



# **TfNSW TAP Unanderra Station Upgrade**

## **Transport Access Program Traffic Impact Assessment**

Transport for New South Wales

03 July 2020

**Gold Coast**

Suite 26, 58 Riverwalk Avenue  
Robina QLD 4226

P: (07) 5562 5377

**Brisbane**

Level 2, 428 Upper Edward Street  
Spring Hill QLD 4000

P: (07) 3831 4442

**Sydney**

Studio 203, 3 Gladstone Street  
Newtown NSW 2042

P: (02) 9557 6202

**W:** [www.bitziosconsulting.com.au](http://www.bitziosconsulting.com.au)

**E:** [admin@bitziosconsulting.com.au](mailto:admin@bitziosconsulting.com.au)

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# 1. INTRODUCTION

## 1.1 Background

Transport for New South Wales (TfNSW) is proposing to upgrade Unanderra Railway Station as part of the Transport Access Program (TAP) which is a NSW Government initiative to improve the safety and accessibility of public transport infrastructure. The TAP involves the upgrade of transport facilities throughout NSW to provide easier access for people with disability, the elderly and parents with prams, and to better connect different modes of transport.

## 1.2 Project Objectives

The Transport Access Program aims to provide:

- stations that are accessible to those with disabilities, are less mobile and parents/carers with prams and customers with luggage
- 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 all 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.

## 1.3 Unanderra Station Upgrade

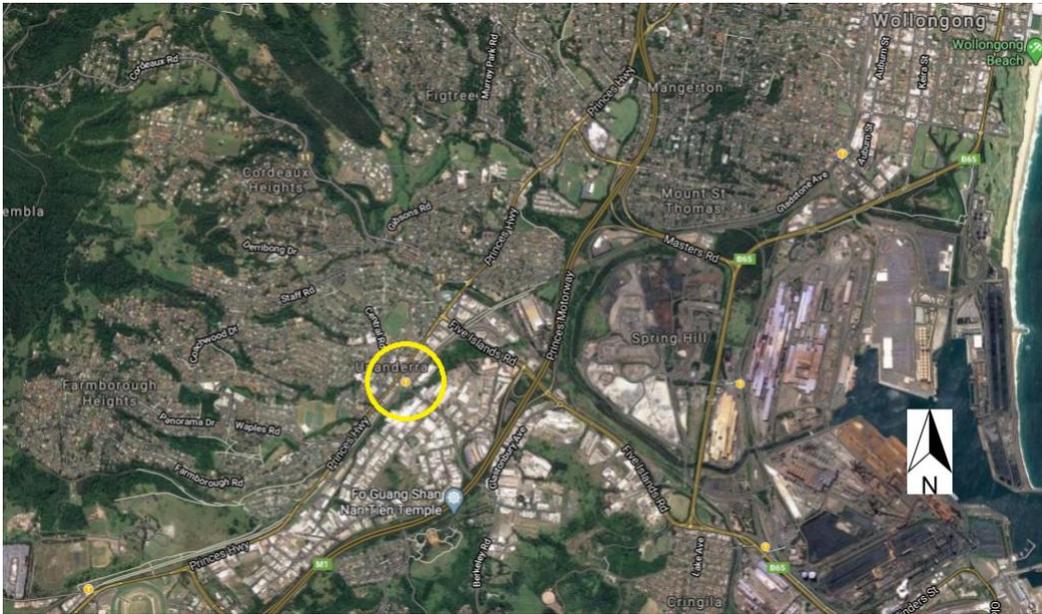
The Proposal involves an upgrade of Unanderra Station as part of the Transport Access Program which would improve accessibility and amenities for customers. The Proposal would include the following key elements:

- installation of three new lifts connecting to the existing footbridge, with canopies for weather protection at the lift landings
- modifications to the existing footbridge, subject to detailed design, including regrading of the deck and replacement of stair treads and handrails
- construction of elevated walkways between the new lifts and the footbridge
- platform modifications including minor platform regrading and line marking of boarding assistance on Platform 1 and 2 and relocation of two benches
- modification of the existing station building layout for the provision of a new family accessible toilet and a new staff unisex ambulant toilet a Station Services Equipment Room (SSER) and store room
- provision of an accessible kiss and ride on Berkeley Road (east) with a new access path to the station entrance including new kerb ramps
- provision of an accessible kiss and ride on Berkeley Road (west) including a widened footpath and a kerb ramp
- conversion of the existing non-compliant DDA parking spaces on Berkeley Road (west of station) into three accessible parking spaces with a shared zone
- provision of accessible footpaths on Berkeley Road (west) between the station entrance, kiss and ride, bus zone and accessible parking spaces.

## 1.4 Study Area

Unanderra Railway Station is located within the Wollongong City Council Local Government Area (LGA), southwest of Wollongong city centre. The station is located in the suburb of Unanderra near the intersection of the Princes Highway and Central Road, which is also the location of the town centre and shopping area.

The local and regional context is shown in Figure 1-1.



Source: Google Maps

**Figure 1-1: Unanderra and Surrounding Environs**

## 1.5 Study Scope

This TIA report details the expected traffic and transport impacts of the proposed Unanderra Station TAP upgrade. This report covers the following:

- The existing traffic and transport facilities and usage in the area.
- Proposed station facility upgrades and additions.
- Anticipated operation traffic impacts resulting from proposed upgrades.
- Traffic impacts anticipated during construction of upgrades.
- Potential mitigation measures required as a result of the impacts.
- This report has been prepared noting the following:
  - Stakeholder consultation was not conducted as part of this study
  - A site visit was conducted, but no traffic or pedestrian behaviour could be recorded due to the COVID-19 restrictions
  - Traffic modelling was not undertaken as a part of this study.

## 1.6 References

In preparing this report, the follow references have been used.

- An inspection of the station and its surrounds
- Wollongong Council Local Environmental Plan (LEP) 2009

- Roads and Maritime Service (RMS) Interactive Crash Statistics Website
- TfNSW Travel Zone Explorer Website
- TfNSW Train Station Entries and Exits Data
- Relevant Council codes and Australian Standards

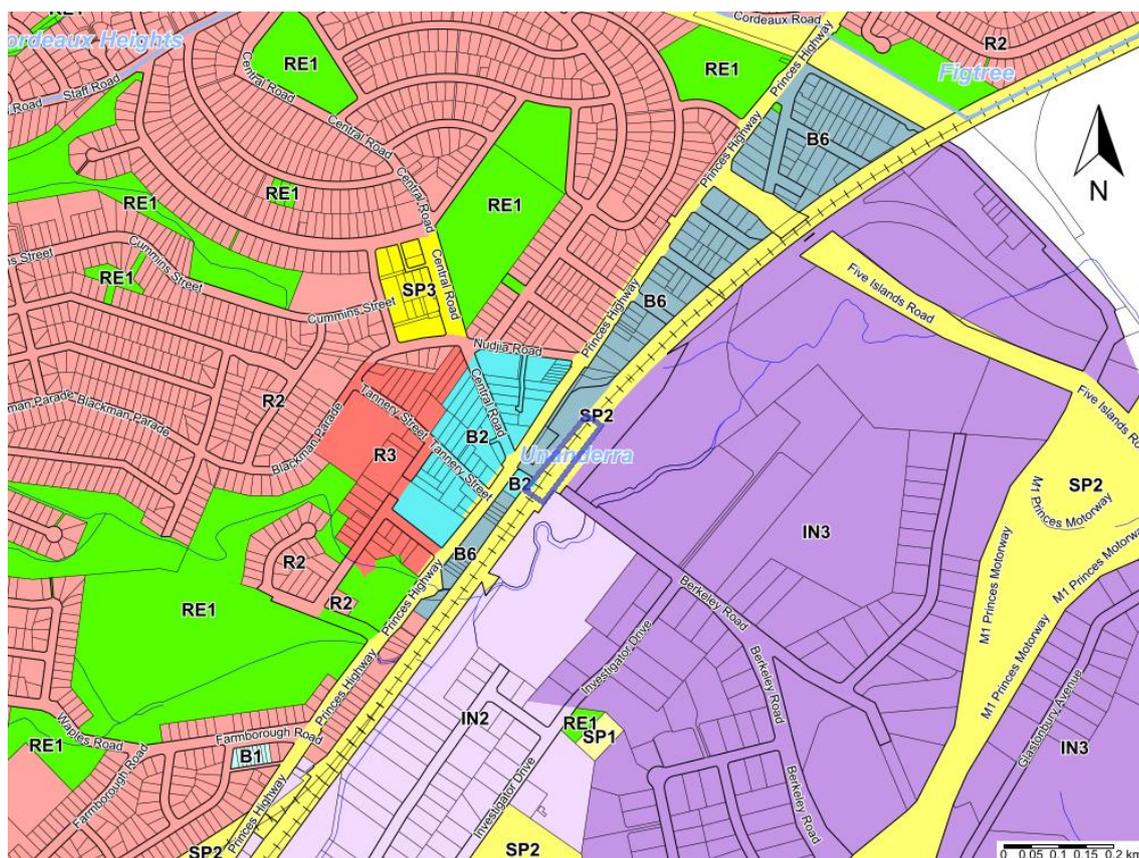
## 2. EXISTING CONDITIONS

Unanderra Railway Station is located within the Wollongong City Council LGA, approximately 70km south of Sydney, and 5km southwest of central Wollongong.

Unanderra Railway Station is on the SCO-South Coast Line two stations away from Wollongong between Coniston Station and Kembla Grange Station. It is relatively busy for a regional station, with data from TfNSW stating an estimated patronage of 500 entries and 500 exits on an average weekday. It is also the closest station to Nan Tien Temple, and visitors to the Temple often travel by train to and from Unanderra Station.

Unanderra station is located where Berkeley Road intersects the rail line. A footbridge connects the island platform to both Berkeley Road east and west. The suburb of Unanderra has a mix of residential, commercial and industrial zones, as shown in the Wollongong Council Local Environmental Plan (LEP) map in Figure 2-1. The station is highlighted in blue.

The town centre of Unanderra is located to the west of the station (B2), with a commercial zone between the railway and the Princes Highway (B6). The residential areas are mostly low-density (R2), with a small medium density zone near the town centre (R3). The east of the station is an industrial zone including heavy industries (IN3) and light industries (IN2). There are several recreational park areas (RE1) around Unanderra, and a sports club (SP3) near the town centre.



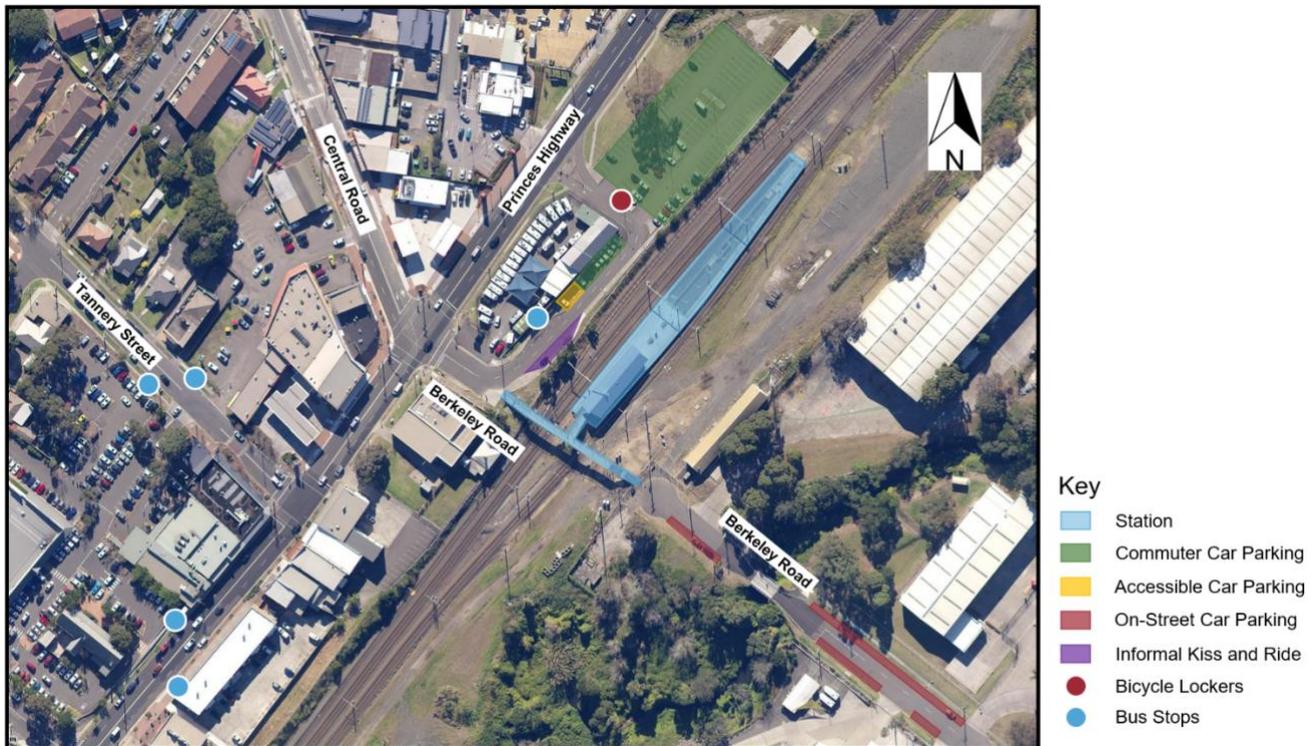
Source: Wollongong City Council LEP 2009

**Figure 2-1: Unanderra Land Use Zoning**

## 2.1 Existing Station Operation

Unanderra Railway Station currently provides facilities for a variety of other transport modes. A commuter car park is located on the western side of the station, along with an informal kiss and ride area. The bus stops on the Princes Highway and Berkeley Road are connected to the station by footpaths, and there is bicycle storage available near the car park.

A summary of the existing facilities is detailed in Figure 2-2.



Basemap Source: SixMaps, NSW Department of Finance and Services

**Figure 2-2: Existing Transport Facilities**

## 2.2 Public Transport

### 2.2.1 Passenger Rail Services

Unanderra Railway Station serviced by the SCO-South Coast Line. Trains stopping here run between Kiama or Dapto and Sydney via Wollongong. Journeys between Unanderra and Central Stations typically take 100 minutes for limited stop services during peak periods, and 120 minutes for all stop services. Journeys between Unanderra and Wollongong take approximately 8-10 minutes. The station platform is not wheelchair accessible and is only accessible by stairs.

Frequencies of timetabled services during weekday AM, PM and weekend peak hours are shown in Table 2-1.

**Table 2-1: Train Services Frequencies at Unanderra Station**

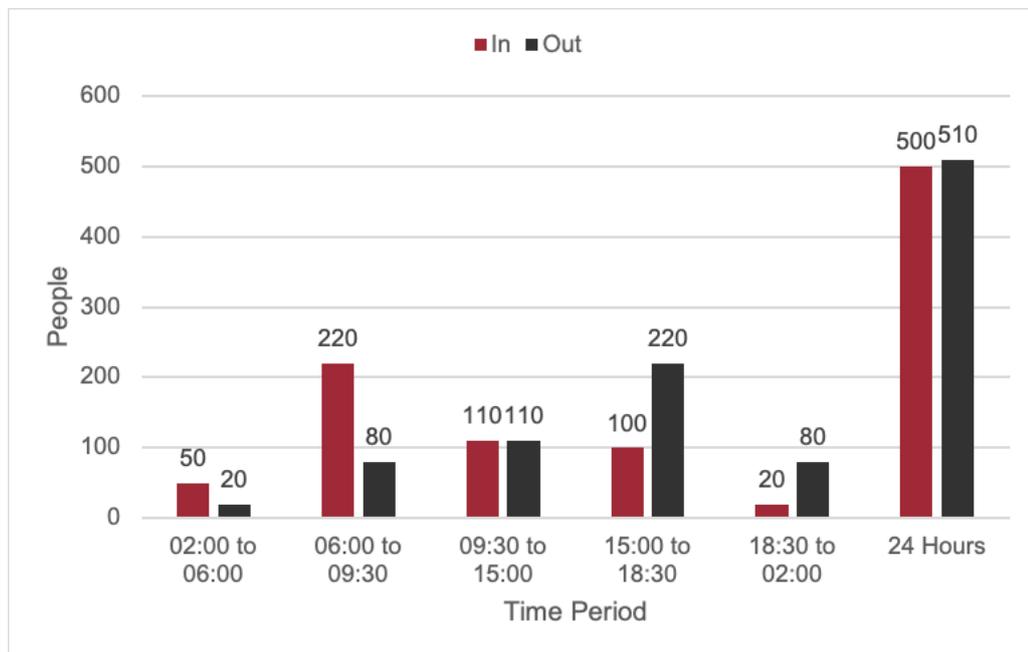
Direction	Peak Period Frequency		
	AM Peak (06:00 to 07:30)	PM Peak (17:00 to 19:00)	Weekend
Northbound (to Sydney)	20 minutes	60 minutes Plus one extra service	60 minutes Plus one extra service between 9:00 am and 10:00 am
Southbound (to Kiama)	20-45 minutes	20-40 minutes	60 minutes Plus one extra service between 5:00 pm and 6:00 pm

A summary of facilities provided at Unanderra Station according to TfNSW is listed below:

- Opal card top-up and ticket machine
- Emergency help point
- Payphone
- Wheelchair accessible toilet
- Wheelchair accessible car space
- Taxi rank
- Commuter car park
- Kiss and ride stopping area
- Bike lockers
- Tactile surfaces
- PA system for announcements
- Short platforms, doors open on last six cars.

## 2.2.2 Rail Patronage

Rail patronage data collected by TfNSW from a typical weekday in 2013 is detailed in Figure 2-3 below.



Source: Train Statistics 2014 (v1.1, Bureau of Transport Statistics, May 2015)

**Figure 2-3: Unanderra Railway Station Patronage**

The figures above suggest that Unanderra Railway Station is used by commuters travelling to work from Unanderra, and by commuters travelling to Unanderra for work, as there are significant numbers of passengers entering and exiting the station during peak hours.

Table 2-2 outlines the Opal card statistics for passengers entering and exiting the station over the course of a typical weekday. The statistics are based on Opal card transactions averaged over three consecutive weekdays. Both sets of data suggest that more passengers catch the train from Unanderra in the AM peak and to Unanderra in the PM peak.

**Table 2-2: Unanderra Railway Opal Entries and Exits 2016 to 2018**

	06:00 to 10:00		10:00 to 15:00		15:00 to 19:00		19:00 to 06:00		24 Hours	
Year	Entries	Exits	Entries	Exits	Entries	Exits	Entries	Exits	Entries	Exits
2016	240	50	70	60	60	200	60	100	430	410
2017	270	50	80	60	70	230	70	120	490	460
2018	260	60	80	70	60	230	90	100	490	460

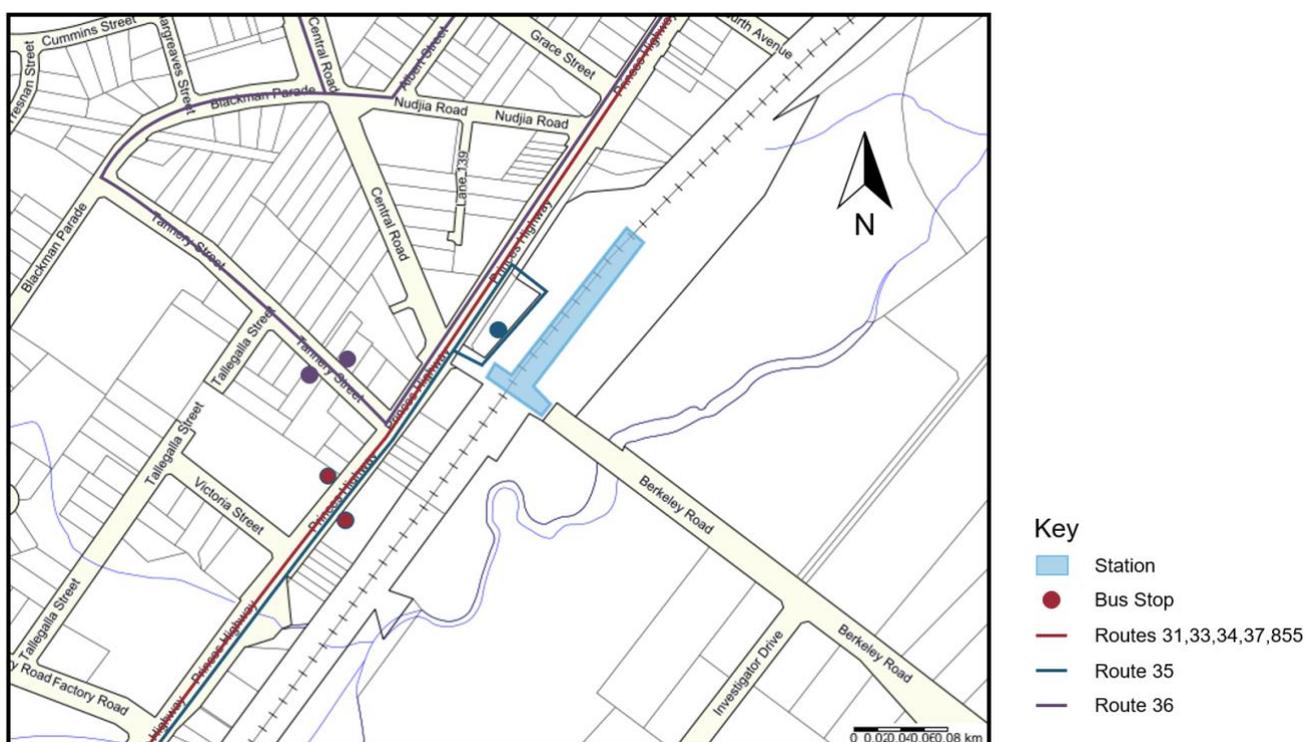
## 2.2.3 Bus Services

Bus stops near the station are located on the Princes Highway and on Berkeley Road on the western side of the station.

The bus stop locations and routes in the vicinity of Unanderra Railway Station are presented in Figure 2-4 and the frequency of buses in Table 2-3.

**Table 2-3: Daily Bus Service Frequencies**

Bus Stop Location	Destination	Routes	Peak Frequency
Berkeley Road	Farmborough Heights	35	30 minutes
Princes Highway Northbound	Wollongong	31,33,37,855	10 minutes
	University of Wollongong	41	60 minutes
Princes Highway Southbound	Dapto / Horsley	31,33,41	30 minutes
	Warrawong / Port Kembla	34	20 minutes
	Farmborough Heights	35	30 minutes
	Shellharbour / Lake Illawarra	37	60 minutes
	Canberra	855	One service per day
Tannery Street	Mount Kembla	36	120 minutes



Basemap Source: Wollongong City Council LEP 2009

**Figure 2-4: Bus Stop and Bus Routes**

### 2.3 Taxi Facilities

No formal taxi rank is provided at Unanderra Railway Station. The informal kiss and ride area may be used by taxis to pick up passengers, but it is not a waiting area for taxis.

### 2.4 Kiss and Ride Facilities

An informal kiss and ride area is located on Berkeley Road on the western side of the station. There is no signage and it has been observed to be used as parking space. There is enough space for three vehicles, and is pictured in Figure 2-5.



*Kiss and Ride Area on the left and Bus Zone on the right*

**Figure 2-5: Kiss and Ride Area**

## **2.5 Walking and Cycling**

### **2.5.1 Pedestrian Infrastructure**

The station platform at Unanderra is accessible by footbridge from both sides of the station. There are currently no lifts to access the footbridge. Existing footpaths connect the station with other transport facilities such as the commuter car park and bus stops and a pedestrian crossing for the Princes Highway is located just outside the station. The footpaths along Berkeley Road on the eastern side of the station are not connected, and pedestrians must walk on the road for some sections, most notably at the bridge where the road narrows. Figure 2-6 shows the current condition of the footbridge and station entrances.



*Clockwise from top left: Stairs on western side of station; top of footbridge; stairs to platform; stairs on eastern side*

**Figure 2-6: Pedestrian Facilities and Station Access**

### 2.5.2 Pedestrian Activity

A site visit was conducted by Bitzios Consulting in April 2020 during the morning peak period. During the site visit, no pedestrians were encountered, but this may be due to the COVID-19 restrictions in place at the time.

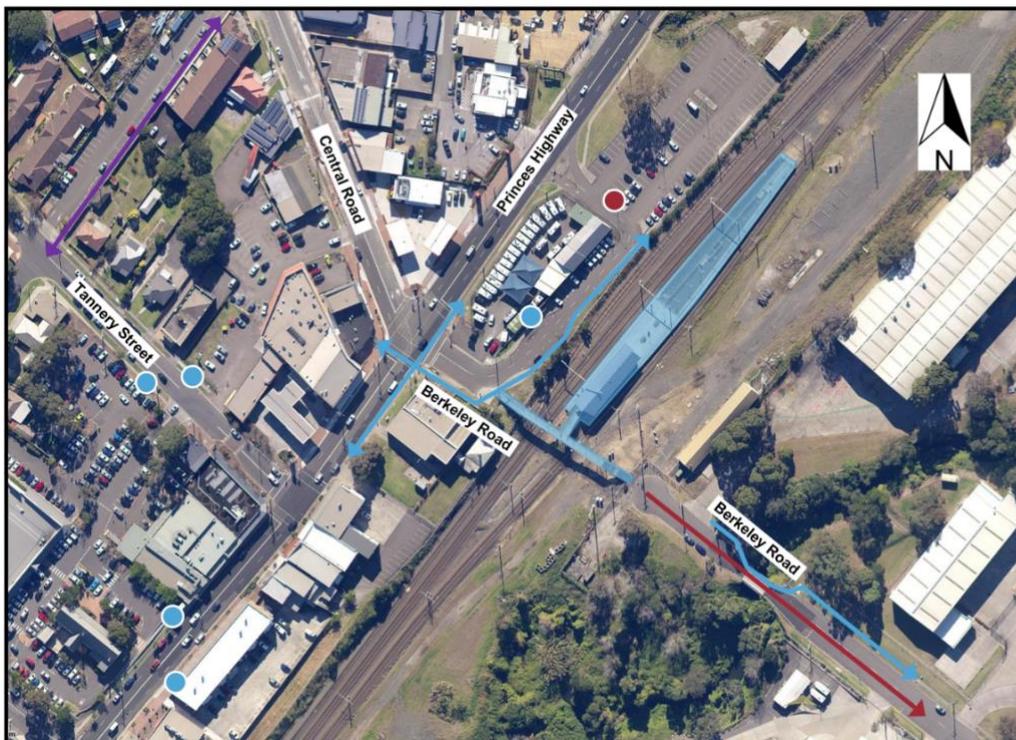
### 2.5.3 Cycling Infrastructure

Bicycle lockers for hire are provided by TfNSW next to the commuter car park, with capacity for four bicycles, there are no bicycle racks or stands for short stay bicycle parking. Figure 2-7 shows the location of the lockers compared to the car park.

Wollongong City Council recognises Berkeley Road east of the station as an unmarked on-road cycling path, and there is a shared path located to the west of the Princes Highway along the side streets. Pedestrian and cycling facilities are outlined in Figure 2-8.



**Figure 2-7: Bicycle Lockers**



Basemap Source: SixMaps, NSW Department of Finance and Services

**Figure 2-8: Pedestrian Desire Lines and Cycling Facilities**

## 2.6 Road Network

### 2.6.1 Berkeley Road West and Berkeley Road East

Berkeley Road is a two-way two-lane local road that runs perpendicular to but does not cross the SCO-South Coast Line. The western section runs from the Princes Highway intersection to the entrance of the station. An unnamed road runs from the entrance of the station to the car park and loops back to the Princes Highway. A bus stop and the kiss and ride area are also located on this road. There is no sign posted speed limit, and there are no traffic calming devices on the road. Figure 2-9 presents the current condition of the roads.



**Figure 2-9: Berkeley Road on western side of station and unnamed road**

The eastern side of Berkeley Road is an undivided no-through road that leads to the industrial zone on the eastern side of the railway. There is a narrow bridge crossing the river about 50m from the station entrance. The bridge is wide enough for one car, as shown in Figure 2-10.



**Figure 2-10: Berkeley Road on eastern side of station**

## 2.6.2 Princes Highway

The Princes Highway at Unanderra is a two-way four-lane road running parallel to the rail line. This section of the Princes highway is classified as a Regional Road by the NSW Roads and Maritime Services (RMS). The sign-posted speed limit is 60km/h. The conditions at the intersection of Berkeley Road and the Princes Highway are pictured in Figure 2-11.



**Figure 2-11: Intersection of Berkeley Road and the Princes Highway looking southwest**

## 2.7 Parking Demand

A commuter car park is provided on the western side of the station with spaces for 127 cars plus 3 non-compliant accessible spaces. Parking demand has been estimated using satellite imagery from a number of weekdays from 2019 to 2020. The demand for parking has a large variance even on weekdays, and has been observed to be at or above capacity. On one occasion, cars were observed parked in the access lane between the two parking aisles. The estimated parking demand for a typical weekday is outlined in Table 2-3.

On the eastern side of the station, on-street parallel parking is available on Berkeley Road and we have considered the 24 spaces closest to the station for the analysis because street parking here may also be used by people working in the industrial zone.

Short-stay parking is available on Central Road, Tannery Street, Tallegalla Street and Victoria Street on the other side of the Princes Highway, but those parking areas are not considered because they are mostly used by people visiting the town centre and not by train commuters.

**Table 2-3: Unanderra Station Typical Parking Demand**

Parking Area	Type	Supply (Spaces)	Demand (Spaces)	Demand (%)
Commuter Car Park	Accessible	3	1	67
	Unrestricted	127	117	92
Berkeley Road East	Unrestricted	24	22	88

The above figures indicate that the existing parking is near capacity, with an estimated parking demand of 140 cars generated by the station. This is approximately 42% of people entering the station between 06:00 and 15:00.

## 2.8 Traffic Volumes

Traffic volumes generated from trips to and from the station were calculated based on Opal Card data and historical trip distributions. Table 2-4 below outlines the estimated number of vehicles generated by the station. These estimates are calculated using the assumption that 42% of train commuters drive to the station and park their vehicles in the commuter car park.

**Table 2-4: Typical Commuter Traffic Generation**

Time	Vehicles In	Vehicles Out	Total
2:00 – 6:00	21	9	30
6:00 – 9:30	93	34	127
9:30 – 15:00	47	47	94
15:00 – 18:30	42	93	135
18:30 – 2:00	9	34	43

The traffic generated by the station generates a significant amount of traffic for the road network, but much of that would be absorbed by the Princes Highway.

## 2.9 Travel Mode Choice

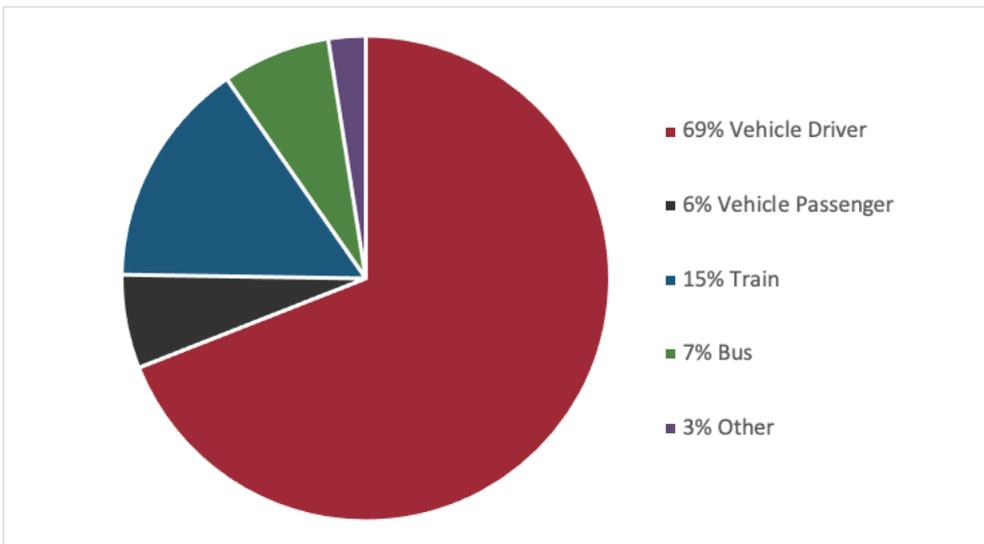
Bitzios Consulting has used 2016 Census data to determine patterns of travel to and from Unanderra Railway Station. Unanderra station is a relatively isolated station, and has a catchment area that includes the suburbs of Berkeley, Cordeaux Heights, Farmborough Heights, and Unanderra. The catchment area is outlined in Figure 2-12.

Census data estimates the population of the combined area to be around 22 000 people. Of the people who responded that they travel to work, 75% use a vehicle to travel to work as a driver or passenger, and only 15% use the train. A breakdown of travel to work mode split is presented in Figure 2-13.



Source: Transport for New South Wales

**Figure 2-12: Census data Journey to Work Data**



**Figure 2-13: 2016 Census Data – Employed Residents Commuting from Unanderra**

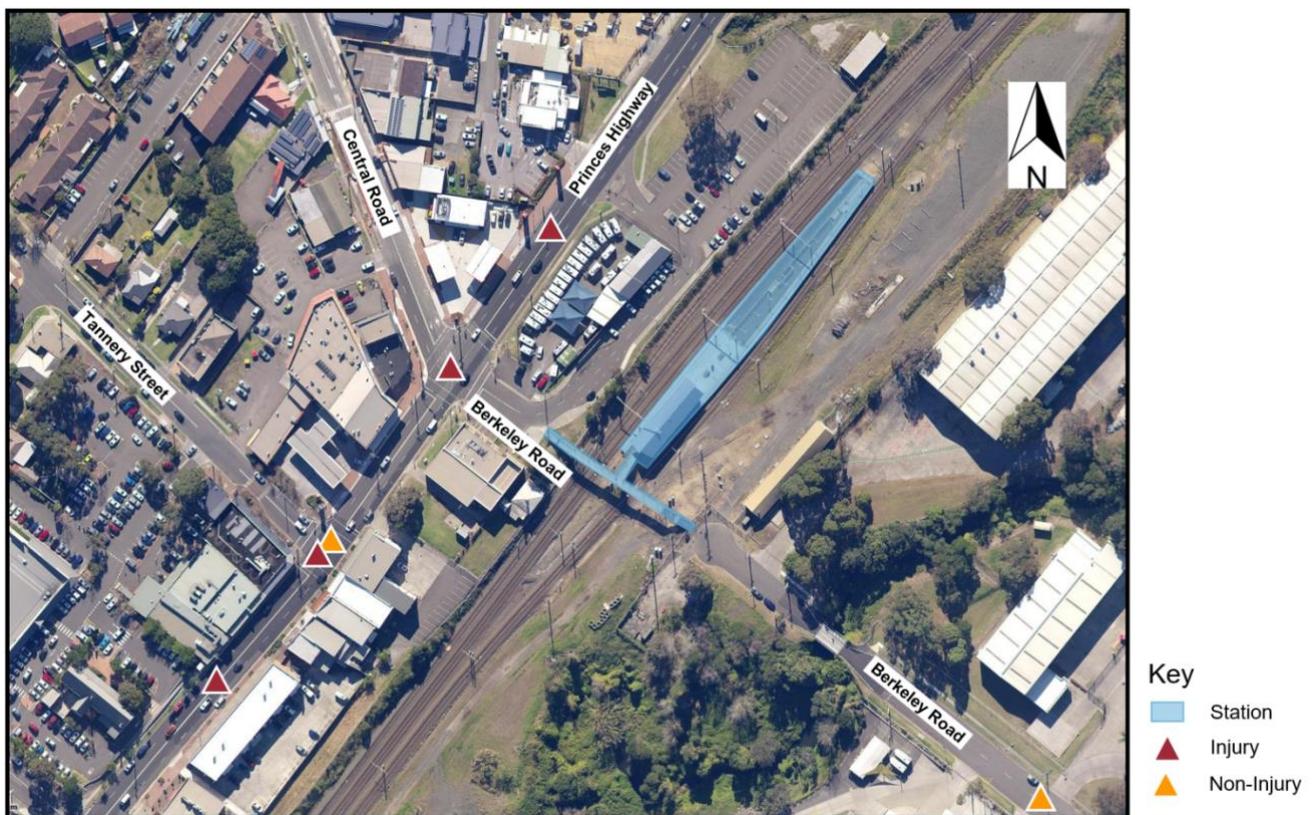
Note that almost all commuters who use the train travel northbound for work either in Sydney or the Wollongong region.

## 2.10 Road Safety

Historical crash data from the RMS Interactive Crash Statistics website indicates that a number of incidents have occurred in the vicinity of Unanderra Railway Station from 2014-2019, mostly near the intersection of the Princes Highway and Tannery Street. Please note that these crash statistics are based on incidents reported to Police, and do not contain near misses, notably those involving pedestrians. A summary of the crash statistics is listed in Table 2-5, and mapped in Figure 2-14.

**Table 2-5: Crash Statistics Summary (2014 – 2019)**

Location	Type of Crash	Number of Crashes
Princes Highway	Into parked car	1
	Off path into object	3
Princes Highway and Central Road Intersection	Pedestrian	1
	Turning vehicles	2
Princes Highway and Tannery Street Intersection	Turning vehicles	3
	Off path into object	1
	Into parked car	1
	Rear end	1
Berkeley Road	U-turn	1



Basemap Source: SixMaps, NSW Department of Finance and Services

**Figure 2-14: Recorded Crash History (2014-2019)**

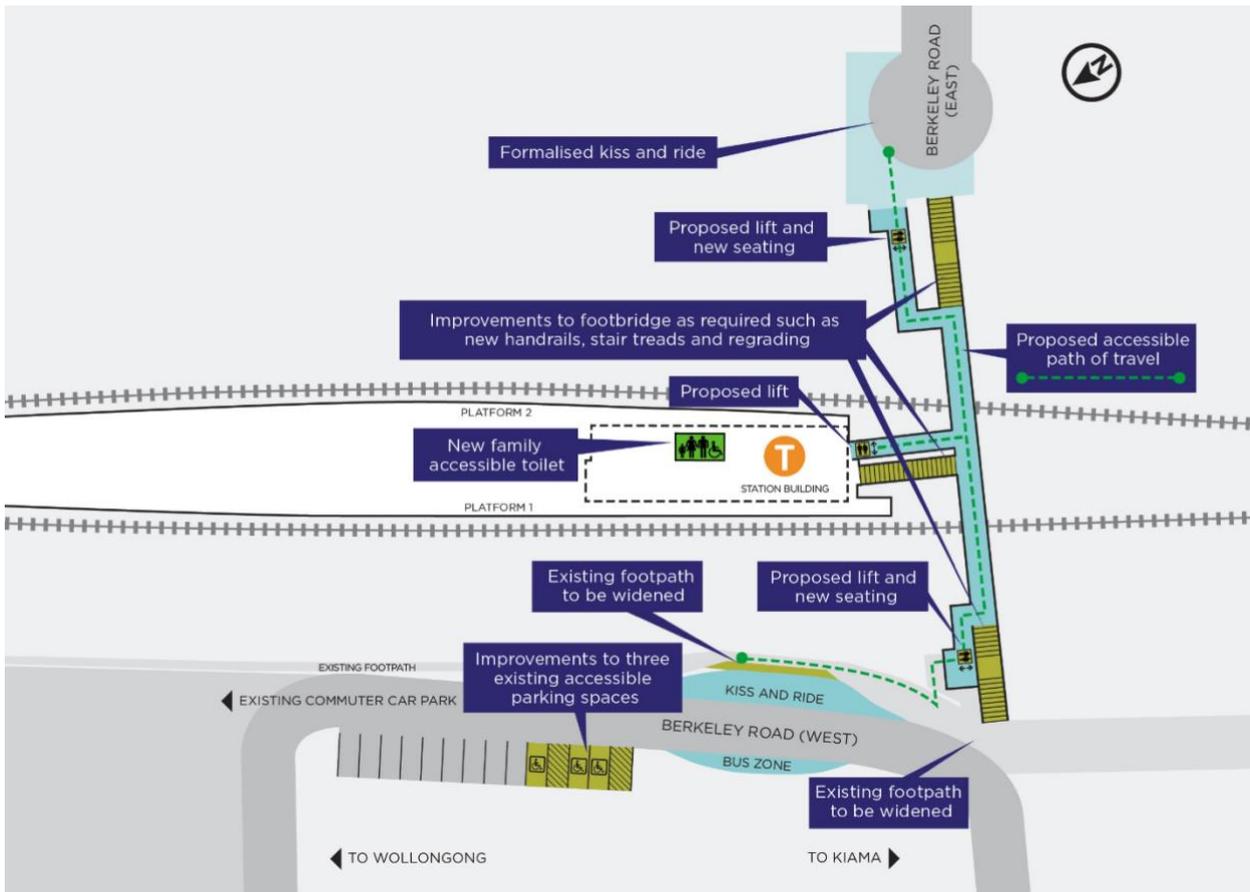
# 3. PROPOSED STATION PRECINCT IMPROVEMENTS

## 3.1 Overview

The Proposal involves an upgrade of Unanderra Station as part of the Transport Access Program which would improve accessibility and amenities for customers. The Proposal would include the following key elements:

- installation of three new lifts connecting to the existing footbridge, with canopies for weather protection at the lift landings
- modifications to the existing footbridge, subject to detailed design, including regrading of the deck and replacement of stair treads and handrails
- construction of elevated walkways between the new lifts and the footbridge
- platform modifications including minor platform regrading and line marking of boarding assistance on Platform 1 and 2 and relocation of two benches
- modification of the existing station building layout for the provision of a new family accessible toilet and a new staff unisex ambulant toilet a Station Services Equipment Room (SSER) and store room
- provision of an accessible kiss and ride on Berkeley Road (east) with a new access path to the station entrance including new kerb ramps
- provision of an accessible kiss and ride on Berkeley Road (west) including a widened footpath and a kerb ramp
- conversion of the existing non-compliant DDA parking spaces on Berkeley Road (west of station) into three accessible parking spaces with a shared zone
- provision of accessible footpaths on Berkeley Road (west) between the station entrance, kiss and ride, bus zone and accessible parking spaces.

The general layout of the proposed works is shown in Figure 3-1.



Source: Transport for New South Wales

**Figure 3-1: Unanderra Railway Station Proposed Layout (indicative only, subject to detailed design)**

### 3.1.1 Station Access

The proposed design includes the upgrade of the existing footbridge and stairs to comply with DDA and Australian Standards. This includes the installation of lifts at the entrances on both sides of the station, and a lift to the platform. The stairs would also be upgraded with new handrails, treads and TGSIs, and the bottom of the stairs would also be regraded. The station platform would also be regraded, and access to toilet facilities would also be improved.

### 3.1.2 Integrated Transport facilities

#### *Kiss and Ride*

The existing kiss and ride on the western side of the station would be formalised, and the footpath next to it would be widened. A new kiss and ride would be constructed on the eastern side of the station on Berkeley Road where there is currently a driveway for accessing railway land.

#### *Car parking*

The existing car parking arrangements are to be maintained, but the accessible parking spaces would be modified to include shared wheelchair manoeuvring spaces next to the parking space. A bollard must be placed on the side of the shared space facing the road to prevent vehicles from entering the shared space, and a footpath should be provided so that wheelchair users can safely leave the car park.

## 4. OPERATIONAL TRAFFIC IMPACTS

### 4.1 Future Demand

TfNSW has provided the patronage data for 2017, predicted rates for 2036 and associated growth rate. This is outlined in **Error! Reference source not found.**

**Table 4-1: Forecast Station Patronage**

Period	2017	2036
Growth (%)	-	14
Average weekday patronage	922	1055
1-hour weekday peak	57	319

### 4.2 Public Transport

It is unlikely that the proposed upgrade would have any significant impacts on train network operations. Even if the proposed upgrades increase demand, it is unlikely that it would cause congestion issues because patronage is currently low.

The proposal is also unlikely to have any significant impact on the surrounding bus network because of the low expected growth in rail patronage.

### 4.3 Pedestrians

The Proposal includes a number of pedestrian facilities that would improve access and safety such as new lifts and footbridge modifications. The lifts would provide wheelchair access for a station that is currently inaccessible and provide easier access for people with mobility issues such as the elderly or parents with prams.

The proposal does not include any changes to the commuter car park. It is noted, however, that the only pedestrian facility within the car park is a footpath next to the railway corridor, and no traffic calming measures have been implemented.

It is unlikely that pedestrian capacity on the footbridge, lifts and stairs would have an impact to the operation of the station as the patronage numbers for Unanderra Station are low.

### 4.4 Cyclists

No additional bicycle facilities have been proposed for the Unanderra Station upgrade in addition to the existing bicycle lockers. The four existing bicycle lockers are to be maintained.

### 4.5 Kiss and Ride

The existing kiss and ride area is to be formalised, and a new kiss and ride is to be provided on the east side of the station. The new kiss and ride is proposed to be constructed at the turning area at the end of Berkeley Road, so vehicles that stop in the designated area would reduce the turning radius available at the turning area.

### 4.6 Traffic Generation and Parking Demand

Parking demand is currently an issue at Unanderra Railway Station because the commuter car park has been observed to be near or at capacity. A small increase in commuters may result in more

commuters parking in the nearby shopping areas or local roads. This may also increase safety issues as commuters may choose to park in undesignated areas. Parking demand may be reduced through incentivising commuters to take public transport to get to the station.

The construction of the new kiss and ride area on the eastern side of Berkeley Road may increase traffic on that road. This may raise safety issues if there is an increase in traffic across the single lane bridge that allows access to the station.

It is unlikely that additional traffic generated on the western side of the station would have a significant impact on the greater road network. The station exits directly onto the Princes Highway which is a major arterial road.

## **4.7 Property Access**

It is not expected that the proposed upgrades would impact vehicle or pedestrian access to neighbouring properties. The kiss and ride would prevent access to a gate that currently allows access to railway land, but there is another access gate on the opposite side of the station stairs. To be able to access the same area, vehicles must pass underneath the footbridge next to the railway, so larger vehicles may have reduced access.

## **4.8 Road Safety**

The proposed upgrades to Unanderra Railway Station would create a number of changes in pedestrian and vehicle patterns which may introduce safety issues.

As mentioned in Section 4.6, an increase in parking demand may result in commuters seeking parking in the nearby town centre area or local roads, thus increasing vehicle activity during peak periods. It may also result in commuters parking in locations that narrow or obstruct parking aisles.

Safety conditions should remain unchanged on the Princes Highway as a result of this upgrade. There has been one report of a vehicle hitting a pedestrian at the Central Road intersection in the past five years, and a marked pedestrian crossing has been provided on all four sides of the intersection.

The footpath connection between the station and accessible parking spaces is limited by the informal pedestrian crossing on Berkeley Road. Visibility of the crossing is limited because it is near the bend in the road and there are no markings on the road.

Only one of the accessible shared spaces has direct access to the footpath. To access the footpath from the other shared space, wheelchair users must use the road to manoeuvre around parked vehicles. This may lead to unsafe situations because the two-way road next to the accessible spaces is relatively narrow.

Refer to Section 6 for recommended mitigation measures.

## 5. CONSTRUCTION TRAFFIC IMPACTS

### 5.1 Construction Activity

The upgrade of Unanderra Railway Station would include construction works on the footbridge over the existing railway and on the station platform, so construction during normal business hours may impact the operation of trains on the SCO-South Coast Line. Should track possession be required during train operating hours, prior notice would need to be given to affected passengers using standard TfNSW procedures.

Most of the work required for the Proposal would be undertaken during standard (NSW) Environment Protection Authority (EPA) 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

Out of hours work is 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 three rail possessions would be utilised to facilitate the following:

- installation of lift structures
- delivery of lift equipment
- resurfacing/regrading of the existing footbridge and station platform.

The construction would also include the installation and repair of footpaths near the entrances on both sides of the station, so alternative access routes or platform closures should be considered during construction planning.

#### 5.1.1 Worker Induction

A site induction would be required for all on-site workers and subcontractors. The induction should include WHS, environmental protocols and emergency procedures, as well as protocols for vehicles accessing the site.

Any workers responsible for road works and traffic control must be suitably trained and covered by the appropriate insurances. All traffic controllers must hold RMS accreditation in accordance with Section 8 of *Traffic Control at Work Sites Version 5*.

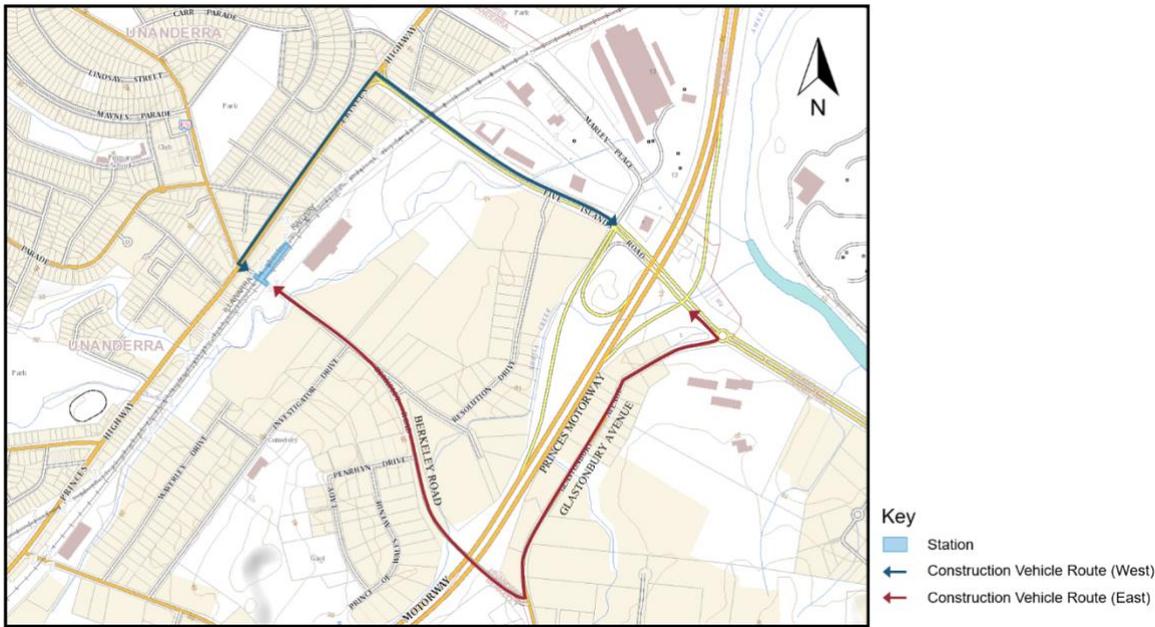
### 5.2 Construction Stage Impacts

#### 5.2.1 Construction Vehicle Routes

Construction vehicles are able to access the western side of the station from the Five Islands Road Exit of the Princes motorway via the Princes Highway. Both these roads are multiple lane arterial roads. Five Islands Road has a signposted speed limit of 80km/h and the Princes Highway is 60km/h. The intersection of Berkeley Road and the Princes Highway has room for larger vehicles to turn to enter the site, but exit through the car park access route may not be possible for larger vehicles, and is a left turn only onto the Princes Highway.

The eastern side of the station is accessible via Glastonbury Avenue and Berkeley Road. These roads are significant access roads for the industrial area east of Unanderra Station, and are often used by trucks. The signposted speed limit is 60km/h for both roads. There is a single lane bridge on Berkeley

Road just before the station, and the turning area at the end of the road may be limited by the construction of the new kiss and ride area.



Basemap Source: SixMaps, NSW Department of Finance and Services

**Figure 5-1: Construction Vehicle Routes**

### 5.2.2 Traffic Impacts

The construction of the proposed upgrades would add extra vehicles to the local roads. Vehicles that would need access to the site include heavy vehicles for material and equipment delivery and removal, light work vehicles for construction workers and subcontractors.

It is expected that a range of trucks would need access to the site, including medium and large rigid vehicles and concrete trucks.

Construction traffic is not expected to exceed 20 light vehicles and 10 heavy vehicles per day during peak construction periods (including scheduled Sydney Trains rail possessions) and would be less when work is undertaken during standard construction hours. The site compound is located on the eastern side of the station, so most of the traffic is expected to be added to Glastonbury Avenue and Berkeley Road. Construction traffic volumes are low and would not have a significant impact on the greater road network.

### 5.2.3 Parking Impacts

Parking demand is high at Unanderra Station, so measures should be taken to minimise potential impacts on parking access for vehicles and pedestrians during construction.

The proposed construction site would encroach onto Berkeley Road on the western side of the station. If this section of road is closed, then the only entrance to the car park would be from the southbound lanes of Princes Highway. Cars travelling northbound on the Princes Highway would have to make a detour through Central Road and Nudjia Road to be able to enter the car park.

The construction work on the eastern side of the station may reduce the number of parking spaces available on Berkeley Road next to the station, but should not be significant compared to the available supply.

Access to the commuter car park may be affected by the footpath widening on the western side of the station which would cause temporary minor disruption to pedestrians and increased safety risks for pedestrians, due to potential interactions with construction plant and vehicles.

#### **5.2.4 Other Impacts**

Bus route 35 currently stops at Berkeley Road (west) next to the station, and uses the road as a turnaround facility to join the southbound lanes of the Princes Highway. Should Berkeley Road (west) be closed during construction, bus route 35 would not be able to stop next to the station and would require an alternative route to change direction from northbound to southbound.

The proposed construction works are expected to cause temporary disruptions to the existing pedestrian facilities on both sides of the stations, particularly for when construction works for the lift and surrounding footpaths are being undertaken. This has the potential for increased safety risks for pedestrians, due to potential interactions with construction plant and vehicles.

The proposed construction works may also affect the turning area at the end of Berkeley Road, so the impact for trucks should be investigated and managed.

Access to neighbouring properties are not expected to be affected.

Refer to Section 6 for recommended mitigation measures.

## 6. RECOMMENDED MITIGATION MEASURES

In order to manage potential issues caused by construction works, a traffic control plan (TCP) that covers the various stages of construction would need to be prepared and submitted to the relevant roads authority and Wollongong City Council before work commences. The TCP should include all required traffic control measures such as signs and line marking as per *the RMS Traffic Control at Work Sites Manual – Version 5*.

A Construction Traffic Management Plan (CTMP) that further details construction traffic impacts on the road network and mitigation procedures would be prepared and submitted to Wollongong Council before the commencement of construction. Traffic and transport issues raised in the sections above should be addressed by the CTMP and TCPs.

The CTMP would be based on the staging and timing of the construction, and would include:

- The proposed construction activities, including hours of operation
- Identification of haulage routes and truck frequency
- Pedestrian and traffic route closures and management methods including public transport
- Identification of construction zone access gates and construction vehicle turning areas to allow forward entry and egress from the frontage roadways
- Loading and unloading of materials, including identification of works zones on frontage roadways
- On-site parking requirements for construction traffic
- Construction traffic impacts on the surrounding road network, including recommendation of mitigation measures if necessary.

If the closure of Berkeley Road (west) is required during construction, coordination with TfNSW would be required to reroute bus route 35 and relocate the bus stop.

During detailed design the following should be investigated to improve safety:

- A pedestrian crossing on Berkeley Road west to improve pedestrian safety between the accessible parking spaces, bus stop, and the station
- A footpath next to the accessible parking spaces on Berkeley Road west
- Alternative pedestrian footpaths or traffic management from commuter carpark to station
- Speed humps, connected footpaths, pedestrian crossings and speed limits within the commuter carpark
- Additional signage and line marking on the single laned bridge on Berkeley Road east to clarify right of way and mitigate congestion
- Relocation of the proposed kiss and ride on the eastern side of the station.