECUTIVE SUMMARY

### Background and upgrade work

Transport for New South Wales (Transport for NSW) has proposed the Pymble Station Upgrade (the 'Proposal'). The Proposal forms part of the Transport Access Program (TAP) which is a New South Wales Government initiative to improve existing transport infrastructure, including train stations, so they are modern, accessible, and secure. The primary aim is to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams, and customers with luggage.

The Proposal would include the following key elements:

- three new lifts connecting the existing footbridge to the Grandview Street station entrance, the Pacific Highway station entrance and the station platform
- upgrades to the Grandview Street station entrance including a widened footpath to allow for a new lift landing with a canopy
- modifications to the existing taxi rank and no parking zone to accommodate the widened footpath on Grandview Street
- two new accessible parking spaces and one accessible kiss and ride space at the Pacific Highway station entrance car park
- upgrades to the Pacific Highway station entrance including:
  - a three stop lift connecting the car park / accessible parking, the bus stop at street level and the footbridge
  - a new accessible path to the lift landing with a new canopy at car park level
  - a new lift landing at street level with footpath upgrades
  - a new widened stair entrance with canopy upgrades.
- upgrades to the existing footbridge including canopy extensions and anti-throw screens, and the conversion of the vacant kiosk to allow for a new lift landing
- canopy extension at platform level from the lift to the boarding assistance zone
- a new family accessible toilet and unisex ambulant toilet within the station building
- upgrade work to the existing stairs including replacement of treads and handrails
- improvements to station lighting and CCTV to improve safety and security
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system upgrade and new hearing induction loops
- modifications to the rail corridor fencing at the Grandview Street and Pacific Highway station entrances
- electrical upgrades for the new infrastructure, including a new padmount substation.

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## EXECUTIVE SUMMARY

### Existing conditions

station patronage data provided by Transport for NSW indicates that the average weekday passenger demand for the AM peak hour (07:00am – 08:00am) at Pymble Station was 657 persons in 2017. Existing station facilities include the following:

- one bike rack with capacity for six bicycles at each of the station entrances on Grandview Street and Pacific Highway
- stair access to the station from Grandview Street and Pacific Highway
- footbridge crossing the rail line and providing access to platforms
- signposted kiss and ride passenger set down / pick up and taxi facilities on Grandview Street
- informal kiss and ride facility in the car park at the Pacific Highway station entrance
- no commuter car parking facility.

The existing pedestrian footpaths constructed in the public road verges surrounding the station can generally be described as good quality although several examples were noted of localised narrowing adjacent to utility poles, sign posts, bins and fences which reduce the available path width on Grandview Street and Pacific Highway such that it would be very difficult or impossible for a person travelling in a wheelchair or a parent / carer walking with a pram to navigate.

There was no available pre-Covid-19 survey data for the kiss and ride and taxi zone activities. However, through a site inspection undertaken on Thursday 13/08/2020, it was observed that the activity in the kiss and ride and taxi zone spaces were relatively low.

### Operational impacts

Forecast station patronage data provided by Transport for NSW indicates that the Pymble Station annual customer demand will increase by 22% between 2017 and 2036 from 657 persons to 801 persons. An additional 15% has also been evaluated as a 'factor of safety' to ensure a conservative assessment. As such, the forecast daily design patronage for a 2036-time horizon is 921 persons.

The Proposal would enable more direct, legible and safe pedestrian routes. The Proposal would also improve compliance with the *Disability Discrimination Act (DDA)* and *Disability Standards for Accessible Public Transport (DSAPT)*. Overall, the user experience including amenity and convenience would be improved.

The existing facility design would be enhanced through improved geometry, line marking and wayfinding signage as part of the Proposal. However, the Proposal would reduce the capacity of taxi zone, kiss and ride or 1P parking spaces by approximately two spaces<sup>1</sup> on Grandview Street to accommodate a widened footpath. This is considered a minor impact based on our observations through a site inspection undertaken in August 2020. The proposed two new accessible parking spaces and one new accessible kiss and ride space in the car park at the Pacific Highway station entrance would require the reallocation of the parking spaces in this car park.

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<sup>1</sup> Subject to detailed design.

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## EXECUTIVE SUMMARY

The Proposal retains the same number of bicycle parking spaces in the same general locale.

Changes to existing traffic capacity and performance are projected to be insignificant given the relatively minor nature and scale of the improvements delivered as part of the Proposal. Whilst there would be some increase in station utilisation as a result of improvements to accessibility and amenity, it is expected that these incremental increases would not result in a material increase in traffic demand.

### Construction impacts

The following key construction-stage impacts are likely to be generated:

- increased construction vehicle traffic including light and heavy vehicles within the station precinct and along proximity roads and streets including Grandview Street and Pacific Highway (State Road A1) for movement to / from the two proposed construction compounds
- some inconvenience for pedestrian movements due to the construction zones and barriers along the footpath on Grandview Street adjacent to the Grandview Street station entrance
- temporary loss of approximately ten parking spaces in the car park at the Pacific Highway station entrance to allow for construction compound – 1 (site office and parking area for construction workers)
- temporary loss of approximately three taxi spaces when a crane or rigid vehicle park in the taxi zone adjacent to Grandview Street station entrance, to undertake work
- the Proposal is not expected to have parking impacts on Pacific Highway as clearways are in place on Pacific Highway from 06:00am to 07:00pm Monday to Friday and 09:00am to 06:00pm on Saturday, Sunday and public holidays
- potential confusion and loss of amenity to customers accessing the station via temporary and changed facilities during construction
- short-term occupation of kerbside space by cranes facilitating construction
- minor travel delays on account of likely Traffic Control Plan (TCP) implementation requiring some users to stop for construction traffic.

Construction impacts are considered to be manageable subject to the preparation and implementation of a Construction Traffic Management Plan (CTMP). The CTMP and subordinate Traffic Control Plans (TCP) should review issues and identify solutions and temporary arrangement to avoid, mitigate and manage risk involving construction activities, users of the transport system, and local residents.

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## Glossary of terms

Term Meaning	Term Meaning
AADT	Annual Average Daily Traffic
ABS	Australian Bureau of Statistics
AS	Australian Standards
ASA	Asset Standards Authority
BTS	Bureau of Transport Statistics, a division of Transport for NSW
CBD	Central Business District
CTMP	Construction Traffic Management Plan
DDA	<i>Disability Discrimination Act 1992</i> (Commonwealth)
DP&E	New South Wales – Department of Planning and Environment
DSAPT	Disability Standards for Accessible Public Transport
Fruin	John J Fruin, who pioneered studies on pedestrian flows and crowding levels. Fruin defined six levels of crowding for queueing areas, walkways and stairways, and given in terms of Levels of Service (LOS).
HV	Heavy vehicles
I & S	Infrastructure and Services, a division of Transport for NSW (formerly Transport Projects Division)
JTW	Journey to Work
LEP	Local Environmental Plan
LGA	Local Government Area
LOS	Level of Service – a qualitative measure of flow and crowding, with LOS A as the ‘most pleasant’ and F the ‘least pleasant’ in terms of pedestrian flow and crowding.
m	metres
mm	millimetres
NSW	State of New South Wales
OOHW	Out of Hours Work

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Term Meaning	Term Meaning
PEA	Preliminary Environmental Assessment
PLC	Presbyterian Ladies College
pmm	pedestrians per metre per minute, a measure of pedestrian flow rate
Rail possession	Possession is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
RailCorp	Rail Corporation New South Wales (now Sydney Trains)
REF	Review of Environmental Factors
Roads Act	<i>Roads Act 1993</i> (NSW)
TAP	Transport Access Program
TCP	Traffic Control Plan
TfNSW	Transport for New South Wales
TT&AIA	Traffic, Transport and Access Impact Assessment (this report)
TGSI	Tactile Ground Surface Indicator
TZ	Travel zone – a geographical unit used as a basis for travel data analysis and statistics.

# 1 Introduction

## 1.1 Background

Transport for New South Wales has proposed the Pymble Station Upgrade (the Proposal). The Proposal forms part of the Transport Access Program (TAP) which is a New South Wales Government initiative to improve existing transport infrastructure, including train stations, so they are modern, accessible, and secure. The primary aim is to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams, and customers with luggage.

In 2018, Stantec was commissioned by Transport for NSW to prepare concept plans and undertake option development for Pymble Station as part of the concept design project phase. A preferred concept has since been selected.

SLR Consulting (SLR) has been commissioned by Transport for NSW to undertake a review of traffic, transport and access matters as part of the Review of Environmental Factors (REF) for the proposal.

### 1.1 TAP objectives

The TAP aims to provide:

- stations that are accessible to people with a disability, limited mobility and parents with prams
- modern buildings and facilities for all modes that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between transport modes for all customers
- safety improvements including extra lighting, lift alarm, fences and security measures for car parks and interchanges, including stations, bus stops and wharves
- signage improvements so customers can more easily use public transport and transfer between modes at interchanges
- other improvements and maintenance such as painting, new fencing and roof replacements.

## 1.2 Proposal overview

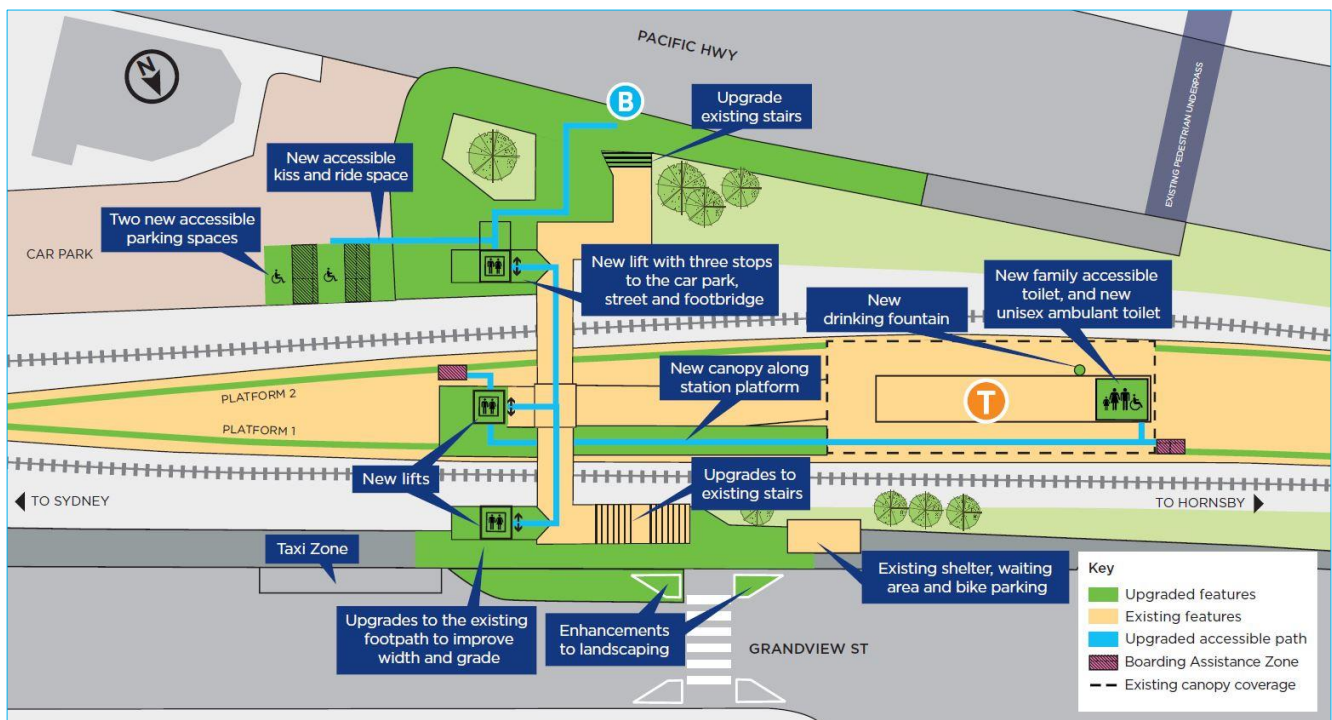
The Proposal involves an upgrade of Pymble Station which would improve accessibility and amenity for customers.

The Proposal would include the following key elements:

- three new lifts connecting the existing footbridge to the Grandview Street station entrance, the Pacific Highway station entrance and the station platform
- upgrades to the Grandview Street station entrance including a widened footpath to allow for a new lift landing with a canopy
- modifications to the existing taxi rank and no parking zone to accommodate the widened footpath on Grandview Street
- two new accessible parking spaces and one accessible kiss and ride space at the Pacific Highway station entrance car park
- upgrades to the Pacific Highway station entrance including:

- a three stop lift connecting the car park / accessible parking, the bus stop at street level and the footbridge
- a new accessible path to the lift landing with a new canopy at car park level
- a new lift landing at street level with footpath upgrades
- a new widened stair entrance with canopy upgrades.
- upgrades to the existing footbridge including canopy extensions and anti-throw screens, and the conversion of the vacant kiosk to allow for a new lift landing
- canopy extension at platform level from the lift to the boarding assistance zone
- a new family accessible toilet and unisex ambulant toilet within the station building
- upgrade work to the existing stairs including replacement of treads and handrails
- improvements to station lighting and CCTV to improve safety and security
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system upgrade and new hearing induction loops
- modifications to the rail corridor fencing at the Grandview Street and Pacific Highway station entrances
- electrical upgrades for the new infrastructure, including a new padmount substation.

Figure 1 provides a visualisation of scope of work as part of this Proposal.



**Figure 1: Overview of scope of work (indicative only, subject to detailed design)**

Source: Transport for NSW, 2020

## 1.3 Objectives of this proposal

The specific objectives of Pymble Station upgrades are as follows:

- provide a station that is accessible to those with a disability, the ageing and parents/carers with prams and customers with luggage
- improve customer experience (weather protection, better interchange facilities and visual appearance)
- minimise pedestrian conflict and crowding points
- improve integration with surrounding precinct
- improve customer safety (CCTV, lighting, stair and handrail upgrades)
- improve wayfinding in and around the station
- respond to the heritage values of the station
- improve customer amenity
- minimise impacts to existing vegetation.

## 1.4 Study scope

SLR Consulting (SLR) has been commissioned by Transport for NSW to prepare this Traffic, Transport and Access Impact Assessment which will form part of the Proposal REF. This report details consideration of the anticipated traffic, transport and access matters associated with the Proposal for inclusion in the REF. This consideration includes the following:

- existing traffic, transport and access conditions and facilities
- operational traffic impacts associated with the proposed facilities
- construction impacts associated with the Proposal
- potential mitigation measures recommended to avoid, mitigate or manage impacts.

This assessment has been prepared noting the following:

- stakeholder consultation was not conducted by SLR as part of this study
- construction activity assumptions were provided by Transport for NSW
- no traffic modelling or pedestrian count surveys was completed as part of this project, nor by other consultants during the concept design development phase given the Proposal is not anticipated to generate any significant additional or changes vehicle and pedestrian traffic demand.

## 1.5 Study area

Pymble Station is located approximately 21.5 kilometres northwest of the Sydney CBD and within the local government jurisdiction of the Ku-ring-gai Council. The station is situated in Pymble shopping village, between Grandview Street and Pacific Highway which are connected via the station's pedestrian footbridge.

The study area incorporates the station, the immediate fronting road and footpath system, kerbside kiss and ride and taxi facilities, and the "construction compound – 1" proposed in relation to the Proposal.

Additional consideration is also made for the area and transport systems surrounding the study area; however, this is not considered the primary area influenced by the Proposal.

The study area adopted by SLR is illustrated in Figure 2.



**Figure 2: Pymble Station study area**

Base map source: Nearmap, 2020

### 1.5.1 References

The following has been relied upon and/or referenced in undertaking this assessment:

- a site inspection undertaken by SLR Consulting staff Thursday 13 August, 2020
- Australian Standards AS2890 – Part 5 (2020): On-street car parking
- Australian Standards AS2890 – Part 6 (2009): Off-street car parking for people with disabilities
- RailCorp (May 2010). *Engineering Standard: Stations and Buildings – Station Design Standard Requirements: ESB 003 – Station Functional Spaces.*

## 2 Existing conditions assessment

### 2.1 Surrounding land uses

Located within the Ku-ring-gai Council LGA, the subject site is bound by the provisions of the *Ku-ring-gai Local Environment Plan 2015* and the *Ku-ring-gai Development Control Plan 2016*.

The *Ku-ring-gai Local Environmental Plan (Local Centres) 2012 Land Zoning Map Sheet LZN\_007C* designates the land on which the station is located as ‘SP2 Infrastructure’.

Land to the north of the station and railway line is classified as “B2 – local centre”, “RE1 – public recreation” and residential with varying densities ranging from “R2 Low Density Residential” to “R4 High Density Residential”.

South of the station and rail corridor is comprised of “R4 High Density Residential” and “R2 Low Density Residential”.

An extract from the *Ku-ring-gai Local Environmental Plan (Local Centres) 2012* map is provided in Figure 3.

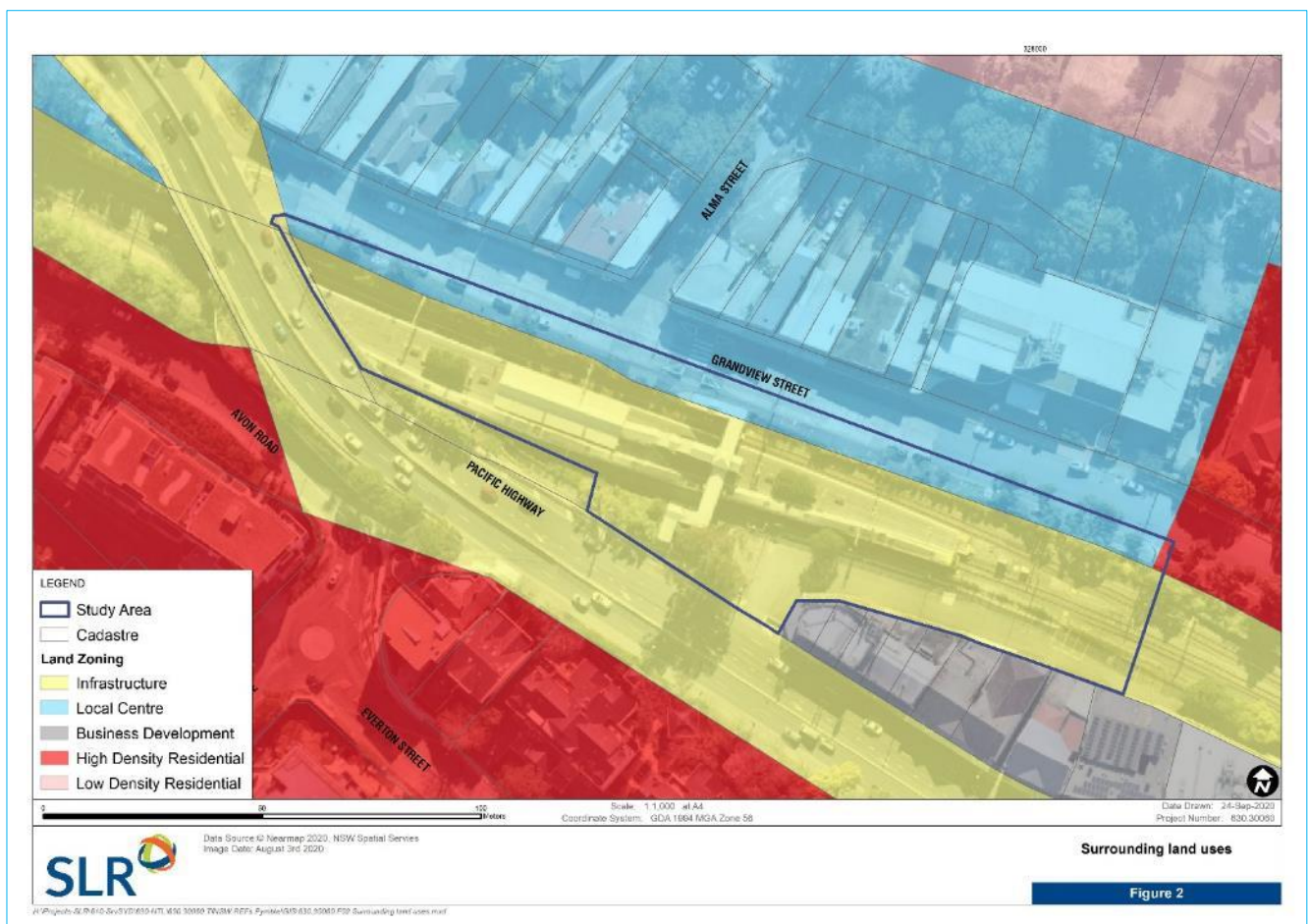


Figure 3: Surrounding land uses

Base map source: Nearthmap, 2020



## 2.2 Movement network

Pymble Station is surrounded by Grandview Street in the north and Pacific Highway (State Road A1) in the south. The main access to the station is from Grandview Street.

Grandview Street and Pacific Highway intersect to the west of the station and connect via an overpass to the east of the station.

The location of the station within the local road network is shown in Figure 4 and the characteristics of the nearby key roads and streets is summarised in Table 1.



Figure 4: Local context and surrounding road network

Base map source: Nearthmap, 2020

Road Name	Posted Speed Limit	School Zone	Configuration
Pacific Highway (State Road A1)	Arterial Road: 60km/h	No	5 marked lanes, divided carriageway, clearway restrictions apply 6am – 7pm Monday to Friday, 9am – 6pm Saturday, Sunday and Public Holidays.
Grandview Street	Local Road: 50km/h	No	2 unmarked lanes, undivided carriageway, a mixture of 1/2P and 1P parking restrictions. Station frontage: 2 unmarked lanes, undivided carriageway, no parking restrictions in the weekday peak hours to allow kiss and ride activity and a taxi zone

**Table 1: Surrounding road network characteristics**

## 2.3 Station access and facilities

### 2.3.1 Station facilities

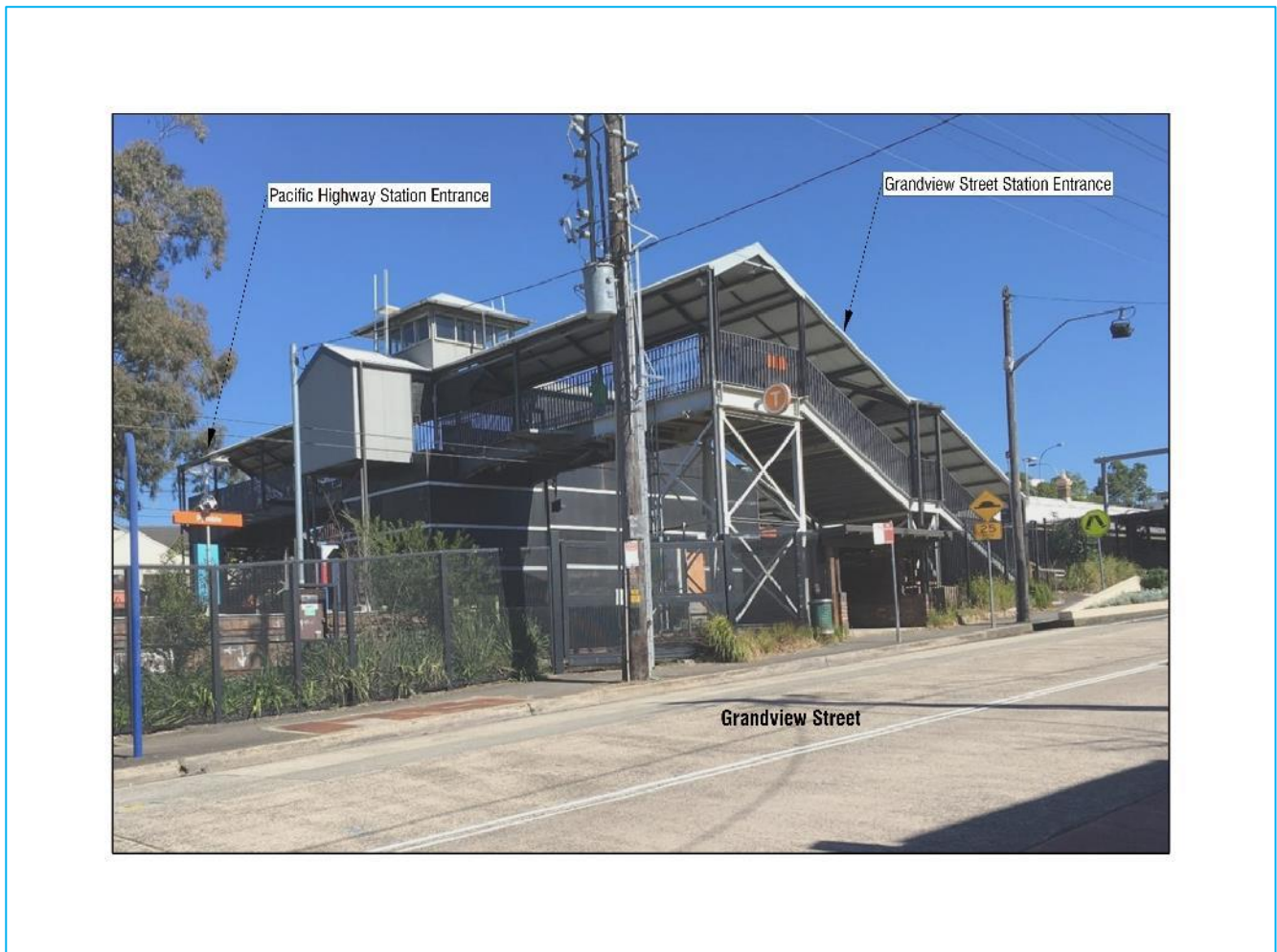
The following accessibility and convenience features are currently installed at the station:

- Opal integrated ticketing card top-up systems
- toilets (one female and one male, neither of which are wheelchair accessible)
- emergency help point
- hearing loop
- a PA system to broadcast audible / verbal announcements to passengers.

### 2.3.2 Pedestrians

#### 2.3.2.1 Pymble Station access

Pedestrian access to Pymble Station is currently possible from Grandview Street (north) and Pacific Highway (south). Both access locations require users to navigate stairs in order to reach train platforms as indicated in Figure 5.



**Figure 5: Access stairs at Pymble Station**

Given the lack of ramps or lifts, the Pymble Station does not currently accommodate persons with a disability, mobility impaired or elderly persons, or parents and carers with prams and is not DSAPT compliant.

### 2.3.2.2 External movement network

There are pedestrian footpaths on either side of the station. The footpath adjacent to the Grandview Street station entrance accommodates separate kiss and ride and taxi facilities that connect to the broader network including a marked zebra crossing from the shops in Pymble shopping village and the following:

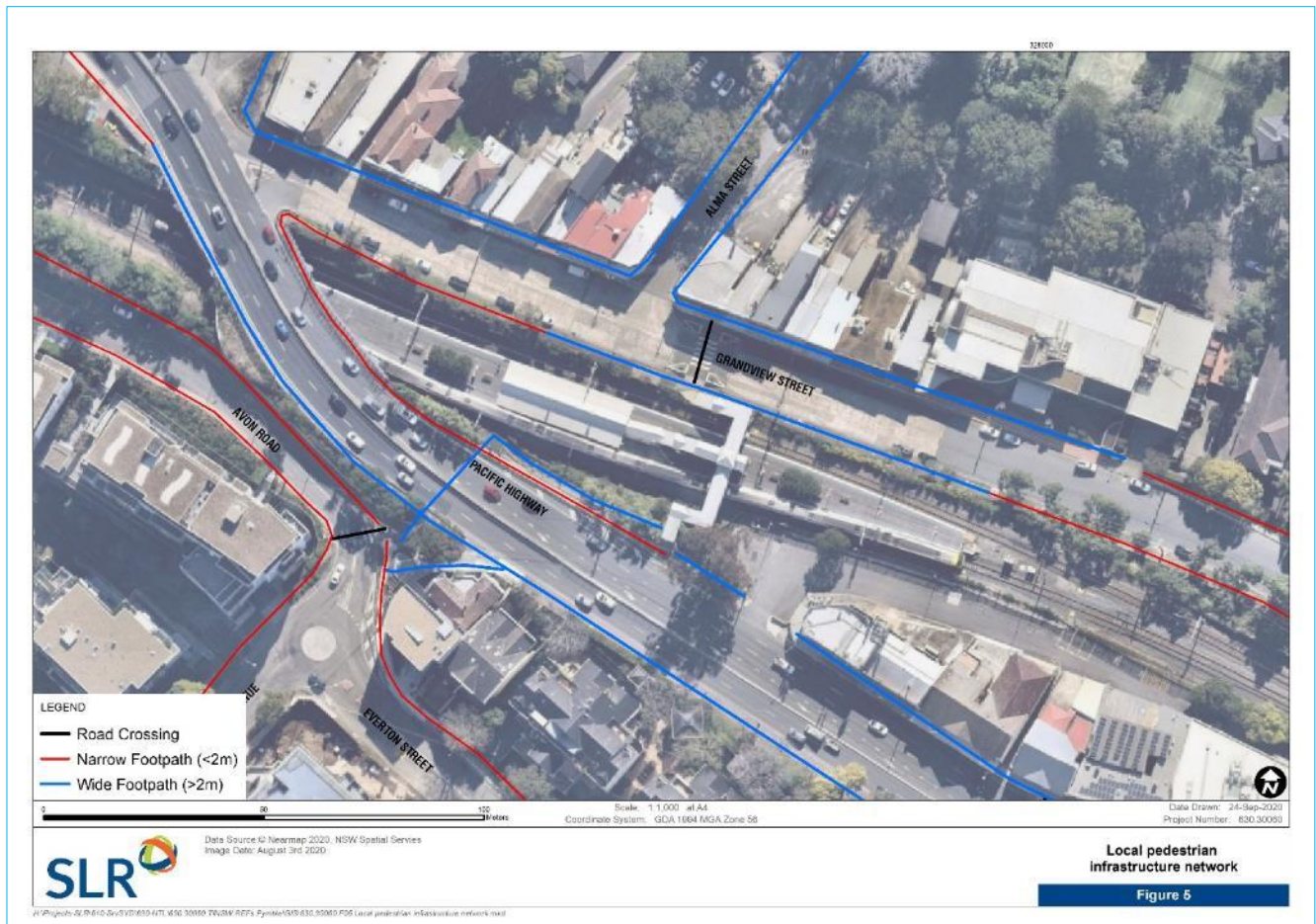
- Grandview Street – 3.5m footpath on the northern side and 3.0 metre footpath on the southern side of the carriageway, noting that there are a bus stop and a taxi zone on the southern side of the carriageway
- Alma Street – 2.0 metre footpath on both sides of the carriageway
- Station Street – 1.2 metre footpath on the western side and 1.8 metre footpath on the eastern side of the carriageway.

On the Pacific Highway station entrance, the following pedestrian infrastructure is currently provided:

- Pacific Highway – A footpath varying between 1.5 metres and 2.5 metres on the northern side of the carriageway and a bus stop on the northern side

- Pacific Highway – A footpath varying between 1.5 metres and 3.5 metres on the southern side of the carriageway, noting that there is an underpass facility for pedestrians connecting either side of Pacific Highway.

The extent of the surrounding pedestrian infrastructure is illustrated in Figure 6.



**Figure 6: Local pedestrian infrastructure network**

Base map source: Nearmap, 2020

The following constraints are noted:

- the light pole adjacent to Grandview Street station entrance narrows the footpath down to 1.5 metres or less. It was also observed that this area is cluttered with signage, posts, a bin and streetscape embellishment as shown in Figure 7.
- the footpath along Pacific Highway narrows down considerably at the railway overpass, at which point the only protection for pedestrians and cyclists from moving vehicles on Pacific Highway is a guardrail. This is not a significant issue for the commuters who reside in the north of Pacific Highway as they can use Grandview Street. Commuters who reside in the south of Pacific Highway however need to walk approximately 500m to Telegraph Road / Pacific Highway intersection and take the signalised crossing to avoid walking on this narrow path and behind guardrails on the overpass.



**Figure 7: Grandview Street footpath**

### 2.3.2.3 Pedestrian demand Study

No pedestrian count survey data was available from Grandview Street and Pacific Highway however very low pedestrian activity was observed during the site inspection on Thursday, 13<sup>th</sup> of August 2020.

## 2.3.3 Cyclists

### 2.3.3.1 Pymble Station access

At present, there are no means of transporting a bicycle to the station platform without having to carry it up (and down) one or two flights of stairs.

There is an unsheltered bicycle rack with capacity for approximately six bicycles on either side of Pymble Station, as indicated in Figure 8 and Figure 9.



Figure 8: Bicycle rack at Pacific Highway station entrance

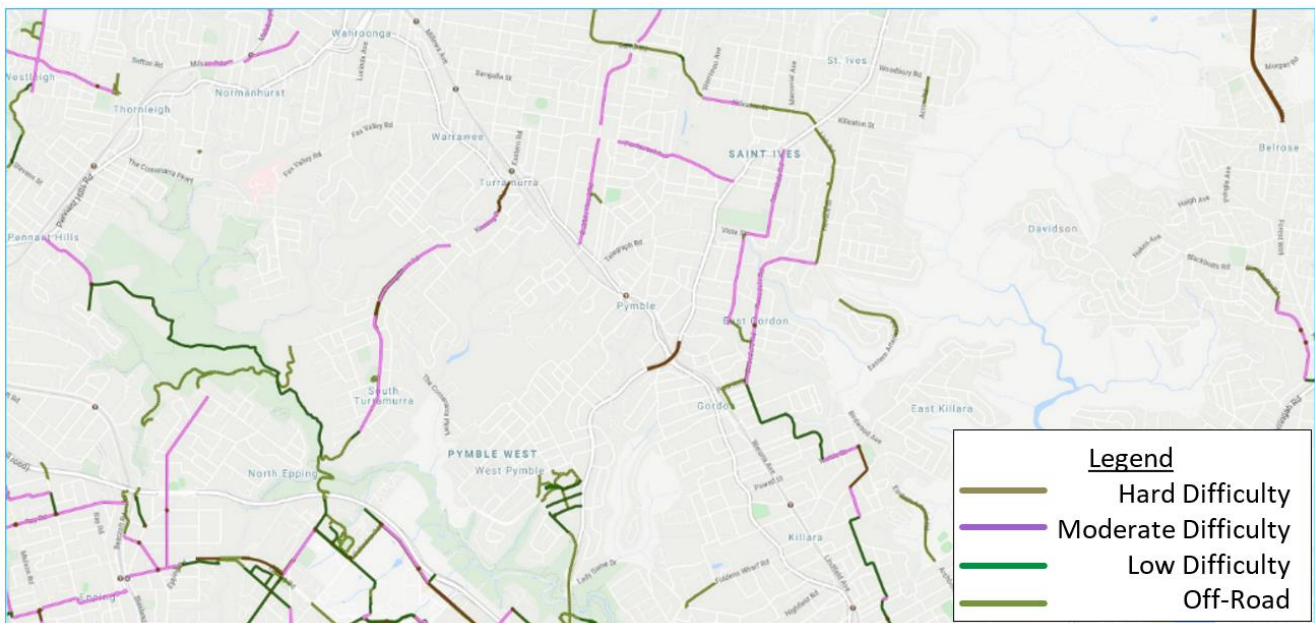


Figure 9: Bicycle rack at Grandview Street station entrance

### 2.3.3.2 External movement network

The cycling network surrounding Pymble Station is comprised of many discontinuous shorter segments. Based on the information obtained through Transport for NSW’s cycleway finder<sup>2</sup>, there are no formal cycle ways that provide access to Pymble Station. A review of the Ku-ring-gai cycle map provided on Council’s website<sup>3</sup> indicated that Telegraph Road and Livingstone Avenue are marked as “useful unmarked routes” and provide the most convenient access to Pymble Station for cyclists.

Figure 10 and Figure 11 provide an outline of the existing cycling network in the area.

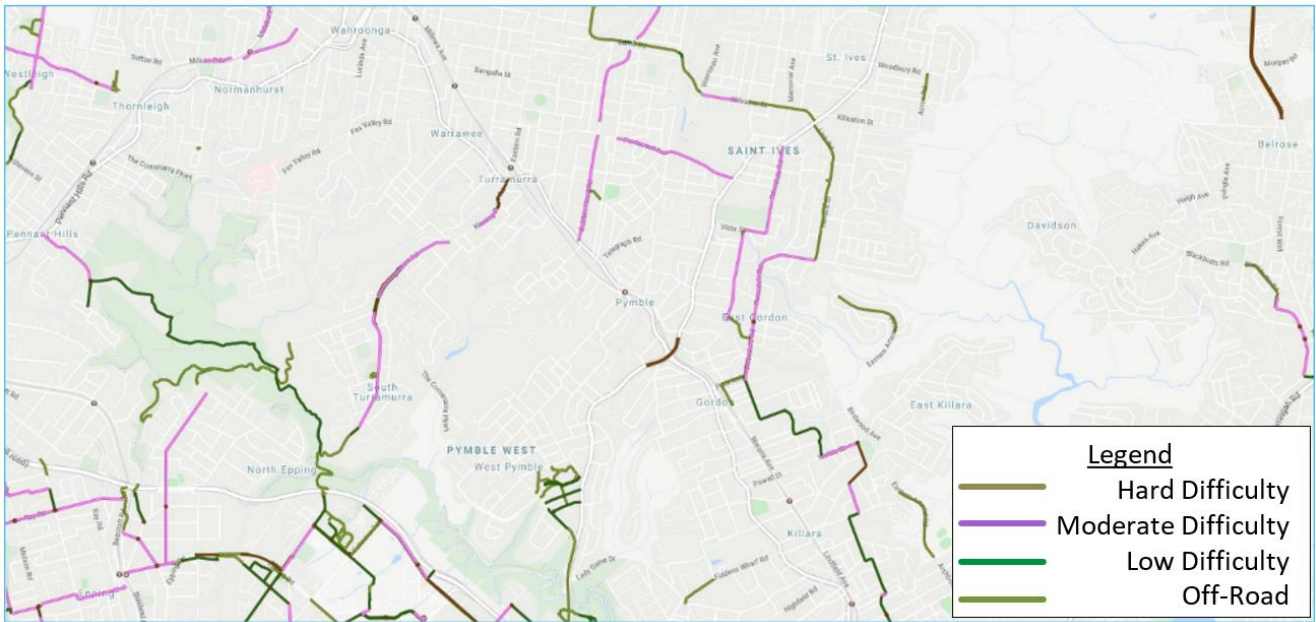


**Figure 10: Bicycle network – regional context**

Source: RMS Cycleway finder, October 2020

<sup>2</sup> [https://www.rms.nsw.gov.au/maps/cycleway\\_finder](https://www.rms.nsw.gov.au/maps/cycleway_finder)

<sup>3</sup> [http://www.kmc.nsw.gov.au/Services\\_facilities/Basics/Cycling](http://www.kmc.nsw.gov.au/Services_facilities/Basics/Cycling)



**Figure 11: Bicycle network – local context**

Source: RMS Cycleway finder, October 2020



## 2.4 External transport network and interchange facilities

### 2.4.1 Rail

#### 2.4.1.1 Services

Pymble Station is part of the T1 North Shore & Western Line and is well serviced by frequent trains travelling between Berowra and Central Station.

Figure 12 provides an overview of T1 North Shore & Western Line.



**Figure 12: Location of Pymble Station within Sydney Trains network**

Source: <https://transportnsw.info/sydney-trains-network-map>

Service frequency of T1 North Shore Line is summarised in Table 2.

Destination	Operating Days	Service Frequency
Central	Monday to Friday	Peak: approx. 6-9 mins Off-peak: approx. 15 mins
	Weekends and public holidays	approx. 15 mins

**Table 2: Pymble Station service frequency**

Source: <https://transportnsw.info/documents/timetables/93-T1-North-Shore-Line-20200524.pdf>

#### 2.4.1.2 Patronage

Station patronage data provided by Transport for NSW indicates that the average weekday passenger demand for the AM peak hour (07:00am – 08:00am) at Pymble Station was 657 persons in 2017.

#### 2.4.2 Bus

##### 2.4.2.1 Services and Stops

There are four bus stops in close proximity to Pymble Station, as follows:

- two bus stops on Grandview Street, to the north of Pymble Station (stop ID: 207332 in the eastbound direction and another bus stop which appears to be inactive at the moment)
- two bus stops on Pacific Highway, to the southeast of Pymble Station (stop ID: 207311 in the southbound direction and stop ID: 207322 in the northbound direction)

The locations of these stops are shown in Figure 13 to Figure 15.



**Figure 13: Bus stops adjacent to Pymble Station**

Base map source: Nearmap, 2020



It should be noted that the bus stop in the eastbound direction in Grandview Street operates between 6:30am-9am and 3pm-7pm only, as shown in Figure 14.

**Figure 14: Bus stop at across Grandview Street station entrance (stop ID: 207332)**



**Figure 15: Bus stop at Pacific Highway station entrance (stop ID: 207311)**

Table 3 and Table 4 summarise the public bus routes and school services that utilise these bus stops.

Service	Route	Approximate Peak Hour Frequency	Approximate Off-Peak Hour Frequency
579	Pymble to East Turramurra	15-20 mins	does not operate
579	East Turramurra to Pymble	Once per weekday	does not operate
152*	Pymble Station to Brigidine College	Once per weekday	does not operate
161*	Pymble Station to Sydney Japanese International School	Once per weekday	does not operate
195S2*	Pymble Station to Brigidine College via St Ives Chase	Once per weekday	does not operate
196S4	Pymble Station to Pittwater Place Shopping Centre via North Narrabeen	Once per weekday	does not operate
196S5	Pymble Station to Pittwater Place Shopping Centre	Once per weekday	does not operate
196S6	Pymble Station to Pittwater Place Shopping Centre	Once per weekday	does not operate
8027	Pymble Station to St Ives HS	Once per weekday	does not operate
8116*	Pymble Station to Northern Beaches Christian School	Once per weekday	does not operate

**Table 3: Pymble Station bus services (stop ID: 207332)**

Note: \* indicates school service.

Source: <https://transportnsw.info/routes/bus>

Service	Route	Approximate Peak Hour Frequency	Approximate Off-Peak Hour Frequency
575	Macquarie University to Hornsby via Turramurra	20 mins	30mins
N90	City Town Hall to Hornsby via Chatswood	-	Four times a night
N90	Hornsby to City Town Hall via Chatswood	-	Five times a night
9039*	Pymble Public School to Pymble Station	Once per weekday	does not operate
9080*	Pymble Public School to Gordon Station	Once per weekday	does not operate

**Table 4: Pymble Station bus services (stop ID: 207311 and 207322)**

Note: \* indicates school service.

Source: <https://transportnsw.info/routes/bus>

## 2.4.3 Kiss and ride and taxi zone

### 2.4.3.1 Facilities

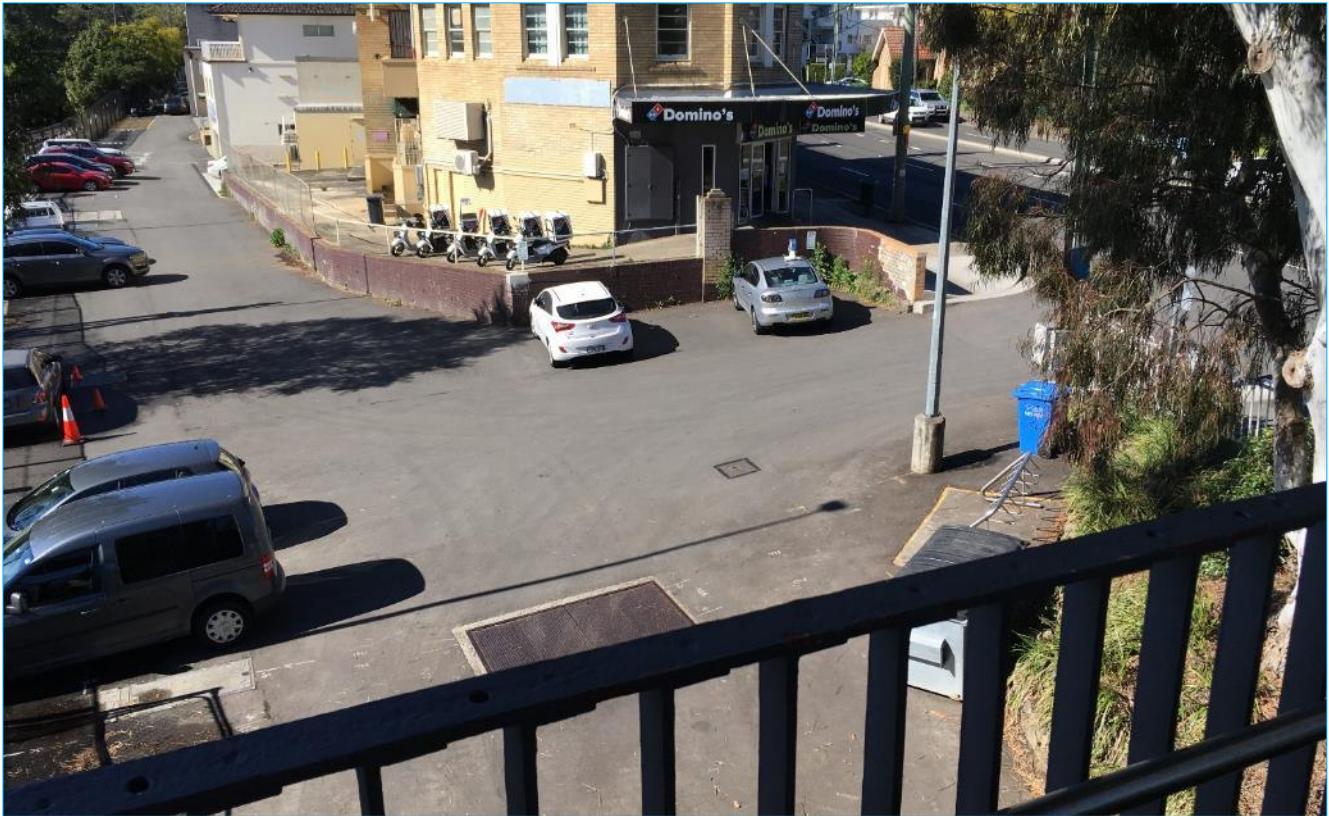
Kiss and ride and taxi facilities are currently provided on Grandview Street frontage only. There is a taxi zone that can accommodate four taxis and No Parking restrictions for two light vehicles to enable kiss and ride activity.

On the Pacific Highway side however, there are no formal taxi or kiss and ride facilities. Nonetheless, site observations have confirmed that open space in the laneway and parking areas near the refuse bins are used by motorists picking-up and setting down passengers.

Kiss and ride and taxi facilities on both sides of Pymble Station are illustrated in Figure 16 and Figure 17.



Figure 16: Taxi zone on Grandview Street to the north of Pymble Station



**Figure 17: Informal kiss and ride and taxi drop-off**

#### **2.4.4 Parking**

There is no commuter car parking facility available to users of Pymble Station. There is however a car park owned by RailCorp at the Pacific Highway station entrance to the southeast of Pymble Station in a laneway off Pacific Highway. This car park provides an approximate of 10-12 short-term parking (1P and 2P) spaces.<sup>4</sup>

It is understood that this car park is leased to Ku-ring-gai Council by Transport for NSW.

A review of the surrounding road network indicated that commuters park their vehicles on Grandview Street between the railway overpass and Wellesley Road. There are approximately 40 informal on-street angle parking spaces at this location. Parking at this location is illustrated in Figure 18.

<sup>4</sup> Subject to how vehicles are parked in the unmarked spaces on the day of observation (i.e. 90-degree angle or in parallel with tracks).



**Figure 18: Informal long-term parking activity on Grandview Street**

Base map source: Nearmap, 2020

A review of Nearmap historical aerial imagery between 20/10/2009 and 28/02/2020 (pre-COVID) indicated that this vacant land was typically at capacity with vehicles on almost every weekday.

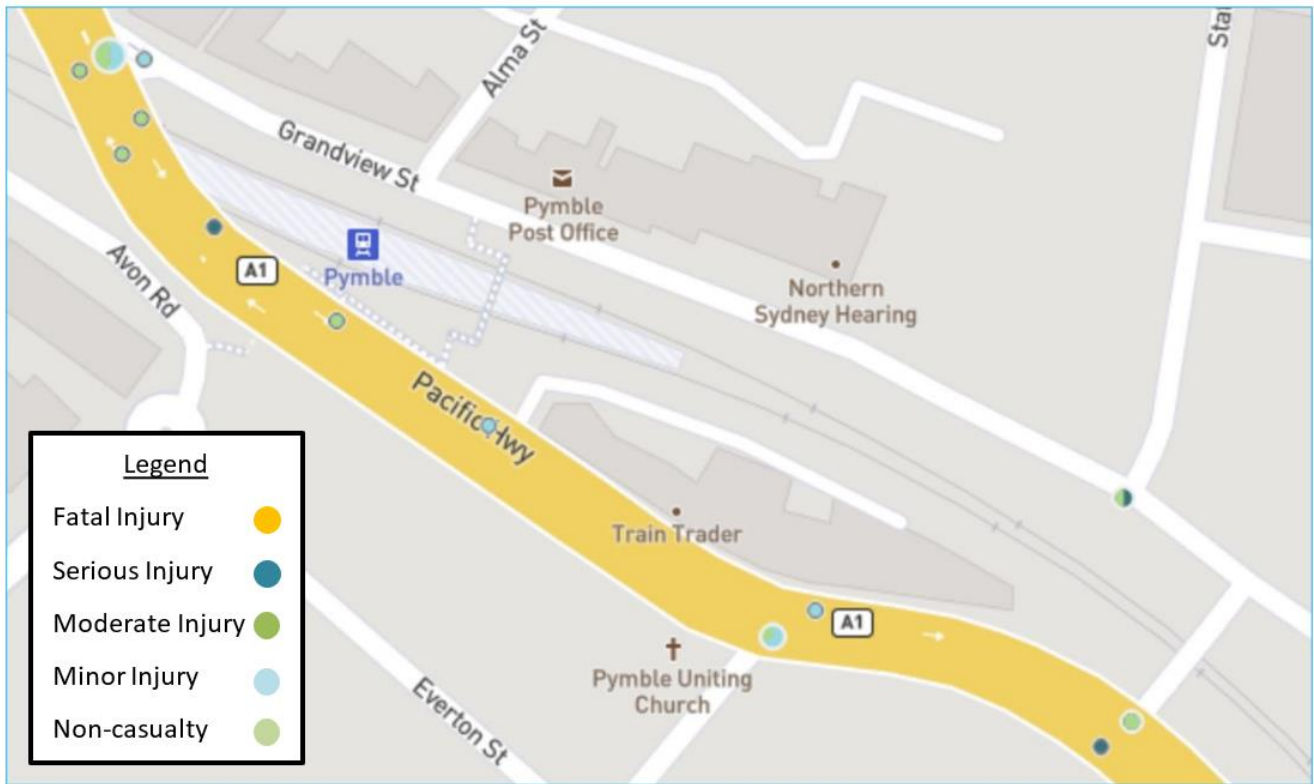
## 2.5 Road safety

Crash statistics from the Transport for NSW Centre for Road Safety suggest that there were no reported fatal crashes in the area between 2014 and 2018.

There were however three reported crashes that resulted in serious injuries. These crashes took place at Pacific Highway in the southbound direction to the north of Pymble Station, Pacific Highway in the northbound direction near railway overpass and at the intersection of Station Street and Grandview Street in the northbound direction.

A total of 16 incidents were noted for the period 2014-2018. A summary of this crash history is illustrated in Figure 19.





**Figure 19: Transport for NSW crash history adjacent to Pymble Station**

Source: Transport for NSW, 2020

A detailed summary of this crash history and causes of crashes are provided in Table 5.

Location	Crash ID	Year	Severity	Rum Code	Description
Pacific Highway / Grandview Street	1007303	2014	Minor injury	33	Lane sideswipe
Pacific Highway / Grandview Street	1052715	2014	Non-casualty (tow away)	30	Rear end
Pacific Highway near Pymble Station	1048737	2014	Non-casualty (tow away)	71	Left off carriageway into object / parked vehicle
Pacific Highway / Railway Overpass	1019427	2014	Non-casualty (tow away)	30	Rear end
Pacific Highway / Railway Overpass	1030478	2014	Non-casualty (tow away)	21	Right through
Pacific Highway / Grandview Street	1082600	2015	Minor injury	45	Reversing
Pacific Highway / Grandview Street	1069171	2015	Non-casualty (tow away)	39	Other same direction
Pacific Highway near the laneway (near Pymble Station)	1063306	2015	Minor injury	7	Driveway
Grandview Street / Station Street	1073958	2015	Non-casualty (tow away)	81	Off Carriageway left on right bend into object / parked vehicle
Grandview Street / Station Street	1074239	2015	Serious injury	85	Off carriageway right on left bend into object / parked vehicle
Pacific Highway / Grandview Street	1098530	2016	Minor injury	0	Ped nearside
Pacific Highway / Grandview Street	1116215	2016	Minor injury	45	Lane change left
Pacific Highway between Grandview Street and Pymble Station	1127021	2016	Serious injury	34	Lane change right
Pacific Highway / Livingstone Avenue	1098977	2016	Minor injury	30	Rear end
Pacific Highway / Grandview Street	1125097	2017	Non-casualty (tow away)	83	Off Carriageway right on right bend into object / parked vehicle
Pacific Highway / Livingstone Avenue	1136676	2017	Minor injury	16	Left near
Pacific Highway / Livingstone Avenue	1161806	2018	Non-casualty (tow away)	30	Rear end
Pacific Highway / Railway Overpass	1171672	2018	Serious injury	34	Lane change right

**Table 5: Transport for NSW crash history in the vicinity of Pymble Station**

Source: Transport for NSW, 2020

## 3 Proposal description

### 3.1 Station access upgrades

Details of the proposed work to improve accessibility and customer experience are as follows:

- construction and installation of three lifts connecting to the existing footbridge which would include:
  - installation of a lift at the Grandview Street station entrance
  - installation of a lift at the Pacific Highway station entrance from the car park, to the street level and the footbridge
  - installation of a lift on the station platform
  - lift landings with canopies for weather protection at the waiting areas.
- canopy extensions from the platform lift to the boarding assistance zone to provide covered access
- service relocations and adjustments to drainage, electrical and communications services for the installation of the lifts
- retention of the existing footbridge with minor modifications which would include:
  - new stairs and canopy at the Pacific Highway station entrance to create a wider entrance (requires demolition of the existing stairway and portion of the canopy)
  - upgrade work, including regrading at the landings to the lifts, replacement of tactile ground surface indicators (TGSIs) on the stairs and the installation of new directional TGSIs, stair nosings and handrails.
- a new accessible path at the Pacific Highway station entrance connecting the car park at the Pacific Highway station entrance to the lift landing, the bus stop on the Pacific Highway and the new widened stair entrance
- modifications to the existing taxi zone and no parking zone to accommodate a widened footpath on Grandview Street
- two new accessible parking spaces and one new accessible kiss and ride space in the car park at the Pacific Highway station entrance
- localised regrading of a section of the car park at Pacific Highway station entrance, from the two new accessible parking spaces to the lift landing
- landscaping work and adjustments to wayfinding.

### 3.2 Station building and platform modifications

Following modifications to the station building and platform are proposed:

- a new family accessible toilet and unisex ambulant toilet within the station building (to replace the existing male/female toilet facilities). This would include:
  - removal of the existing internal walls and fittings
  - installation of new fittings, fixtures, finishes, services connections (water, wastewater, electrical, and mechanical services)

- adjustments to the doorways and access provisions including the requirement to lower the floors to provide level access and the provision of remote access control
- upgrades to the electrical distribution board within the station building, including associated trenching and cabling within the platform to connect to the new padmount substation
- improvements to station lighting and CCTV to increase safety and security
- improvements to customer information and communication systems, including public address (PA) system upgrades, new hearing induction loops within the station platforms, and a new Opal card reader at the lift landing on the station platform
- new TGSIs (including along the length of both platform edges and at the base of the footbridge stairs).

Following ancillary upgrades are also proposed in addition to the main station access, station building and platform upgrades:

- regrading and resurfacing of the platform to provide compliant paths of travel between the lift, boarding assistance zones, family accessible toilet and other facilities on the platforms
- resurfacing other areas of the platform which are impacted by construction activities, including services trenching work
- new stormwater drainage connections from the new lifts to the existing stormwater system
- services and utilities protection, adjustments and/or relocations to accommodate the new work
- upgrades to the station power supply to cater for the new lifts including:
  - undergrounding of the overhead wiring in Grandview Street and other aerial lines in proximity to the Proposal
  - replacement of the existing transformer with a new pad mount substation
  - upgrades to the station distribution board.
- earthing and bonding of electrical equipment and new or modified structures
- fire safety modifications including the provision of a portable fire extinguisher and upgrades to the station distribution board
- adjustments to the station furniture including rubbish bins, payphone and the installation of a new drinking fountain
- new / upgraded wayfinding signage and other station signage
- adjustments to rail corridor boundary and fencing.

## 3.3 Interchange facilities including external movement networks

### 3.3.1 Pedestrians

Localised footpath enhancement work is proposed consisting of the following:

- upgrade work including footpath widening in the southern side of Grandview Street and regrading of the area to achieve a maximum cross fall of 1:40 between the lift landing and taxi zone
- modifications to wayfinding signage.

### 3.3.2 Bicycle parking

- no changes are proposed to the existing bicycle racks and parking arrangements.

### 3.3.3 Public transport

No changes to the bus capacity or operation of the existing stops are proposed. However, it is proposed that the bus stop adjacent to Pacific Highway station Entrance could be temporarily relocated about 50 metres south during the construction stage.

### 3.3.4 Kiss and ride and taxi facilities

No changes are proposed to the existing kiss and ride facilities adjacent to the bus stop in the southern side of Grandview Street.

However, in order to widen the footpath in the southern side of Grandview Street, the existing taxi zone is proposed to be relocated further south by approximately 20 metres.

### 3.3.5 Parking

No significant changes are proposed with respect to the provision of parking except for the following:

- two new accessible parking spaces and one new accessible kiss and ride space in the car park at the Pacific Highway station entrance, including pavement cross-fall adjustments, line marking and signage modifications
- the relocation of the existing taxi zone in Grandview Street further south will reduce the kerbside storage capacity<sup>5</sup> of approximately two taxi zone, kiss and ride or 1P parking spaces on Grandview Street due to the footpath widening.

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<sup>5</sup> Subject to detailed design.

## 4 Operational impacts

### 4.1 Future demand

Forecast station patronage data provided by Transport for NSW indicates that the average weekday passenger demand for Pymble Station is expected to increase by 22% from 657 persons in 2017 to 801 persons in 2036.

An additional 15% has also been evaluated as a 'factor of safety' to account for any unforeseen circumstances and to provide a conservative assessment. As such, the forecast daily design patronage for a 2036-time horizon is 921 persons.

The projected passenger demands are summarised in Table 6.

Year	AM Peak Hour Demand	Assumed Peak Train (AM boarding / PM alighting)	Assumed Peak Train (AM alighting / PM boarding)
2017	657	146	52
2036	801	178	63
<b>Design (2036 + 15%)</b>	<b>921</b>	<b>205</b>	<b>72</b>

**Table 6: Pymble Station patronage demand and forecasts**

Source: Transport for NSW, 2020

### 4.2 Public transport

The Proposal is not projected to have any material impact on the existing operation of public transport services, nor would it prejudice future planning and design for services. The existing timetable arrangements are not affected by the Proposal and the minimal increase in station demands would not require changes to existing service.

If the Proposal is to impact public transport in any way, it is likely to be positive given the proposed accessibility enhancements would improve movement between modes.

### 4.3 Pedestrians

#### 4.3.1 Pedestrian improvements

The Proposal would significantly enhance pedestrian accessibility given the inclusion of facilities such as new lifts to each platform and station access and improvements to the canopy. Beyond station accessibility, these enhancements would also serve to improve the connection across the rail corridor and improve user amenity.

The new lifts in particular are integral in allowing all areas of the station to be accessed by persons with a disability or mobility impairment, which is not currently possible given the design of the existing pedestrian footbridge. This would facilitate improved community outcomes by increasing the independence and mobility of the local community regardless of their level of mobility, therefore reducing reliance on private vehicles as a means of travel.

The proposed external footpath upgrades on Grandview Street would also provide similar benefits through eliminating trip hazards as well as enhancing circulation by widening the paths, especially adjacent to the taxi zone, bus stop, and kiss and ride facility (adjacent to the location with no parking restrictions).

All footpaths that form part of the Proposal must be a minimum of 1.2 metres wide in accordance with DSAPT and AS1428, although 1.5 metres is desirable.

### 4.3.2 Capacity assessment

A pedestrian capacity assessment has been performed by Stantec<sup>6</sup> in 2019 to determine whether the existing arrangements would provide sufficient capacity for pedestrian movement before and after implementation of the proposed enhancements.

It is expected that a level of service C could be achieved in 2036 AM peak period as the customers would arrive in the period between train services (6 to 9 mins in the AM peak period).

In the PM peak however, it is expected that a level of service lower than C would be achieved in the PM peak period in 2036 due to majority of customers alighting from PM peak trains at the same time.

Lifts are not expected to make future customer level of service any worse than the predictions as all customers are assumed to take the stairs as part of this study.

The capacity assessment was done at the footbridge, the narrowest point through, which pedestrians must travel to access the station. It is worth noting that this Proposal does not propose to change the width - and therefore the pedestrian capacity - of the footbridge in any way.

This capacity assessment was undertaken in accordance with RailCorp's *Engineering Standard: Stations and Buildings - Station Design Standard Requirements: ESB 003 - Station Functional Spaces*, which mandates a minimum standard of Level of Service (LOS) C as determined by the Fruin Theory. This theory assesses capacity in terms of pedestrian throughput within a certain width, in this case pedestrians per metre per minute (pmm), and then classifies the results according to the categories specified in Table 7.

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<sup>6</sup> Stantec report dated 15/02/2019, Scoping Design Report: Pymble Station

Level of Service	Pedestrian Flow Rate (pmm)
A	0-23
B	23-33
C	33-49
D	49-66
E	66-82

**Table 7: Pedestrian level of service using the Fruin Theory**

## 4.4 Cyclists

The Proposal would retain the same number of bicycle parking spaces at the Grandview Street and Pacific Highway station entrances (twelve spaces in total). Based on current station patronage and observed demand for the existing parking, this supply is considered reasonable and can accommodate the existing and any projected increase attributable to the Proposal.

## 4.5 Kiss and ride and taxi facilities

The Proposal does not include modifications to the operations of the existing kiss and ride facilities; however, it is proposed that the taxi zone on Grandview Street would be relocated further south by approximately 20 metres to allow for the widening of the footpath adjacent to the Grandview Street station entrance. The Proposal also seeks to formalise and enhance the existing facilities by improving line marking and signage and kerbs adjacent to the Grandview Street station entrance.

The improved Grandview Street station entrance would improve safety and amenity for motorists and loading / unloading passengers contingent on the proposed reconfiguration of kerbs and line marking being such that the design accords with AS2890.5 whereby kiss and ride and taxi spaces are at least 2.1 metres (minimum) and 2.3 metres (desirable) wide.

## 4.6 Parking

The Proposal includes the provision of two new accessible parking spaces in the car park at the Pacific Highway station entrance. The design of the two new accessible parking spaces and the associated passenger loading areas should be refined in the detailed design stage and should accord with AS2890.6.

The widening of the footpath adjacent to the Grandview Street station entrance will permanently reduce the kerbside storage capacity by approximately two taxi zone, kiss and ride or 1P parking spaces on Grandview Street. The widened footpath would immediately impact the taxi zone spaces however by relocating these taxi zone spaces to the east, this impact could be compensated by the removal of two kiss and ride or 1P parking spaces<sup>7</sup>.

<sup>7</sup> Subject to detailed design.



There was no available pre-Covid-19 survey data for the kiss and ride and taxi zone activities. However, through a site inspection undertaken on Thursday 13/08/2020, it was observed that the activity in the kiss and ride and taxi zone spaces were relatively low. It is expected that the impacts of removing these two spaces will be minimal.

Although the station improvements may encourage additional passenger throughout and associated demand for accessible parking spaces, this is expected to be relatively minor given the primary focus of the Proposal is improving accessibility for mobility impaired customers rather than increasing utilisation and passenger capacity.

## 4.7 Traffic impacts

Consistent with that noted above with respect to kiss and ride, taxi facilities and car parking, the Proposal is not projected to generate a material volume of additional traffic movements that would have an impact on the existing operational performance or capacity of the surrounding road network.

On the other hand, given the key attraction of the Proposal is for persons with a disability and mobility impairments, the elderly, as well as parents / carers with prams - i.e. those who are unlikely to travel to the station via active or public transport - any new demand generated by the Proposal is likely to manifest in additional traffic. This increase is expected to be relatively small in magnitude and is thus unlikely to result in a significant deterioration in local traffic conditions.

## 4.8 Property access

The Proposal is not expected to have any impact on existing property accesses within the vicinity of the station.

## 4.9 Safety

The Proposal is expected to improve pedestrian safety and mobility to / from and surrounding the station given the installation of widened paths and new lifts. The enhancement of existing kiss and ride and taxi facilities is also likely to improving safety by minimising conflicts between pedestrians and vehicles.

## 5 Construction impacts

### 5.1 Construction work

The key construction activities as part of the upgrade of Pymble Station are expected to primarily consist of construction of the lift shafts and associated footbridge, as well as the internal renovation of the station building and regrading of the areas adjacent to Pacific Highway and Grandview Street station entrances. Limited earthwork and excavation are expected as part of the work, including that for the following:

- construction of the lift shafts as a result of open cut excavations
- demolition of the stairs and construction of new walkway at the Pacific Highway station entrance
- localised regrading / resurfacing of the footbridge
- footpath modifications at Grandview Street
- localised platform regrading / resurfacing work
- localised regrading of the car park at Pacific Highway
- other minor civil work including footings and foundations for structures, drainage / stormwater work, and trenching activities for service adjustments and relocations.

The amount of excavated material in cubic metres is expected to be 150 – 250 cubic metres at this stage and this will be confirmed at a later stage subject to detailed design. Excavated material would be re-used on site where possible or disposed of in accordance with relevant legislative requirements.

The source and quantity of materials would be determined during the detailed design phase. Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

As part of the construction work, ancillary facilities would also be required to accommodate the needs of construction workers. Two adjacent compounds will be required to undertake the work listed above, one being a site office and parking area and another for the materials to be laid down.

Figure 20 indicates the proposed location of the “construction compound - 1” (site office and a small parking area for a portion of the construction workers), to be provided in the car park at the Pacific Highway station entrance. Majority of the construction workers would be expected to park away from the station and carpool where practicable.



**Figure 20: Construction compound 1 in the car park off Pacific Highway**

Base map source: Nearmap, 2020

Figure 21 indicates the proposed location of the “construction compound – 2” (material lay down area), within the railway corridor boundaries off Grandview Street.



**Figure 21: Construction compound 2 within railway corridor off Grandview Street**

Base map source: Nearthmap, 2020

Subject to detailed design, other worksite areas may be established during the construction period and would be staged to minimise the inconvenience to the customers and adjacent public areas, and would include suitable demarcation hoarding or fencing, including for the following:

- worksite areas on the station platforms, ensure access to the station platform is available at all times when trains are running
- worksites in and around the existing footbridge, including:
  - for footbridge upgrades
  - for the lift construction.
- worksites external to the rail corridor for utility protection, adjustments or diversions and power supply upgrade work
- worksites for interchange work within the adjacent road reserves.

## 5.2 Hours of work

The majority of work would be undertaken during standard construction hours, which are as follows:

- 7.00 am to 6.00 pm Monday to Friday
- 8.00 am to 1.00 pm Saturdays
- no work on Sundays or public holidays.

Certain work may need to occur outside standard hours and would include night work and work during approximately six track possessions (which are scheduled closures that would occur regardless of the Proposal, when part of the rail network is temporarily closed and trains are not operating).

A number of these track possession would take place on weekends as well as on weekdays, and for the North Shore Line take typically 48 hours in duration.

Out of hours work are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers, and to ensure the safety of railway workers and operational assets. It is estimated that approximately six track possessions would be required to facilitate activities including the following:

- detailed site survey, services investigations, and / or geotechnical investigations and services relocation
- construction work including site establishment and demolition work
- installation of construction hoardings
- electrical, power supply and communication upgrades
- excavation, piling, forming and concrete pouring of lift pits / foundations
- installation of lift structures
- demolition of the existing kiosk on the footbridge and the installation of the new landing
- platform regrading / resurfacing and platform excavations for services
- modifications to the station building.

Out of hours work may also be scheduled outside rail possession periods. Approval from Transport for NSW would be required for any out of hours work and the affected community would be notified as outlined in Transport for NSW's *Construction Noise and Vibration Strategy* (Transport for NSW, April 2019).

## 5.3 Construction timing

Subject to approval, construction is expected to commence in early 2021 and take around 24 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport for NSW.

The proposed construction activities for the Proposal are identified in Table 8. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Each of the work identified in Table 8 can progress independently. As a general guide, however, lift installation is expected to be the most critical.

Stage / Duration	Activities
Early Work / Approximately four months	<ul style="list-style-type: none"> <li>• service relocations</li> </ul>
High voltage undergrounding and other electrical work on Grandview Street / Approximately eight months	<ul style="list-style-type: none"> <li>• establish work zone - hoarding or fencing</li> <li>• isolate and remove feeder cables</li> <li>• decommission and remove existing pole top transformer</li> <li>• decommission and remove poles</li> <li>• earthwork for new cabling and underground to overhead (UGOH) poles</li> <li>• install new UGOH poles and cables</li> <li>• install new transformer and connect to UGOH poles</li> </ul>
Civil work on Grandview Street / Approximately three months	<ul style="list-style-type: none"> <li>• establish work zone - hoarding or ATF</li> <li>• earthwork for new kerb extension (Grandview Street)</li> <li>• form-reo-pour for kerb extensions</li> <li>• concrete work pour</li> <li>• fit out of handrails, tactiles, bollards, etc.</li> <li>• localised regrading of car park for DDA accessible car spaces (Pacific Highway) which will be done simultaneously with civil work on Grandview Street.</li> </ul>
Lift installations / Approximately five months	<ul style="list-style-type: none"> <li>• geotechnical testing and service search</li> <li>• hoarding installation</li> <li>• piling and excavation for lift pits</li> <li>• form-reo-pour for lift pits</li> <li>• crane in lift shafts, lift landings and canopies</li> <li>• fit out of lift elements including lift car installation</li> <li>• commissioning to new power supply</li> </ul>
January 2022 to May 2022 Building and Platform Work	<ul style="list-style-type: none"> <li>• close either male or female toilets</li> <li>• strip and demolish existing fit out, including internal wall modifications</li> <li>• relocate plumbing and services as needed</li> <li>• waterproofing, tiling and new fit out</li> <li>• commission toilet facility and repeat for another toilet.</li> </ul>

**Table 8: Indicative construction staging for key activities**

## 5.4 Haulage Routes

A review of route planner application in the National Heavy Vehicles Regulator (NHVR) website<sup>8</sup> revealed that a 19m articulated vehicle (AV) is permitted to approach and depart from Pymble Station via a number of routes<sup>9</sup>. These routes are summarised in Table 9.

Approach & Departure	Proposed Route
Approach from north-west	Approach from Pacific Highway (A1) and enter Grandview Street from the north
Exit to north-west	Exit (right-turn out) from the railway overpass into Pacific Highway (A1)
Approach from north-east	Approach from Mona Vale Road (A3), right-turn into Pacific Highway (A1) and right-turn into railway overpass
Exit to north-east	Exit (left-turn out) from the railway overpass into Pacific Highway (A1) and left-turn into Ryde Road (A3)
Approach from south-west	Approach from Ryde Road (A3), left-turn into Pacific Highway (A1) and right-turn into railway overpass
Exit to south-west	Exit (left-turn out) from the railway overpass into Pacific Highway (A1) and right-turn into Ryde Road (A3)
Approach from south-east	Approach from Pacific Highway (A1), right-turn into railway overpass
Exit to south-east	Exit (left-turn out) from railway overpass into Pacific Highway (A1) and travel through at Ryde Road intersection in the southbound direction

**Table 9: Proposed Haulage Routes**

Figure 22 provides a visualisation of the summary provided in Table 9.

<sup>8</sup> <https://www.service.nhvr.gov.au/#page=informationHub/routePlannerTool>

<sup>9</sup> Subject to construction traffic management plan (CTMP)

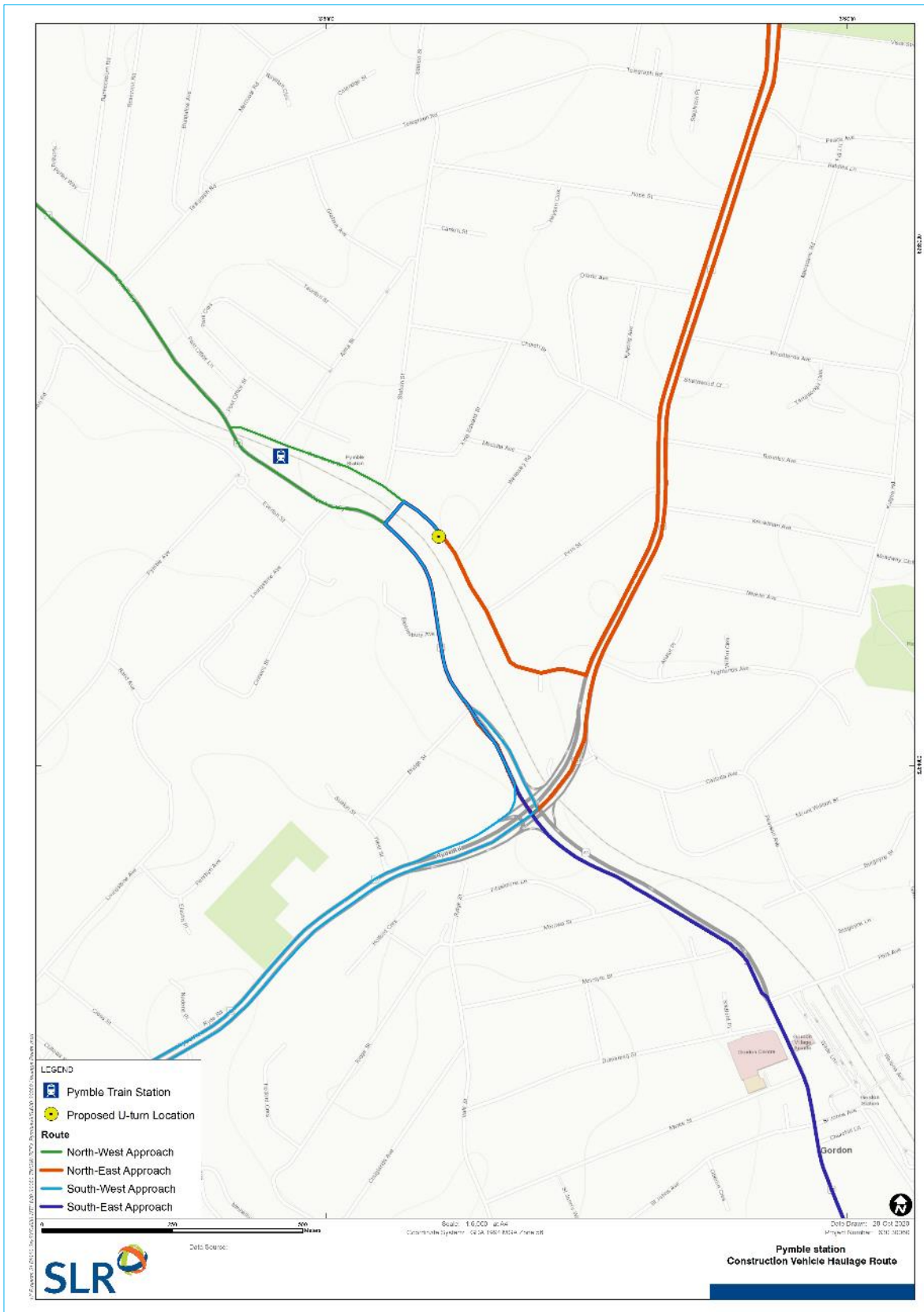


Figure 22: Proposed Haulage Routes for a 19m Articulate Vehicle



## 5.5 Access to construction compounds

Transport for NSW has identified two construction compounds as illustrated in the aerial images Figure 20 and Figure 21.

Access to “construction compound – 1” would be via the Pacific Highway in the southbound direction and vehicles would be required to make a left-turn movement into the car park at the Pacific Highway station entrance. The access to the car park is illustrated in Figure 23.



**Figure 23: Access to construction compound – 1**

Access to “construction compound – 2” would be through Grandview Street in the southbound and northbound directions. There is an existing access to the rail line between where the informal commuter car parking activity takes place and Wellesley Road. The gate to the rail line is illustrated in Figure 24.



**Figure 24: Access to construction compound – 2**

Access to “construction compound – 1” would be direct from Pacific Highway.

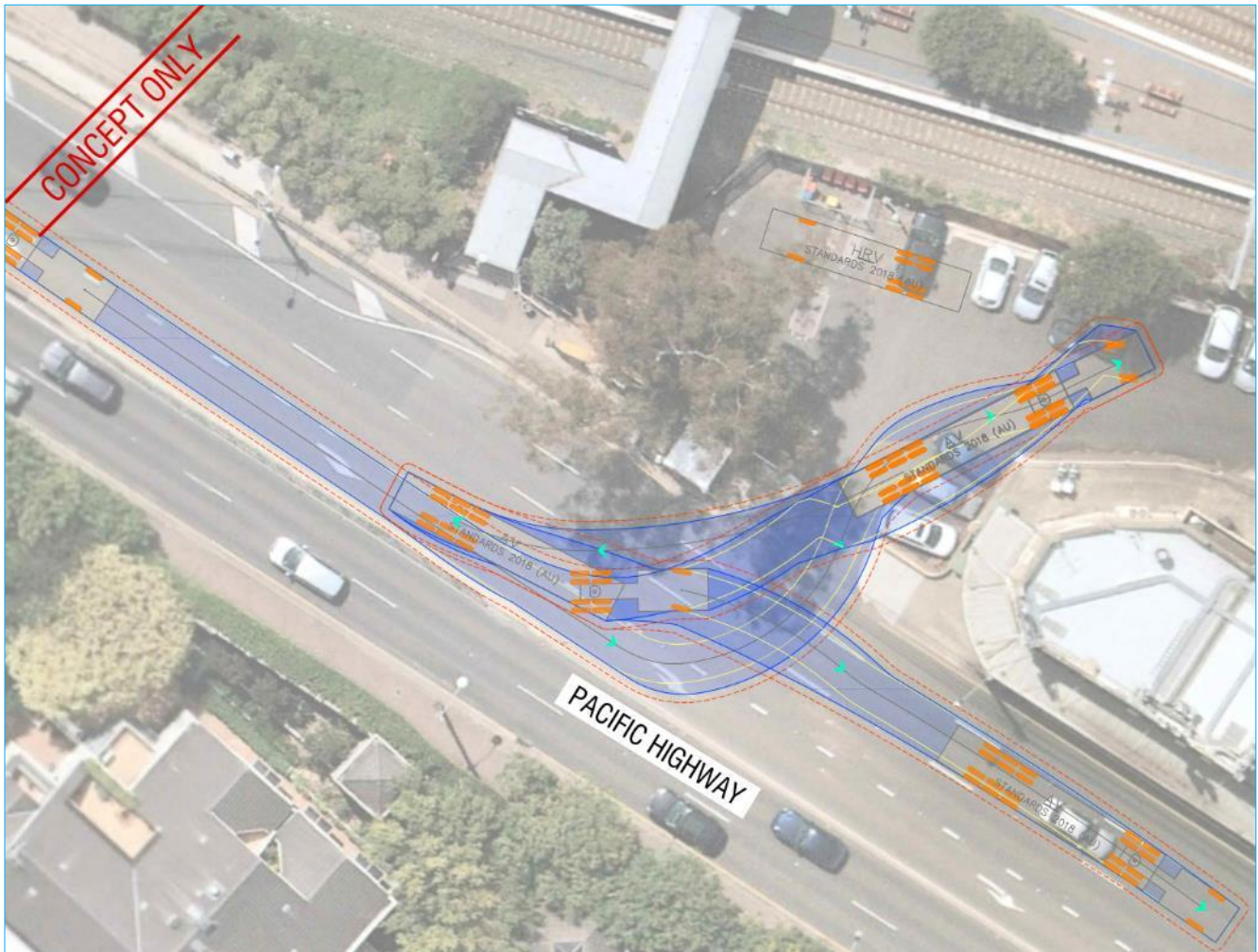
Access to “construction compound – 2” however can be provided through Pacific Highway (State Road A1) and then Grandview Street in the southbound direction (preferred) or through Mona Vale Road (State Road A3) and then Grandview Street in the northbound direction.

The information provided by Transport for NSW indicated that the largest vehicle providing materials to these compounds would be an articulated vehicle (19m AV).

SLR undertook a number of swept path assessments for both compounds using AutoTURN. Swept path assessments revealed that semi-trailers were unable to exit either of the compounds in a forward direction without traffic control measures. Based on this, swept path assessments were repeated assuming traffic control measures would be provided so that these vehicles could facilitate the entire width of the carriageways in Pacific Highway and Grandview Street.

Figure 25 illustrates that the swept path assessment of an articulated vehicle entering and exiting the “construction compound – 1” while there is a 50-tonnes crane (less than 12.5 metres in length but assumed 12.5 metres) already parked inside ready for the delivery of the lift shaft.

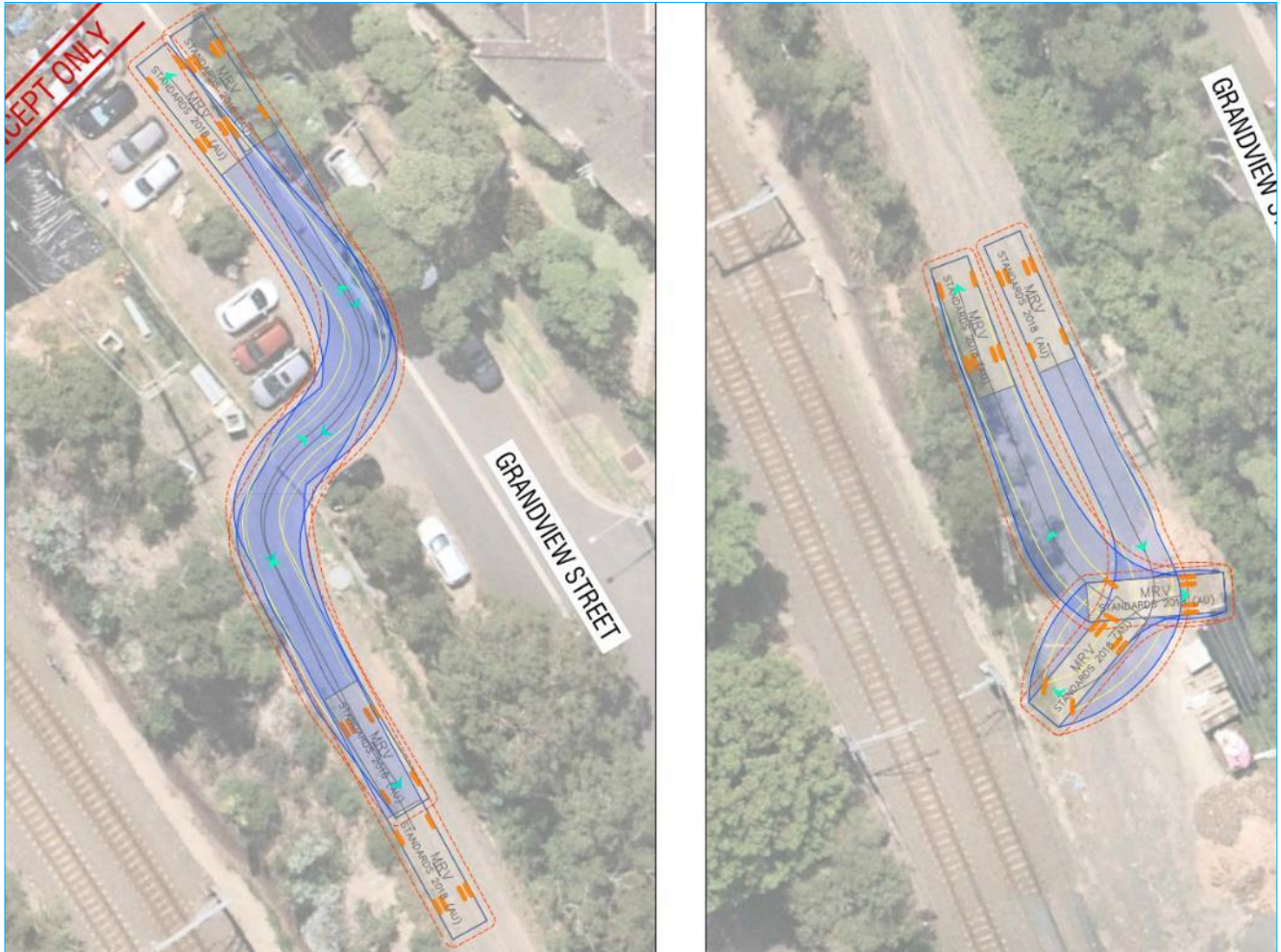
It should be noted that this movement will require traffic control measures.



**Figure 25: AV (19m) swept path assessment at construction compound - 1**

Base Map Source: Nearmap, 2020

Figure 26 illustrate that the longest vehicle that can enter and exit to / from the “construction compound – 2” in a forward direction with a typical three-point turn-around manoeuvre is an MRV tipper truck (8.8 metres).

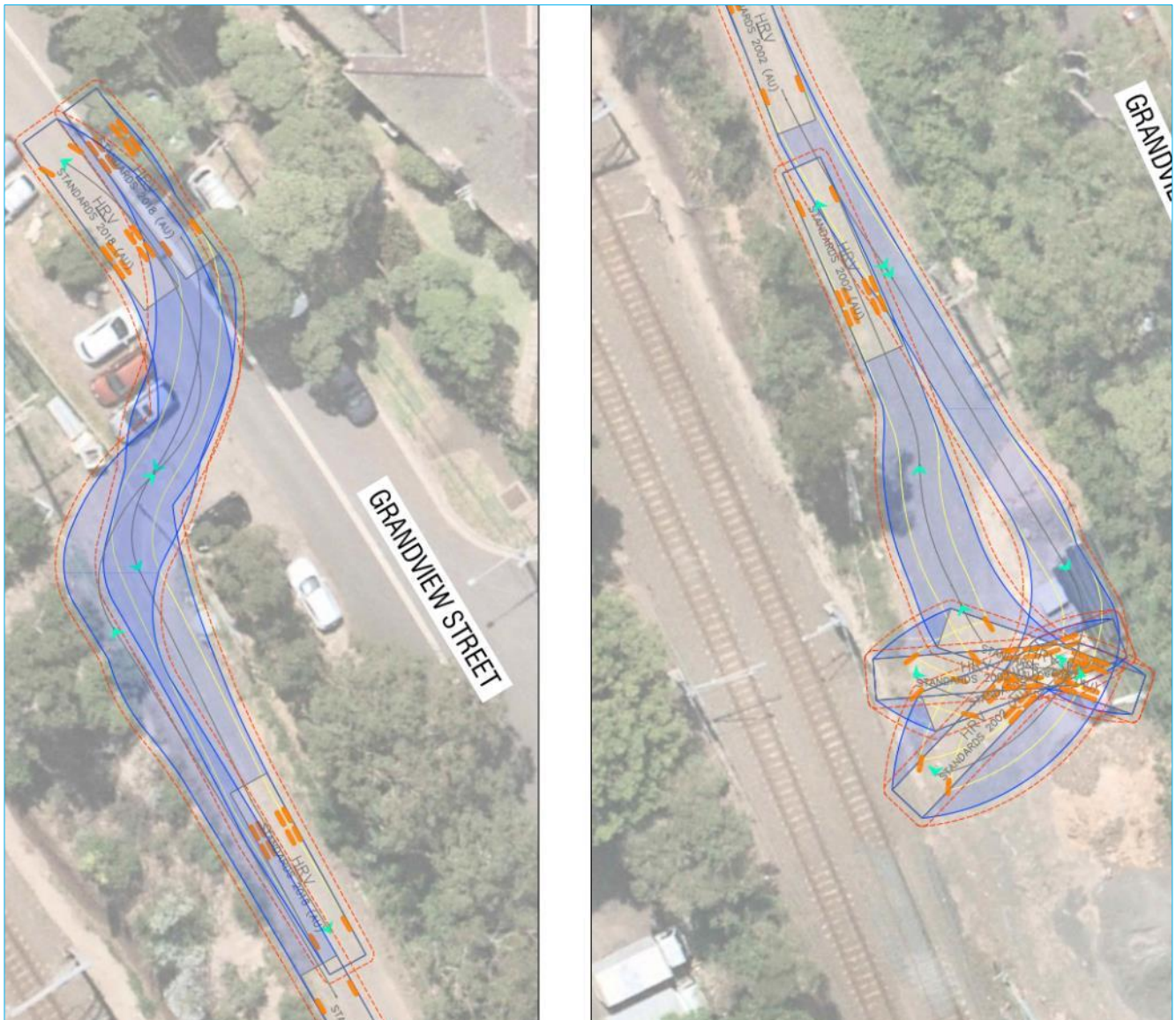


**Figure 26: MRV (8.8m) swept path assessment at construction compound - 2**

Base Map Source: Nearmap, 2020

Swept path assessments in Figure 27 indicate that an HRV (heavy rigid vehicle - 12.5 metres) can not perform a turn-around inside “construction compound – 2” using a typical three-point-turn manoeuvre, however this can be accomplished with a five-point- turn manoeuvre and use of the area directly adjacent to the train track.

An alternative to allow a typical three-point-turn manoeuvre for an HRV (12.5 metres) could be facilitated by the installation of track access systems (pads). Track access pads are useful when there is a high frequency of construction vehicle movements. However, due to low construction vehicle movements expected, the installation of track access systems is not<sup>10</sup> proposed at this stage.



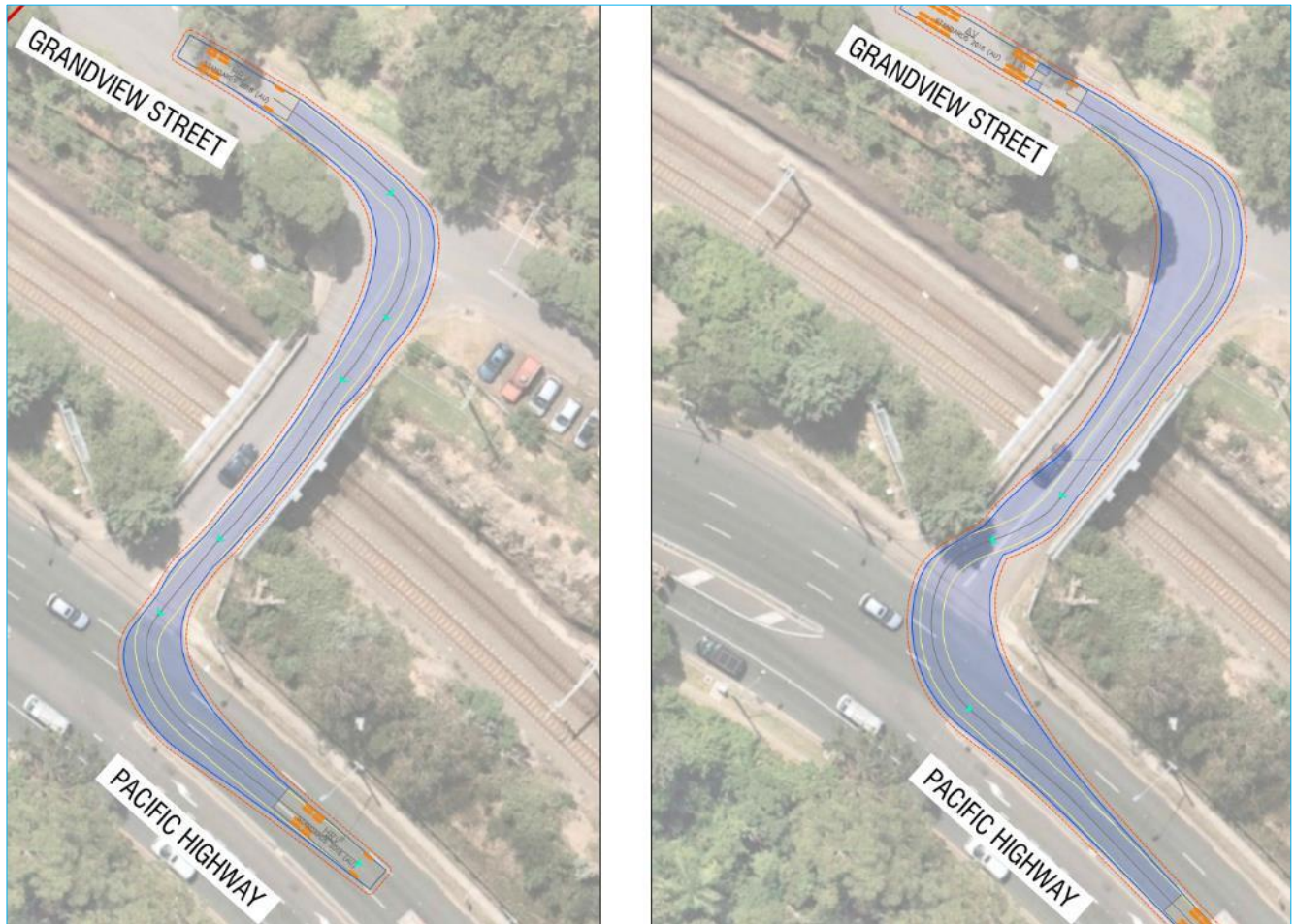
**Figure 27: HRV (12.5m) swept path assessment at construction compound – 2**

Base Map Source: Nearmap, 2020

<sup>10</sup> Subject to construction vehicle volumes identified in the construction traffic management plan (CTMP).

A 50-tonnes crane (less than 12.5 metres in length but assumed 12.5 metres) and an AV (19 metres) can enter Grandview Street from Pacific Highway.

Figure 28 illustrates that these vehicles can also exit the area via the railway overpass to the south of Grandview Street with traffic control measures.

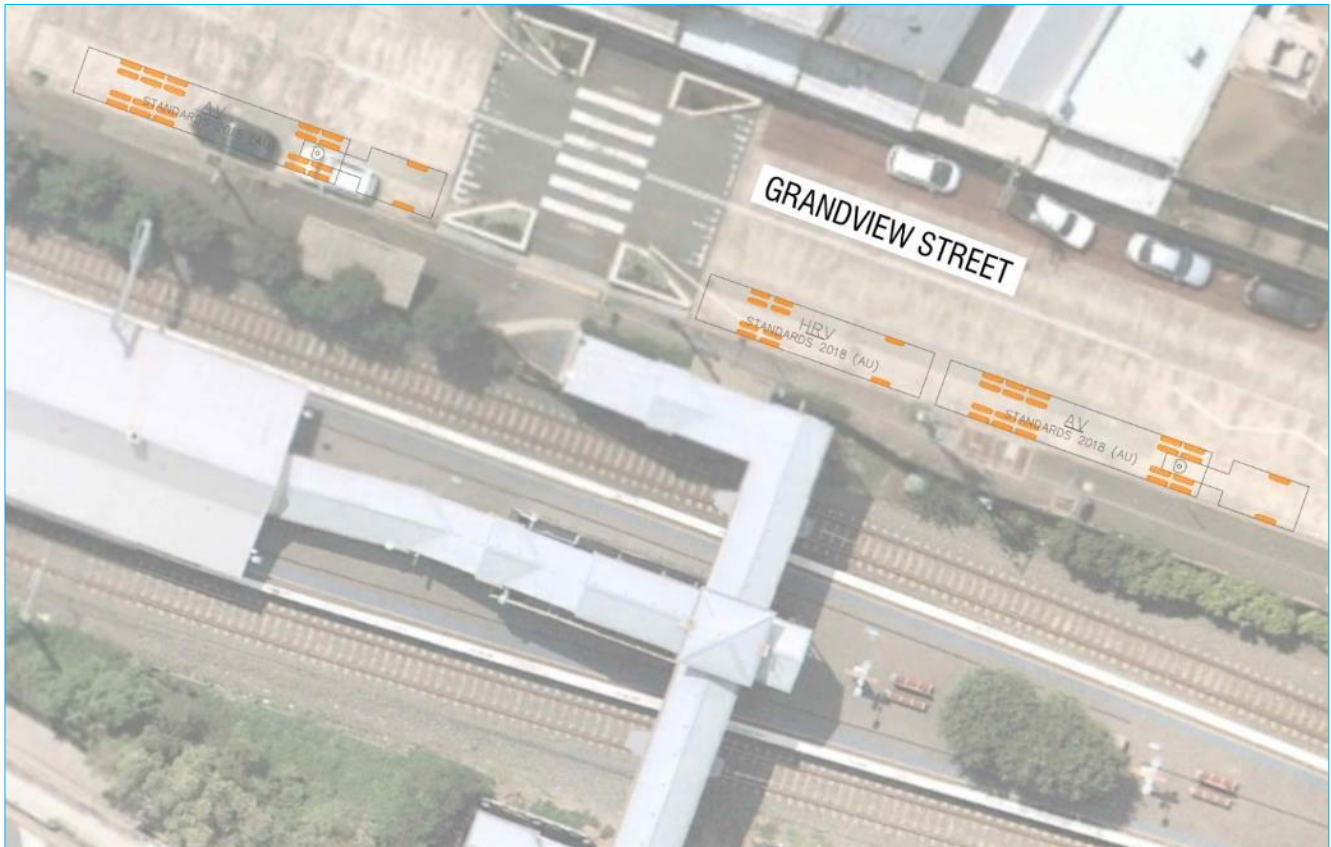


**Figure 28: Swept path assessment at Railway overpass**

Base Map Source: Nearmap, 2020

Full-size captures of all swept path assessments discussed in this report are provided in **Appendix B**.

Figure 29 illustrates a number of options for how the crane and the articulated vehicle could be positioned in order to deliver and install the lift shafts.



**Figure 29: Potential positions for an AV (19m) and a 50-tonne crane (less than 12.5m)**

Table 10 provides a summary of the swept path assessments SLR has undertaken at the two construction compounds.

Construction compound	Travel Direction	19m AV	12.5m HRV	8.8m MRV
Construction compound – 1 off Pacific Highway	Northbound on Pacific Highway	Access is not possible due to divided carriageway.		
	Southbound on Pacific Highway	Forward entry and exit is possible with traffic control measures only.	Forward entry and exit are possible.	
Construction compound – 2 off Grandview Street	Northbound on Grandview Street	Forward entry and exit are not possible due to insufficient turn around space within the railway boundary.		Forward entry and exit are possible.
	Southbound on Grandview Street			

**Table 10: Summary of swept path assessments at construction compounds**

It should be noted that the height of the overhead power lines was not considered as part of the swept path assessments.

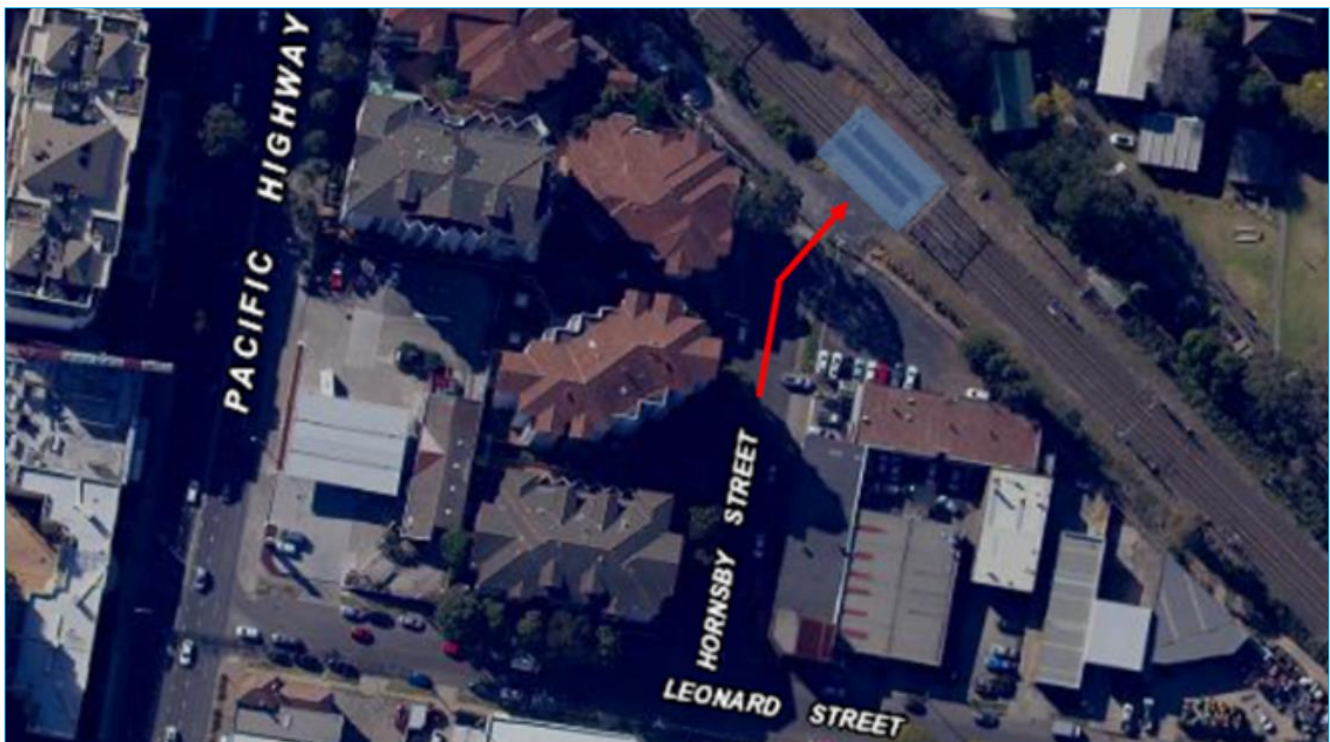
The findings of the swept path assessments at two construction compounds will prescribe which route trucks can use in travelling to / from the construction compound. The future construction traffic management plan (CTMP) should consider these routes and constraints in resolving detail regarding access and traffic control measures.

## 5.6 Access to Rail Tracks

It is understood that TfNSW is considering deploying hi-rail vehicles on rail tracks during the construction of the proposed upgrades. The following three locations are considered by TfNSW:

- Hornsby Street, Hornsby – existing track access pads available
- Grandview Street, Pymble (construction compound – 2)
- Hill Street, Roseville – existing track access pads available

Figure 30 illustrates the hi-rail vehicle access location in Hornsby Street. A review of Nearmap high-resolution aerial imagery (image date 02/10/2020) indicated that track access pads were already deployed at this location on this day, meaning the proposed location is consistent with the previous uses. We also identified that Leonard Street and Hornsby Street have 12.8m wide carriageways. Based on this, we expect HRVs (12.5m) to be able to enter and exit this track access point in the forward direction.



**Figure 30: Hi-Rail Vehicle Access to Rail Tracks via Hornsby Street, Hornsby**

Image Source: TfNSW



As discussed in Section 5.5 and illustrated in Figure 27 earlier in this report, an HRV (12.5m) can enter and exit the railway gates in the forward direction and perform safe turn-around manoeuvres within construction compound – 2. Construction compound – 2, as shown in Figure 31, is our preferred hi-rail vehicle access point as traffic management will be concentrated at this location should the need arise.



**Figure 31: Hi-Rail Vehicle Access to Rail Tracks via Grandview Street, Pymble**

Image Source: TfNSW

Figure 32 illustrates the hi-rail vehicle access location in Hill Street, Roseville. A review of Nearmap high-resolution aerial imagery (image date 26/09/2020) indicated that track access pads were already deployed at this location on this day, meaning the proposed location is consistent with the previous uses.



**Figure 32: Hi-Rail Vehicle Access to Rail Tracks via Hill Street, Roseville**

Image Source: TfNSW

## 5.7 Active transport impacts

The following impacts to pedestrians, cyclists and station customers are anticipated to arise from construction activities associated with the Proposal:

- reduction in size of footpath adjacent to Grandview Street and Pacific Highway station entrances may require users to dismount and potentially deviate around construction work associated with the footbridge
- increased safety risk due to the interaction of cyclists, pedestrians and construction vehicles at the proposed site compound access/s on Grandview Street
- uneven surfaces and detours required during footpath upgrade and platform resurfacing work
- increased platform congestion due to localised platform closures and dedications during the resurfacing and regrading of the platform surfaces
- potential confusion and loss of amenity for customers due to the temporary relocation of station accesses and facilities
- detours required for potential footpath closures on Grandview Street due to work associated with the footbridge and nearby kiss and ride/taxi facilities.

These impacts are deemed to be manageable subject to the preparation and implementation of a CTMP and traffic control plans (TCPs) by a suitably qualified Contractor outlining how safety issues and other impacts may be mitigated.

## 5.8 Public transport impacts

Train services would be affected during track possessions although these are not specific to this project and would occur regardless and accordingly are not impacts arising from the Proposal. Buses would replace trains during rail possession periods. Accordingly, any construction activities occurring during possessions must consider additional buses and users. This should be addressed as part of the CTMP and TCPs.

Beyond track possession periods, the Proposal's impact on public transport services is expected to be minor, as summarised below:

- bus stop adjacent to Pacific Highway station entrance could be temporarily relocated about 50 metres south
- increased safety risk due to the interaction of bus users at the proposed site compound access off Pacific Highway
- reduced travel speeds as a result of traffic management could increase travel times for bus services on Grandview Street and Pacific Highway
- bus services may also be delayed due to the interaction with construction vehicles entering and exiting the site compound off Pacific Highway.

## 5.9 Traffic impacts

Traffic generated by construction activities includes construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, and construction plant and equipment. Vehicle types and sizes would vary depending on the required use, but typically include medium and large rigid vehicles and articulated vehicles for import of bulk materials or spoil removal as well as for the transportation of plant and equipment.

The amount of fill material or spoil / demolition spoil would be minor due to the limited extent of excavation required for the Proposal. Specific oversize vehicles may be required for prefabricated / precast elements such as lift shaft structure components, and steel beams. In such cases, specific permits would be required, and advance route planning would need to be undertaken in order to ensure that a suitable route with sufficient geometric capacity to accommodate these vehicles is chosen.

A review of traffic volume data<sup>11</sup> (2018) from the southbound direction in Pacific Highway indicated that average weekday volumes are 3017 vehicles per hour between 06:00am and 07:00am. The traffic generated as a part of the construction work is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during peak construction periods. Given the high volumes on Pacific Highway, this construction demand is unlikely to cause any significant impact to traffic flow or operational performance.

## 5.10 Parking impacts

As detailed in Section 5.1, it is proposed that two temporary construction compounds will be facilitated to undertake the construction work.

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<sup>11</sup> PeopleTrans report dated 13/03/2018, Sydney Clearway Strategy: Pacific Highway – Travel Time and Volume Analysis

As shown in Figure 21, construction compound – 2 (material lay down area) is not expected to have an impact on general parking as all materials will be laid down within the railway corridor.

Construction compound – 1 (site office and parking area), as illustrated in Figure 20, however, is expected to result in the temporary closure of up to fourteen parking spaces in the car park off Pacific Highway to the south of Pymble Station. This car park is operated by Ku-ring-gai Council and comprises a mixture of 2P and business parking.

Undergrounding of high-voltage lines is expected to result in the temporary closure of up to fifteen<sup>12</sup> 1P parking spaces in Grandview Street. The extents of the temporary removal of parking in Grandview Street are indicated in Figure 33.



**Figure 33: Extents of the Temporary Removal of 1P Parking on Grandview Street during Construction**

The Proposal is not expected to have parking impacts on Pacific Highway as clearways<sup>13</sup> are in place on Pacific Highway from 06:00am to 07:00pm Monday to Friday and 09:00am to 06:00pm on Saturday, Sunday and public holidays.

<sup>12</sup> Subject to detailed design.

<sup>13</sup> <https://www.rms.nsw.gov.au/projects/01documents/pac-hwy-clearway-wahroonga-to-pymble/pac-hwy-clearway-project-update-2018-06.pdf>

It is not clear at this stage if access will be provided to the parking spaces at the eastern end of the car park. This should be clarified as part of the CTMP.

## 5.11 Kiss and ride and taxi impacts

Construction of the Proposal is expected to have a minor impact on the operation and capacity of the kiss and ride and taxi facilities on either side of the station. This is likely to be a limited closure of these facilities during the construction of the lifts on Grandview Street and Pacific Highway station entrances.

It is also understood that Transport for NSW plans to utilise the kiss and ride spaces and taxi zone on Grandview Street as a staging area for cranes when required. Seeing as the crane would likely be deployed for use for major lifting activities only - which would require a track possession and thus would be expected to occur outside of peak travel periods - the closure of this facility would only be required on an occasional basis.

Parked construction vehicles are expected to result in the temporary closure of all kiss and ride and taxi zone spaces in the southern side of Grandview Street. There are no kiss and ride and taxi zone spaces in the car park at the Pacific Highway station entrance.

Furthermore, given the lack of demand observed at these facilities, it is concluded that any closure or other restrictions required within the two kiss and ride and taxi facilities is unlikely to have any impact on passenger volume or traffic conditions on the adjacent road network.

## 5.12 Property access impacts

Property accesses are to be maintained and unaffected by construction work where possible, however temporary obstruction of accesses may be possible during activities such as the loading and unloading of oversized materials and plant. Should this be necessary all affected properties are to be notified in advance of disruptions.

## 5.13 Construction impact mitigation

To assist in minimising and mitigating any construction impacts on the operation of the surrounding active, public and vehicular transport networks, a CTMP would be required for submission to Transport for NSW and/or the Ku-ring-gai Council in preparation for the proposed work.

Preparation and submission of a CTMP should be the responsibility of the nominated Contractor for each phase of construction, and should specify the following at a minimum:

- construction approach and staging
- additional traffic demands associated with the construction work
- parking strategy for workers, heavy vehicles and plant
- construction vehicle travel routes, including details of any road closures and alternative routes
- design and location of the site compound ingress and egress location/s
- temporary relocation of existing facilities such as crossings, parking or kiss and ride and taxi zones, including associated signage.

This plan would also incorporate additional detail on specific mitigation measures within a Traffic Control Plan (TCP) with the aim of not compromising the safety or amenity of the road network during construction. To achieve this, a TCP would include details of the following:

- signage to inform motorists and users of the surrounding active and public transport infrastructure of temporary changes to accommodate construction activity, including any static and variable signage and line marking to be installed in advance of and within the construction area to provide warning of any changes in conditions
- specific traffic measures required during the work, including lane and path closures, diversions, speed limit and other regulatory changes, temporary stoppage of traffic as well as other traffic control measures.

The construction planning should also include advance communication to the surrounding community regarding upcoming disruptions to traffic, transport and/or access arrangements as well as significant vehicle and plant movements. Work and disruptions should also be timed to occur outside of peak travel periods wherever possible in order to reduce any adverse traffic, transport or access impacts.

## 6 Summary, conclusions and recommendations

The relatively minor scope of the Proposal is not anticipated to result in any material operational impacts. The Proposal would improve pedestrian connectivity and amenity, for all users including persons who experience mobility impairments.

The Proposal would include the following key elements:

- three new lifts connecting the existing footbridge to the Grandview Street station entrance, the Pacific Highway station entrance and the station platform
- upgrades to the Grandview Street station entrance including a widened footpath to allow for a new lift landing with a canopy
- modifications to the existing taxi rank and no parking zone to accommodate the widened footpath on Grandview Street
- two new accessible parking spaces and one accessible kiss and ride space at the Pacific Highway station entrance car park
- upgrades to the Pacific Highway station entrance including:
  - a three stop lift connecting the car park / accessible parking, the bus stop at street level and the footbridge
  - a new accessible path to the lift landing with a new canopy at car park level
  - a new lift landing at street level with footpath upgrades
  - a new widened stair entrance with canopy upgrades.
- upgrades to the existing footbridge including canopy extensions and anti-throw screens, and the conversion of the vacant kiosk to allow for a new lift landing
- canopy extension at platform level from the lift to the boarding assistance zone
- a new family accessible toilet and unisex ambulant toilet within the station building
- upgrade work to the existing stairs including replacement of treads and handrails

- improvements to station lighting and CCTV to improve safety and security
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system upgrade and new hearing induction loops
- modifications to the rail corridor fencing at the Grandview Street and Pacific Highway station entrances
- electrical upgrades for the new infrastructure, including a new padmount substation.

The following is a summary of the operational impacts likely to be generated as part of the Proposal:

- no impacts to the existing public transport services are expected
- significant improvements to pedestrian experience should be expected with the provision of three lifts, particularly for the customers with a mobility disability
- no impacts to the existing capacity of Pymble Station are expected
- no impacts to the existing cycling infrastructure are expected
- widened footpath on Grandview Street is expected to improve the existing kiss and ride and taxi pick-up and drop-off experience
- taxi zone on Grandview Street will be relocated to south by approximately 20 metres to enable the footpath widening adjacent to the station entrance
- provision of two new accessible parking spaces in the car park at Pacific Highway station entrance
- no impacts to the traffic flow in Pacific Highway and Grandview Street are expected.
- no property impacts are expected
- it is expected that the pedestrian safety will be significantly improved by the widened footpath on Grandview Street and installation of three lifts.

The following key construction-stage impacts are likely to be generated:

- increased construction vehicle traffic including light and heavy vehicles within the station precinct and along proximity roads and streets including Grandview Street and Pacific Highway (State Road A1) for movement to / from the two proposed construction compounds
- some inconvenience for pedestrian movements due to the construction zones and barriers along the footpath on Grandview Street adjacent to the station entrance
- temporary loss of ten parking spaces in the car park at the Pacific Highway station entrance to allow for construction compound – 1 (site office and parking area for construction workers)
- temporary loss of approximately three taxi spaces when a crane or rigid vehicle parks adjacent to Grandview Street station entrance, in the taxi zone to undertake work
- the Proposal is not expected to have parking impacts on Pacific Highway as clearways are in place on Pacific Highway from 06:00am to 07:00pm Monday to Friday and 09:00am to 06:00pm on Saturday, Sunday and public holidays
- the traffic generated as a part of the construction work is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during peak construction periods. Given the high volumes on Pacific Highway, this construction demand is unlikely to cause any significant impact to traffic flow or operational performance.

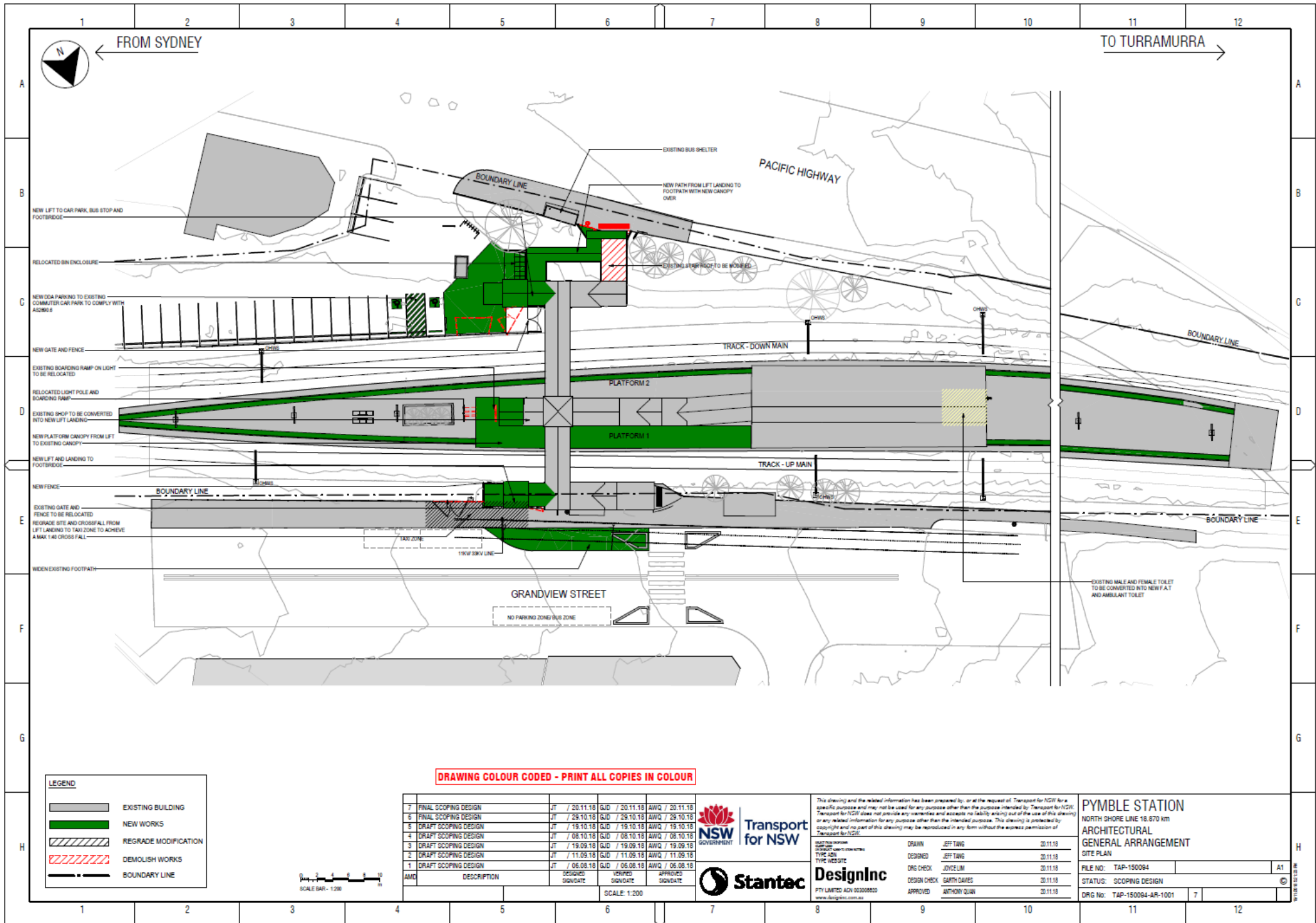
- potential confusion and loss of amenity to customers accessing the station via temporary and changed facilities during construction
- short-term occupation of kerbside space by cranes facilitating construction
- minor travel delays on account of likely TCP implementation requiring some users to stop for construction traffic.

Construction impacts are considered to be manageable subject to the preparation and implementation of a Construction Traffic Management Plan (CTMP). The CTMP and subordinate Traffic Control Plans (TCP) should review issues and identify solutions and temporary arrangement to avoid, mitigate and manage risk involving construction activities, users of the transport system, and local residents.



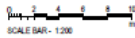
# APPENDIX A

## Development Concept Plan



**LEGEND**

	EXISTING BUILDING
	NEW WORKS
	REGRADE MODIFICATION
	DEMOLISH WORKS
	BOUNDARY LINE



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6	FINAL SCOPING DESIGN	JT / 29.10.18	GJD / 29.10.18	AWQ / 29.10.18
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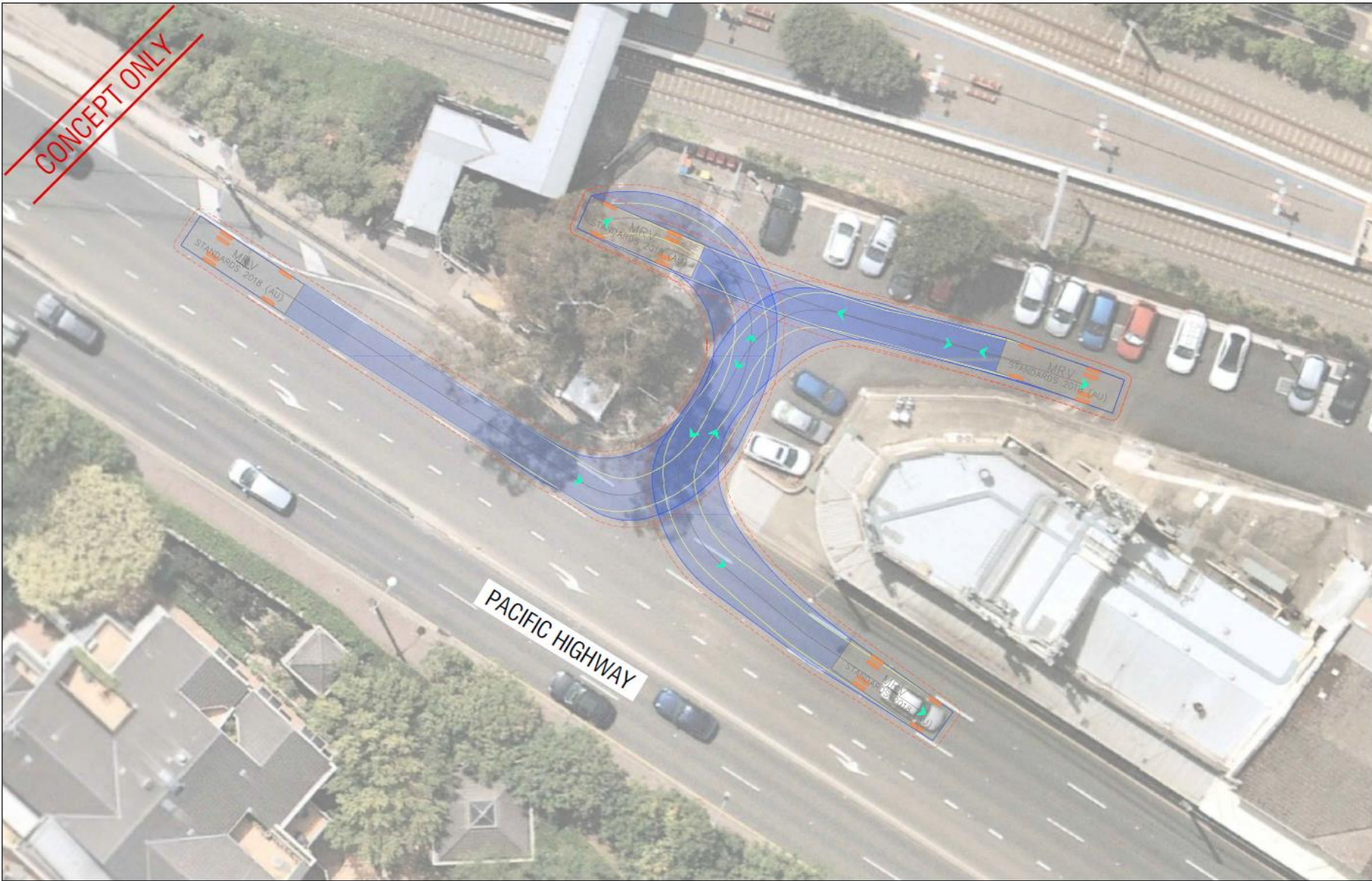
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 NORTH SHORE LINE 18.870 km  
 ARCHITECTURAL  
 GENERAL ARRANGEMENT  
 SITE PLAN

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# APPENDIX B

## Swept Path Assessments



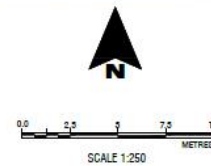
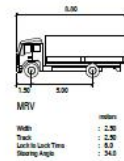
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**SWEEP PATH LEGEND**

- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheel Path



TfNSW Transport Access Program

**Pymble Station**

**Swept Path Assessment**  
**MRV - Construction Compound 1**

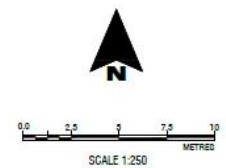
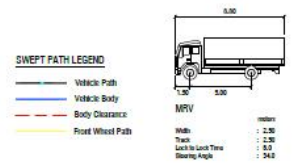
FIGURE SK01-1



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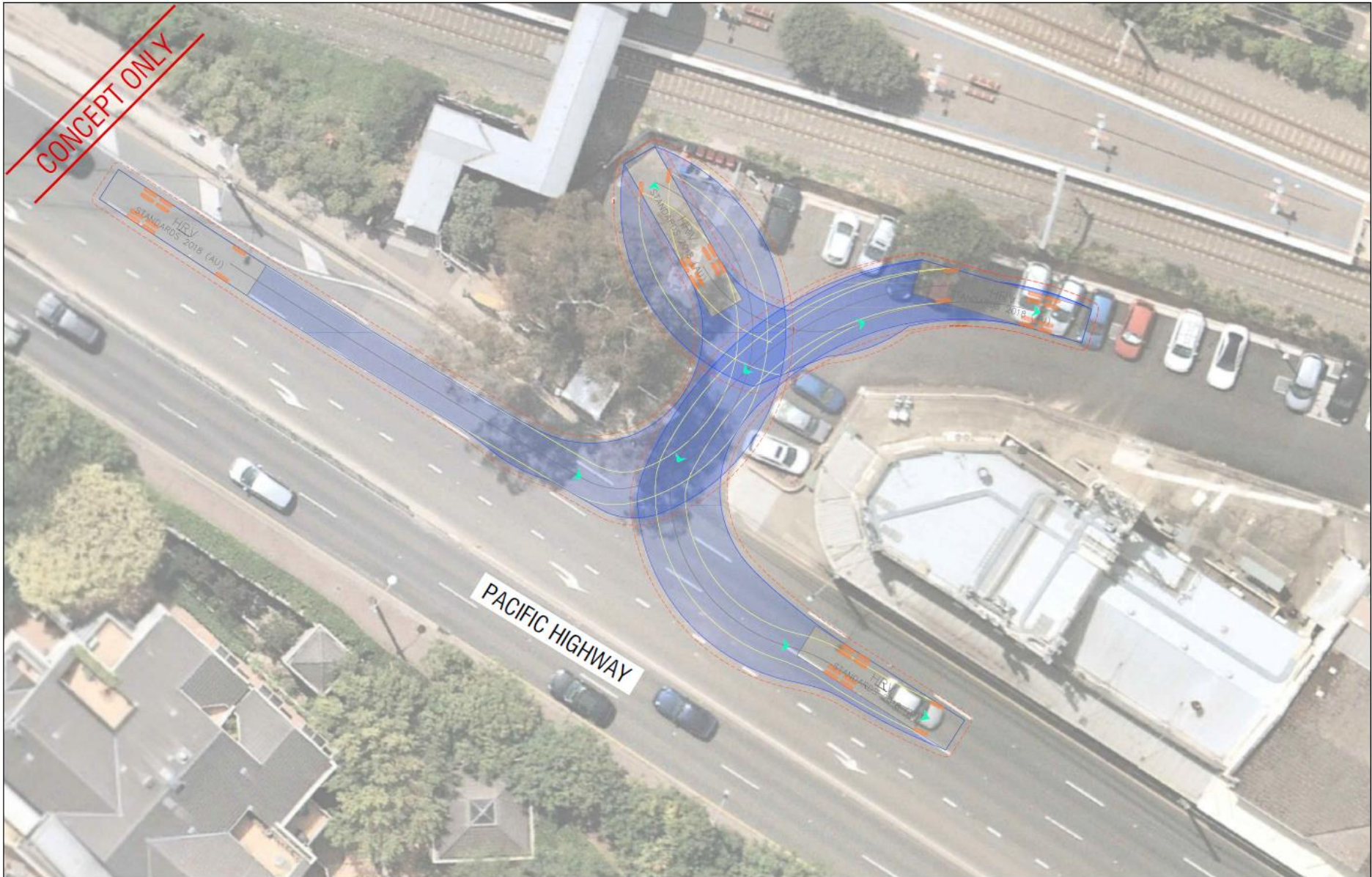
TfNSW Transport Access Program

**Pymble Station**

**Swept Path Assessment**

**MRV - Construction Compound 1**

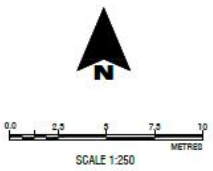
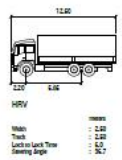
FIGURE SK01-2



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- SWEPT PATH LEGEND**
- Vehicle Path
  - Vehicle Body
  - Body Clearance
  - Pivot Wheel Path



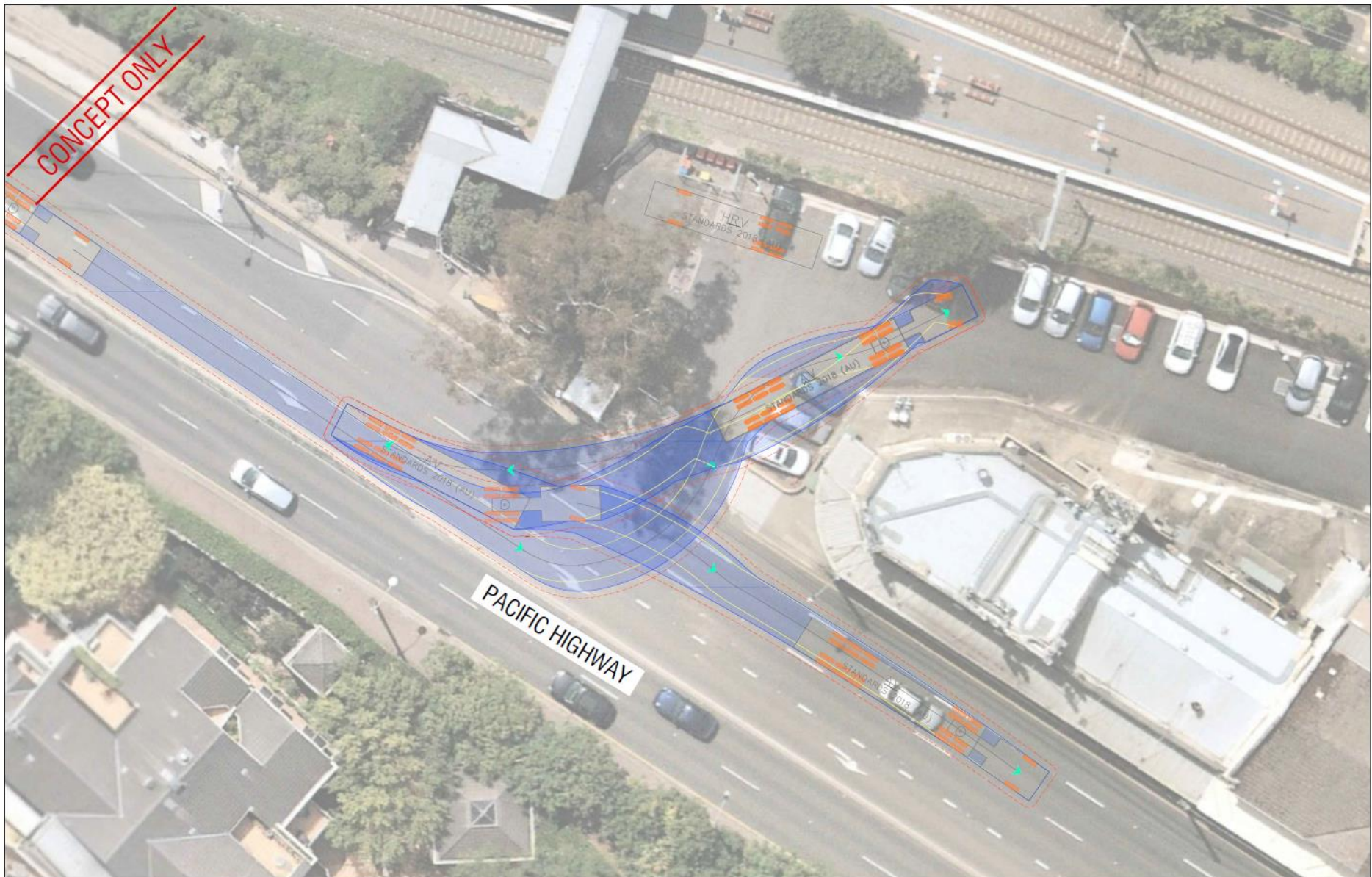
TfNSW Transport Access Program

Pymble Station

**Swept Path Assessment**

**HRV - Construction Compound 1**

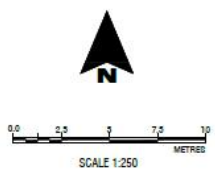
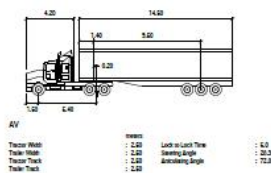
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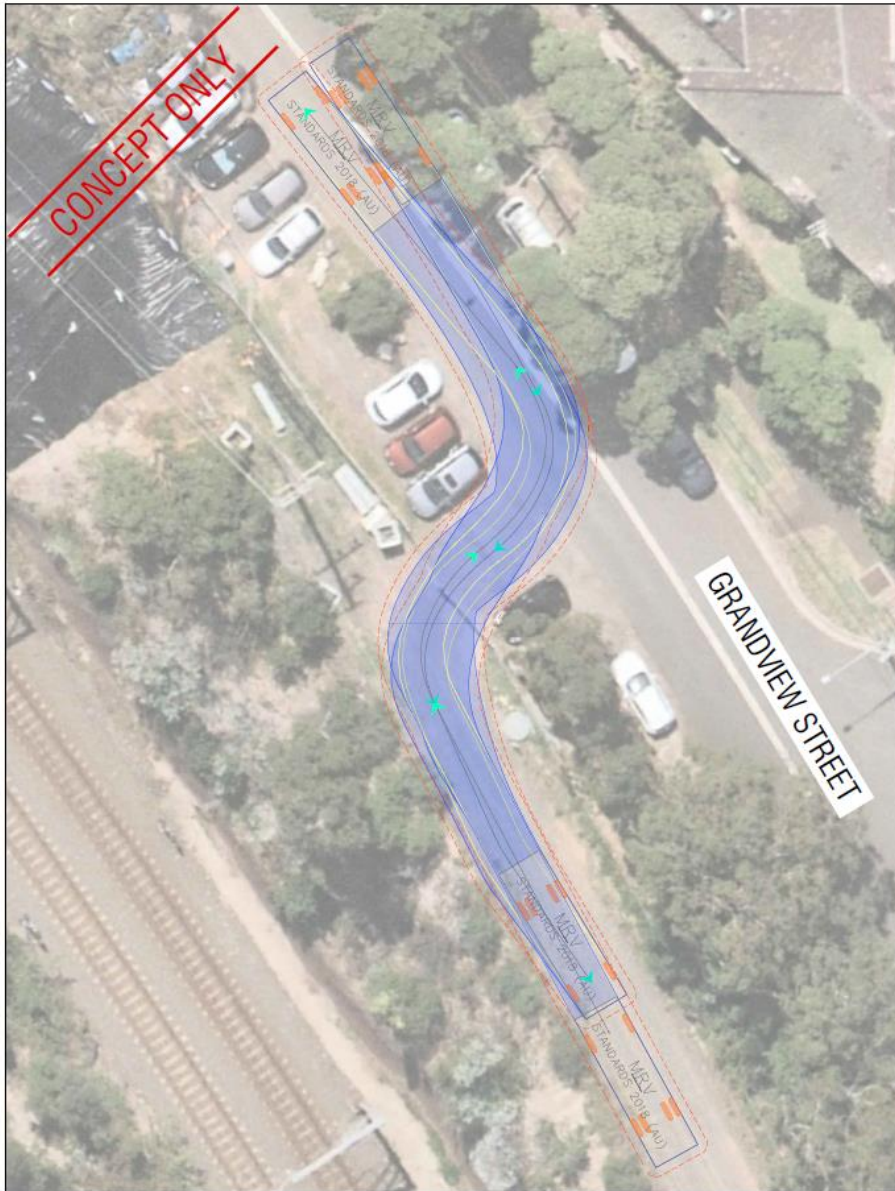
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- SWEEP PATH LEGEND**
- Vehicle Path
  - Vehicle Body
  - Body Clearance
  - Front Wheel Path



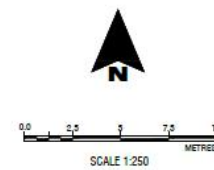
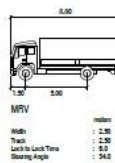
TfNSW Transport Access Program  
**Pymble Station**  
**Swept Path Assessment**  
**AV - Construction Compound 1**  
 FIGURE SK01-4



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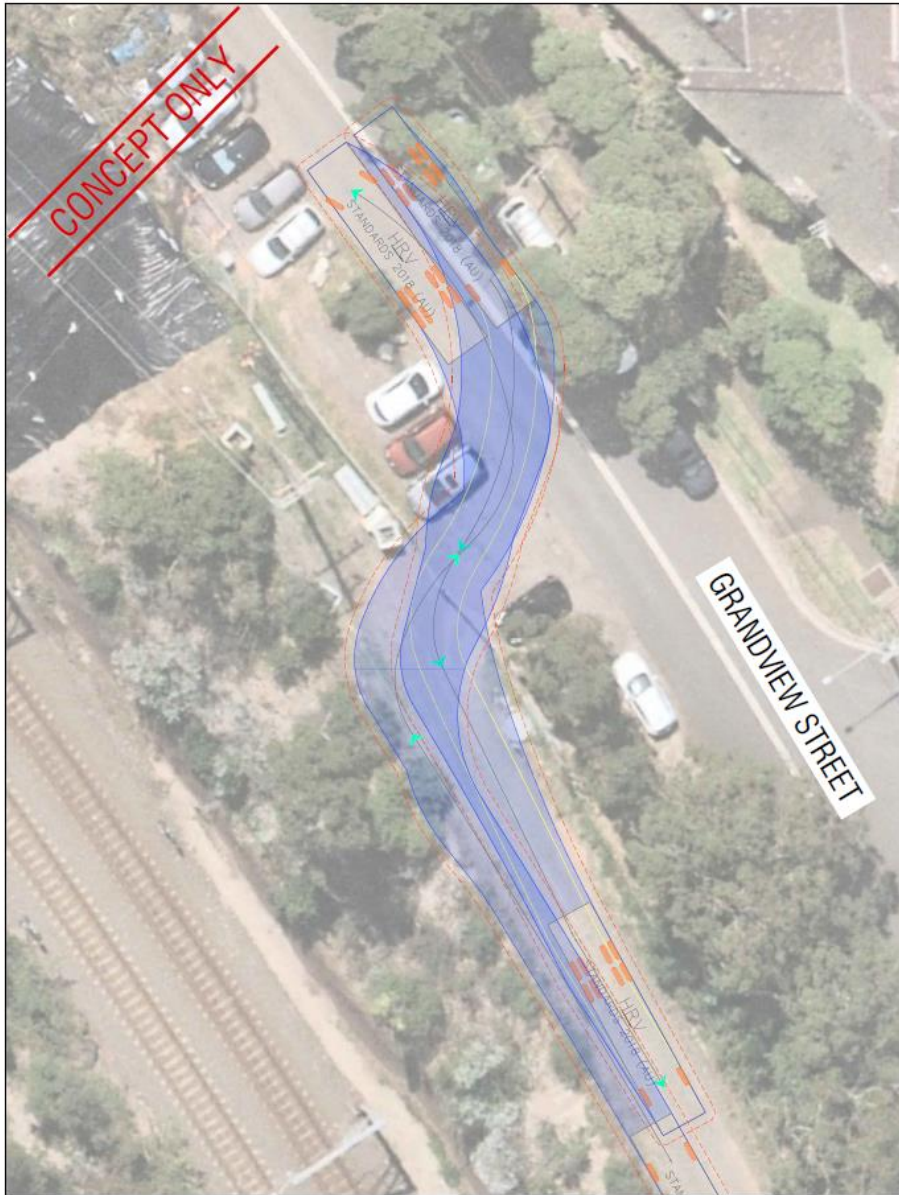
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Projection:	-

- SWEEP PATH LEGEND**
- Vehicle Path
  - Vehicle Body
  - Body Clearance
  - Front Wheel Path



TfNSW Transport Access Program  
**Pymble Station**  
**Swept Path Assessment**  
**MRV - Construction Compound 2**  
 FIGURE SK02-1

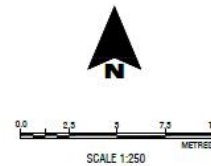




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**SWEEP PATH LEGEND**  
 - Vehicle Path  
 - Vehicle Body  
 - Body Clearance  
 - Fixed Wheel Path



TfNSW Transport Access Program  
 Pymble Station  
**Swept Path Assessment**  
**HRV - Construction Compound 2**  
 FIGURE SK02-2







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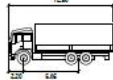
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**SWEEP PATH LEGEND**


-  Vehicle Path
-  Vehicle Body
-  Body Clearance
-  Front Wheel Path

**HRV**





Wheel	mm
Track	2,500
Lock to Lock Time	2,500
Steering Angle	30.0

**AV**



Wheel	mm
Track	2,500
Lock to Lock Time	2,500
Steering Angle	30.0
Track Track	2,500

  
N

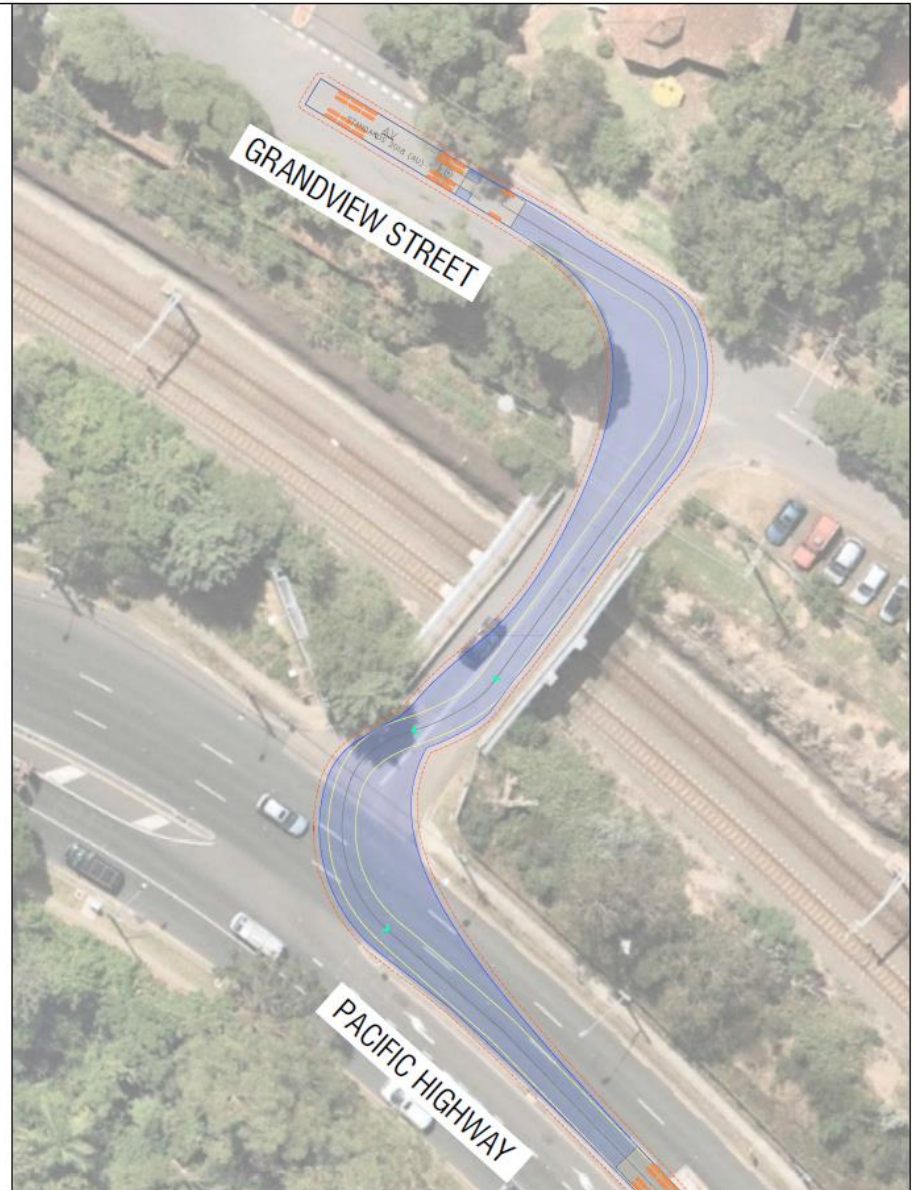
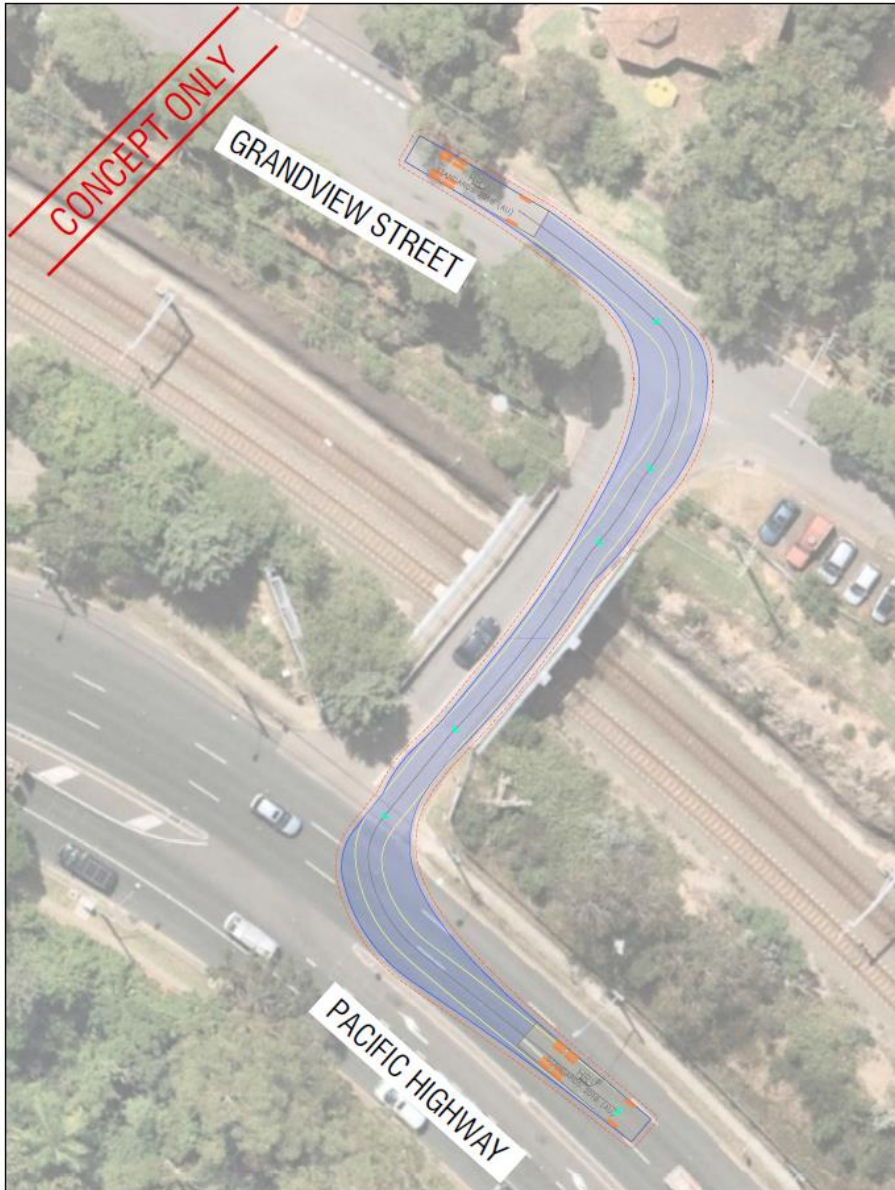
  
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TfNSW Transport Access Program

Pymble Station

**Swept Path Assessment**  
**HRV/AV - Grandview Street**

FIGURE SK03

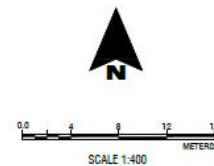
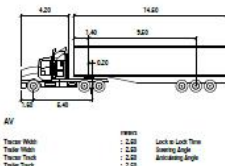
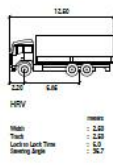


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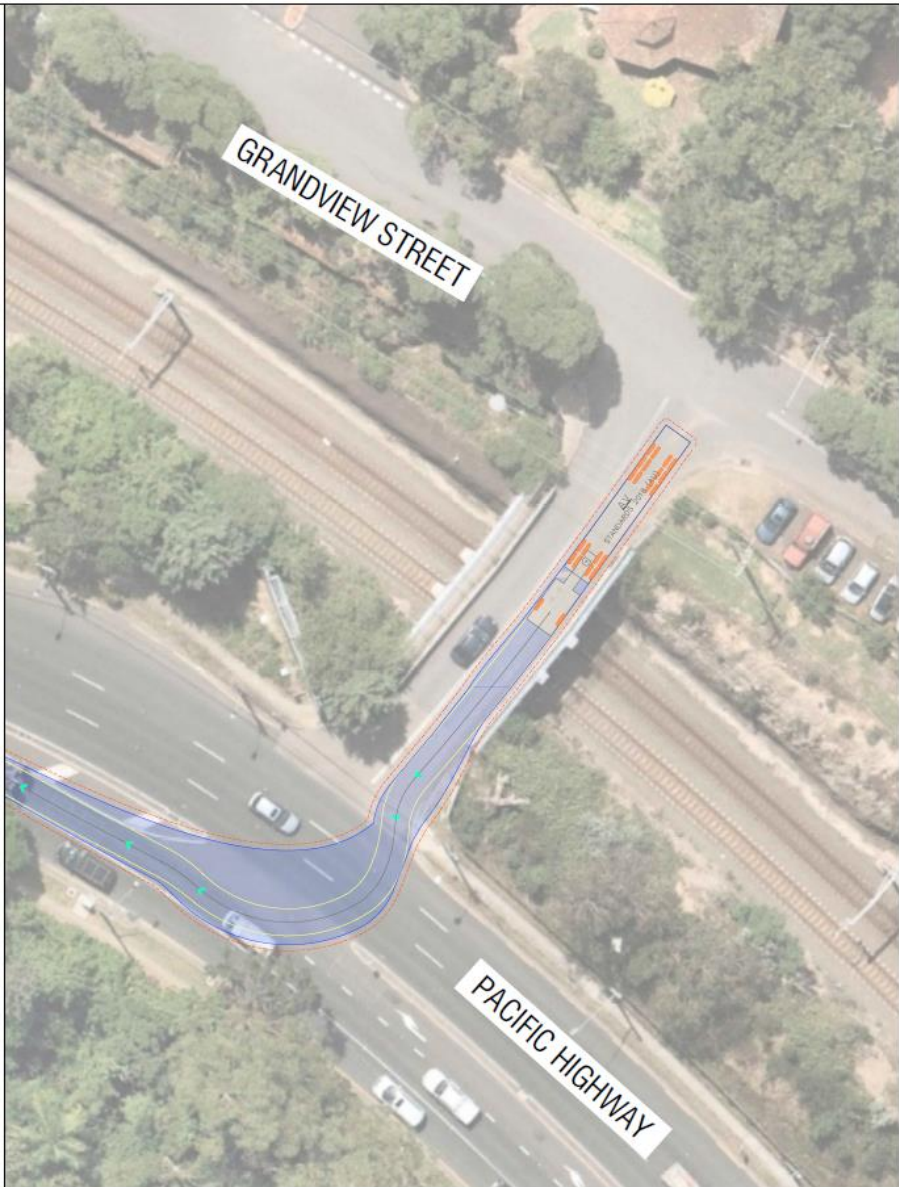
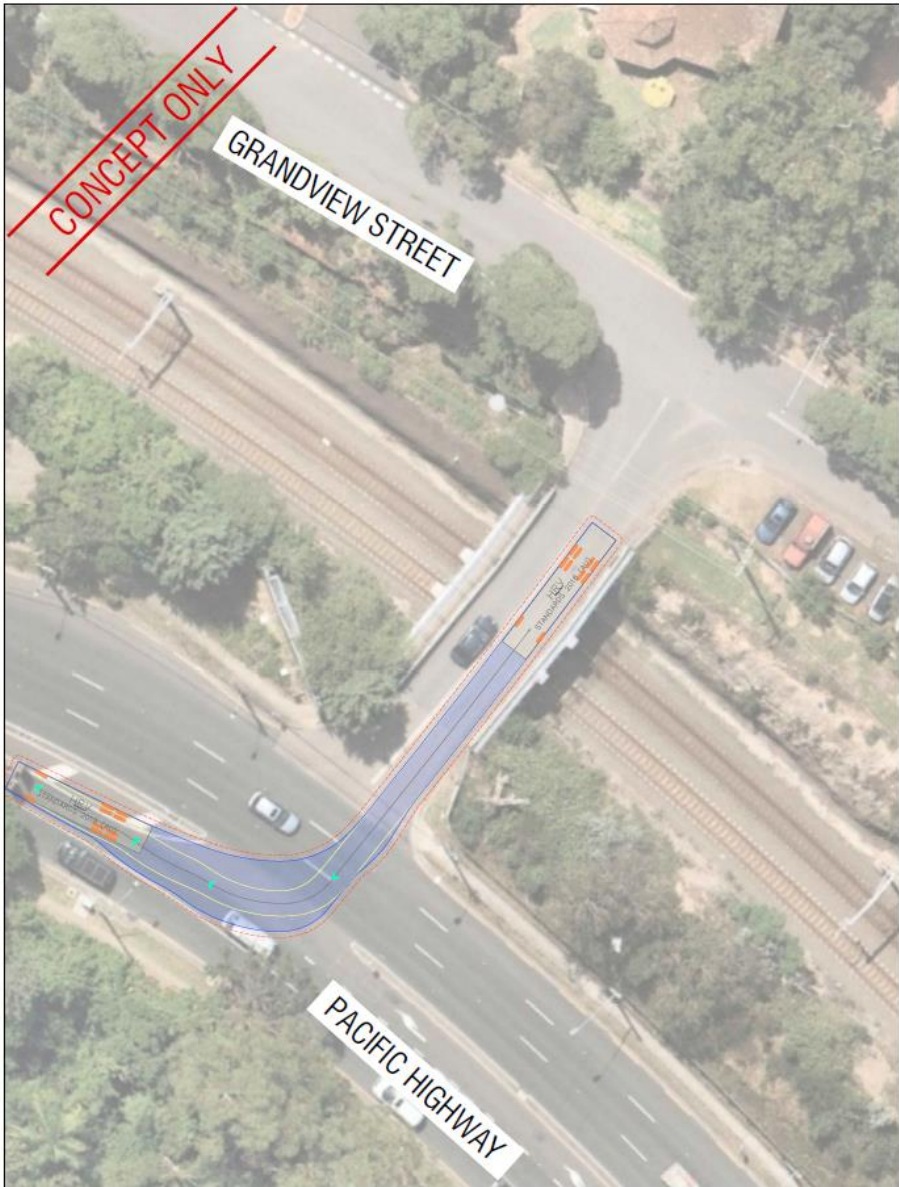
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**SWEEP PATH LEGEND**

- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheel Path



TfNSW Transport Access Program  
**Pymble Station**  
**Sweep Path Assessment**  
**HRV/AV - Overpass**  
 FIGURE SK04-1

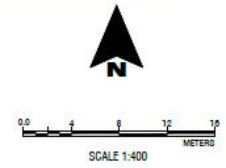
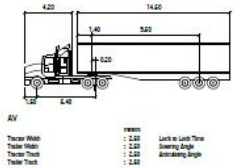


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- SWEEP PATH LEGEND**
- Vehicle Path
  - Vehicle Body
  - Body Clearance
  - Front Wheel Path

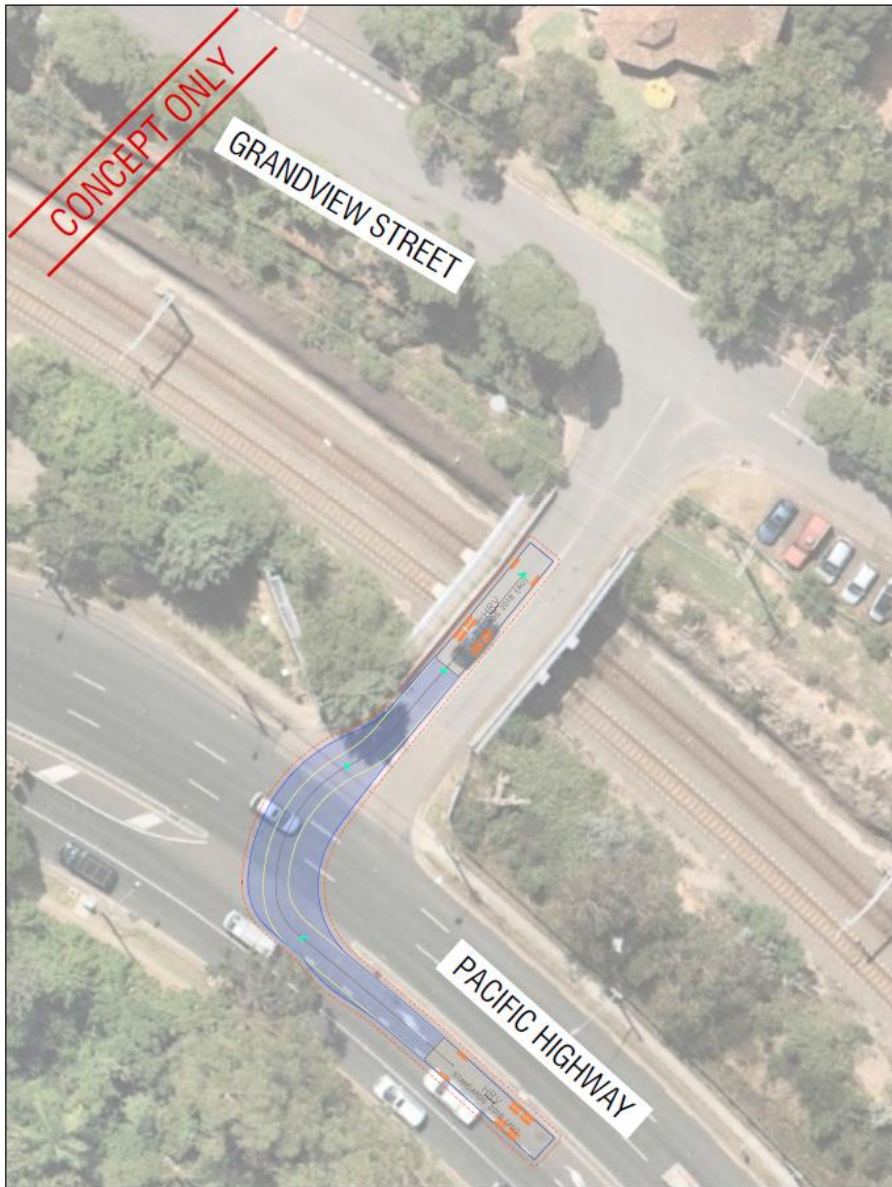


TfNSW Transport Access Program

**Pymble Station**

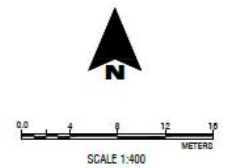
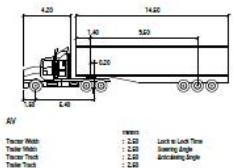
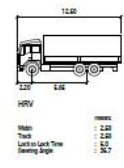
**Swept Path Assessment**  
**HRV/AV - Overpass**

FIGURE SK04-2



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 Projection: -

**SWEEP PATH LEGEND**  
 - Vehicle Path  
 - Vehicle Body  
 - Body Clearance  
 - Fixed Wheel Path



TfNSW Transport Access Program  
**Pymble Station**  
**Swept Path Assessment**  
**HRV/AV - Overpass**  
 FIGURE SK04-3

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