



# Rooty Hill Commuter Car Park

Transport for NSW

Traffic, Transport and Access  
Impact Assessment

FINAL

November 2017

**SECA**solution 

# Rooty Hill Station - Commuter Carpark and Easy Access Upgrades

## Traffic, Transport & Access Impact Assessment

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## 1 Introduction

### 1.1 Background

Seca Solution was commissioned by Pitt & Sherry on behalf of Transport for NSW to prepare a Traffic, Transport and Access Impact Assessment (TT&AIA) for the proposed expansion of the commuter carpark at Rooty Hill Station as part of the Transport Access Program (TAP). The report will form part of a Review of Environmental Factors (REF) to support an Environmental Impact Assessment (EIA) process under Part 5 of the EP&A Act, being prepared by Pitt & Sherry.

The TAP is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

The program aims to provide:

- Stations that are accessible to people with a disability, ageing 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 all modes for all customers
- Safety improvements including extra lighting, help points, 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.

This report is based on a review of:

- Rooty Hill Station Precinct - Accessibility and Commuter Car Park Upgrade (AECOM, 2015) including the Traffic, Transport and Access Impact Assessment
- Existing operations at the Rooty Hill Station Carpark
- Traffic and pedestrian movement data collected by Seca Solution
- Site visit to the Rooty Hill Station and environs and analysis by Seca Solution

This assessment has been prepared with regard to Austroads Guidelines and the "RTA Guide to Traffic Generating Developments" published by the Roads and Maritime Services (RMS).

### 1.2 Scope of Report

The scope of this report is to review the external traffic arrangements at the proposed site for the expanded Rooty Hill Commuter Carpark for both construction and ongoing operation of the facility. The report provides advice on traffic, transport and access issues including active travel opportunities.

(a) The preparation of the TT&AIA requires:

- i. assessment of key environmental impacts as they relate to traffic generated by the project;
- ii. assessment of cumulative impacts during both construction and operation;
- iii. identification of any impact mitigation measures as they relate to the project; and
- iv. assessment of traffic, transport and access impacts.

### 1.3 Issues and Objectives of the study

The issues relative to the proposal are:

- Assess impact on the local road network due to additional construction and operational traffic flows;
- Assess the impact of the additional parking generated by the proposed project, during both construction and operation;
- Review the access arrangements for the project; and
- Assess any other transport impacts associated with the project.

The objective of the report is to document the impacts of the proposed development and provide advice on any infrastructure work or measures required to mitigate the impact of the project.

## 2 Existing Situation

### 2.1 Site Description and Proposed Activity

The proposed expansion for the Rooty Hill Commuter Car Park involves the construction of a new multi-level carpark on Station Street, which will replace the existing at-grade commuter carpark in this location. This carpark will provide for a total of 504 commuter carparking spaces, which is a net increase of 344 spaces above the existing capacity of this carpark. These future parking space numbers have been determined based upon the existing station patronage and the forecast 2036 patronage, which is expected to increase by around 15%.

### 2.2 Site Context

#### 2.2.1 Location

The subject site is located on Station Street, approximately 80 metres west of Rooty Hill Station on the northern side of the rail corridor as shown in Figure 2-1 below. To the north of the site there is an existing skatepark with the commuter carpark bounded by a Blacktown City Council depot to the north and east. Rooty Hill Town Centre precinct lies to the east of the site on Rooty Hill Road.

#### 2.2.2 Zoning and Adjacent Land Use

The surrounding land use consists of mostly retail and commercial development within the Rooty Hill Town Centre, with a Council depot to the rear of the site. Land further to the west consists of predominately low density residential together with Rooty Hill Public School and Rooty Hill High School.



Figure 2-1 - Location of the subject site in the context of the local road network (Source: pitt&sherry)

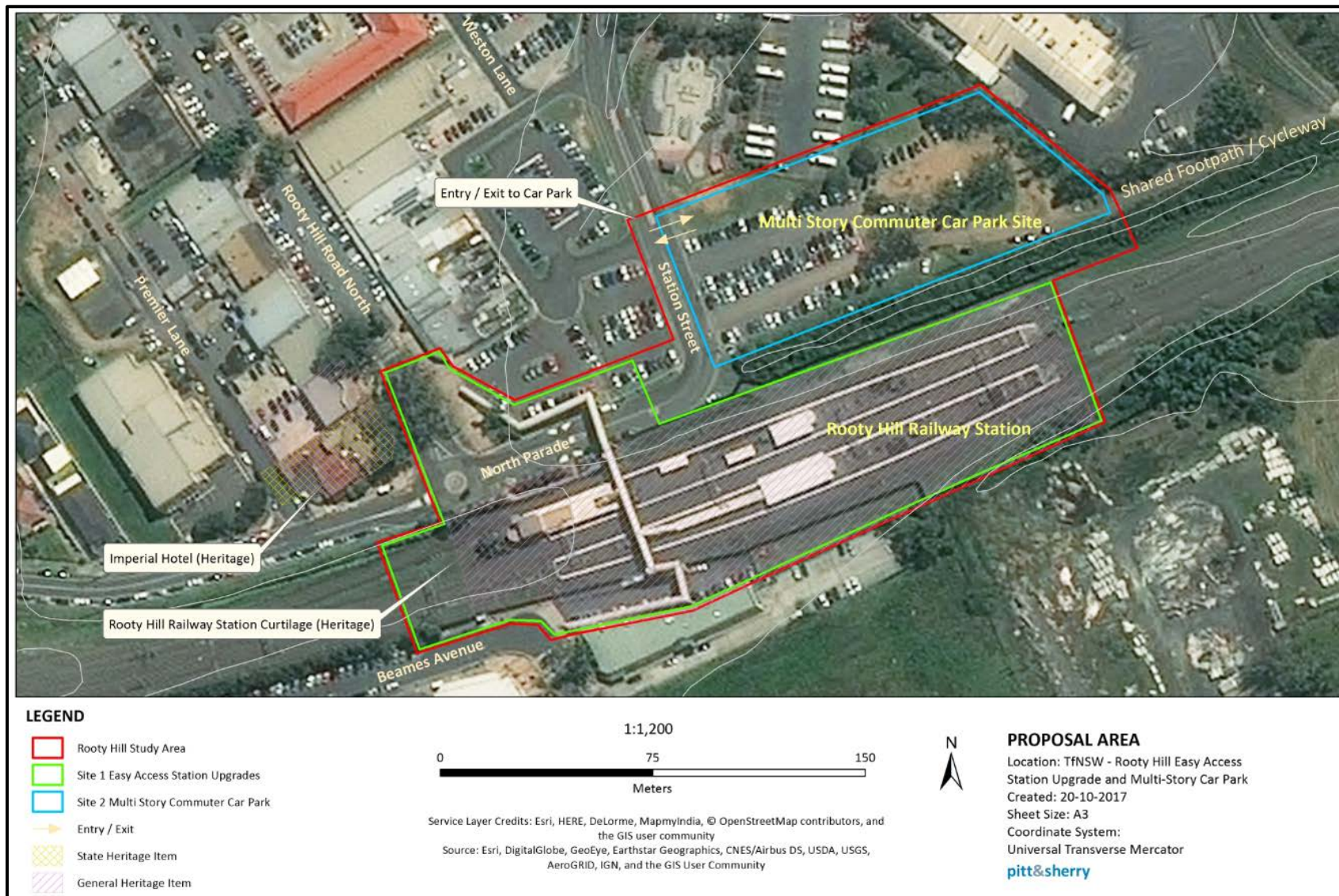
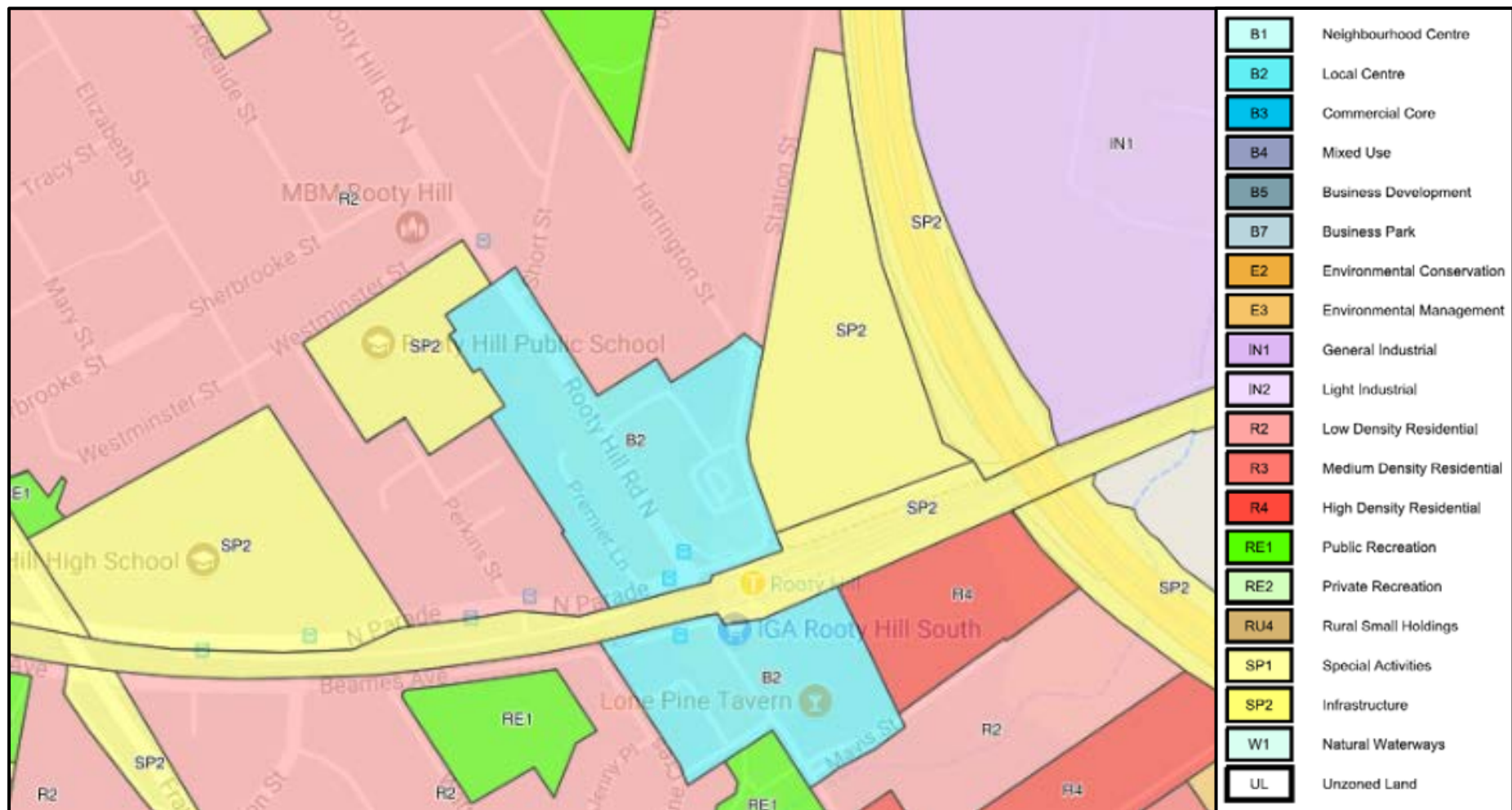


Figure 2-2 - Land Use Zoning (Source: NSW Planning & Environment)





### 2.2.3 Existing Station Facilities

Rooty Hill Station currently services the T1 Western Line which provides services between Emu Plains or Richmond and Sydney City. It is attended by station staff and facilities currently provide at the station are listed below in Figure 2-3. Rooty Hill Station is not currently wheelchair accessible and the proposed easy access upgrades will allow for this.

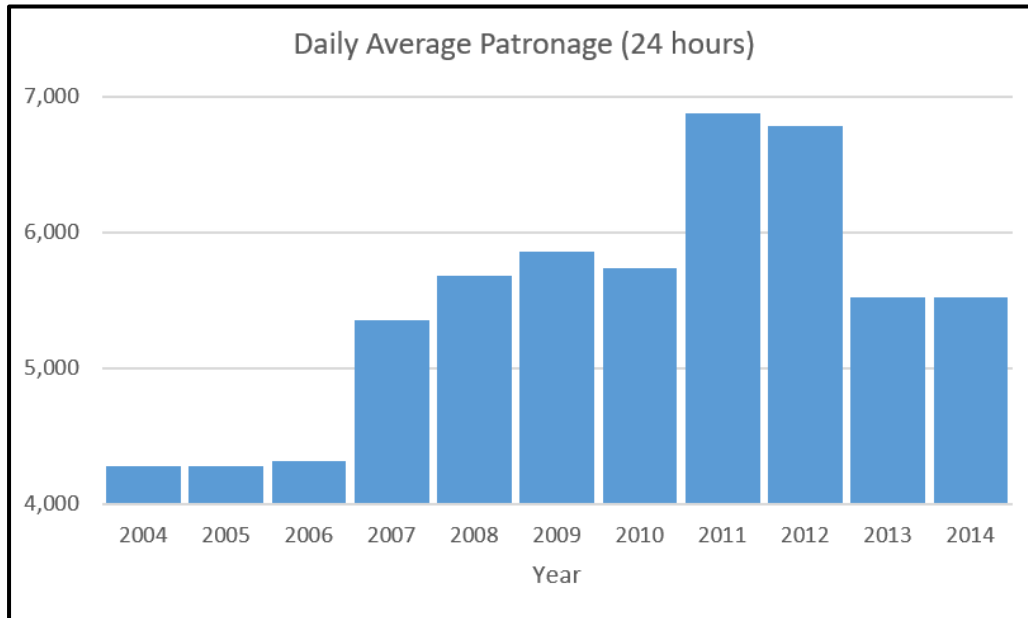
Figure 2-3 – Existing Station Facilities (Source: Sydney Trains)

Getting around the station		Accessibility	
	Stairs 		Hearing loop 
	Escalator 		Platform tactile tiles 
	Lift 		Portable boarding ramp 
	Ramp (1:6 gradient) 		Wheelchair accessible toilet 
	Level crossing 		Wheelchair accessible payphone 
			Wheelchair accessible carspace/s 
General facilities		Transport interchanges	
	Opal top up machine <a href="#">Check »</a>		Bus stop close by 
	Opal single trip ticket machine <a href="#">Check »</a>		Ferry wharf close by 
	Toilet 		Taxi rank close by 
	Payphone 		Bike racks or bike lockers 
	Passenger display screens 		Kiss and ride 
	Help point 		Car park close by 

#### 2.2.4 Current Demands and Patronage

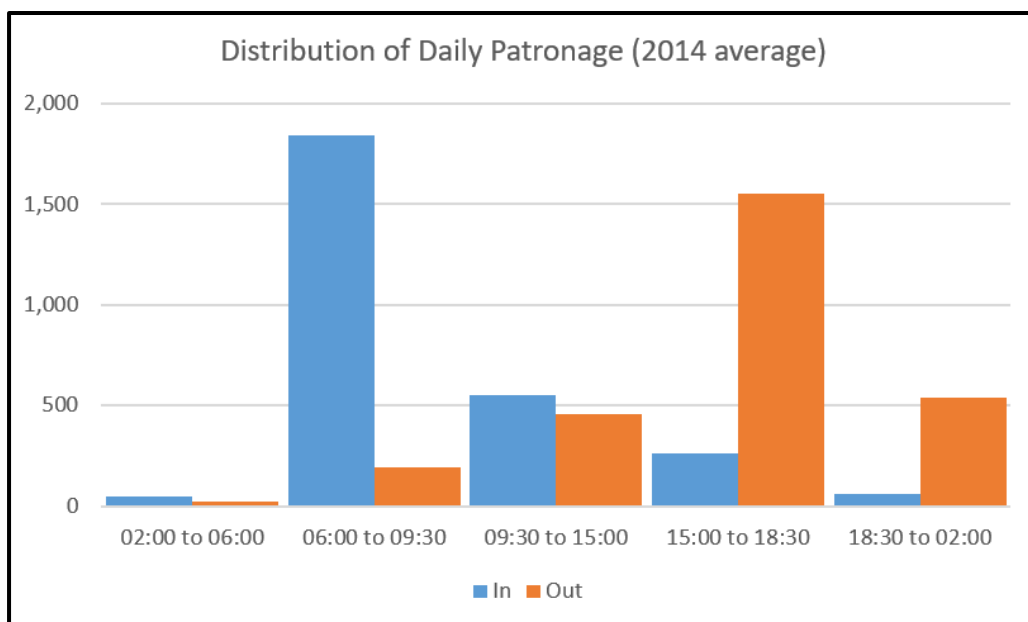
Data collected by the Bureau of Transport Statistics indicated that in 2014 there was an average of 5,500 people passing through Rooty Hill Station during a typical week day. There has been significant growth over the last 10 years with a significant jump in the number of people using this station between 2006 and 2007 followed by a period of limited growth. Daily average patronage through Rooty Hill Station between 2004 and 2014 is shown in Figure 2-4 below.

Figure 2-4 – Rooty Hill Station Patronage 2004-2014 (Source: Bureau of Transport Statistics).



A large percentage of the overall demand through Rooty Hill Station occurs during the typical peak commuter periods. A review of the transport statistics and barrier counts at the station shows that most people arrive at the station between 6am and 9.30am and travel via train to key employment areas such as Paramatta, Blacktown or the Inner City. Most commuter return to the station at the end of the working day between 3pm and 6:30pm as shown in Figure 2-5.

Figure 2-5 – Rooty Hill Station 24-hour trip distribution (Source: Bureau of Transport Statistics).



### 2.2.5 Distribution of Commuter Trips

A review of the 2011 Journey to Work data shows that a significant proportion of people who live in Rooty Hill work within the Mount Druitt area (23% of residents) and drive to work. A large percentage of residents also work in Paramatta (10%), Inner City (10%) or Blacktown (9%) with many of these residents electing to travel by train.

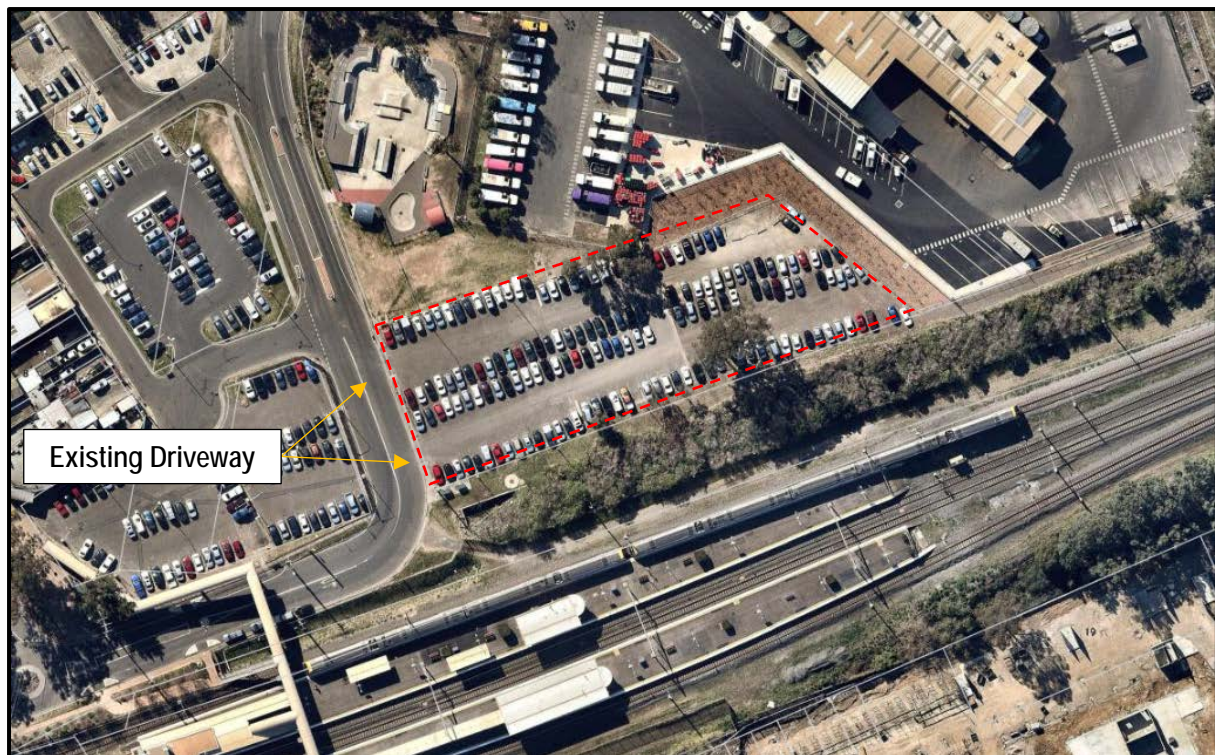
Only a small percentage of people who work in Rooty Hill travel by train with many of these people also living within the surrounding area.

## 2.3 Site Access

### 2.3.1 Road

Access to the existing commuter carpark is provided via two separate driveways off Station Street as shown in Figure 2-6 with each driveway allowing for both entry and exit movements.

Figure 2-6 Showing existing access to the commuter carpark off Station Street.



## 2.4 Pedestrian Pathways

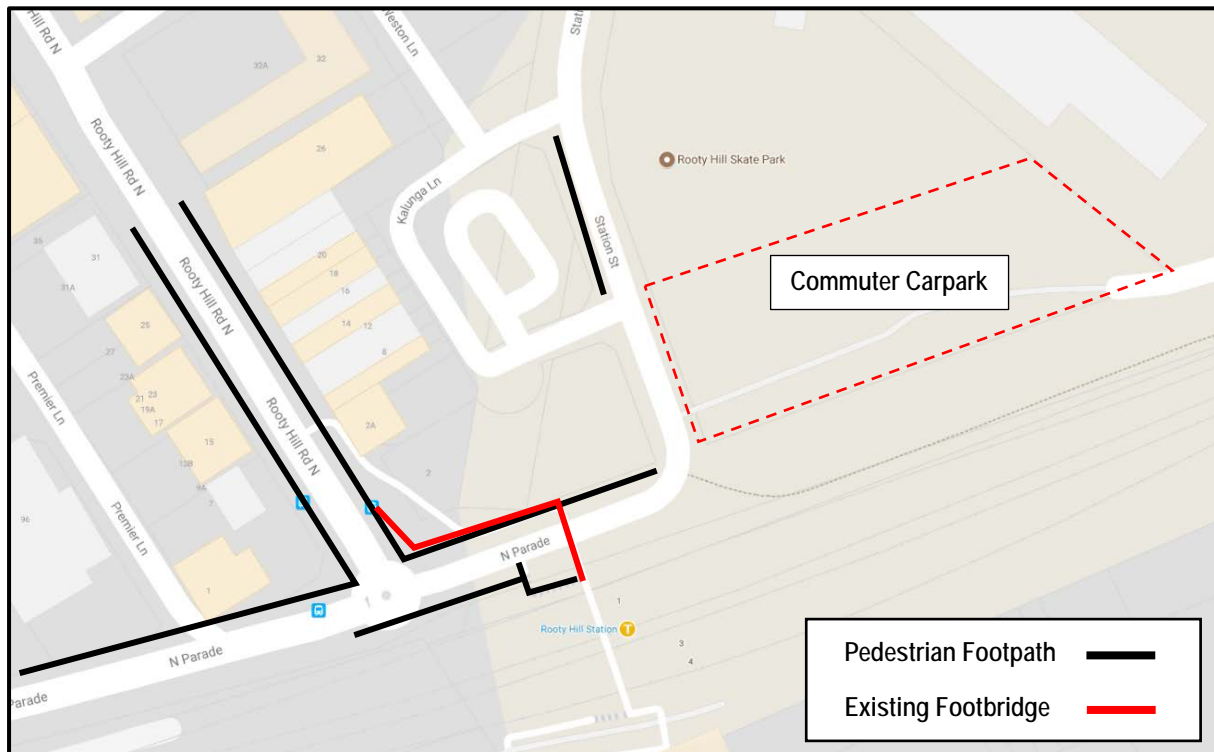
The existing carpark is located approximately 80 metres west of Rooty Hill Station. There are currently no pedestrian facilities along the southern side of North Parade, with pedestrians who walk between these facilities observed to walk along the roadway next to parked vehicles.

Pedestrian pathways are provided on the northern side of North Parade which allow for access to the adjacent commuter carpark via an opening in the boundary fence. A pedestrian refuse island to the front of the station also allows for staged pedestrian movements across North Parade, although it is noted that the opening in the fence is not in line with this refuse island.

There is an existing pedestrian footbridge across North Parade which allows for safe pedestrian access to the station from Rooty Hill Road as well as nearby bus stops in this location. Observations on site confirm that the existing pedestrian overbridge is well used, for both train access and by people accessing across the railway line.

To the west of the pedestrian North access Rooty Hill Station, there is a sealed pathway on the southern side of North Parade which extends west to the roundabout intersection at Rooty Hill Road North. Beyond this footpaths continue along the northern side of the street only.

Figure 2-7 – Existing Pedestrian Facilities (Source: Nearthmap).



#### 2.4.1 Cycling Pathways

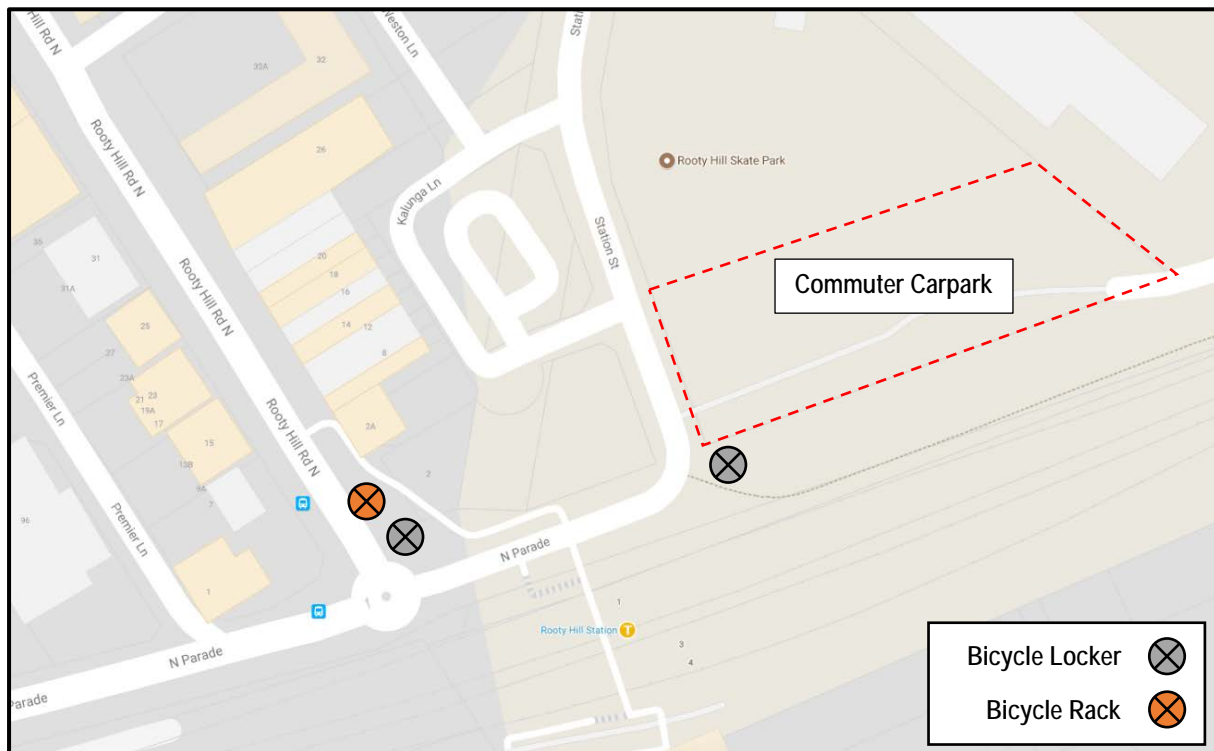
Rooty Hill has limited cycling routes with no formal connection to Rooty Hill Station. There is an off-road cycle path through Rooty Hill Central Park on the southern side of the rail line. A shared pathway also runs parallel to the Westlink M7 Motorway to the east of the site with connections to a number of residential side roads.

There are bicycle lockers located next to the pedestrian ramp on Rooty Hill Road with additional lockers provided adjacent to the commuter carpark on Station Street as shown in Figure 2-8. Bike racks are also provided at the bus stop on Rooty Hill Road.

Observations on site indicate that cyclists typically park their bikes informally, securing them to the pedestrian ramp rather than within the designated lockers.



Figure 2-8 – Location of bicycle storage facilities.



## 2.5 Road Network

### 2.5.1 Road Hierarchy

**North Parade** operates as a local collector road providing the major access to Rooty Hill Station and the adjacent commuter carparks. North Parade is a two lane, two-way road allowing for a single travel lane in each direction with kerbside parking to each side. Street lighting is provided along its length. A kiss and ride facility is provided to the front of Rooty Hill Station with kerb buildouts for protection. The posted speed limit on North Parade is 40 km/hr within the Rooty Hill Town Centre, increasing to 50 km/hr to the west of Premier Lane. School zones operate to the front of Rooty Hill Public School.

North Parade continues as Station Street to the east of Rooty Hill Station, forming a 90-degree bend to the front of the commuter carpark. Station Street continues north providing access to the commuter carpark and several residential dwellings to the north.

**Rooty Hill Road North** runs north-south through the Rooty Hill Town Centre, connecting with North Parade to the west of Rooty Hill Station via a three-leg roundabout controlled intersection. It provides a width in the 13 metres allowing for a single lane of travel in each direction with kerbside parking lanes. Rooty Hill Road North widens through the town centre allowing for 90-degree angle parking to both sides. Street lighting is also provided. The posted speed limit on this road is 40 km/hr within the Rooty Hill Town Centre.

Rooty Hill Road North connects with Sherbrooke Street to the north of Rooty Hill Town Centre, forming a 'Give Way' controlled T-intersection where Rooty Hill Road has priority. This intersection allows for all turning movements.

**Francis Street** operates as a collector road providing the main north-south connection over the rail corridor to the west of the site. It provides for a single lane of travel in each direction with sealed shoulders along most of its length. Additional lanes are provided at intersections to ensure capacity and street lighting is provided. The



posted speed limit on Francis Street is 60 km/hr. To the north of Sherbrooke Street, Francis Street continues as **Railway Street** north past Mount Druitt Hospital.

Francis Street and Railway Street form a four-way signal controlled intersection with Sherbrooke Street with this intersection allowing for all turning movements. A left slip lane allows for continuous flow for the left turn out of Sherbrooke Street onto Francis Street (southbound).

**Sherbrooke Street** is a local collector road providing an approximately east-west connection between Rooty Hill Road North and North Parade. It provides a width in the order of 13 metres allowing for a single lane of travel with kerbside parking lane in each direction. Kerb and guttering and street lighting are provided along its length. The posted speed limit on Sherbrooke Street is 50 km/hr.

## 2.5.2 Roadworks (Current and Proposed)

There are no road works currently occurring in the immediate vicinity of the subject site.

For the expansion of the existing commuter carpark, a new access point will be created off Station Street to the north of the existing access driveways. The redundant driveway crossovers will be removed and kerb and guttering reinstated.

## 2.5.3 Traffic Management Works (Current and Proposed)

There are two raised zebra crossings located on Rooty Hill Road North which control traffic speeds through the town centre. The town centre also operates as a high pedestrian area with a speed limit of 40 km/hr.

No other traffic management works are noted in the immediate vicinity of the site.

As part of the easy access upgrades to Rooty Hill Station, the new pedestrian crossing will be provided on North Parade to improve pedestrian safety for those accessing the station across this road.

## 2.6 Traffic Flows

### 2.6.1 Peak Hour Flows

Seca Solution has completed traffic surveys at the existing commuter carpark to review the current road operation and quantify the existing traffic volumes along both Station Street, and within each of the commuter carparks. These surveys were completed over a typical weekday (Thursday 12<sup>th</sup> October 2017) during both the morning (6:30am to 9:30 am) and evening (4:00pm to 6:30pm) commuter peak periods. Survey results are summarised below in Table 2-1 with detailed results provided within Attachment B.

Table 2-1 - Current peak hour flows on Station Street

Location	Time	Two Way	Northbound	Southbound
Station Street (south of Kalunga Lane)	AM	399	160	239
	PM	359	160	199
Station Street (north of Kalunga Lane)	AM	404	139	265
	PM	334	176	158

Peak hours were determined as being 7:00am-8:00am in the morning and 4:00pm-5:00pm in the evening.

### 2.6.2 Daily Traffic Flows

RMA guidelines indicate that peak hour flows typically represents between 8% and 12% of daily traffic volumes. This would indicate that daily flows along Station Street could be in the order of 3,200-4,800 vehicles per day, with flows being slightly lower to the north of Kalunga Lane.

### 2.6.3 Daily Traffic Flow Distribution

Based on the survey data, there appears to be a slight bias in southbound traffic along Station Street past the carpark, with this movement representing between 55%-60% of observed traffic during the peak periods. This is

likely due to drivers connecting to Station Street further to the north to then pull up in front of the station when setting down or picking up passengers.

For the commuter carpark, most vehicle movements are inbound during the morning and outbound during the evening commuter peak. During the evening peak vehicles were observed to arrive at the station and park within the Kiss and Ride facilities prior to the train arriving. When this facility is full, many vehicles were observed to continue travelling along Station Street and then turn left into the commuter carpark (opposite the station) when picking up passengers, creating a strong demand for this movement.

#### 2.6.4 Vehicle Speeds and Safety

No speed surveys were completed as part of the survey work however observations on site indicate that vehicles typically travel at or below the speed limit in this location due to the interactions with pedestrians and vehicles parking on North Parade.

A small number of vehicles were observed to speed along North Parade or Station Street during the morning peak. These vehicles were observed to be associated with train passengers running late, arriving at the station to drop off passengers at the same time the train was pulling into the platform.

A review of accident data provided by Roads & Maritime shows that there have been 3 accidents recorded in the locality of site over the 5 year period between 2012 and 2016. Two of these accidents occurred on Rooty Hill Road North involving pedestrians being hit by vehicles within the town centre. Neither of these accidents were fatal.

The remaining accident occurred at the roundabout intersection of Rooty Hill Road and North Parade involving two vehicles travelling north.

None of the accidents above involved speeding or fatigue.

#### 2.6.5 Existing Site Flows

The existing commuter carpark off Station provide for a total of 160 car parking spaces. The existing traffic demands associated with this carpark were observed as part of the project work completed by Seca Solution.

Surveys undertaken on site demonstrate that the carpark is typically full by around 7:30am-7:45am with only a small number of vehicles observed to access the carpark beyond this time. In the hour prior, a total of 67 vehicles entered the carpark with 15 of these vehicles also exiting due to being unable to locate a parking space. All vehicles which entered the site later in the morning also exited the site. The peak demand for the carpark occurs earlier than the peak hour on the local road network.

During the evening, departures occur in groups spread out across the hour in line with trains arriving at Rooty Hill Station. Departures occurred consistently throughout the entire survey period with a maximum of 53 vehicles exiting the site between 5:30pm and 6:30pm. A total of 15 vehicles also accessed the site during this period. Peak demands for the carpark occur later than the evening peak hour on the local road network.

The existing commuter carpark caters for all day parking with a minimal turnover of vehicles throughout the normal working day.

Surveys were also completed to determine the traffic demands associated with the commuter carpark on the western side of Station Street. Two-way flows for this carpark were in the order of 65 vehicles during the morning peak and 138 vehicles during the evening peak with the higher flows in the evening associated with use of this carpark as an extension to the existing Kiss and Ride facility on North Parade.

#### 2.6.6 Heavy Vehicle Flows

There is a high demand for heavy vehicles along Station Street throughout parts of the day associated with the nearby Blacktown City Council depot. During the morning peak heavy vehicle represents approximately 14% of the total traffic on Station Street. In the evening peak, only a small number of heavy vehicles were observed being less than 2% of vehicles.

No bus routes operate along Station Street however services do operate along North Parade and Rooty Hill Road North further to the west.

#### 2.6.7 Current Road Network Operation

The local road network in the locality of the commuter carpark currently operates well with minimal delays and congestion throughout the day or in the morning and afternoon peak. Minor delays can occur on North Parade to the front of the station associated with vehicles reversing into parking spaces or the Kiss and Ride facility. These queues were minimal and cleared quickly once the afflicting vehicle had completed this manoeuvre.

Nearby intersections and the access driveways to each of the commuter carparks operate to a good standard with very minimal delays or queuing during the peak hours.

#### 2.6.8 Pedestrian Movements

Surveys of the pedestrian demands at the access to Rooty Hill Station from North Parade were completed as part of the project work by Seca Solution. During the morning peak, 471 pedestrians entered or exited Rooty Hill Station on the northern side of the rail corridor, of which 50 were pedestrians who walked from the commuter carpark and along North Parade to access the station.

A similar number of pedestrian movements were observed during the evening peak (479) of which 63 were pedestrians who walked to/from the commuter carpark on the roadway.

Most of the demands observed were for pedestrians crossing over the footbridge or crossing North Parade at the existing pedestrian refuge.

The report prepared by AECOM for the project shows that in 2008 in the AM peak between 6.00-9.30 AM 25% of passengers walked to the station. The corresponding peak demand in 2014 44% of all passengers.

### 2.7 Parking Supply and Demand

#### 2.7.1 On-street Parking Provision

There is a significant number of on street (commuter) parking spaces available along North Parade, to the west of the station platform. This parking is located parallel to the road way and has no time restriction for use. There is further unrestricted kerbside parking available in the locality along Station Street to the north of Kalunga Lane. Time restricted parking is available along Rooty Hill Road North, with 90° angle parking on both sides of the road designated as 1 hour parking. This allows for local parking for the general business users in the area.

Further commuter parking is available on-street to the south of the train station, along Beames Avenue, Catherine Crescent and Rooty Hill Road South.

#### 2.7.2 Off-Street Parking Provision

Off street parking is currently provided in the Council car parks located at the subject site, north of the rail line. This includes all day commuter parking in a marked lot off North Parade. Further all-day parking is provided to the east of Station Street, with a line marked parking lot, as well as an additional informal parking area utilised by commuters. There is a third council parking lot in the locality that provides some all-day parking, with a number of parking spaces in the lot being time restricted. There is limited off-street parking available to the south of the rail line.

#### 2.7.3 Motorcycle Parking

There are no dedicated motorcycle parking spaces in the general locality of the proposed car park.

#### 2.7.4 Parking Demand and Utilisation

There is a significant demand for unrestricted (commuter) parking in the Council carpark and along the local roads where the unrestricted parking is permitted surrounding Rooty Hill Station, which is a major transport interchange. Parking surveys completed on site indicate that local parking opportunities are heavily utilised with the Council car park generally reaching full capacity by 7.30am on weekday mornings. There is also significant demand for on

street commuter parking spaces along the rail corridor on North Parade, with these spaces generally filling shortly after.

Parking survey data collected by Seca Solution on the 12<sup>th</sup> October 2017 shows that the unrestricted parking available for commuters is full at 7:30am and remained near capacity when reviewed at 3:45pm. The Council car park that includes time restricted parking maintained spare capacity during observation periods, with this parking considered to have a regular turn-over throughout the day.

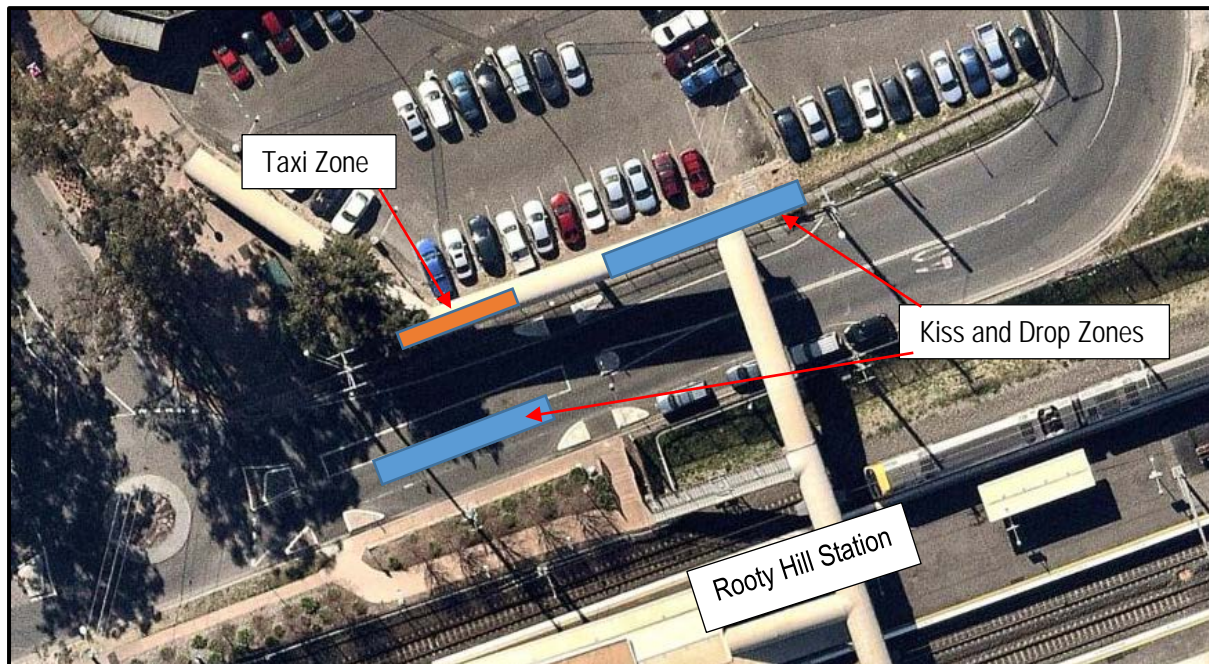
#### 2.7.5 Short term set down or pick up areas

There is a formal kiss 'n' ride area located along both sides of North Parade, in the area immediately adjacent to the pedestrian access to Rooty Hill Station. These allow for passenger pick up and set down, with a maximum stay of 2 minutes. There is also a taxi zone located prior to the kiss and ride area on the northern roadside. These areas are shown to follow in Figure 2-10.

The AECOM report indicates that in 2008 in the AM peak 27% of passengers used the kiss 'n' ride facility which increased slightly to 30% in 2014.

Figure 2-9 – Location of short term set down or pick-up areas.

Th



## 2.8 Public Transport

### 2.8.1 Buses

Local buses operate through Rooty Hill providing connection to areas including Mt Druitt and Blacktown. Local bus routes operating within the locality of the proposed carpark are shown in Figures 2-11 to 2-13 below.



Figure 2-10 – Bus route map for Route 728: Mt Druitt to Blacktown and Route 738: Mt Druitt to Horsley Park (Source: busways).

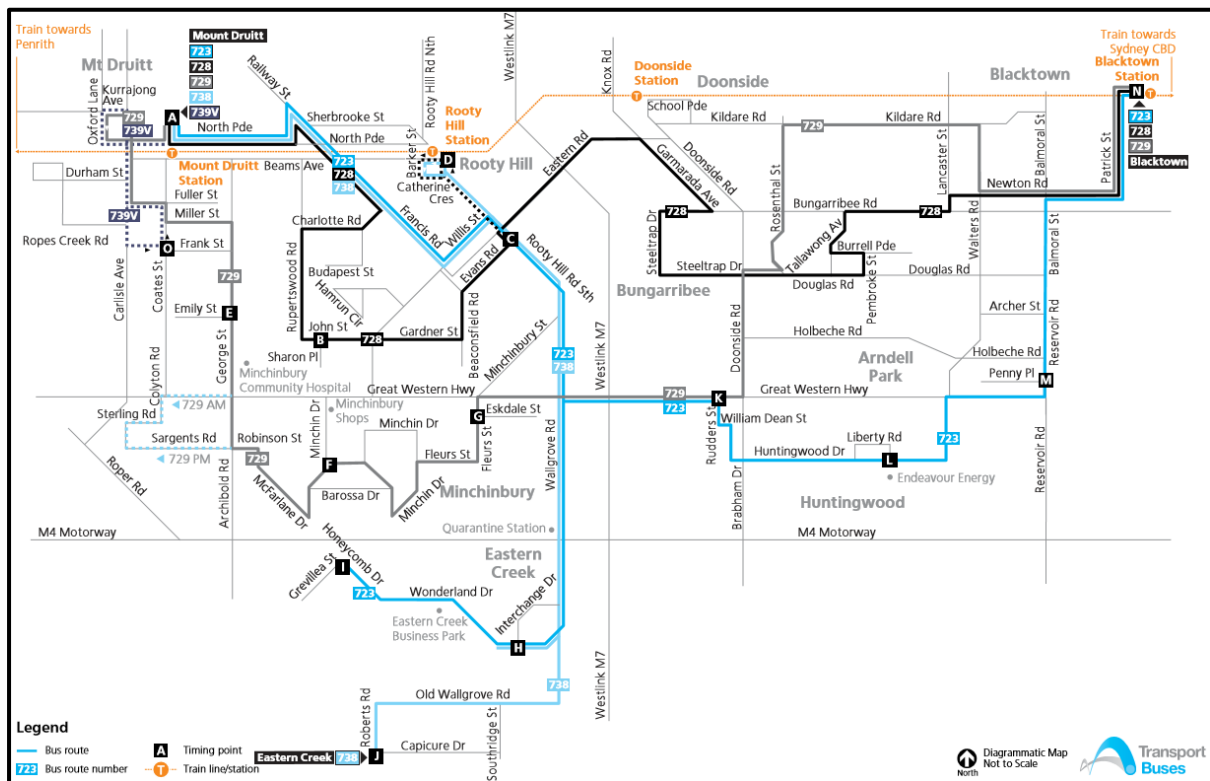


Figure 2-11 – Bus route map for Route 756: Mt Druitt to Blacktown (Source: busways)

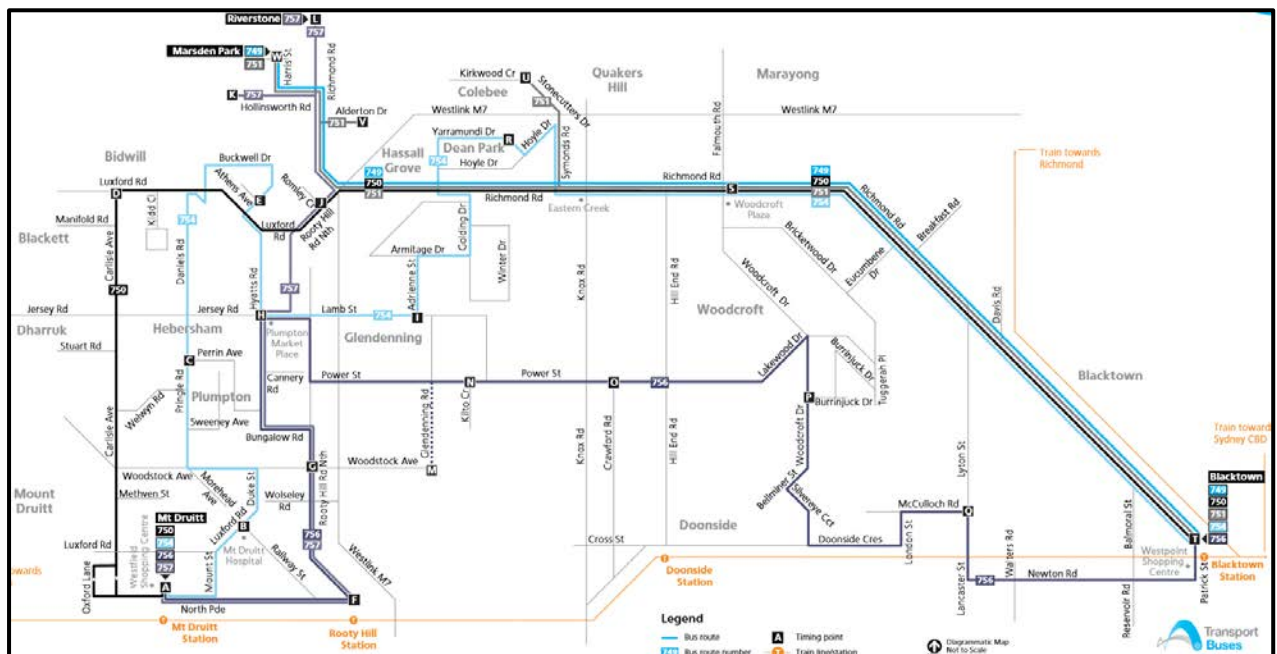
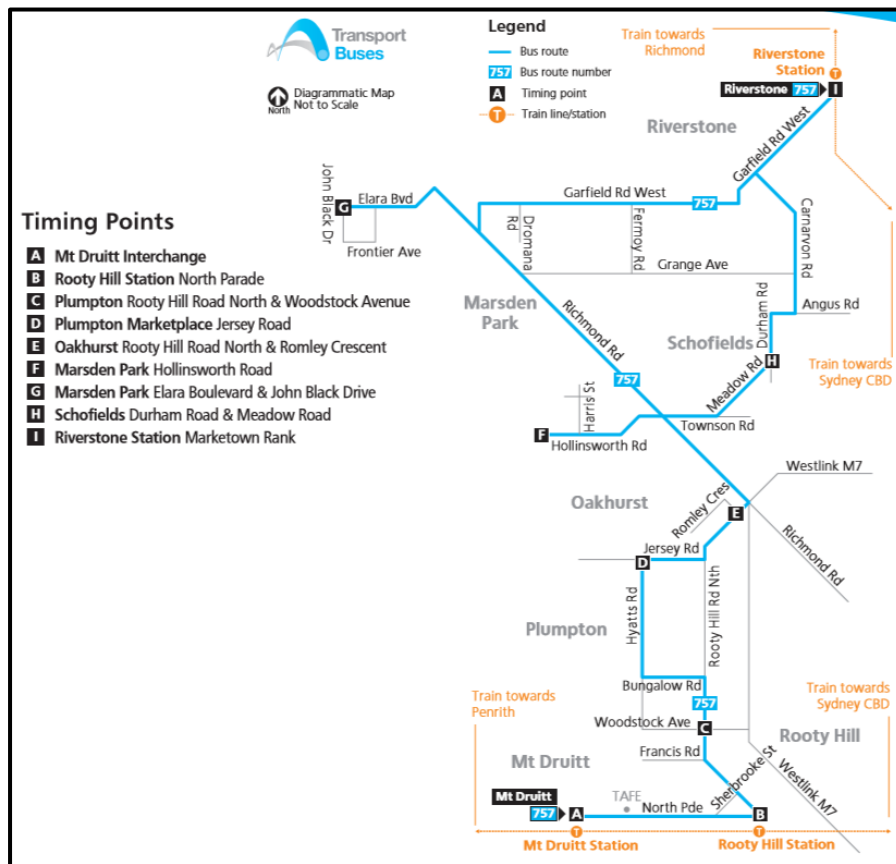




Figure 2-12 – Bus route map for Route 757: Mt Druitt to Riverstone (Source: busways)



### 2.8.1.1 Bus Stops

There are bus stops located on Rooty Hill Road North and North Parade that allow for bus users to connect with the train facilities from the north of the rail line. There is a further stop to the south of Rooty Hill Station in the locality, along Beames Avenue.

The frequency of local bus services operating through Rooty Hill during the peak commuter periods are summarised in Table 2-2.

Table 2-2 – Rooty Hill Weekday Bus Frequency

Route	Description	No. of Services AM Peak (7.00-8.00am)	No. of Services PM Peak (5.00-6.00pm)	No. of Services PM Peak (6.00-7.00pm)
728	Mt Druitt to Blacktown	3	0	0
	Blacktown to Mt Druitt	1	2	1
738	Mt Druitt to Horsley Park	2	2	1
	Horsley Park to Mt Druitt	2	3	2
756	Mt Druitt to Blacktown	2	2	2
	Blacktown to Mt Druitt	3	2	2
757	Mt Druitt to Riverstone	0	1	0
	Riverstone to Mt Druitt	1	1	0
<b>Total</b>		<b>14</b>	<b>13</b>	<b>8</b>

## 2.8.2 Trains

As discussed in Section 2.2.3, Rooty Hill Station is currently serviced by the T1 Western Line with a high frequency of services provided throughout the day. Table 2-3 shows the frequency of trains passing through Rooty Hill Station during the morning and evening commuter period.

Table 2-3 – Rooty Hill Station Train Frequencies

Line	Description	No. of Services AM Peak (7.00-8.00am)	No. of Services PM Peak (5.00-6.00pm)	No. of Services PM Peak (6.00-7.00pm)
T1 Western Line	Emu Plains to City, Richmond to City	4	3	4
T1 Western Line	City to Emu Plains, City to Richmond	3	4	4
<b>Total</b>		<b>7</b>	<b>7</b>	<b>7</b>

### 3 Proposed Development

#### 3.1 The Development

The proposal allows for the construction of a new four storey carpark consisting of 504 commuter car parking spaces, which is an increase of 344 parking spaces over the existing supply. Access to the site will be provided via a new combine entry/exit driveway on Station Street to the north of the existing driveways for the site.

The new parking structure is to be constructed in a single stage to minimise disruptions.

##### 3.1.1 Hours and days of operations

The new parking facility will operate 24 hours per day, 7 days per week with peak use expected to be between 6:00am and 7:00pm Monday to Friday associated with commuter parking demands.

#### 3.2 Access

##### 3.2.1 Driveway Location

Vehicle access to the proposed car park will be provided via a new entry/exit driveway off Station Street, with this new access to be located north of the existing driveways to the site. Redundant driveway crossovers will be removed and kerb and guttering reinstated along the site frontage in accordance with Council's requirements.

##### 3.2.2 Sight Distances

Station Street provides a straight horizontal and vertical road alignment in this location, which ensures that there is excellent visibility for vehicles travelling in both directions.

Sight distance requirements for an access driveway are specified by Australian Standard AS2890.1:2004 Parking Facilities (Off-Street Car Parking), which for the posted speed limit of 50 km/hr along Station Street, requires a minimum entering sight distance of 45 metres.

A review of the sight lines at the location of the proposed driveway has been completed on site. Sight distances exceeds more than 50 metres looking south along Station Street, with visibility extending to the 90-degree bend within the roadway at North Parade. Sight distances for drivers looking north along Station Street exceeds 65 metres. Parking is restricted on Station Street to the front of the site and there are no other obstructions along the site frontage which impact upon sight lines. Sight distances at the proposed driveway therefore satisfy the above requirements.

Photo 1 – View looking left (south) along Station Street from the site frontage. Shows straight and flat road alignment on Station Street.



Photo 2 – View looking right (north) along Station Street from the site frontage. Shows straight and flat road alignment on Station Street.



### 3.2.3 Service Vehicle Access

The development would require minimal service vehicle access, with the only servicing being for lighting, lift, and storm water maintenance. The lighting and lift maintenance would have minimal requirements and typically only require access for a small van such as a Toyota HiAce. These vehicles will be able to park within the car park as required during maintenance activities.

The stormwater maintenance truck would only require access to the ground floor level of car park area. No dedicated service area is required for the car park.

### 3.2.4 Queuing at entrances

Traffic associated with the carpark will be predominately inbound during the morning peak and outbound during the evening peak, consistent with the existing travel patterns of commuters. Inbound traffic during the morning period would be spread out as commuters arriving at varying times depending upon the arrival time of their desired train service and how early they arrive prior to this service departing. This spread of arrivals reduces the absolute peak demands for vehicles entering or exiting the site and reduces the queues accordingly.

Most of the traffic currently accesses this carpark from the north along Station Street, turning left into the site. Outbound traffic is reasonably balanced in both directions along Station Street.

During the evening peak, traffic is also dispersed due to differences in train times and working days for patrons. It was noted however that departures out of the carpark typically occur in groups following the arrival of a train at the station. Between trains arriving at the station, only a small number of vehicles exit the carpark, which are typically those who appeared to be checking their phones or ran other errands within the town centre before departing.

AS2890 provide advice regarding queueing areas at entrances to a car parking structure. For a carpark with more than 100 spaces, it specified a minimum queueing area of 3 cars for the first 100 spaces, 2 cars for the next 100 spaces and 1 car per 100 spaces thereafter. This equates to queueing area of 8 vehicles for the proposed carpark however it is noted that these rates assume a peak hourly inflow volume of up to 75% of the parking capacity (i.e. 378 vehicles). This is unlikely given the wide spread of arrival times associated with differences in the travel patterns of commuters and train services departing Rooty Hill Station.

No control points are proposed along the access driveway which provides sufficient length for up to 8 vehicles to be queued whilst waiting for a vehicle to park at the start of the carpark. Allowing for the above, this is appropriate for the site.

### 3.2.5 Current access compared with proposed access

Access to the site is currently provided via two separate driveways off Station Street. These driveways will be removed and replaced with a single combined entry/exit driveway further to the north on Station Street.

Relocating the access further north along Station Street will increase the sight lines for vehicles entering or exiting the site, which are currently restricted by the 90-degree bend at Station Street / North Parade. This provide an improvement to the overall safety of the site compared to the existing situation, reducing the potential for conflicts associated with vehicles exiting onto Station Street.

### 3.2.6 Access to Public Transport

There would be no need for public transport to access the car park.

## 3.3 Circulation

### 3.3.1 Pattern of circulation

All traffic will enter and exit the carpark via a single entry/exit driveway off Station Street. The design of the car park structure allows for circulation in a clockwise direction throughout each parking level with separate ramps providing for one-way movements up or down the various parking levels.

All vehicles will be able to enter and exit the site in a forward direction.



### 3.3.2 Internal Road width

The car park layout including the ramps and circulation roads shall be designed in accordance with AS2890 allowing for one-way and two-way traffic movements as appropriate. This requires a minimum width of 3 metres between kerbs for one-way ramps and circulation roads with an additional clearance required to vertical obstructions on each side.

For the proposed carpark layout, AS2890 requires separate entry (6m wide) and exit (4-6m wide) driveways, a separation of at least 1 metre. Given the nature of the site and its operation, which caters for all day parking with arrivals and departures being spread out across the morning / evening, the proposed combined entry/exit driveway is considered appropriate. Sight lines at the site frontage are constrained by the 90-degree bend to the south, and the provision of a single access on Station Street will improve this situation by consolidating the existing driveway further from this bend.

The layout of the access driveway is to be confirmed as part of the detailed design of the site.

### 3.3.3 Internal Bus Movements

No requirement to accommodate internal bus movements within the carpark.

### 3.3.4 Service Area Layout

No dedicated service area would be provided for the development. Service vehicles can park within the car park as required and would typically only be small vans such as a Toyota HiAce.

### 3.3.5 Pedestrian and Bicycle Facilities

An important consideration for the project is the provision of suitable pedestrian connections to Rooty Hill Station. There are currently no footpaths on Station Street or North Parade to accommodate pedestrian demands between the existing commuter carpark and Rooty Hill Station. Pedestrians currently walk along the road between these two facilities.

As part of the easy access upgrades proposed, a new pedestrian walkway will be constructed on Station Street and North Parade to accommodate the demands for pedestrian traffic created by the extended commuter carpark. This pathway will be accessible along its entirety. Pedestrian access into Rooty Hill Station will also be upgraded with new lifts allowing for improved accessibility and relocation of the pedestrian ramp to the southern side of North Parade.

A new pedestrian crossing will also be created on North Parade, which will replace the existing pedestrian refuge islands in this location and allow for improves access across this road.

A new shared pathway will also be provided connecting Rooty Hill Station to the existing shared pathway on the Westlink M7 Motorway.

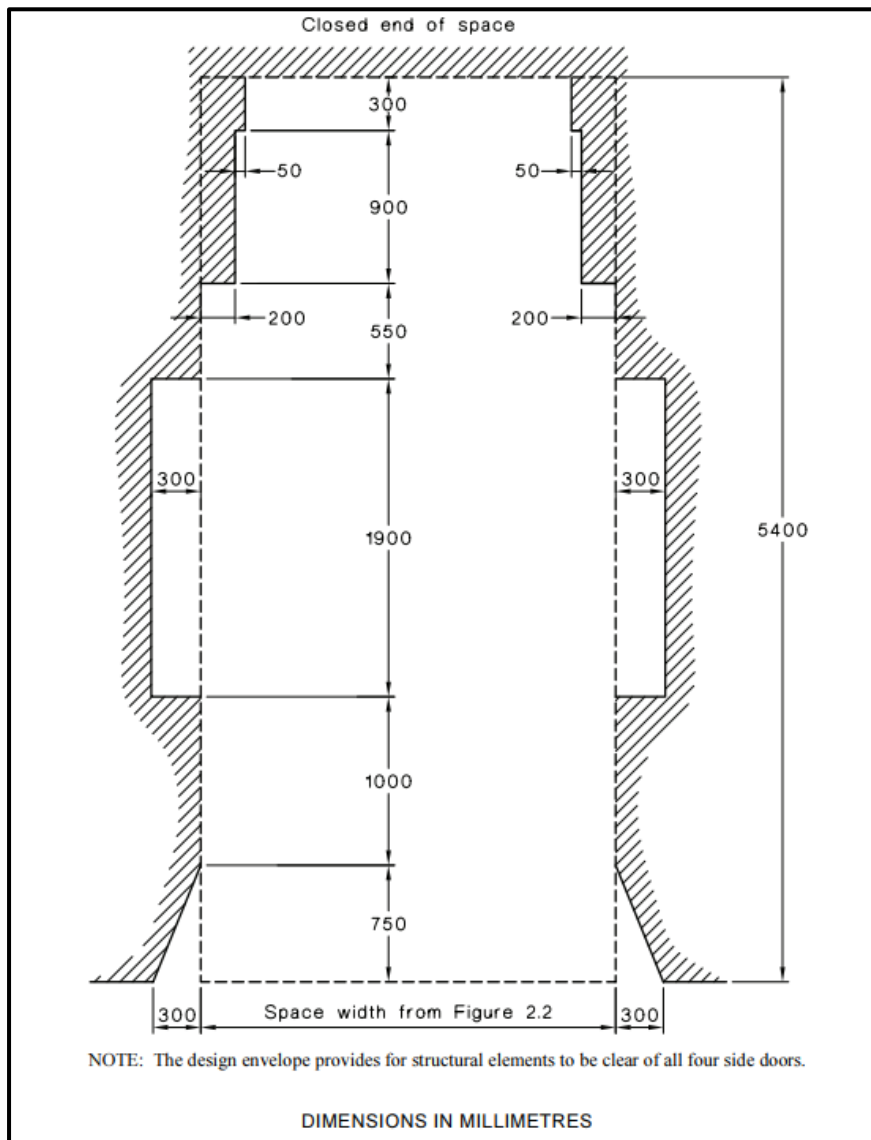
The proposed commuter carpark will remove 4 bicycle storage lockers currently provided on Station Street, however these will be replaced with 10 new covered bicycle racks at the station entrance. No cycling facilities will be provided within the new parking structure with cyclists expected to use these new facilities at the front of the station.

## 3.4 Layout of the Carpark

At present, the layout of the proposed commuter carpark has been developed to concept stage only, with the final layout to be confirmed as part of the detailed design process. The car park layout shall be designed in accordance with AS2890.

For a Class 1 parking facility, which is the recommended classification for commuter parking, parking spaces shall require minimum dimensions of 2.4m wide by 5.4m long with each parking aisle to provide a minimum width of 6.2 metres as described above. The location of obstructions such as columns shall be in accordance with the design envelope around a parking spaces shown in Figure 3-1 below.

Figure 3-1 – Design envelope around parking spaces to be kept clear of columns, wall and obstructions (Figure 5.2, AS2890.1)



## 4 Transportation Analysis

### 4.1 Traffic Generation

The commuter car park would show a strong inbound traffic movement during the morning commuter peak and a corresponding strong outbound movement in the evening commuter peak period.

For the inbound traffic movements, most vehicles are expected to enter the carpark between 6:00am and 8:00am, consistent with the existing travel patterns (the existing carpark fills up by around 7:45am with several vehicles continuing to enter the carpark in search of a parking space). For the capacity of the new commuter carpark being 504 spaces, this results in potentially 252 inbound vehicles per hour (consistent with the existing situation where less than 50% of the capacity enters the site during the absolute peak). This represents an increase in the order of 170 vehicles over the existing commuter carpark.

A review of morning peak one-hour passenger flows on trains arriving from the Western Line to Central Station shows that the peak arrival time occurs between 7.45am and 8.45am (2012 Compendium of Sydney Rail Statistics). Allowing for train travel between Rooty Hill and Central to take 50-60 minutes (based on current timetables) with commuters arriving 5-10 minutes prior to train departure times, this would equate to peak commuter demands occurring between 6:35am and 7:50am, consistent with the surveyed demands. Those who work in Parramatta or Blacktown and travel to work by train would likely depart later in the morning.

In the evening, the peak one-hour passenger flows on trains departing Central Station along the Western Line occurs between 5:05pm and 6:04pm. Allowing for the travel time of 40-50 minutes, most commuters would be expected to arrive back at Rooty Hill Station and return to their vehicles between 5:50pm and 7:05pm (allowing 5 minutes to walk to the carpark) with those who work closer to Rooty Hill (i.e. Parramatta, Blacktown or Penrith) arriving earlier in the evening. Assuming that outbound movements typically occur between 5:15pm and 7:15pm, the carpark could see potentially 252 vehicles outbound per hour (consistent with the existing situation where less than 50% of the capacity exit the site during the absolute peak). This represents an increase in the order of 200 vehicles over the existing commuter carpark.

#### 4.1.1 Daily and Seasonal Factors

The nature of the commuter demands means that the car park would be highly used Monday through to Friday, with much lower use over the weekend. There would be minimal seasonal demands, although there are typically reduced demands over Christmas / New Year periods and during the school holidays.

#### 4.1.2 Pedestrian Movements

There would be a high demand for pedestrian movements between the commuter carpark and Rooty Hill Station during the morning and evening with reduced demands during the day. Assuming a car occupancy rate of 1.2 persons per vehicle, the commuter carpark could create demands for in the order of 300 people, walking between these facilities each hour during the peaks. This represents an increase in the order of 240 movements over the existing demands for this movement. It is noted however that these would likely replace existing pedestrian movements elsewhere within the road network.

These movements will be catered for with the new accessible path created on Station Street and North Parade along the entire length between the proposed extended carpark and upgraded station access.

### 4.2 Traffic Distribution and Assignment

#### 4.2.1 Origin / destinations assignment

It is expected that distribution of vehicles accessing the commuter carpark will be consistent with the travel patterns for the existing carpark. This gives in the order of 55-60% of vehicles having an origin/destination north along Station Street with the balance having an origin/destination via North Parade.

#### 4.3 Impact on Road Safety

The proposed commuter carpark would see increased traffic flows along both Station Street and North Parade associated with vehicles travelling to the site. Most of these additional demands would be vehicles that already travel within the road network but elect to park elsewhere due to the limited capacity within the existing carpark. As such, there would be minimal increases in the traffic demands within the broader road network, rather being a redistribution of existing traffic volumes in the local area.

Both Station Street and North Parade currently operate well within their capacity with the nearby intersections experiencing minimal delays and congestion due the peak hours. The local road network provides an acceptable layout with roads typically providing a straight road alignment ensuring that there is excellent visibility for drivers approaching bends and intersections.

There have been only three accidents in the general locality over the last 5 years indicating that the roads provide a satisfactory level of traffic safety. None of these accidents occurred on Station Street in the immediate locality of the proposed commuter carpark.

Vehicle speeds in this location are typically within the posted speed limit due to the intersections created by the high pedestrian demands and vehicles parking on North Parade (including the Kiss and Ride facility). A 90-degree bend at Station Street / North Parade together with a roundabout intersection at the intersection with Rooty Hill Road North work together to further control vehicles speeds past the station and near the commuter carpark.

Sight distances for the proposed access driveway at the commuter carpark exceeds the authority requirements and provides an improvement over the existing access arrangements. Similarly, the provision of a new pedestrian path on Station Street and North Parade will reduce the number of pedestrians which currently walk along the road pavement, creating further benefits to safety.

#### 4.4 Impact of Generated Traffic

Car parks in their own right are not generators of traffic but rather represent the end point for vehicle movements associated with a traffic generating development. The proposed car park will provide an alternative end point for traffic currently associated with Rooty Hill Station, and as such the broader road network will not experience a significant change. Vehicles that park in the new facility would have otherwise parked on street having already entered the broader road network.

The key impact of the proposed commuter carpark would be a redistribution of local traffic, which would see increased demands for vehicles accessing the carpark off Station Street. This in turn will see an increased demand for vehicles through the roundabout intersection at North Parade and Rooty Hill Road North, or from the various side roads along Station Street.

Observations of the existing road network operation suggest that the intersection of North Parade and Rooty Hill Road North currently operates well within its capacity with very minimal delays and congestion during the peak hours.

Allowing for the above, it is concluded that the demand for up to 200 additional vehicles (120 north and 80 south on Station Street) can easily be supported within the road network and will have an acceptable impact on its overall capacity.

##### 4.4.1 Peak Hour Impact on Intersections

The potential traffic impacts on key intersections within the local road network has been assessed by the application of the Austroads Guidelines and RTA Guide to Traffic Generating Developments to determine the need for a detailed traffic analysis. Based on these guidelines, and with consideration to the observed operation of these intersections and the potential changes in local traffic associated with this development, the need to undertake detailed modelling (Sidra Analysis) is not considered necessary. This is supported by a peer review of similar assessments of traffic impacts for other similar commuter carparks in busy urban centres.

The operation of the roundabout controlled intersection of Rooty Hill Road North and Station Street has been previously assessed by AECOM as well as the intersection of Station Street and Hartington Street. The results of the Sidra assessment for each intersection, allowing of the future scenario with the additional traffic associated with the expanded commuter car park, shows that the intersections will continue to operate at a level of service of A. This is consistent with the current observed operation of these intersection, with minimal delays and congestion during both the morning and afternoon / evening peak periods.

With dispersed trips and trips occurring over an extended period beyond one hour, it is considered that the impact of the increased traffic demands associated with the commuter carpark expansion will be acceptable. It is further noted that these trips will already be on the road network and are diverting to this station car park due to the increased parking provision. This can have a positive benefit by reducing the travel demands on the wider road network. It is considered that the traffic will be relatively local traffic associated with the residential development of the railway station.



## 5 Impact of Construction Traffic

The construction work would create a number of impacts upon the local road network, due to the requirement for the existing car park to be closed for the duration of the works.

The construction work would last for less approximately 9 months on site and would require up to 60 people to work on site at any one time (50 workers for the carpark and 10 for the station upgrade). There would be a requirement for a crane to be used on site during construction. There would be periods of intense work on site associated with the concrete pours for the various floors which would be created, involving a large number of truck movements to and from the site. For the balance of the works on site, the extent of heavy vehicle movement will be much lower and associated with material drop off.

During weekend possessions, North Parade/Station Street will be closed to vehicles between Rooty Hill Road North and Kalunga Lane. Traffic control will manage vehicle and pedestrians' movements around the station. Access to the two Council car parking lots on the western side of Station Street will be maintained. Access for pedestrians to the footbridge will be impacted. A shuttle bus is an option to allow for pedestrians to access either side of the station during the times where the footbridge requires closure for construction safety.

Outside of weekend possessions, there will be no road closures. Traffic control will be placed along Station Street and North Parade to allow construction vehicles to safely access the site and deliver / pick up materials. During this time there may be minimal delays to pedestrians and vehicles.

**Demolition hours** would be undertaken during standard hours, between 7.00am and 5.00pm Monday to Saturday. No demolition work is anticipated to be required on a Sunday or public holiday. It is not anticipated that demolition work contributing to unacceptable noise levels or major deliveries would be scheduled outside of weekdays in line with EPA Guidelines. The extent of demolition is minimal for the car park as there is no existing structure on the site.

**Construction hours** would be between 7.00am and 5.00pm Monday to Saturday. No construction work would be carried out on a Sunday or public holiday. It is not anticipated that construction work contributing to unacceptable noise levels or major deliveries would be scheduled outside of weekdays in line with EPA Guidelines.

Work may be undertaken outside these hours where the following occurs:

- The delivery of fill or material may occur outside these hours if required by the Police or other authorities;
- Council provides permission for working out of hours;
- It is required in an emergency to avoid loss of life, damage to property and / or to prevent environmental harm;
- The work is approved under a Construction Noise and Vibration Management Plan;
- Residents likely to be affected by the works are notified of the timing and duration of these works at least 48 hours prior to the commencement of the works.

The location of the site and the work required may require a works zone to be provided on Station Street along the site frontage for the duration of construction works at the site (Monday through to Saturday). A detailed Construction Traffic Management Plan incorporating a Traffic Control Plan would be prepared during the detailed design stage of the project in consultation with Council as the road authority.

All works on site will be governed by the relevant EP&A rules.

## 5.1 Construction Traffic Generation

### 5.1.1 Heavy Vehicles

TfNSW has advised that during peak construction periods, the number of heavy vehicles accessing the site could be up to 50 heavy vehicles per day. There would be up to 15 heavy vehicles per day accessing the site outside of peak periods, although typical numbers would be less. Peak construction would occur over approximately a 6-month period. Typically, heavy vehicles do not access construction sites during the AM and PM peak hours, however for a robust assessment it has been assumed that 10% of construction heavy vehicle traffic would access the site during the weekday AM and PM peak period (i.e. 5 vehicles).

It is proposed that all construction storage containment would be within the site.

### 5.1.2 Light Vehicles

Up to 60 construction workers may be expected to be on site during peak periods, with around 40 workers at the site on a typical day during the initial stages, decreasing to around 25 staff near completion. Allowing for the convenience of travel on the adjacent rail line it has been assumed that up to half of workers will travel by train whilst some could car share. This would result in typically 30 vehicles accessing the site and its vicinity during the peak construction period, and 20 during more typical construction days.

It is expected that workers would arrive to commence work at the start of the day (6.30am-7.00am) and depart at the end of the construction working day, with the majority leaving between 3pm-3:30pm and all staff off site by 5.00pm.

### 5.1.3 Total Construction Traffic

The construction traffic generation for the site is summarised in Table 5-1 below.

Table 5-1 Peak Hour Construction Traffic Generation

Construction Traffic	AM In	AM Out	PM In	PM Out
Heavy Vehicles	5	5	5	5
Light Vehicles (workers)	20	0	0	20
Total	25	5	5	25

### 5.1.4 Construction Traffic Routes

Construction traffic can access the site via a number of different routes. All heavy construction traffic will be via the route detailed below, for both inbound and outbound movements. The route will be via North Parade – Sherbrooke Street – Railway Street – Luxford Road – Carlisle Avenue to connect to the Great Western Highway / M7 / M4.

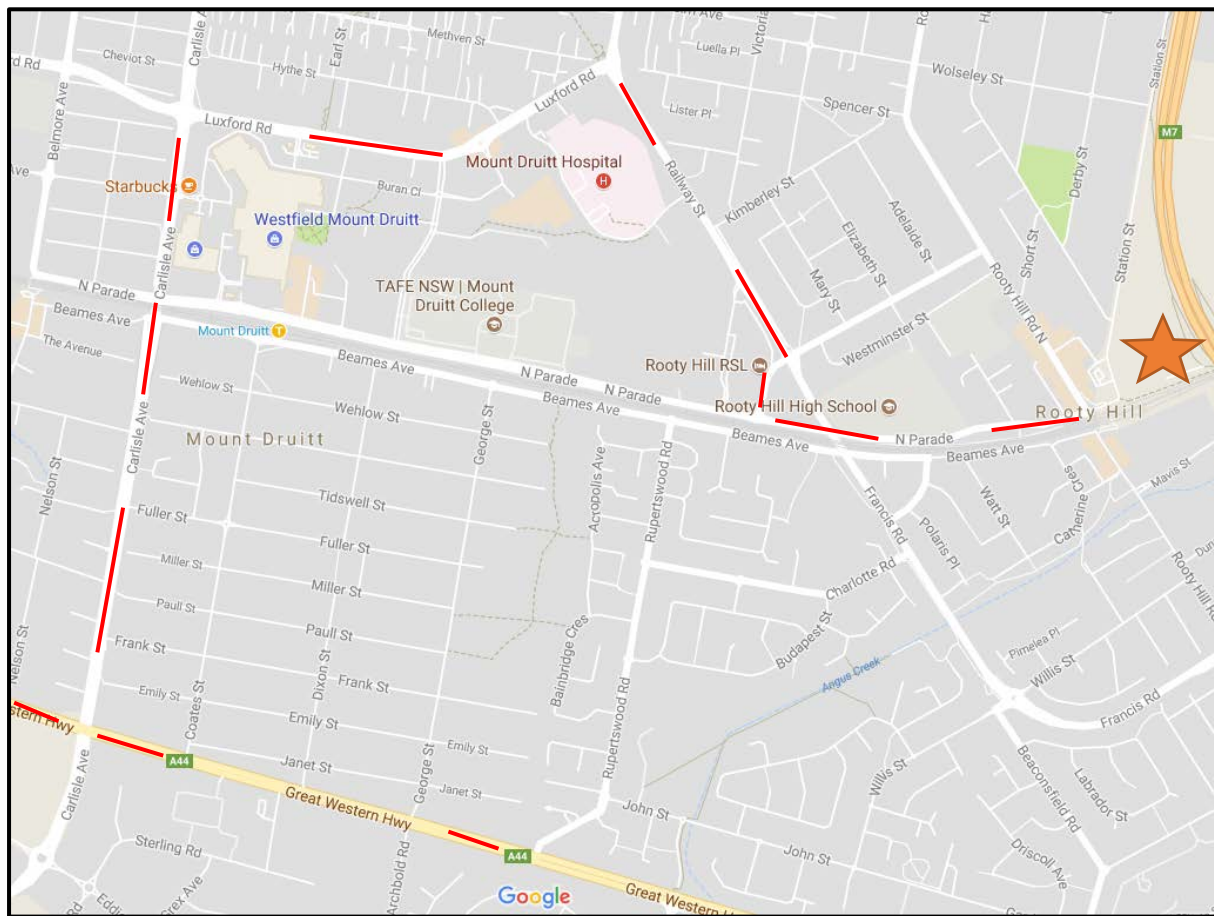
Traffic can access the locality via the arterial road network i.e. Great Western Highway and M4 Western Motorway and M7 with all the traffic movements controlled by traffic signals or roundabouts to control traffic movements in a safe and appropriate manner. All of these junctions allow for all turning movements.

For the traffic entering and exiting Station Street to the site will require a right turn in to the site and a left turn out. A Traffic Control Plan (TCP) will be provided to control traffic movements and maintain safety during the construction works. Both of these movements can be safely accommodated.

A detailed Traffic Management Plan and Traffic Control Plan will be prepared as part of the detailed design stage of the project. As part of this traffic management plan the traffic movements (light and heavy) associated with the construction activities will be detailed.

The transport routes for construction activities are shown below.

Figure 5-1 – Transport routes for construction activities



### 5.1.5 Construction Parking Impacts

The construction work would create a number of impacts upon the local road network, due to the requirement for the existing car park on the eastern side of Station Street to be closed for the duration of construction works for the new multi storey carpark. The existing parking on the southern side of the station will also be removed to allow for a temporary site office, as well as the construction of a new elevator and stairs. Access to the remaining two council carparks to the west of Station Street will remain available throughout construction.

The closure of the car park for the duration of the construction work would require the current vehicles to park in other locations in the general vicinity of the subject site. The current car park has a capacity of 160 spaces, indicating that typically there would be a need for 160 vehicles to be parked in the general locality of the site for commuters. There could also be additional vehicles associated with the construction that would require parking.

An option to cater for this loss of parking has been identified, with temporary parking to potentially be set up on the Council land on the south-eastern side of the station. This would include creation of a path to allow for direct access from this carpark, to the station. Sufficient parking would be supplied in this area to compensate for the loss of parking at the multi storey car park construction site. This temporary parking would then be removed post construction. The requirement to allow for the commuter and Council car park use elsewhere within the immediate vicinity of the subject site will be discussed and agreed with Council (as the road authority) through the detailed design stage of the project.

## 5.2 Impacts to Other Users

### 5.2.1 Pedestrians

There is no pedestrian path adjacent to the site on Station Street and with the car park closed, there will be limited demand for pedestrians along the site frontage. As part of the Traffic Control Plan, pedestrians will be diverted to the opposite side of Station Street during the construction works.

For the potential temporary car park to the south of the station, there are existing footpaths available for pedestrians and a path will be provided as part of this temporary car park to connect to these paths. There are marked pedestrian crossings on Rooty Hill Road South that can be used by pedestrians to safely cross this road.

Based on the above the construction of the site would have minimal impacts to pedestrians.

### 5.2.2 Cyclists

There are currently no off road shared pathways in the vicinity of the site, with cycling facilities to be upgraded as part of the redevelopment.

Construction of the site will impact upon cycle parking (Bike Locker Hire facilities) which is currently provided within the vicinity of the site.

### 5.2.3 Bus Services

Bus services operating through the locality are discussed in Section 2.7, with bus routes travelling along Rooty Hill Road North and North Parade. The construction work on the site will not impact upon this route, with the only interaction being those associated with delivery vehicles for construction materials. This would be a minor impact and with normal road rules applying there would be minimal delays for the existing bus services.

### 5.2.4 Kiss and Ride

The existing Kiss and Ride facilities will remain operational on Station Street, with the exception of the possession period on weekends where this section of the road will be closed.

### 5.2.5 Motorcycle Parking

There is no dedicated motorcycle parking provided in the existing car parks in the locality, hence there will be no impact to motorcycle parking during the construction works.

### 5.2.6 Taxis

As per the Kiss and Ride facilities, the existing taxi zone on Station Street will remain operational, with the exception of the possession period on weekends where this section of the road will be closed.



## 6 Summary and Recommendations

### 6.1 Summary

The following conclusions are drawn from the investigations into the proposed upgraded commuter car park off Station Street, Rooty Hill, NSW.

The proposed development is for an extension to the existing at-grade car park, providing approximately 344 additional parking spaces for railway users. The site currently allows for commuter parking with 160 spaces provided. The upgrade would allow for additional parking spaces to be provided over a number of levels with access retained direct onto Station Street via a new entry / exit driveway crossing.

Pedestrian access between the railway station and the car park will be provided via a new shared path along the side of Station Street between the car park and the railway access that allows for a good and safe all weather connection between the car park and the station.

The car park would increase the number of vehicles entering and exiting the during the typical morning arrivals period and the afternoon departure period, Monday through to Friday with significantly less traffic flows in the evening and weekends. The car park would provide approximately 344 additional spaces, generating 344 additional traffic movements inbound to the car park in the morning and a similar additional number in the afternoon. Given the current traffic flows in the immediate vicinity of the subject site together with the single directional traffic flows associated with the car park this is considered to create minimal delays for road users.

The car park and the site access has been designed in accordance with AS2890 and allows for safe entry and exit movements. It is considered that the access to the carpark and the access to this adjacent approved development can occur in a safe and appropriate manner.

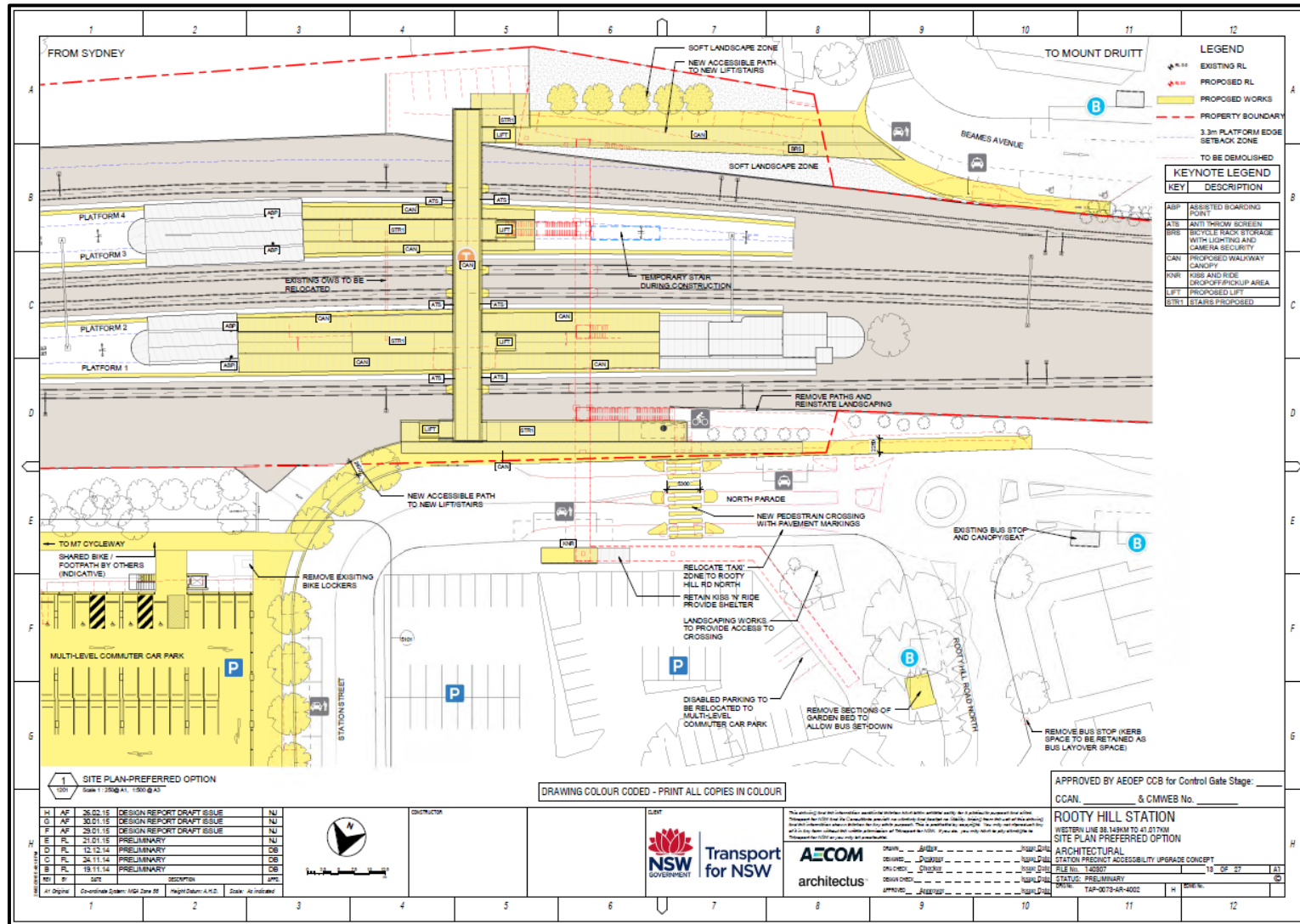
The key findings for the project are:

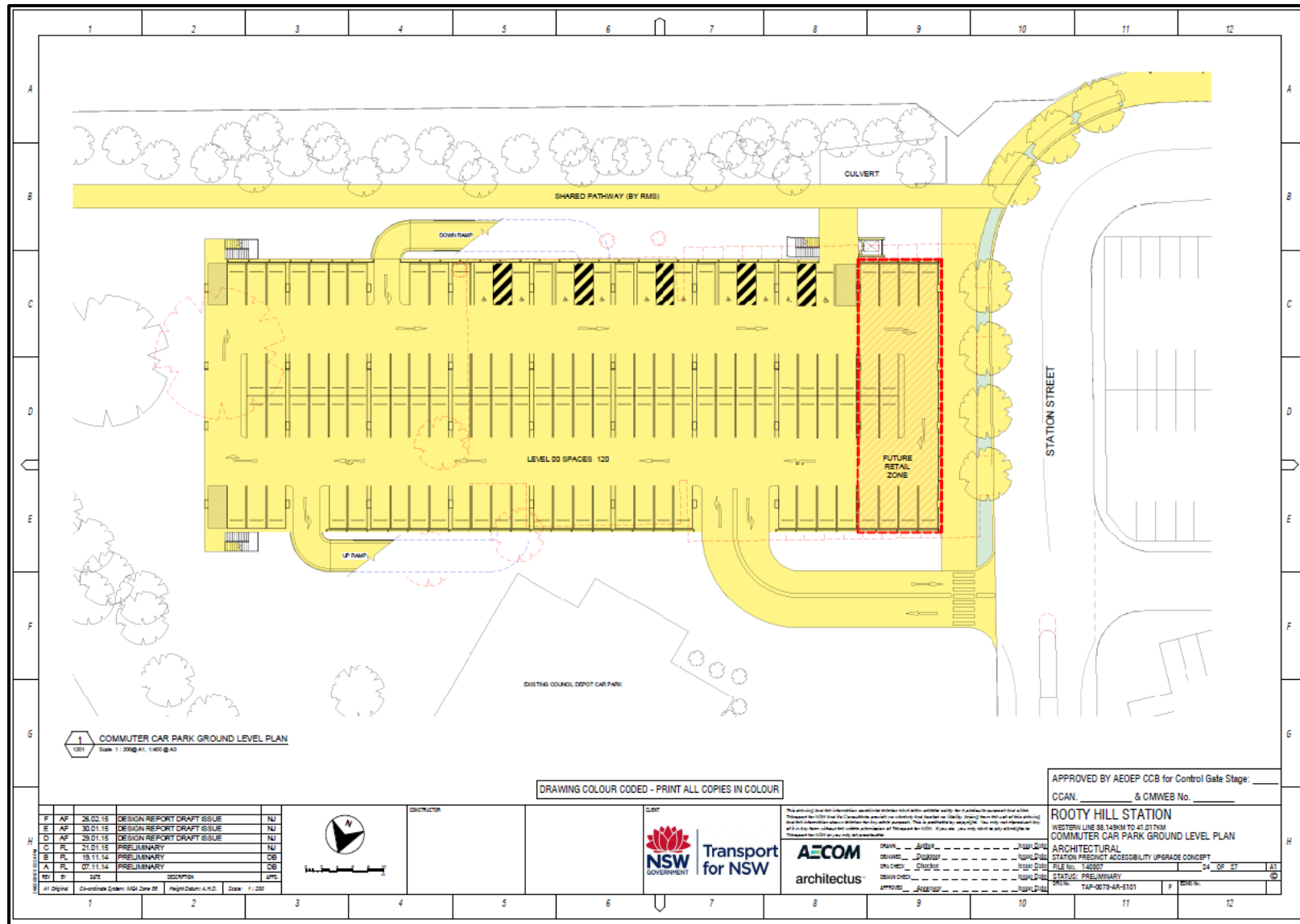
- The proposed car park is located 60 metres from the railway station and provides good pedestrian connectivity between the car park and the station
- The carpark would provide an additional 344 spaces which would allow for the current and future parking demands expected for the commuters in this area
- The access to the car park is located in a similar location to the existing car park access and would continue to operate in a safe and appropriate manner
- During construction, the major impact would be created by the closure of the car park, requiring existing users to park elsewhere within the locality of the site. A number of options have been identified to cater for this parking with Council land identified south of the railway station and will need to be discussed and agreed with Council as the road authority.
- Traffic movements associated with the construction activities would have a minimal impact upon the overall operation of the road network, and the key routes are all designed to accommodate heavy vehicles. The turn movements are controlled by traffic signals or roundabouts to ensure no adverse impact upon road safety;
- Once the car park is operational, the traffic movements associated with the car park would have an acceptable impact upon the local road network, with traffic modelling completed by AECOM confirming that the local intersections will continue to operate with minimal delays and congestion. Observations on site during both the morning and afternoon peak periods show that the local road network is working well. The key impact could be at the site access and the access will operate to an acceptable standard, based on the requirements of AS2890.

From the project analysis, it is considered that the major impacts would be those created during construction, with the requirement to close the existing car park, which forces an additional 160 cars to park elsewhere. It is considered that discussion should be had with Council to use vacant land south of the railway station as temporary parking, with this land to be made good once this new commuter car park is constructed and operational.

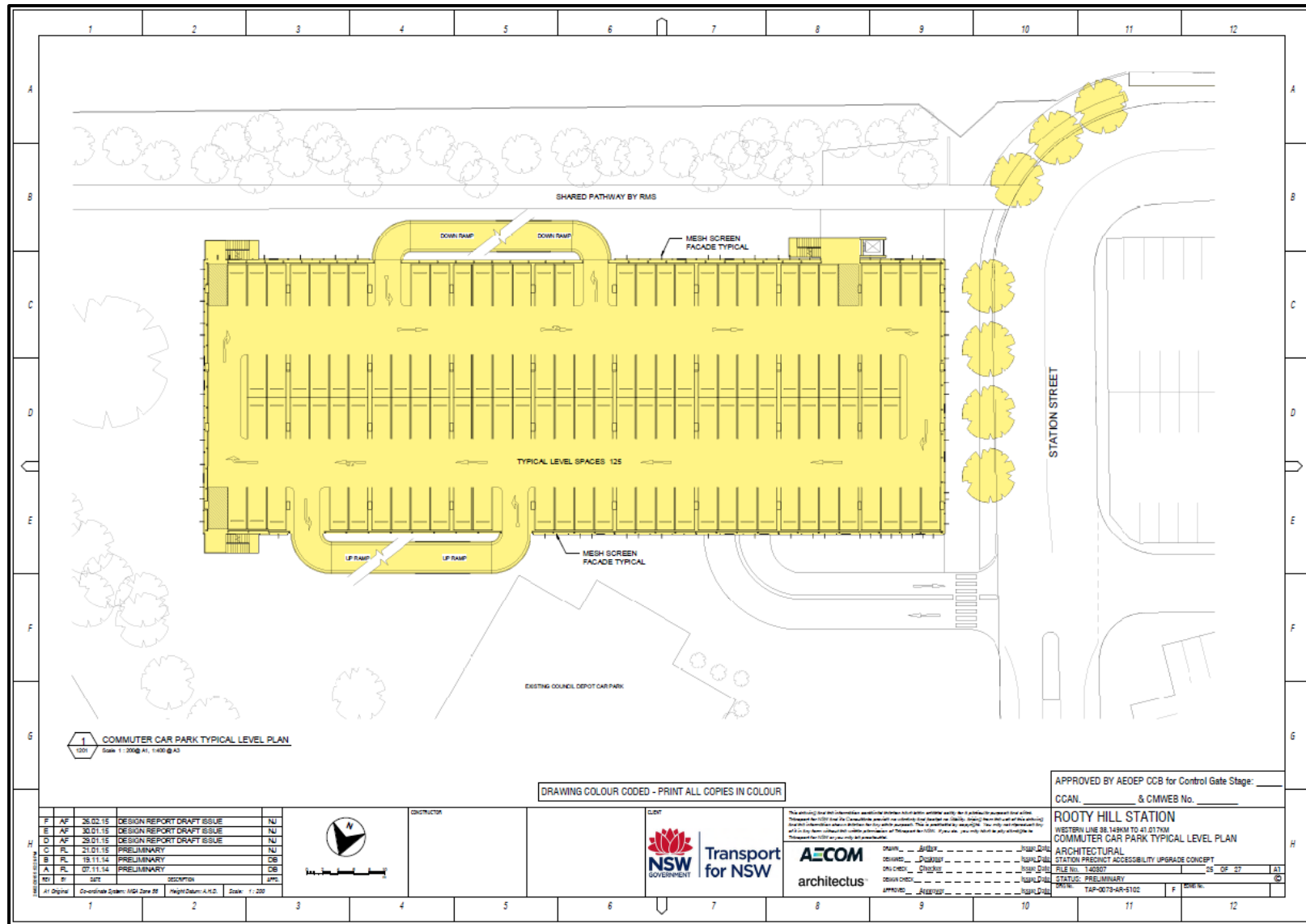
The overall conclusion from the investigations is that traffic and parking arrangements for the development proposal are satisfactory and that there are no traffic impediments to the development of the car park.

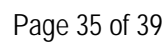
Appendix A – Concept Plans (subject to detailed design)



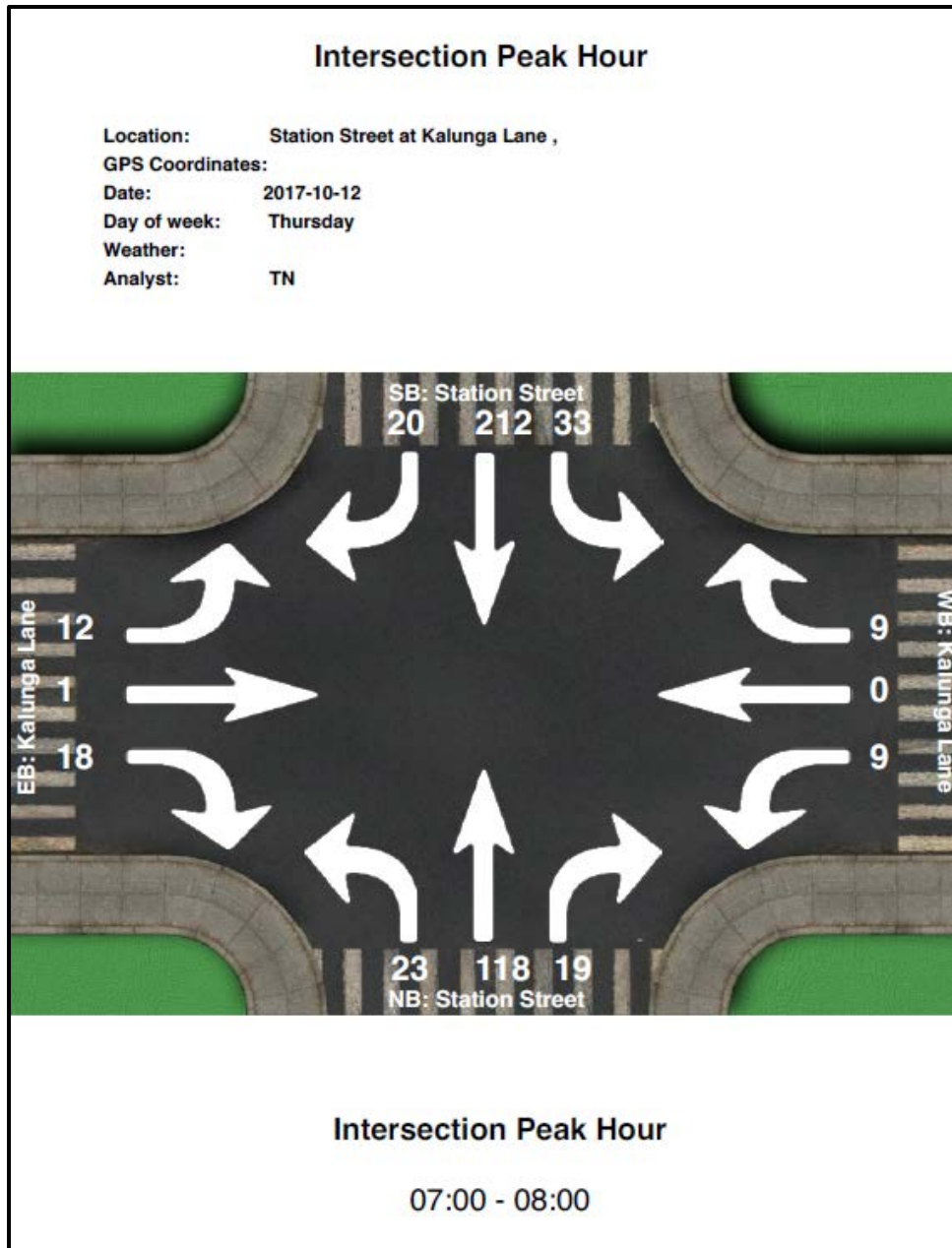






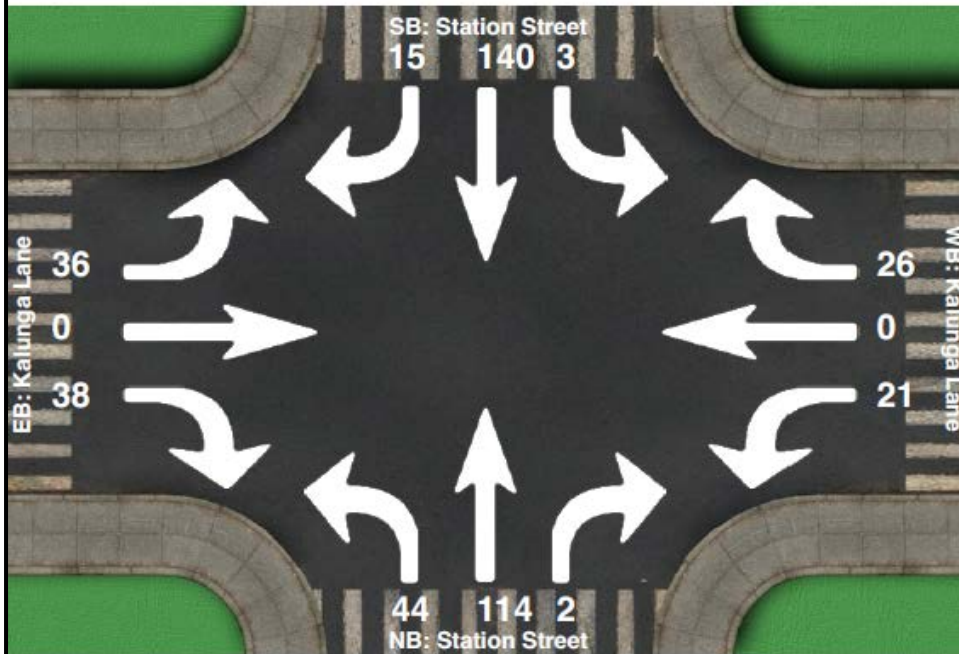


## Appendix B – Traffic Surveys



### Intersection Peak Hour

Location: Station Street at Kalunga Lane ,  
 GPS Coordinates:  
 Date: 2017-10-12  
 Day of week: Thursday  
 Weather:  
 Analyst: TN




### Intersection Peak Hour

16:00 - 17:00



## Appendix C - Accident Data

# Summary Crash Report



# Crash Type	Contributing Factors	Crash Movement	CRASHES	CASUALTIES
Car Crash 3 75.0%	Speeding 0 0.0%	Intersection, adjacent approaches 0 0.0%	Fatal 0 0.0%	Killed 0 0.0%
Light Truck Crash 1 25.0%	Fatigue 0 0.0%	Head-on (not overtaking) 0 0.0%	Serious inj. 0 0.0%	Seriously inj. 0 0.0%
Rigid Truck Crash 0 0.0%	Weather	Opposing vehicles; turning 0 0.0%	Moderate inj. 2 50.0%	Moderately inj. 3 50.0%
Articulated Truck Crash 0 0.0%		U-turn 0 0.0%	Minor/Other inj. 1 25.0%	Minor/Other inj. 3 50.0%
Heavy Truck Crash (0) (0.0%)		Rear-end 0 0.0%	Uncategorised inj. 0 0.0%	Uncategorised inj. 0 0.0%
Bus Crash 0 0.0%		Lane change 1 25.0%	Non-casualty 1 25.0%	Unrestrained 0 0.0%
Heavy Vehicle Crash (0) (0.0%)		Parallel lanes; turning 0 0.0%	Self Reported Crash 0 0%	^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn
Emergency Vehicle Crash 0 0.0%	Rain 0 0.0%	Vehicle leaving driveway 0 0.0%	Crashes Casualties	
Motorcycle Crash 0 0.0%	Overcast 1 25.0%	Overtaking; same direction 0 0.0%		
Pedal Cycle Crash 0 0.0%	Fog or mist 0 0.0%	Hit parked vehicle 0 0.0%		
Pedestrian Crash 2 50.0%	Other 0 0.0%	Hit railway train 0 0.0%		
		Hit pedestrian 1 25.0%		
	Road Surface Condition	Permanent obstruction on road 0 0.0%	Time Group % of Day	
	Wet 1 25.0%	Hit animal 0 0.0%	00:01 - 02:59 0 0.0% 12.5%	2 2014 5
	Dry 3 75.0%	Off road, on straight 0 0.0%	03:00 - 04:59 0 0.0% 8.3%	1 2013 1
	Snow or ice 0 0.0%	Off road on straight, hit object 1 25.0%	05:00 - 05:59 0 0.0% 4.2%	1 2012 0
	Natural Lighting	Out of control on straight 0 0.0%	06:00 - 06:59 0 0.0% 4.2%	
	Dawn 0 0.0%	Off road, on curve 0 0.0%	07:00 - 07:59 0 0.0% 4.2%	
	Daylight 4 100.0%	Off road on curve, hit object 0 0.0%	08:00 - 08:59 0 0.0% 4.2%	
	Dusk 0 0.0%	Out of control on curve 0 0.0%	09:00 - 09:59 0 0.0% 4.2%	
	Darkness 0 0.0%	Other crash type 1 25.0%	10:00 - 10:59 0 0.0% 4.2%	
			11:00 - 11:59 0 0.0% 4.2%	
			12:00 - 12:59 0 0.0% 4.2%	
			13:00 - 13:59 2 50.0% 4.2%	
			14:00 - 14:59 1 25.0% 4.2%	
			15:00 - 15:59 0 0.0% 4.2%	
			16:00 - 16:59 1 25.0% 4.2%	
			17:00 - 17:59 0 0.0% 4.2%	
			18:00 - 18:59 0 0.0% 4.2%	
			19:00 - 19:59 0 0.0% 4.2%	
			20:00 - 21:59 0 0.0% 8.3%	
			22:00 - 24:00 0 0.0% 8.3%	
			Street Lighting Off/Nil % of Dark	
			0 of 0 in Dark 0.0%	

## Detailed Crash Report

NOTES: 7381 - Rooty Hill Rd & N Parade & Station St Crash Data - 1 Jan 2012 to 31 Dec 2016

Crash No.	Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
Sydney Region																							
Blacktown LGA																							
Rooty Hill																							
North Pde																							
822414 P	04/01/2013	Fri	16:32	200 m	W	PERKINS ST	2WY	STR	Fine	Dry	50	1	TRK	M61	W in NORTH PDE	50	Proceeding in lane	MC	0	0	1	0	0
E49862635																							
Nth Rooty Hill Rd																							
788494 P	03/03/2012	Sat	14:40	10 m	N	NORTH PDE	TJN	STR	Overcast	Wet	60	2	CAR	U U	N in NTH ROOTY HILL RD	Unk	Veering right	NC	0	0	0	0	0
E197013894																							
Rooty Hill Rd																							
1065707 P	01/12/2014	Mon	13:30	50 m	N	NORTH PDE	2WY	STR	Fine	Dry	50	2	CAR	M22	N in ROOTY HILL RD	10	Proceeding in lane	OC	0	0	0	1	0
E56748766																							
1029987 P	14/06/2014	Sat	13:30	40 m	S	WESTON LANE	2WY	STR	Fine	Dry	50	5	CAR	M65	N in ROOTY HILL RD	20	Reverse parking	MC	0	0	2	2	0
E55138061																							

Crashid dataset 7381 - Rooty Hill Rd & N Parade & Station St Crash Data - 1 Jan 2012 to 31 Dec 2016

Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data. Reporting yrs 1996-2004 and 2017 onwards contain uncategorised inj crashes.