

# TRANSPORT ACCESS PROGRAM

## **Birrong Station Upgrade Traffic, Transport and Access Impact Assessment**

### **Prepared for:**

Transport for NSW  
Level 5, Tower A, Zenith Centre,  
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NSW, 2067

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## BASIS OF REPORT

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

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## DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.19079-R03-v0.1	31 October 2019	Tom Gibbs	Tim Sullivan	DRAFT
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## EXECUTIVE SUMMARY

Transport for NSW (TfNSW) proposes to upgrade Birrong Station to meet disability access requirements (the Proposal) as outlined in the *Disability Discrimination Act 1992* (DDA Act). The Proposal would include an upgrade of Birrong Station as part of the Transport Access Program which would improve accessibility and amenity for customers.

This report presents an assessment of construction and operational traffic, transport and access impacts associated with the concept design and identifies feasible and reasonable traffic, transport and access mitigation and management measures to be incorporated in the detailed design and construction planning stage of the Proposal. This assessment forms part of the input to the Review of Environmental Factors (REF).

### Existing Conditions

Birrong Railway Station is located in the City of Canterbury Bankstown. It is currently surrounded by largely low density residential, with a small strip of shops no longer in use as commercial enterprises on the west side of the station (on Hudson Parade), and Birrong Boys High School on the east side.

Birrong Station is on the T3 Bankstown Line, and is the last station before the T3 line splits to branch towards Liverpool or to Lidcombe. Platform 1 serves the City-bound services, and Platform 2 serves Liverpool and Lidcombe services. Because of the rail stopping patterns, Birrong has become an interchange station for passengers wanting to transfer across these two branch lines.

Birrong Station is currently not accessible as per the Commonwealth *Disability Discrimination Act 1992* (DDA) and *Disability Standards for Accessible Public Transport* (DSAPT) and elements of the station do not meet current standards.

Birrong Station is a station with a significant park and ride mode share with a small commuter carpark located off Hudson Parade on the western side of the station, and overflow commuter parking on surrounding streets particularly Hudson Parade.

Birrong Station consists of one island platform, with access to the station via stairs from Avalon Street overbridge. A raised pedestrian crossing on the eastern side of the bridge and pedestrian fences currently facilitate safe movement of pedestrians from both footpaths on either side of the bridge.

There are currently two accessible parking spaces provided within the commuter carpark which don't meet DDA or DSAPT.

There are currently no bicycle parking facilities provided at Birrong Station and currently no dedicated bicycle paths in the vicinity of the station.

A drop off and pick up only zone serving approximately 2-3 vehicles is provided on Teresa Street immediately before the eastern side of the overbridge.

Bus stop provision is currently limited. The nearest regular route bus stops are located 300m away on the eastern side of the station on Cooper Road at Birrong Boys High School (Stop ID 214336) and 600m away on the western side of the station on Auburn Road at Birrong Public School (Stop ID 214368, serving route 909).

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An initial review of TfNSW crash data (2013-2017 inclusive) suggests that there are no significant road safety issues within the immediate vicinity of the station.

### Operational impacts

Data predictions for Birrong Station indicates that there is a 1.1% per annum growth for station entries and 1.8% per annum growth for station exits between the 2011 base year to 2036 future year data. Similarly, a 1.6% per annum growth for station entries and 2.3% per annum growth for station exits between the 2011 base year to the 2036 + 15% future year data.

Pedestrian access to Birrong Station would be significantly improved through the installation of the new footbridge and elimination of the need for station users to access via the bridge on Avalon Street through the removal of the existing stairs to the platform. This would significantly reduce walking distance for a majority of customers in the walking catchment and also from the commuter carpark.

The proposed Kiss and ride bay on Teresa Street would provide increased opportunities and facilitate more safe and efficient option for people dropping off and picking up passengers, particularly for people travelling from the eastern side of the station. The proposed new kiss and ride bay has the potential to improve congestion during peak periods and significantly reduce the amount of illegal parking in the area.

Given the relatively minor nature and scale of the improvements delivered as part of the Proposal, it is not expected that there would be any significant impacts on road capacity or performance. Whilst there would be some increase in station utilisation as a result of improvements to accessibility and amenity, it is expected that these incremental increases would not result in a material increase in traffic demand.

### Construction impacts

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

- Potential confusion and possible increased walking distances during the demolition of the existing stairways and construction of new stairs and access path.
- Potential higher levels of platform congestion arising from localised restrictions/narrowing of portions of the platform temporarily fenced off during construction of the lifts and internal station building modifications.
- Elevated frequency of pedestrian and truck interactions particularly on Rodd Street, Avalon Street and Hudson Parade.
- Potential confusion and loss of amenity for customers during the construction works including the visual impact of laydown / storage and amenities areas.
- Delays to customers arising during construction including management of traffic and work activities.
- Higher road safety risk levels associated with construction vehicle-pedestrian interaction, particularly on Rodd Street, Avalon Street and Hudson Parade.

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These impacts are considered to be manageable subject to a detailed Construction Environmental Management Plan (CEMP) to be prepared by a suitably qualified person or agency, either directly or in partnership with the nominated Contractor. The CEMP would be prepared in the next phase of the Proposal as construction activities and works programs are resolved and should identify strategies, work practices, and traffic control plans that avoid, reduce and mitigate safety risks for all users of the transport system including customers of Birrong Station.

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Term	Meaning
CEMP	Construction Environmental Management Plan
CML	Concessional Mass Limit
CTMP	Construction Traffic Management Plan
DDA	<i>Disability Discrimination Act 1992 (Commonwealth)</i>
DSAPT	<i>Disability Standards for Accessible Public Transport 2002</i>
GML	General Mass Limit
LOS	Level of Service
NSW	State of New South Wales
NVHR	National Heavy Vehicle Regulator
PEA	Preliminary Environmental Assessment
Rail shutdown	Rail shutdown is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
REF	Review of Environmental Factors
RMS	Former New South Wales Roads and Maritime Services (now part of TfNSW)
TAP	Transport Access Program
TCP	Traffic Control Plan
TfNSW	Transport for New South Wales

# 1 Introduction

Transport for NSW (TfNSW) proposes to upgrade Birrong Station to meet disability access requirements (the Proposal) as outlined in the *Disability Discrimination Act 1992* (DD Act). The Proposal would include an upgrade of Birrong Station as part of the Transport Access Program which would improve accessibility and amenity for customers.

The Proposal is part of the Transport Access Program (TAP) which is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. A key objective of the program is to ensure that all stations, and in this instance Birrong Station, meet legislative requirements under the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

The Proposal would provide safe and equitable access to the island platform and the surrounding pedestrian network at Birrong Station and would also improve customer facilities and amenities. The improvements would, in turn, assist in supporting the growth in public transport use and would provide an improved customer experience for existing and future users of the station.

## 1.1 Report objectives

SLR Consulting Australia Pty Ltd (SLR) has been engaged by TfNSW to prepare a construction and operational traffic, transport and access assessment for the proposed station upgrade at Birrong.

The aims of this assessment are to:

- Summarise the existing conditions and provide an assessment of the construction and operational transport impacts of the concept design for the Proposal.
- Identify feasible and reasonable transport related mitigation and management measures to be incorporated in the detailed design and construction planning stage of the Proposal.

This assessment forms part of the input to the Review of Environmental Factors (REF).

## 1.2 Proposal overview

The Proposal involves an upgrade of Birrong Station as part of the Transport Access Program which aims to improve accessibility and amenity for customers. The Proposal would include the following elements.

### **New footbridge, lift and ramps:**

- installation of a new pedestrian footbridge south of the existing Avalon Street overbridge which would provide access from Rodd Street (east) over the rail corridor to Rodd Street (west). The footbridge would comprise a concrete structure with protection screens
- installation of one lift to provide access between the new pedestrian footbridge and the platform
- construction of a new eastern station entrance, to include accessible ramp and stairs to connect to the new footbridge, with landscaping near entrance
- construction of a new western entrance, to include a new accessible ramp and stairs to connect to the new footbridge, with landscaping near the entrance; and

- removal of the existing stairs to the platform from the Avalon Street overbridge and reinstating the existing bridge parapet.

#### Platform and station building works:

- localised platform regrading to ensure accessibility, tactile ground surface indicators and line marking as required for DSAPT compliance;
- canopies at the boarding assistance zones;
- conversion of the existing unisex toilet to a unisex ambulant toilet;
- upgrades to the existing family accessible toilet including:
  - replacement of items for compliance with DSAPT;
  - new entry ramp; and
  - extension of the roof canopy of the platform building to provide adequate shelter at the toilet entrance.

#### Interchange upgrades:

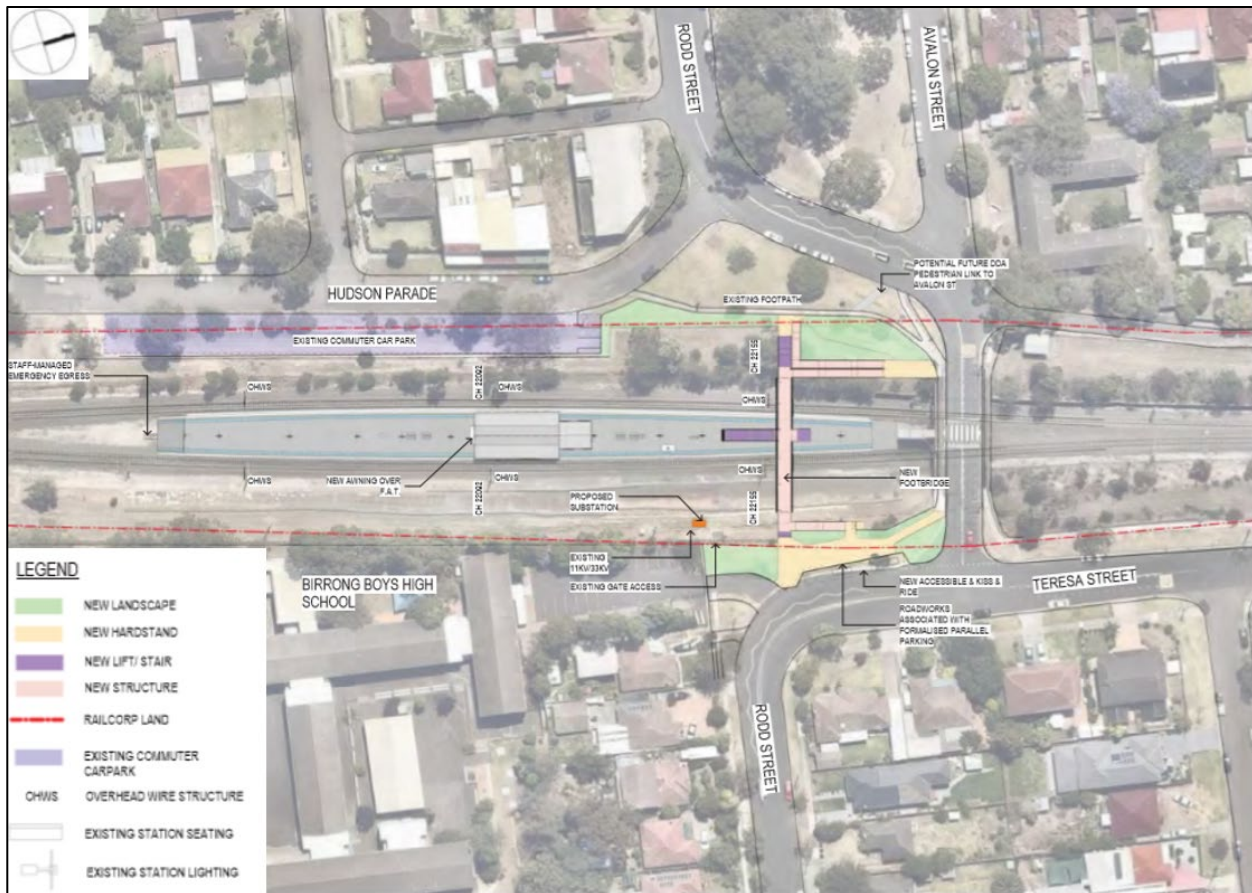
- a signposted accessible kiss and ride bay on Teresa Street adjacent to the eastern station entrance;
- an accessible parking space to the eastern side of the station (adjacent to Birrong Boys High School staff car park entrance);
- conversion of the two existing accessible parking spaces in the commuter car park to standard car parking spaces; and

#### Ancillary work:

- upgrade to the station power supply and a new 11kV padmount substation to be located on the eastern side of the rail corridor, south of the proposed footbridge; and
- adjustments to station lighting, security systems including CCTV and communication systems including public announcement and hearing induction loops.

Key elements of the proposal are shown in **Figure 1**.

Figure 1 Key elements of Proposal



### 1.3 Scope and methodology

This report has been prepared in reference to the transport and traffic impact assessment undertaken by Aurecon in May 2018. This assessment was based on a review of the proposed station upgrade arrangement and forecast pedestrian demands at a previous concept design stage.

The concept design has since progressed with amendments; however, the majority of the Aurecon’s findings remain valid in consideration for the Review of Environmental Factors (REF). Accordingly, this report references and builds upon the prior assessment. SLR has been commissioned to undertake a gap analysis of these previously reported findings and prepare a specialist report including elements that require additional assessment suitable for inclusion as part of the REF.

### 1.4 References

The following documents were used as reference as a part of this assessment:

- RPS (April 2018). Birrong Station Upgrade Preliminary Environmental Assessment, Transport Access Program 3, Ref-6005458.
- Aurecon (May 2018). Transport and Traffic Impact Assessment, Ref-501680 Revision E.
- Aurecon (August 2015). Transport Access Program – Birrong Station Precinct Accessibility Upgrade Concept Design, Birrong Station Pedestrian Assessment, Red-247043 Revision B.

## 2 Existing conditions

### 2.1 Site context

Birrong Railway Station is located in the City of Canterbury Bankstown. It is currently surrounded by largely low density residential, with a small but abandoned strip of shops on the west side of the station (on Hudson Parade), and Birrong Boys High School on the east side.

Birrong Station is on the T3 Bankstown Line, and is the last station before the T3 line splits to branch towards Liverpool or to Lidcombe. Platform 1 serves the City-bound services, and Platform 2 serves Liverpool and Lidcombe services. Because of the rail stopping patterns, Birrong has become an interchange station for passengers wanting to transfer across these two branch lines.

The station is located within the City of Canterbury-Bankstown Local Government Area and is accessed via stairs from the southern side of Avalon Street overbridge.

### 2.2 Surrounding road network

Key roads within the Birrong Station precinct include: Avalon Street, Teresa Street, Rodd Street and Hudson Parade which are discussed below. The location of Birrong Station in the local area and road network context is illustrated in **Figure 3**.

#### 2.2.1 Avalon Street

Illoura Avenue functions as a local road providing access to a number of residential properties and also provides a connection across the rail line between Rodd Street and Teresa Street via the Avalon Street overbridge. It has one traffic lane in each direction, with kerbside parking provided on both sides of the street, with the exception of at the overbridge. A pedestrian (zebra) crossing is located on the eastern side of the bridge providing access from both sides of the bridge to the stairs down to the station platform. Avalon Street does not have a sign posted speed limit, so a default urban speed limit of 50 km/h applies other than during school zone times where a speed limit of 40 km/h applies. The school zone begins on the western side of Avalon Street overbridge and continues to the east towards Cooper Road and streets surrounding Birrong Boys High School and Birrong Girls High School.

#### 2.2.2 Teresa Street

Teresa Street functions as a local road adjacent to the railway line to the east of Birrong Station. It runs with a north-south alignment and forms a connection with Rodd Street outside Birrong Boys High School. Teresa Street has one traffic lane in each direction, with unrestricted parking on both sides of the road. A pick up and drop off only zone is located on the western side of Teresa Street just south of the overbridge. Teresa Street does not have a sign posted speed limit, so a default urban speed limit of 50 km/h applies, other than in School zone times where a speed limit of 40 km/h applies.

Teresa Street has a pedestrian footpath connection from the station entrance all the way to Birrong Girls High School along its western side.

### 2.2.3 Rodd Street

Rodd Street functions primarily as a collector road connecting Auburn Road in the west (continuing to Hector Road) to Cooper Road in the east. It provides access over the rail corridor and serves a number of adjoining residential roads. Unrestricted parking is generally provided on either side of Rodd Street. Rodd Street does not have a sign posted speed limit, so a default urban speed limit of 50 km/h applies, other than in School zone times where a speed limit of 40 km/h applies in some sections.

Rodd Street has a pedestrian footpath from the station entrance to Birrong Boys High School along its western side.

### 2.2.4 Hudson Parade

Redleaf Avenue functions as a local road providing access to the Birrong Station commuter carpark and unrestricted on street parking on both sides utilised primarily for commuter parking. Hudson Parade has one traffic lane in each direction, with a posted speed limit of 50 km/h.

Hudson Parade has a pedestrian footpath from the commuter carpark to the station entrance and also a footpath on the western side.

**Figure 2** Surrounding road network



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## 2.3 Station access and facilities

### 2.3.1 Pedestrians

#### 2.3.1.1 Station access

Customer access to Birrong station is via a single access point from the southern side of the Avalon Street overbridge (on the eastern side of the span), with a short 5m long (2.5m wide) concourse and stair access down to the island platform.

There are pedestrian footpaths on both sides of Rodd Street, except alongside the park on the west of the rail station. While the footpath grades on the eastern Rodd Street approach to the station are currently within the acceptable gradients for AS 1428.1 Design for Access and Mobility (that is, less than 3-5%), the grades on some western approaches to the station are steeper, particularly from the commuter car park off Hudson Street to the Avalon Street overbridge, alongside the rail corridor.

A raised pedestrian crossing (wombat crossing) is located on the eastern side of the rail overbridge. Pedestrian fencing on both sides of the bridge effectively control illegal pedestrian crossing outside of the wombat crossing. The platform is currently only accessible by stairs from this location.

The pedestrian crossing and station access is shown in **Figure 3**.

**Figure 3 Birrong Station Access**

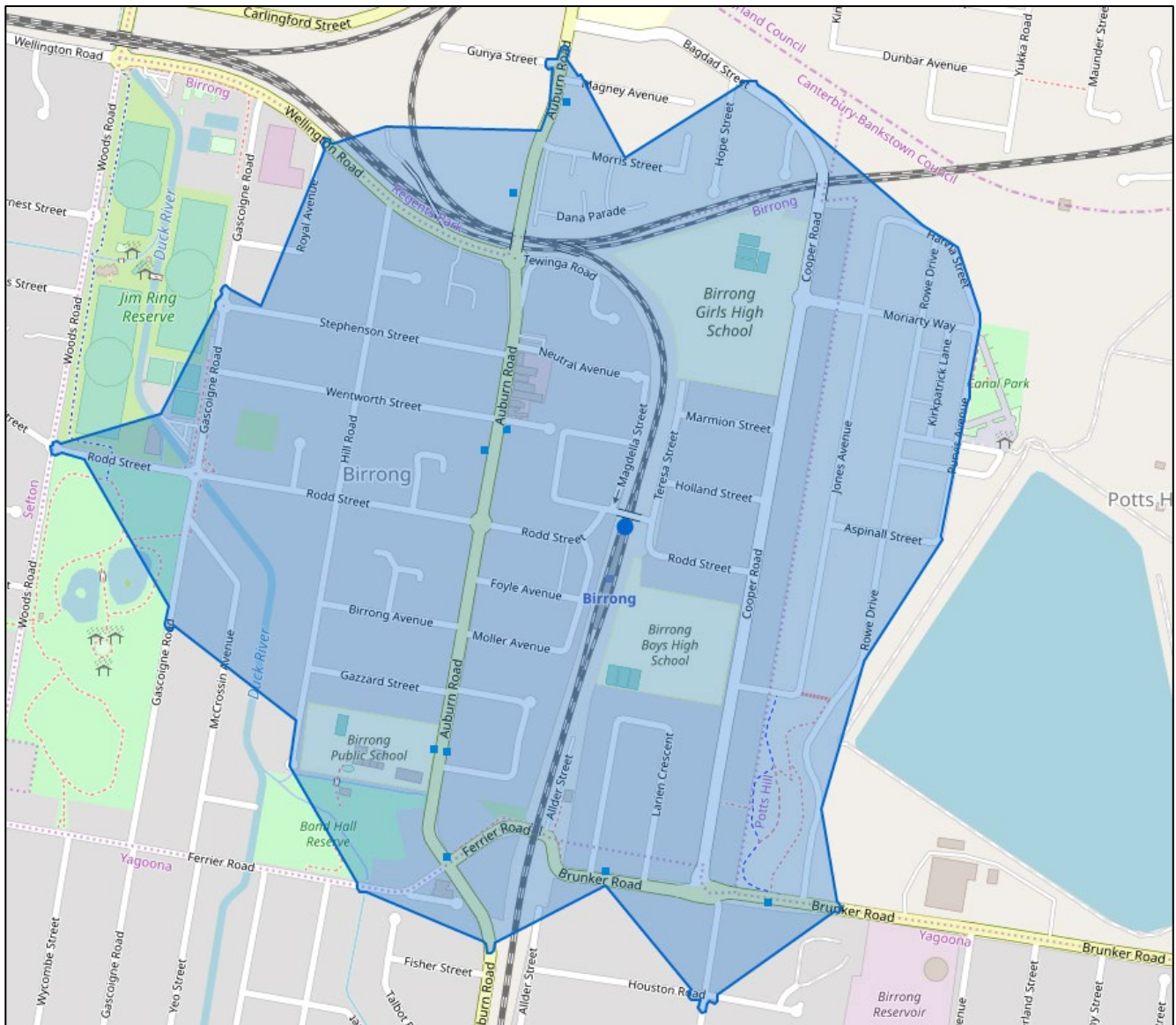


### 2.3.1.2 External movement network

The 10-minute walkable catchment is illustrated in **Figure 4**.



Figure 4 10 minute walking catchment (source: iso4app.net)



The pedestrian network in the vicinity of Birrong Station provides connections to a number of schools including Birrong Boys School and Birrong Girls School to the east and Birrong Public School to the west of the station. A large number of residential properties are situated within the 10 minute walking catchment primarily to the north of the station. To the east the 10 minute walking catchment also captures Birrong Sports Club, Jim Ring Reserve and Maluga Passive Park.

### 2.3.1.3 Mode share assessment

No formal mode share assessment was performed. However, due to the commuter car park off Hudson Parade and significant amount of on-street parking available, particularly on Hudson Parade, Birrong station has both a significant Park and Ride function and potential for an increased active transport function due to its close proximity to a number of schools and residential properties.

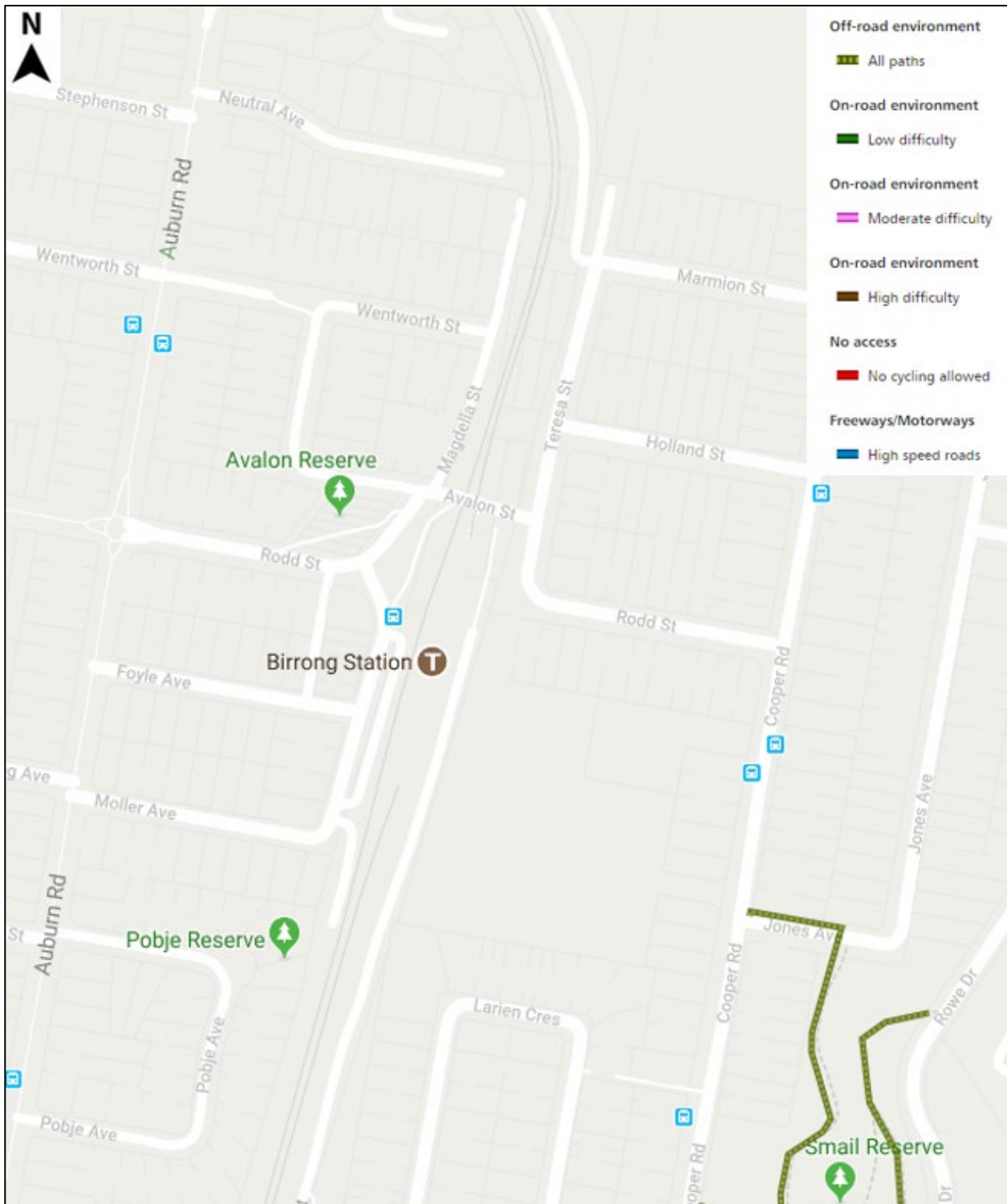
## 2.3.2 Cyclists

### 2.3.2.1 Station access

There are currently no bicycle parking facilities provided at Birrong Station. The bicycle network around the vicinity of Birrong Station is shown in **Figure 5**. The figure shows that there are currently no bicycle paths in the vicinity of the station.

The nearest cycleways are over 2km west and south on local streets (shared bike/parking lane in Chester Hill/ Bass Hill on Robertson Rd-Marks St-Bambridge St, and in Condell Park/ Yagoona on Glassop St) There is no formal bike parking (racks or lockers) currently provided in the vicinity of the rail station.

**Figure 5 Existing bicycle routes (RMS Cycleway finder, last updated 8/06/2018)**



## 2.4 Public transport

### 2.4.1 Train

#### 2.4.1.1 Services

While Birrong’s locality is very suburban in character, it has the same rail service frequency as the major town centre of Bankstown. Generally the train frequency is 4 trains per hour in each direction, increasing to a peak of 8 trains between 7-8am weekdays, and 7 trains between 8-9am weekdays. This high rail frequency, coupled with its interchange role, means that Birrong Station has become a popular station for commuters in surrounding suburbs up to 5 kilometres away.

#### 2.4.1.2 Patronage

AM peak entries at Birrong Station in 2011 were 420 passengers. Following a timetable revision in 2014, there was a jump in patronage. Based on data provided by TfNSW, and using the “land use growth controlled to STM growth total (Population data)” figures, the design rail patronage was calculated to be 982 passenger entries in the AM peak period, into Birrong Station in 2036 (including TfNSW’s required 15% contingency).

**Table 1 Existing and Future Forecast AM Peak entries at Birrong Station (Aurecon, 2018)**

AM Peak entries	2011	2016	2021	2026	2031	2036	2036+15%	change 2011 to 2036+15%
2011 barrier count share (held constant)	420	458	454	481	516	550	632	50%
Land Use Growth controlled to STM growth total (Population Data)	420	684	618	724	804	854	982	134%
Land Use Growth NOT controlled to STM growth total (Population Data)	420	531	629	652	665	682	785	87%

### 2.4.2 Bus

#### 2.4.2.1 Services and stops

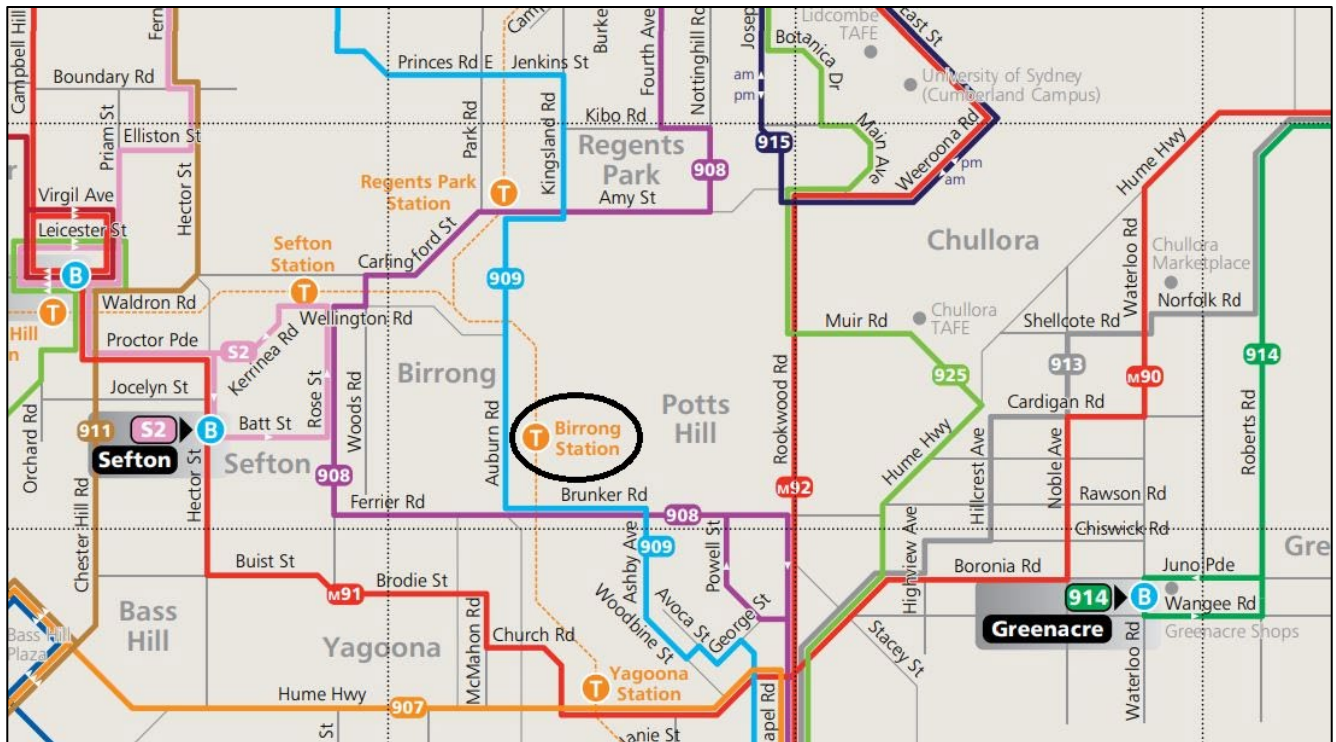
The nearest regular route bus stops are located 300m away on the eastern side of the station on Cooper Road at Birrong Boys High School (Stop ID 214336) and 600m away on the western side of the station on Auburn Road at Birrong Public School (Stop ID 214368, serving route 909).

It has been previously noted that TfNSW currently has no plans to introduce new bus routes/stops at the station, nor are any bus layover facilities required. During rail closures (possessions), a rail bus operates from Hudson Parade and travels over Rodd Street on both sides of the rail line, and this provision and route is to be maintained. A school charter bus has previously been observed parked across the Birrong Boys High School staff parking access driveway at approximately 8:30am, standing for approximately 10 minutes to pick up students.

Latent bus demand could exist from surrounding suburbs, as evidenced by the extensive commuter car parking in surrounding streets, particularly on the western side of Birrong Station.

A bus route network map is shown in **Figure 6**, which shows Birrong station is primarily served by bus route 909.

Figure 6 Bus route network (Source: Transdev NSW, 2018)



## 2.5 Taxis

Taxi demand is currently low at Birrington Station. As bus routes directly to the station are limited, this may increase the demand for taxis in the future in line with an expected increase in patronage. TfNSW have not identified a need to provide a dedicated taxi stand at Birrington Station, which is a view also supported by the Council. Future taxi pick-up and drop-off can occur in kiss and ride spaces.

## 2.6 Kiss and ride

Based on observations, peak accumulation of kiss and ride activity on the eastern approach is 3 vehicles; and on the western approach is 2 vehicles, but with a total observed accumulation of 4 vehicles at any one time. It has been previously noted that there is a lot of illegal drop-off activity occurring on Avalon Street, Magdella Street, and Rodd Street. A drop off and pick up only zone is provided on the western side of the station on Teresa Street, shown in **Figure 7**.

With future increase in AM peak entries of 130% by 2036, it can be estimated that the future peak accumulation of kiss and ride activity could be in the order a total of 9 vehicles at any one time.

**Figure 7 Drop off and pick up only zone on Teresa Street**



## 2.7 Park and ride

The one-way single lane commuter carpark accessed off Hudson Parade holds approximately 15 standard spaces with an additional 2 accessible parking spaces. These car spaces are approximately 110 metres walking distance from the station entrance and do not meet current DDA or DSAPT Australian Standards.

Informal on-street commuter car parking was observed to extend approximately 300-350m from the station access point on the western side of the station (along Avalon Street, Rodd Street to beyond Auburn Road, Hudson Parade, Foyle Avenue, Moller Avenue) and approximately 200m from the station access point on the eastern side of the station (along Rodd Street, Teresa Street, Marmion Street, and Holland Street). This extent represents a walk to the station of up to 4 minutes. It is estimated that around 100 commuter cars can be parked on-street at any one time.

## 2.8 Traffic, car parking, pedestrian and cyclist demands

No additional demand surveys were carried out as part of this study.

It is expected that pedestrian demand would increase in all directions in line with an increase in station patronage by 130%. There is currently a low cycling demand at Birrong Station, however bikes have been observed to be chained to pedestrian fences indicating the need for improved bike parking facilities to unlock potential demand.

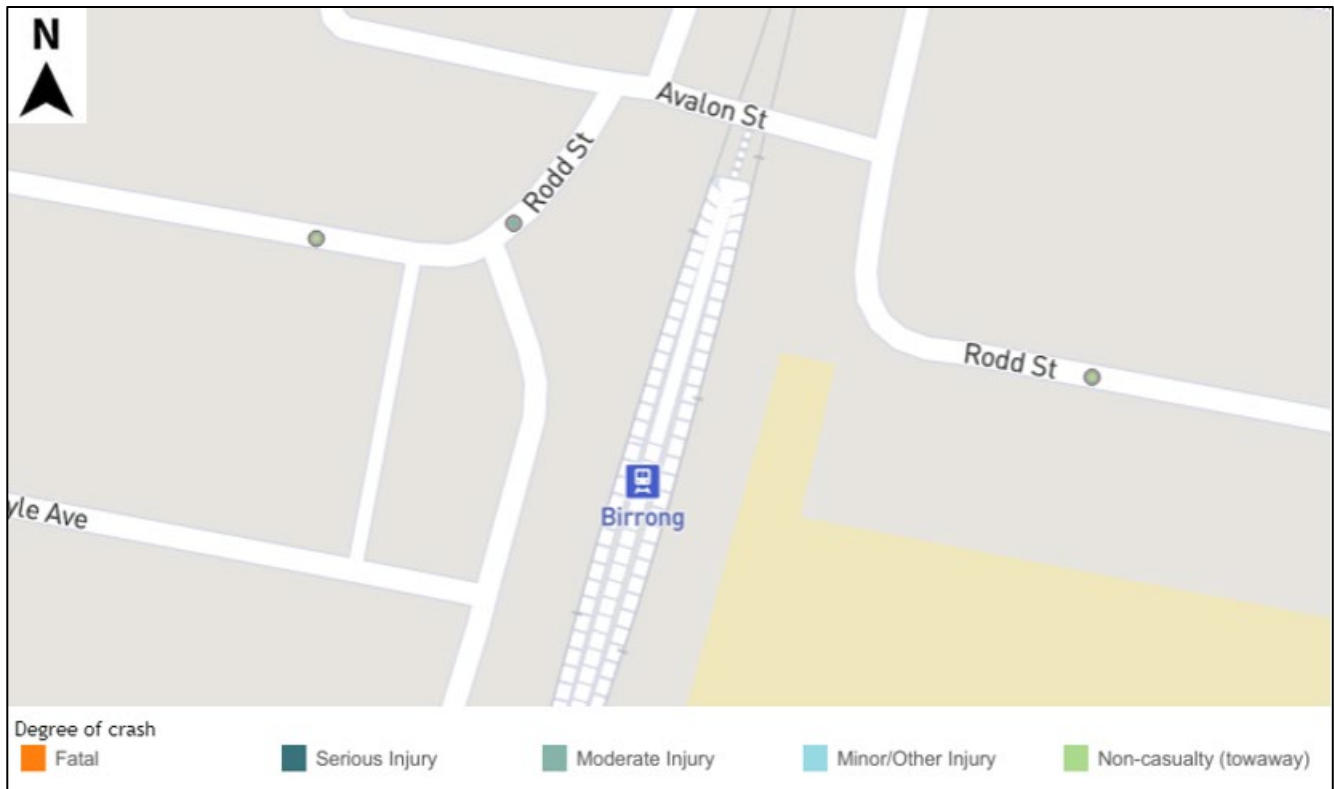
Traffic tube count data (from Bankstown Council from 2011), taken at Rodd Street near the pedestrian refuge on the west of the rail overbridge (near the Avalon Street intersection), shows that there is a dramatic peak in traffic volumes at 9:00am on weekdays, with approximately 300 vehicles in both directions, totalling 600 vehicles. This is likely to be associated with student drop-offs at Birrong Boys High School. Traffic on weekends has peaks throughout the day, reaching 200 vehicles in a peak hour on Saturdays and 100 vehicles in a peak hour on Sundays.

## 2.9 Transport safety

Crash information has been sourced from the former NSW Roads and Maritime Services for the period 2013-2017 (inclusive) for an area within the immediate vicinity of the station. The data indicates 3 crashes were reported for the region shown in **Figure 11**, including one moderate injury crash in 2018 which was a rear end type crash near the intersection of Rodd Street and Hudson Parade. An initial review of crash data suggests that there are no significant road safety issues on the road network within the immediate vicinity of the station.

A summary of results are shown in **Figure 8** and **Table 2**

**Figure 8 TfNSW crash data (2013 - 2017 inclusive)**



**Table 2 TfNSW crash data (2013 - 2017 inclusive)**

Crash year	Crash location	Crash ID	Crash severity	Crash description (Road User Movement (RUM) code)
2018	Intersection at Rodd Street / Hudson Parade	1177713	Moderate injury	RUM 30 – Rear end
2016	2-way undivided on Rodd Street (east of station)	1112069	Non casualty / towaway	RUM 73 – Off road right into object
2016	2-way undivided on Rodd Street (west of station)	1123065	Non casualty / towaway	RUM 71 – Off road left into object

## 2.10 Existing situation summary

The existing traffic, transport and access observation issues can be summarised as follows based on the combined investigations undertaken by Aurecon (May 2018) and SLR.

Birrong Station is a station with a significant park and ride mode share with a small commuter carpark located off Hudson Parade on the western side of the station.

Birrong Station currently consists of one island platform, with access to the station via stairs from Avalon Street rail bridge. A raised pedestrian crossing on the eastern side of the bridge and pedestrian fences currently facilitate safe movement of pedestrians from both footpaths on either side of the bridge. Birrong Station is currently not accessible as per the Commonwealth Disability Discrimination Act 1992 (DDA) and Disability Standards for Accessible Public Transport 2002 (DSAPT) and elements of the station are below current standards.



There are currently two accessible parking spaces provided within the commuter carpark which don't meet Australian Standards.

There are currently no bicycle parking facilities provided at Birrong Station and currently no dedicated bicycle paths in the vicinity of the station.

A drop off and pick up only zone serving approximately 2-3 vehicles is provided on Teresa Street immediately before the eastern side of the rail overbridge.

Bus stop provision is currently limited. The nearest regular route bus stops are located 300m away on the eastern side of the station on Cooper Road at Birrong Boys High School (Stop ID 214336) and 600m away on the western side of the station on Auburn Road at Birrong Public School (Stop ID 214368, serving route 909).

An initial review of TfNSW crash data (2013-2017 inclusive) suggests that there are no significant road safety issues within the immediate vicinity of the station.

## 3 Operational impacts

### 3.1 Future station patronage

AM peak hour 2036 station patronage forecast provided by the NSW Bureau of Transport Statistics is detailed in the Birrong Station Precinct Accessibility Upgrade Concept Design, Birrong Station Pedestrian Assessment document (Aurecon, August 2015).

This study included the 2036 and 2036 + 15% future year modelled pedestrian volumes. **Table 3** shows the Birrong Station future year growth as provided by the NSW Bureau of Transport Statistics. The "Land Use Growth controlled to Strategic Travel Model (STM) growth total (Population Data)" data for Birrong Station indicates the greatest growth and such has been used to predict the future year normal operation pedestrian demands. This data indicates that there is a 1.1% per annum growth for station entries and 1.8% per annum growth for station exits between the 2011 base year to 2036 future year data. Similarly, a 1.6% per annum growth for station entries and 2.3% per annum growth for station exits between the 2011 base year to the 2036 + 15% future year data. This 2036 and 2036 + 15% annual growth has been applied to the existing pedestrian volumes to reflect the 2036 and 2036 + 15% future year volumes.

**Table 3 Birrong Station Pedestrian Growth**

	AM Peak		Entries		1,000m		Population Data	
	2011	2016	2021	2026	2031	2036		
2011 barrier count share (held constant)	420	458	454	481	516	550		
Land Use Growth controlled to STM growth total (Population Data)	420	684	618	724	804	854		
Land Use Growth NOT controlled to STM growth total (Population Data)	420	531	629	652	665	682		

	AM Peak		Exits		1,000m		Population Data	
	2011	2016	2021	2026	2031	2036		
2011 barrier count share (held constant)	280	378	359	382	409	434		
Land Use Growth controlled to STM growth total (Population Data)	280	511	424	454	470	482		
Land Use Growth NOT controlled to STM growth total (Population Data)	280	408	483	501	511	524		

	All Day		Entries		1,000m		Population Data	
	2011	2016	2021	2026	2031	2036		
2011 barrier count share (held constant)	1,040	1,053	1,024	1,081	1,160	1,221		
Land Use Growth controlled to STM growth total (Population Data)	1,040	1,692	1,401	1,598	1,780	1,837		
Land Use Growth NOT controlled to STM growth total (Population Data)	1,040	1,198	1,420	1,472	1,501	1,539		

	All Day		Exits		1,000m		Population Data	
	2011	2016	2021	2026	2031	2036		
2011 barrier count share (held constant)	1,040	1,075	1,057	1,118	1,194	1,267		
Land Use Growth controlled to STM growth total (Population Data)	1,040	1,695	1,535	1,692	1,814	1,904		
Land Use Growth NOT controlled to STM growth total (Population Data)	1,040	1,198	1,420	1,472	1,501	1,539		

The accessibility improvements would be expected to increase patronage for customers with limited mobility and potentially result in a shift in mode for some users, for example from private vehicle to walking. Generally however, a total increase in patronage over time would be largely determined by future land use and factors such as cost and reliability of the service compared to other transport modes, such as private vehicle.

### 3.2 Public transport

The relatively minor scope of works that form part of the Proposal are not anticipated to be significant enough that they would induce a material change to the existing public transport utilisation and/or capacity. Accordingly, the Proposal impacts to public transport, if any, would be minor but broadly positive given they would contribute to making travel by rail more accessible for the local community, particularly those with limited mobility.

### 3.3 Pedestrians

Pedestrian access to Birrong Station would be significantly improved through the installation of the new footbridge and elimination of the need for station users to access via the bridge on Avalon Street through the removal of the existing stairs to the platform. This would significantly reduce walking distance for a majority of customers in the walking catchment and also from the commuter carpark.

The installation of one lift to provide access between the new pedestrian footbridge and the platform would provide the necessary access for both disabled users and customers with limited mobility. The new eastern and western entrances, both including new accessible ramps and stairs to connect to the new footbridge would significantly enhance the ability for the station to accommodate larger pedestrian flows during peak hours. These improvements would also enhance the visual appeal, sense of safety and wayfinding for pedestrians, as it would clearly indicate both accesses as opposed to the existing access on the rail overbridge.

### 3.4 Cyclists

The Proposal does not include any changes to bicycle parking in the vicinity of Birrong station.

### 3.5 Taxis

No formal taxi zones are included in the Proposal. As the demand for Taxis is relatively low at Birrong Station, it is not expected that this would have a significant impact on traffic operation. As it is proposed to include a new accessible space and kiss and ride facility in the space previously reserved as drop off and pick up only on Teresa Street, it would be reasonably expected that Taxis would make use of this facility on occasion.

### 3.6 Kiss and ride

The proposed kiss and ride bay on Teresa Street would provide increased opportunities and facilitate safer and more efficient option for people dropping off and picking up passengers, particularly for people travelling from the eastern side of the station. The proposed new kiss and ride bay has the potential to improve congestion during peak periods and significantly reduce the amount of illegal parking in the area.

As the proposed kiss and ride bay starts directly after the apex of a curve there may be potential safety issues in regard to managing the speed of vehicles entering the facility and also potential issues for drivers safely exiting the facility as vision of approaching vehicles may be obscured. This would be subject to a Road Safety Audit.

### 3.7 Road network

Due to the fact that no additional parking is being proposed, the limited opportunities to increase park and ride facilities close to the station and the existing dense urban environment, it is not expected that the proposal would have any major operational impacts in terms of an increase in traffic. It is expected that a minor increase in traffic would occur due to a steady increase in patronage over time.

The Proposal would increase accessibility to Birrong Station and improve the customer experience and amenity, likely leading to a minor increase in utilisation and patronage. This would manifest in customers either travelling by train where they did not before, or by changing from another nearby station.

Accordingly, there may be some increase in traffic generation; however, it is expected to be minor and would have a negligible impact on the surrounding road network or the amenity of local residents. Importantly, the Proposal features infrastructure improvements that would encourage more sustainable transport options through providing improved pedestrian infrastructure such as the new accessible ramps on both sides of the station.

The new footbridge works on are not expected to create any significant change in operation on the surrounding road network, other than a potential localised increase in road safety due to pedestrians being redirected away from the narrow footpaths of the rail overbridge and general traffic.

## 3.8 Car parking

One new accessible parking space would be created on the eastern side of the station on Teresa Street. This would provide a significant improvement to the existing situation where currently the accessible parking spaces are non-compliant and require customers to navigate non-compliant grades at a distance of around 110 metres to the station access. The new accessible parking space is approximately 10 metres from the proposed eastern station entrance, representing a much more favourable situation for customers with limited mobility.

The Proposal does not result in the loss of any regular car spaces. The two existing non-compliant accessible parking spaces within the commuter car park are being converted to regular parking spaces.

Overall, the Proposal has the potential to increase parking demand by a minor amount given the accessibility improvements which may lead to a small increase in station utilisation and patronage.

## 3.9 Property access

The Proposal is not expected to have any impact on existing access to properties in the vicinity of Birrong Station.

## 3.10 Transport safety

The Proposal should improve pedestrian safety given that the improved footpaths and new footbridge and station entrances provide for increased space and manoeuvrability for pedestrians.

It is not expected that the Proposal would have any significant bearing on the road safety at surrounding intersections. In general, the improved access for pedestrians, particularly for less mobile pedestrians, would result in an increase in pedestrian safety.

The Proposal is not expected to have any bearing on the crash types identified in **Section 2.9**.

# 4 Construction impacts

## 4.1 Construction works

The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with TfNSW. The construction staging outlined in this assessment is indicative and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program, and sequencing of work.

The key TAP3 accessibility upgrade scope includes the following key tasks:

### New footbridge, lift and ramps:

- installation of a new pedestrian footbridge south of the existing Avalon Street overbridge which would provide access from Rodd Street (east) over the rail corridor to Rodd Street (west). The footbridge would comprise a concrete structure with side screening
- installation of one lift to provide access between the new pedestrian footbridge and the platform

- construction of a new eastern station entrance, to include accessible ramp and stairs to connect to the new footbridge, along with landscaping near the station entrances
- construction of a new western entrance, to include a new accessible ramp and stairs to connect to the new footbridge
- removal of the existing stairs to the platform from the Avalon Street overbridge and reinstating the existing bridge parapet

#### Platform and station building works:

- localised platform regrading to ensure accessibility, tactile ground surface indicators and line marking as required for DSAPT compliance
- canopies at the boarding assistance zones
- conversion of the existing unisex toilet to a unisex ambulant toilet
- upgrades to the existing family accessible toilet including:
  - replacement of items for compliance with DSAPT
  - new entry ramp
  - extension of the roof canopy of the platform building to provide adequate shelter at the toilet entrance

#### Interchange upgrades:

- a signposted accessible kiss and ride bay on Teresa Street adjacent to the eastern station entrance
- relocation of two accessible parking spaces from the western side of the station to Teresa Street near the new kiss and ride, and upgrades to these spaces

#### Ancillary work:

- upgrade to the station power supply and a new 11kV padmount substation to be located on the eastern side of the rail corridor, south of the proposed footbridge
- adjustments to station lighting, security systems including CCTV and communication systems including public announcement and hearing induction loops.

## 4.2 Construction hours

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.

Work outside of standard hours may be required occasionally at night, on weekends and during scheduled SydneyTrains trackwork periods. These are scheduled line closures that would occur regardless of the Proposal when part of the rail network is temporarily closed for maintenance and trains are not operating.

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. Existing planned trackwork periods would be utilised to complete a portion of the proposed work. It is estimated that approximately four trackwork periods would be utilised to facilitate:

- overhead wiring works
- electrical upgrades (including the new 11kV padmount substation)
- excavation and installation of the footbridge and lift
- platform works (such as regrading, trenching for power/communications systems and installation of tactiles)
- reconfiguration of internal station buildings

Out of hours works may also be scheduled outside trackwork periods. Approval from TfNSW would be required for any out of hours work and the affected community would be notified as outlined in the TfNSW *Construction Noise and Vibration Strategy* (TfNSW, 2018b).

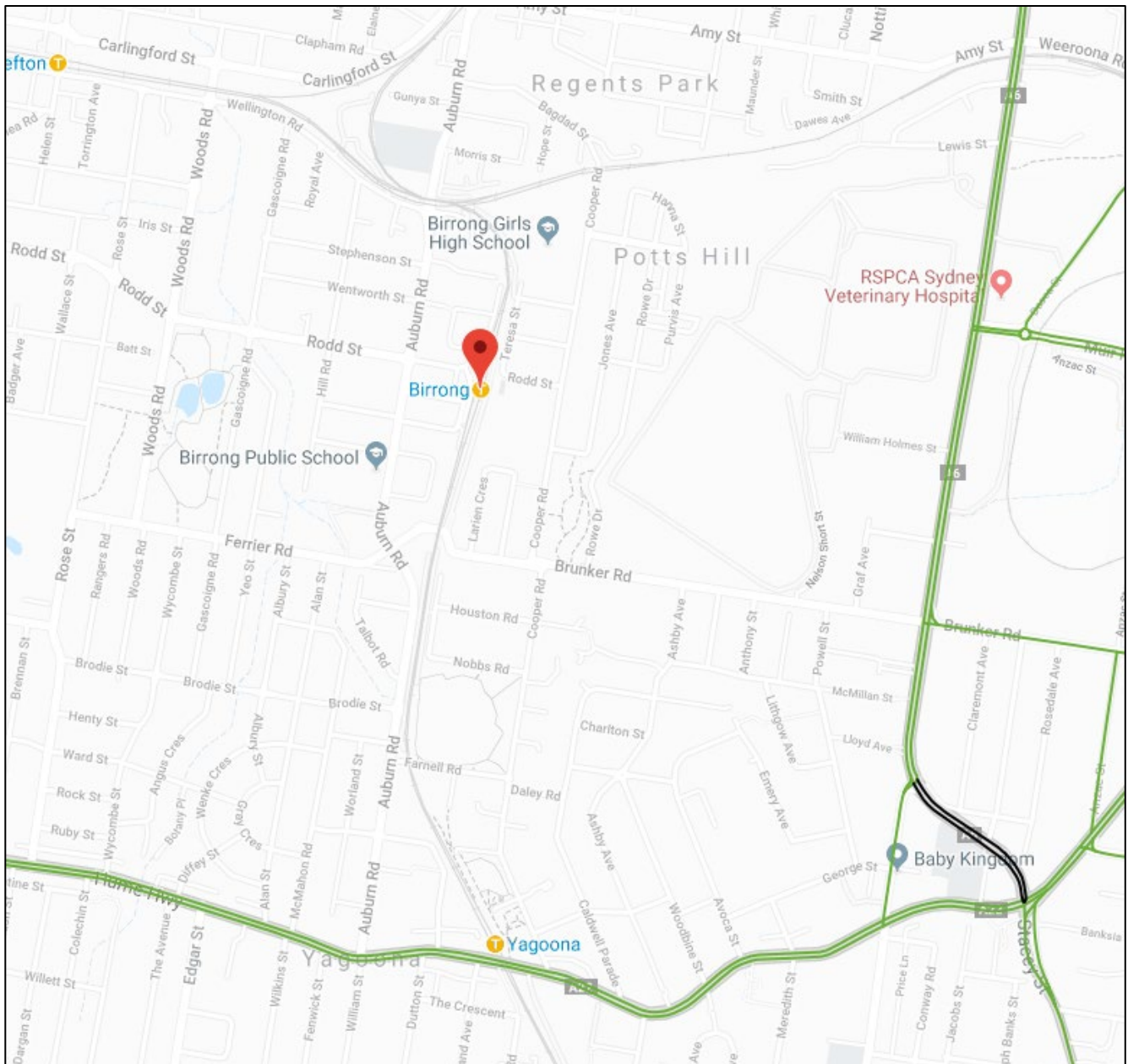
### 4.3 Construction period

Subject to approval, construction is expected to commence in mid 2020 and take around 16 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Construction Contractor in consultation with TfNSW.

### 4.4 Haulage routes

Birrong Station is situated approximately 1.5 kilometres north of the Hume Highway and approximately 1.3 kilometres west of Rockwood Road. Mapping prepared by the National Heavy Vehicle Regulator (NHVR) illustrates that both of these roads can accommodate larger vehicles including High Mass Limit 19 metre, 23 metre and 25/26 metre B-Doubles. This is illustrated in **Figure 9**.

Figure 9 NSW RMS approved 19m, 23m, 25/26m B-Double GML/CML network



Heavy vehicle construction access would be available to both the eastern and western sides of the station via Rodd Street. It is assumed that heavy vehicle routes would be on the state road network, with possible local traffic control and parking restrictions on local roads to provide access to the site.

Detailed assessments (e.g. swept paths, bridge rating analysis) to determine the suitability of these proposed routes for heavy vehicle use would be undertaken and the proposed access routes would be identified in the Construction Traffic Management Plan (CTMP). Broadly these construction routes are likely to include the following roads, subject to additional analysis during the detailed design phase:

- Hume Highway

- Roackwood Road
- Bruncker Road
- Cooper Road
- Rodd Street

## 4.5 Work induction

All workers and subcontractors involved in the construction works would be required to undertake a site induction before commencing work. It is recommended that work induction include the permitted access routes, driver and worker protocols, emergency procedures, WHS requirements and environmental measures. All workers, including construction and traffic controllers, are to hold all appropriate licences.

## 4.6 Pedestrian impacts

The following impacts to pedestrians / rail customers are anticipated to arise from construction activities:

- Potential confusion and possible increased walking distances during the demolition of the existing stairways and construction of new stairs and access path.
- Potential higher levels of platform congestion arising from localised restrictions/narrowing of portions of the platform temporarily fenced off during construction of the lifts and internal station building modifications.
- Elevated frequency of pedestrian and truck interactions particularly on Rodd Street, Avalon Street and Hudson Parade.
- Potential confusion and loss of amenity for customers during the construction works including the visual impact of laydown / storage and amenities areas.
- Delays to customers arising during construction including management of traffic and work activities.
- Higher road safety risk levels associated with construction vehicle-pedestrian interaction, particularly on Rodd Street, Avalon Street and Hudson Parade.
- Potential impacts to more vulnerable users, including school children travelling to and from Birrong Boys High School and Birrong Girls High School. School children may be required to alter their path of travel during these time times and would potentially require a safe temporary crossing on Teresa Street to facilitate safe movement around the construction zone.

These impacts are considered to be manageable subject to a detailed Construction Environmental Management Plan (CEMP) to be prepared by a suitably qualified person or agency, either directly or in partnership with the nominated Contractor. The CEMP would be prepared in the next phase of the Proposal as construction activities and works programs are resolved and should identify strategies, work practices, and traffic control plans that avoid, reduce and mitigate safety risks for all users of the transport system including customers of Birrong Station.



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## 4.7 Traffic impacts

The traffic generated during construction is likely to vary and would be confirmed in the detailed design and construction planning phase, however construction traffic would increase during scheduled weekend rail shutdown periods. The traffic generated as a part of the construction works is not expected to exceed 20 light vehicles and 10 heavy vehicles per day during peak construction periods. The removal of the existing stairs to the platform from the Avalon Street overbridge and reinstating the existing bridge parapet would require partial road closures and potentially full road closures during certain times, subject to a Traffic Control Plan. The use of the concrete truck on the rail overbridge would require traffic management under a Traffic Control Plan. It is likely that drivers would experience some delay, however due to the relatively low traffic demand outside peak hours this is not expected to cause a significant reduction in travel time.

A detailed construction methodology and associated management plans (such as a Construction Environmental Management Plan (CEMP)) would be developed during the next design phase of the Proposal to manage potential traffic and access impacts.

## 4.8 Parking impacts

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. Areas on the western side of the station, off Hudson Parade, have been identified for use as construction compound and stockpile areas. No public parking spaces would be temporarily affected by the establishment of the compound. **Figure 10** shows the proposed work areas and construction compound area. The construction compound would be located on land owned by Railcorp.

**Figure 10 Temporary laydown, storage and amenities areas**



It is also recommended that construction workers be encouraged to travel via non-private vehicle modes or to travel with workmates/carpool where possible. Construction workers should be discouraged from parking in nearby streets that would be most convenient for station customers.

Prior notice should be given if material temporary losses in existing public car parking is planned during the construction period.

#### 4.9 Property access

The Proposal is not expected to have any significant impact on access to existing residential properties in the vicinity of Birrong Station. A number of property accesses on Hudson Parade are situated adjacent to the construction access area, however this would not result in a loss of access to properties as construction vehicles would remain in parking areas or general work areas.

There are potential property access issues to Birrong Boys High School due to a number of classes being held on Saturday. Access to the parking area located off Teresa Street would likely be affected resulting in increased demand for parking on nearby residential streets.

TfNSW does not propose to acquire any property as part of the Proposal. Work would be undertaken entirely within the rail corridor (including the construction compound area on land owned by RailCorp) and land owned by Canterbury-Bankstown Council. Temporary occupation of council land would be required to facilitate construction and this land would be reinstated upon completion.

## 4.10 Transport safety

During the construction period there would be an elevated frequency of pedestrian and truck interaction and higher road safety risk levels associated with construction vehicle - pedestrian interaction, particularly on Rodd Street, Avalon Street and Hudson Parade.

As construction would occur in several stages, this may result in potential confusion and loss of amenity for customers during works at the station entrances and potential footpath closures and/or diversions. Due to the altered conditions, particularly during peak periods, some users may take unnecessary risks to avoid delay. It is therefore essential that clear signage and infrastructure be put in place in accordance with CTMPs to mitigate these impacts.

## 5 Conclusion and recommendations

### 5.1 Conclusion

The scope of the Proposal is not anticipated to result in any significant adverse operational impacts. The Proposal would aim to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams, and customers with luggage.

The proposed station access improvements, including the two new station entrances with lift, and new footbridge would offer considerable pedestrian benefits and improve the customer experience at the station. Furthermore, the active transport environment outside the station would be significantly improved through the construction of a new accessible walkway and ramp, new stairs and handrails, new bike parking, and formalised zone for kiss and ride, and accessible parking on Teresa Street.

### 5.2 Operational mitigation measures

Recommendations to mitigate operational impacts include:

- Consider installing bike parking hoops on the Teresa Street side of the station and also on the western entrance to provide convenient bicycle parking facilities for potential cyclists in the catchment west of the station.
- Given that Birrongo Station is an important interchange between lines, it is recommended to consider the installation of an additional covered area on the platform to improve the customer experience waiting for the next train.

### 5.3 Construction mitigation measures

Birrongo Station is a popular park and ride station and also provides an important pedestrian connection to the nearby schools of Birrongo Boys High School, Birrongo Girls High School and Birrongo Public School. There is a need to ensure that any potential risks and/or confusion to pedestrians during the construction period is minimised. A CTMP inclusive of detailed TCPs would need to be prepared and submitted to the relevant roads authority.

The Contractor should prepare CTMP for each phase of construction. The CTMP should specify the following:

- construction approach and staging
- construction traffic demands

- construction parking strategy
- construction vehicle travel routes
- road closures and alternative routes
- compound access and egress locations
- pedestrian management strategy

TCPs incorporate standard signage informing users of the transport system of temporary changes implemented to accommodate construction activity including heavy vehicle movements, lane/path closures and/or diversions, changes in speed limits, and the possible need to stop if directed, etc. This should include static signage installed in advance of, and throughout the works precinct.

Other possible mitigation measures to minimise traffic impacts during construction of the station upgrade should generally include:

- Appropriate traffic management, including static signs, manual traffic control and provision of temporary barriers to control the proposed work areas and minimise delays.
- Establishment of safe access points to work areas from the adjacent road network including safety measures such as barriers and warnings to pedestrians, maintaining sight distance requirements and signage and the provision of traffic management measures such as those identified above.
- Establishment of temporarily realigned vehicle and/or pedestrian facilities.
- Use of traffic controllers to negotiate pedestrian and construction vehicle priority and access, if required.
- Construction workers encouraged to travel via non-private vehicle modes or to travel with workmates/carpool where possible.
- Work inductions include the permitted access routes, driver and worker protocols, emergency procedures, WHS requirements and environmental measures.
- Construction Traffic Management Plans (CTMPs) consider special or at-elevated risk land uses including schools and lower order residential routes, with consideration given to limit or avoid construction vehicle activity during School Zone periods.
- As the main station access on Avalon Street overbridge would be removed, this has the potential to impact the usual travel patterns of many residents both east and west of the station. Residents should be notified well in advance of the alternate station accesses with appropriate advanced signage on key pedestrian routes approaching the station, and identified in detailed TCP's.

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