

Transport for NSW

Erskineville Station Upgrade

Supporting Studies



ERSKINEVILLE STATION

Transport Access Program Traffic, Transport and Access Assessment

Prepared for:

Transport for New South Wales
7 Harvest Street
Macquarie Park
NSW 2113

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BASIS OF REPORT

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
630.30084.00000-R04-v1.0	11 March 2021	Charlie Seventekin	Charlie Seventekin	Kris Stone

EXECUTIVE SUMMARY

Background and upgrade work

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

The Proposal would include the following key elements:

- a new southern station entrance off Bridge Street including a new footbridge with three new lifts and stairs connecting to all platforms
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1 (whilst retaining the existing overhead booking office, footbridge, and stairs)
- one new kiss and ride area and one accessible parking space at the northern terminus of Bridge Street providing an accessible path of travel to the existing (northern) Station entrance
- a new kiss and ride area with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance
- new canopies on the platforms to provide weather protection
- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the family accessible toilet on Platform 1 for improved accessibility
- upgrade work along the footpaths approaching the northern and southern station entrances
- kerb modifications and line marking at the southern station entrance to provide access to the new kiss and ride areas
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system modifications and new hearing induction loops
- localised platform regrading and the installation of new tactiles along the platforms
- improvements to station lighting and CCTV to improve safety and security
- landscaping work, tree removal and adjustments to wayfinding
- electrical upgrades for the new infrastructure and service relocations.

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Existing conditions

Station patronage data provided by Transport for NSW indicates that the average weekday passenger demand for the AM peak hour (08:00am – 09:00am) at Erskineville Station was 822 persons in 2017. Existing station facilities include the following:

- two bike racks with capacity for twelve bicycles at the station entrance on Swanson Street
- a concourse that is built over the rail line as part of the railway bridge (Swanson Street)
- direct access to the station concourse from Swanson Street and stair access from the station concourse to the platforms
- no formal kiss and ride passenger set down / pick up facility
- no commuter car parking facility.

The existing pedestrian footpaths constructed in the public road verges surrounding the station can generally be described as acceptable quality although several examples were noted of localised narrowing adjacent to utility poles, signposts (including two school zone signs adjacent the public school), bins and fences. These localised reductions in the available path width on Swanson Street make it difficult for a person travelling in a wheelchair or a parent / carer walking with a pram to navigate.

There are no formal kiss and ride facilities in the vicinity of Erskineville Station; and no passenger drop-off demand data was made available to SLR with respect to the existing situation. No illegal or informal passenger drop-off activities were observed during a site inspection undertaken at 10:00am on Wednesday 21/10/2020.

Construction impacts

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

- increased construction vehicle traffic including light and heavy vehicles within the station precinct and along proximity roads and streets including Swanson Street, Erskineville Road, Bridge Street and Concord Street for movement to / from the two proposed construction compounds
- some inconvenience for pedestrian and cyclist movements due to the construction zones and barriers along the footpath on Erskineville Road, Swanson Street and Bridge Street
- temporary closure of pop-up cycle way in Bridge Street when a crane or an articulated vehicle park in Bridge Street
- minor parking impacts near the intersection of Bridge Street and Ashmore Street
- the traffic generated as a part of the construction work is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during peak construction periods. This construction demand is unlikely to cause significant impact to traffic flow or operational performance except when footbridge, canopy and lift shafts are being delivered as these activities may require the closure of traffic for a short period of time.
- potential confusion and loss of amenity to customers accessing the station via temporary and changed facilities during construction
- short-term occupation of kerbside parking, cycleways, and footpaths by cranes facilitating construction

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- minor travel delays on account of likely Traffic Control Plan (TCP) implementation requiring some road users to stop for construction traffic.

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

Operational impacts

Forecast station patronage data provided by Transport for NSW indicates that the Erskineville Station annual customer demand will increase by 31% between 2017 and 2036 from 822 persons to 1,079 persons for the AM peak hour (08:00am – 09:00am). An additional 15% has also been evaluated as a ‘factor of safety’ to ensure a conservative assessment¹. As such, the forecast daily design patronage for a 2036-time horizon is 1,241 persons.

The Proposal would enable an additional access point on Bridge Street, and more direct, legible and safe pedestrian routes in the immediate vicinity of the station. The Proposal would also improve compliance with the *Disability Discrimination Act* (DDA) and *Disability Standards for Accessible Public Transport* (DSAPT). Overall, the user experience including amenity and convenience would be improved.

The existing facility design would be enhanced through improved geometry, line marking and wayfinding signage as part of the Proposal. The Proposal would provide one new kiss and ride area and one accessible parking space at the Bridge Street cul-de-sac in addition to two new kiss and ride areas with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance. The Proposal will provide four additional bicycle parking hoops under the stairs at the new Bridge Street entrance.

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

¹ Source: Erskineville Station Network Intermodal Integration Report, Arcadis, dated 20/11/2020.

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Glossary of terms

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

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

1 Introduction

1.1 Background

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

In 2020 concept plans were developed and an options analysis completed for Erskineville Station as part of the concept design project phase. A preferred concept has since been selected.

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

1.1 TAP objectives

The TAP aims to provide:

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

1.2 Proposal overview

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

The Proposal would include the following key elements:

- a new southern station entrance on Bridge Street including a new footbridge with three new lifts and stairs connecting to all platforms
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1 whilst retaining the existing overhead booking office, footbridge, and stairs
- one new kiss and ride area and one accessible parking space at the Bridge Street cul-de-sac providing an accessible path of travel to the northern Station entrance
- two new kiss and ride areas with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance
- new canopies on the platforms to provide weather protection

- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the family accessible toilet on Platform 1 for improved accessibility
- upgrade work along the footpaths approaching the northern and southern station entrances
- kerb modifications and line marking at the southern station entrance to provide access to the new kiss and ride areas
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system modifications and new hearing induction loops
- localised platform regrading and the installation of new tactiles along the platforms
- improvements to station lighting and CCTV to improve safety and security
- landscaping work, tree removal and adjustments to wayfinding
- electrical upgrades for the new infrastructure and service relocations.

Figure 1 and Figure 2 show the general layout of key elements for the Proposal.

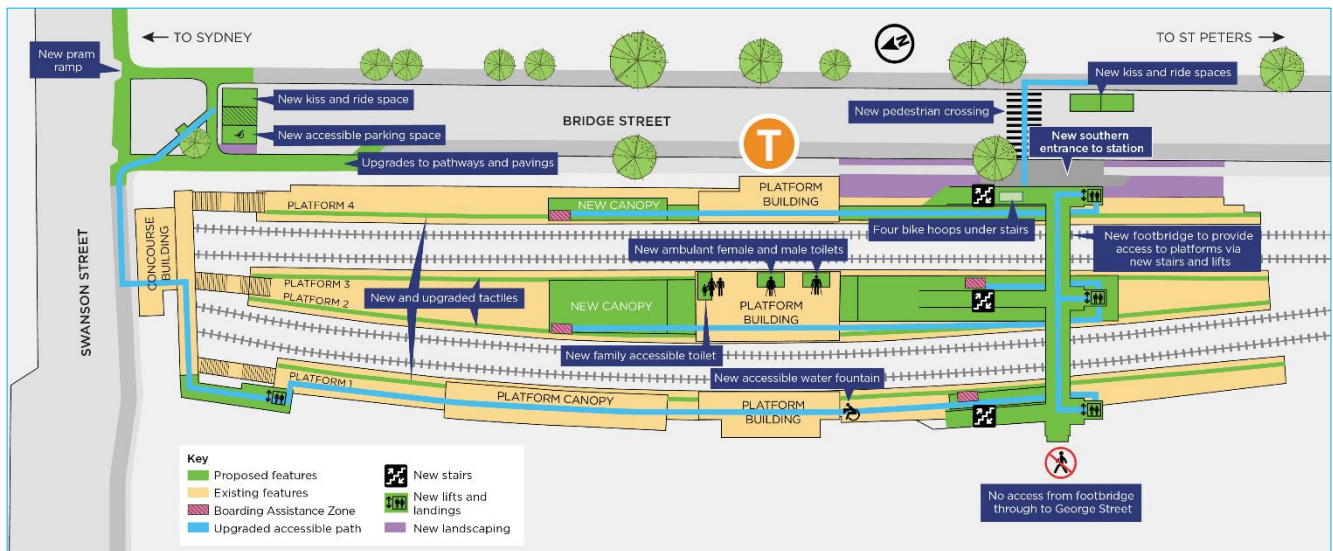


Figure 1: Proposed General Station Schematic²

² Subject to change during the detailed design stage.

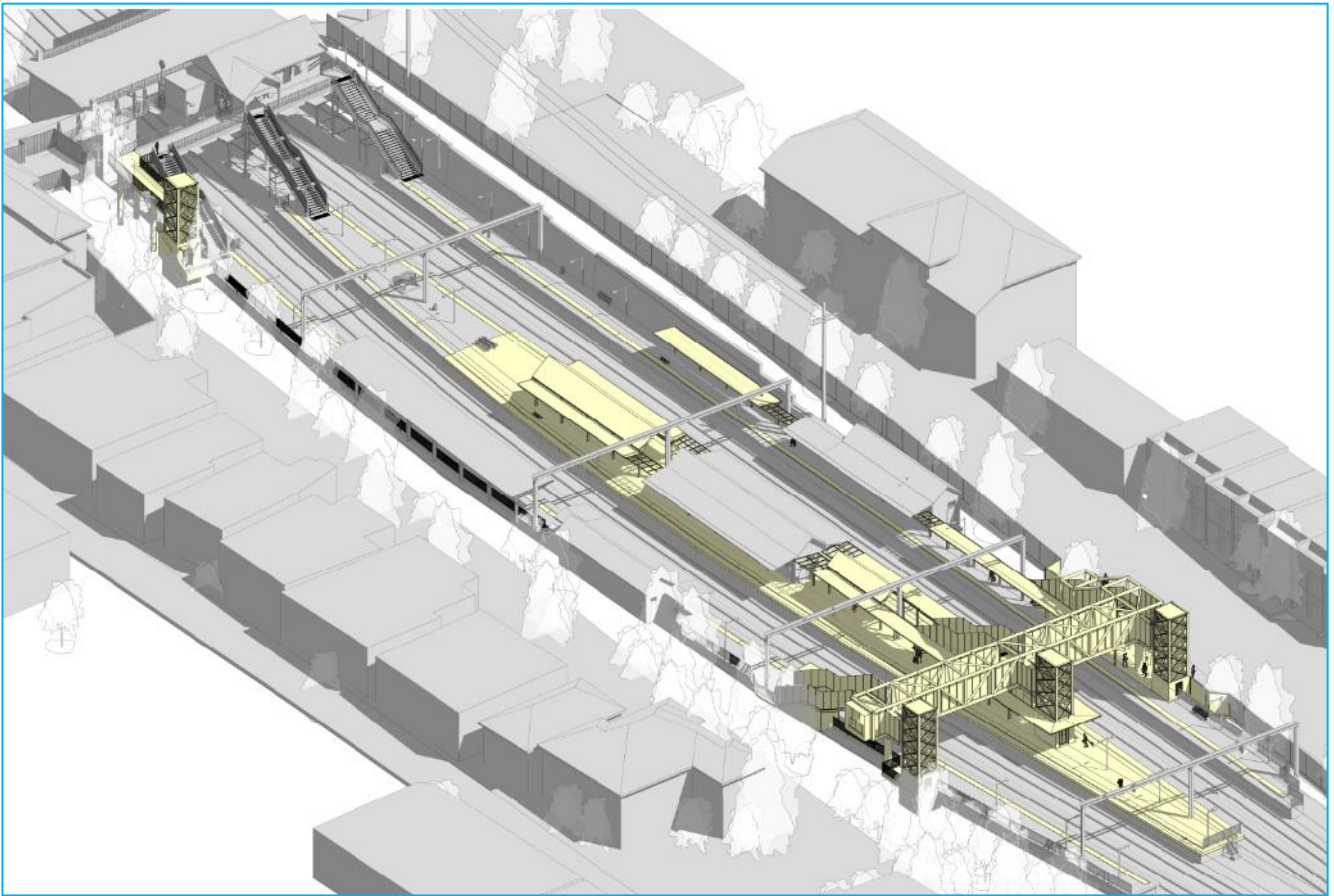


Figure 2: Proposed General Station Layout – Axonometric View³

Source: Urban Design and Public Domain Plan: St Peters Station, Laing O'Rourke, December 2020

1.3 Objectives of this proposal

The specific objectives of the Proposal are as follows:

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

³ Subject to change during the detailed design stage.

1.4 Study scope

SLR Consulting (SLR) has been commissioned by Transport for NSW to prepare this Traffic, Transport and Access Impact Assessment which will form part of the REF for the Proposal. This report assesses the anticipated traffic, transport and access impacts associated with the Proposal. The following matters are addressed as part of this assessment:

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

This assessment has been prepared noting the following:

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

1.5 Study area

Erskineville Station is located approximately 5.5 kilometres south of the Sydney CBD and within the local government jurisdiction of the City of Sydney Council. The station is situated in Erskineville, near Eveleigh border.

The study area incorporates the station, the immediate fronting roads of Swanson Street and Bridge Street, surrounding footpath system, and two proposed construction compounds in relation to the Proposal.

The area and transport systems surrounding the study area have also been considered, however these are not the primary area influenced by the Proposal.

The study area adopted by SLR is illustrated in Figure 3.



Figure 3: Erskineville Station study area

Base map source: Nearthmap, 2020

1.5.1 References

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

- a site inspection undertaken by SLR staff on Wednesday 21st of October 2020
- Australian Standards AS2890 – Part 5 (2020): On-street car parking
- Australian Standards AS2890 – Part 6 (2009): Off-street car parking for people with disabilities
- Erskineville Station Urban Design Report, Arcadis, dated 20/11/2020
- RailCorp (May 2010). *Engineering Standard: Stations and Buildings – Station Design Standard Requirements: ESB 003 – Station Functional Spaces.*

2 Existing conditions assessment

2.1 Surrounding land uses

Located within the City of Sydney Council LGA, the subject site is bound by the provisions of the *Sydney Local Environment Plan (LEP) 2012* and the *Sydney Development Control Plan (DCP) 2012*.

The *Sydney LEP 2012 Land Zoning Map Sheet #10* designates the land on which the station is located as 'SP2 Infrastructure' and defines Swanson Street and Erskineville Road as classified roads.

Land surrounding the station is mainly classified as "R1 – general residential" with the exception of "SP2 – infrastructure" for the following three land uses:

- Erskineville Station and rail line
- nearby public school
- Swanson Street and Erskineville Road.

An extract from the Sydney LEP 2012 map is provided in Figure 4.

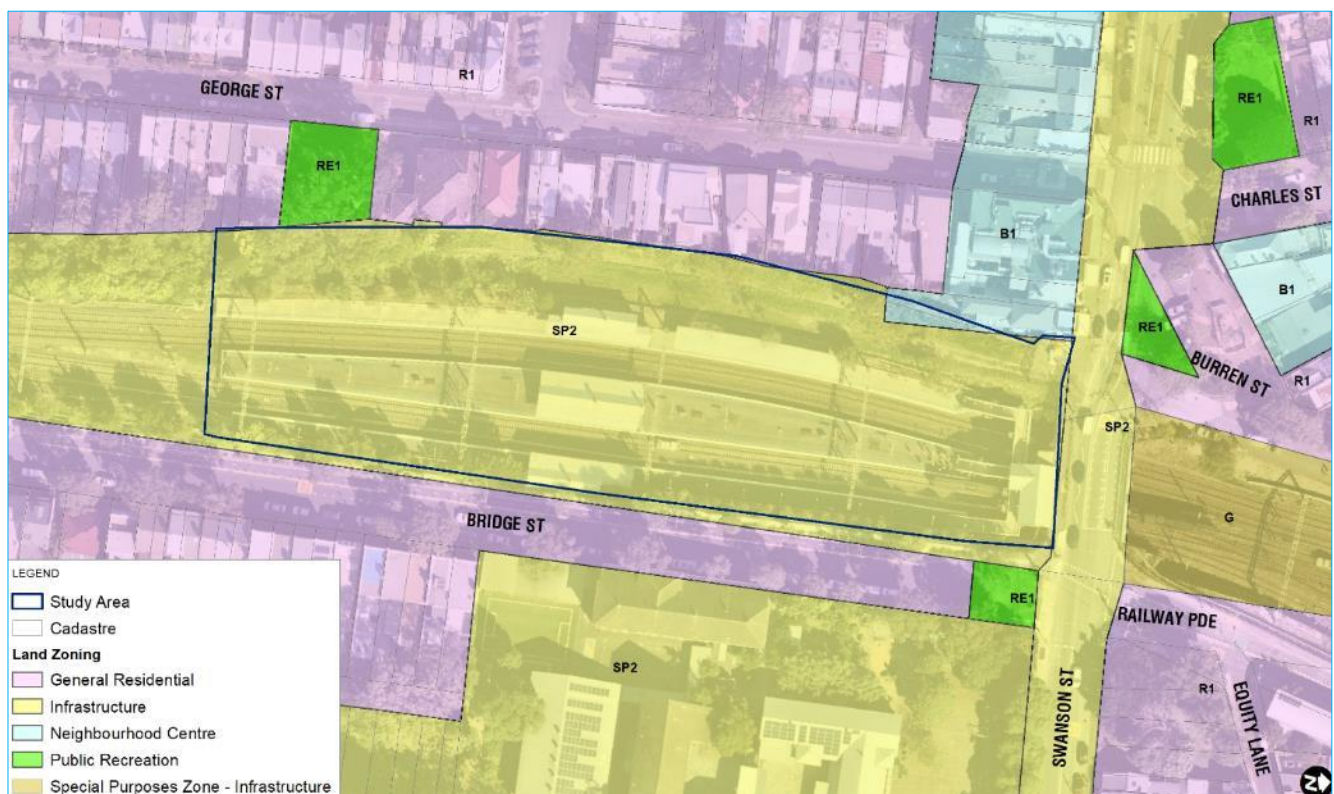


Figure 4: Surrounding land uses

Base map source: Nearmap, 2020

2.2 Movement network

Erskineville Station is surrounded by Swanson Street (State Road 193) and Erskineville Road (State Road 193) to the north and Bridge Street (local road) to the east. The only pedestrian access to the station is from Swanson Street.

Bridge Street is a no-through-road with a cul-de-sac in the northern end. A separated on-road cycleway has recently been installed along the western kerb as part of TfNSW's CovidSafe Travel Plan⁴ to tackle the recent challenges in public transport which have arisen due to the Covid-19 pandemic. A review of high-resolution Nearmap aerials indicated that this cycleway was installed sometime between 1st of June 2020 and 1st of August 2020.

The location of the station within the local road network is shown in Figure 5 and the characteristics of the nearby key roads and streets is summarised in Table 1.



Figure 5: Local context and surrounding road network

Base map source: Nearmap, 2020

⁴ <https://transportnsw.info/news/2020/sydneys-new-pop-up-cycleways-help-you-ride-to-work>

Road Name	Posted Speed Limit	School Zone	Configuration
Swanson Street & Erskineville Road (State Road 193)	Arterial Road: 50km/h and 40km/h (school zone)	Yes	2 marked lanes, partially divided carriageway, partially no stopping restrictions and partially 1/2P parking. No formal kiss and ride spaces, 1 nearby taxi zone space, 1 nearby car-share parking space. <u>Station frontage</u> : 2 marked lanes, undivided carriageway, no stopping restrictions in place
Bridge Street	Local Road: 40km/h	No	2 unmarked lanes, undivided carriageway, 2P parking in the eastern side of the carriageway, a pop-up cycleway and no parking restrictions in the western side of the carriageway.

Table 1: Surrounding road network characteristics

2.3 Station access and facilities

2.3.1 Station facilities

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

- Opal integrated ticketing card top-up systems
- a family accessible toilet
- emergency help point
- hearing loop
- a public address (PA) system to broadcast audible / verbal announcements to passengers.

2.3.2 Pedestrians

2.3.2.1 Erskineville Station access

The only pedestrian access to Erskineville Station is currently possible from Swanson Street (north). This access requires users to navigate stairs in order to reach train platforms as indicated in Figure 6.



Figure 6: Access stairs to platforms at Erskineville Station

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

2.3.2.2 Local Pedestrian Infrastructure

There are pedestrian footpaths on either side of Swanson Street, Erskineville Road and Bridge Street. The verge adjacent to the Swanson Street station entrance accommodates a 3.3m wide footpath, one marked zebra crossing in the west and two signalised pedestrian crossings in the east of the station.

There is a pocket park (Bridge Street Rest Area) 20m to the east of the Swanson Street Station Entrance with two benches providing some recreational space to the members of the community.

The footpath network surrounding the station has the following attributes:

- Swanson Street and Erskineville Road – 3.3m footpath on the southern side and 1.2 metre footpath on the northern side of the carriageway (a railway overpass)
- Bridge Street – 1.2m footpath on the western side and 2.0 metre footpath on the eastern side of the carriageway.

The extent of the surrounding pedestrian infrastructure is illustrated in Figure 7.



Figure 7: Local pedestrian infrastructure network

Base map source: Nearthmap, 2020

The following constraints in the footpaths are also noted:

- the school zone signs on either side of Swanson Street adjacent to Erskineville Public School narrow the footpaths down to 1m or less, as shown in Figure 8. It was also observed that this area is cluttered with parking signs, street lighting poles, power poles, traffic lantern poles and streetscape embellishments.
- the footpath in the northern side of Swanson Street (a railway overpass) and Erskineville Road has a number of impediments which reduces the desirability of this footpath⁵. These impediments include a driveway crossover for construction vehicles and a narrow section of footpath across the railway overpass, as illustrated in Figure 9. It was observed at a site inspection that the southern footpath was used much more than the northern footpath.

⁵ Based on our observations from site inspection.



Figure 8: Swanson Street footpaths

Image source: Nearmap, 2020

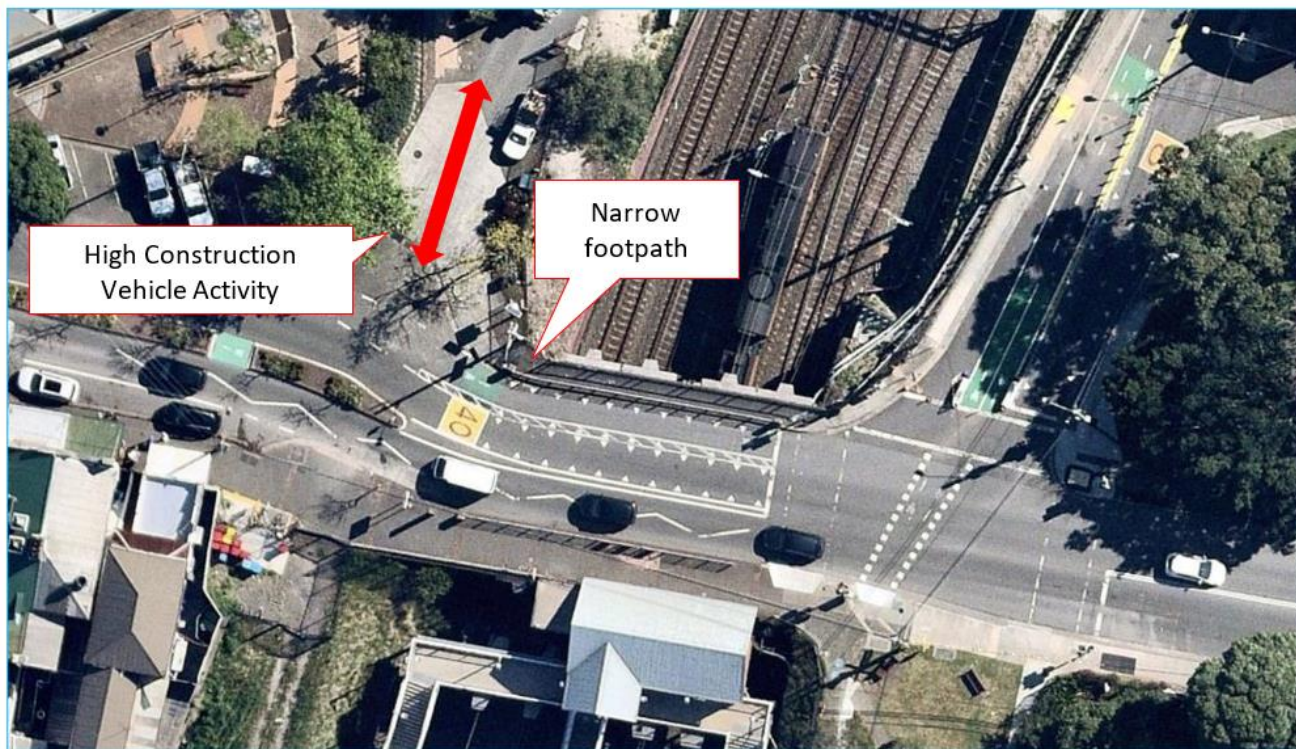


Figure 9: Hindrance to the Pedestrians

Image source: Nearmap, 2020

2.3.2.3 Pedestrian demand Study

No pedestrian count survey data was available from Swanson Street, Erskineville Road and Bridge Street; however, very low pedestrian activity was observed during the site inspection on Wednesday, 21st of October 2020. This could be associated with the ongoing COVID-19 pandemic.

2.3.3 Cyclists

2.3.3.1 Erskineville Station access

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

There are two unsheltered bicycle parking racks with capacity of approximately 12 bicycles on Swanson Street, as indicated in Figure 10.

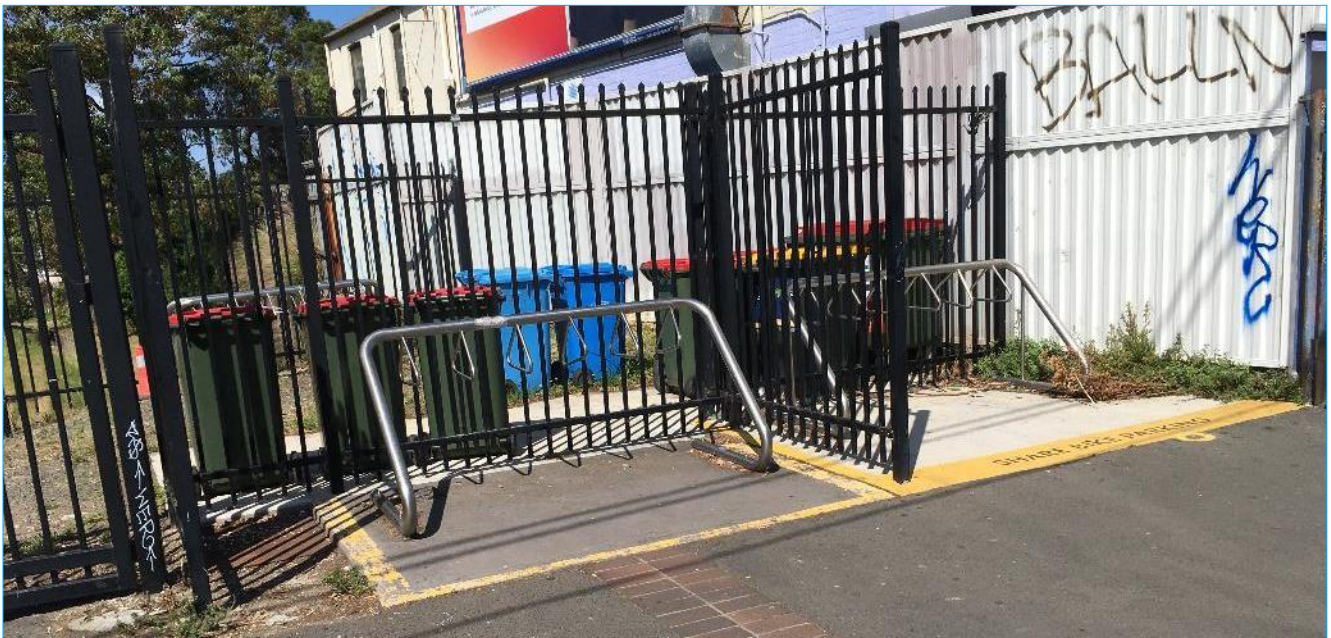


Figure 10: Bicycle racks at Swanson Street station entrance

2.3.3.2 Local Cycling Infrastructure

Based on the information obtained through City of Sydney Council's website⁶, cycle ways within the proximity of St Peters Station have continuous and direct linkages to Sydney CBD and are equipped with wayfinding signage. As mentioned earlier in this report, a pop-up cycleway was also opened in Bridge Street in 2020 that form the eastern boundary from Erskineville Station.

Figure 11 and Figure 12 provide an outline of the existing cycling network in the area.

⁶ <https://www.cityofsydney.nsw.gov.au/lists-maps-inventories/sydney-cycling-map>

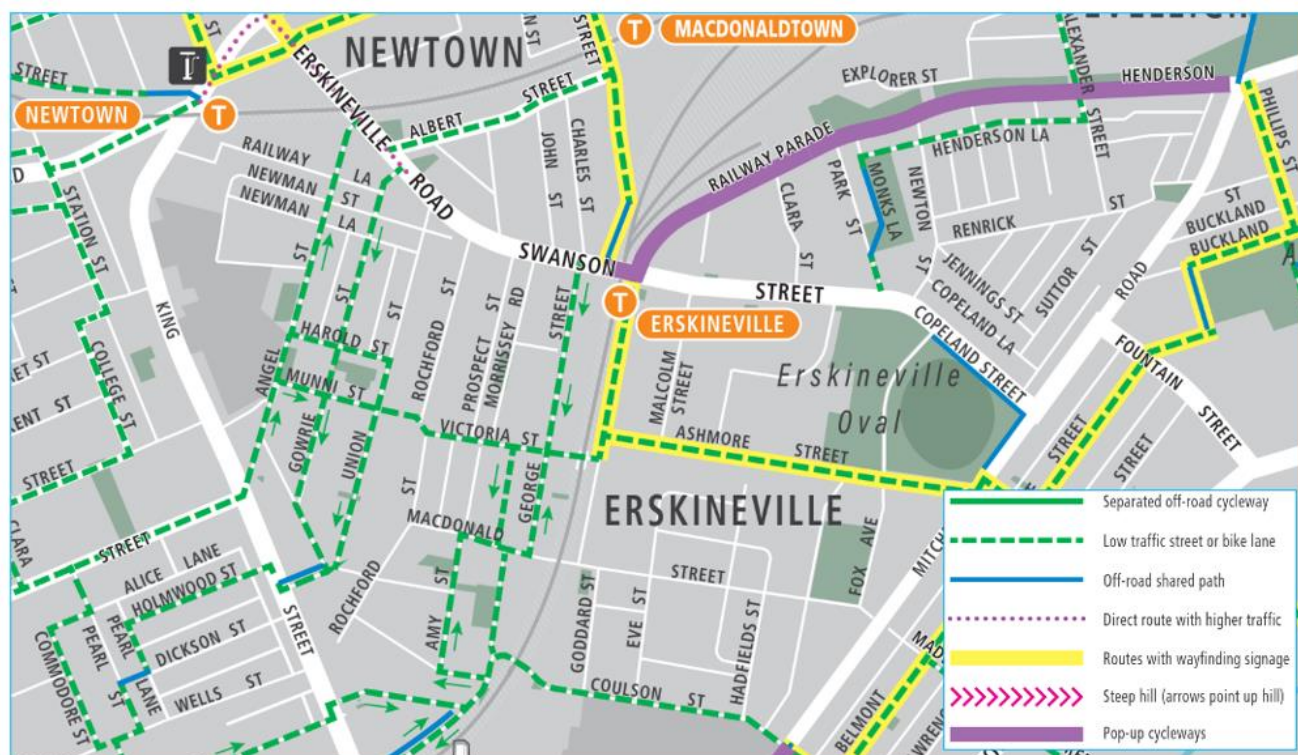


Figure 11: Bicycle network – local context

Source: City of Sydney Council Website, November 2020

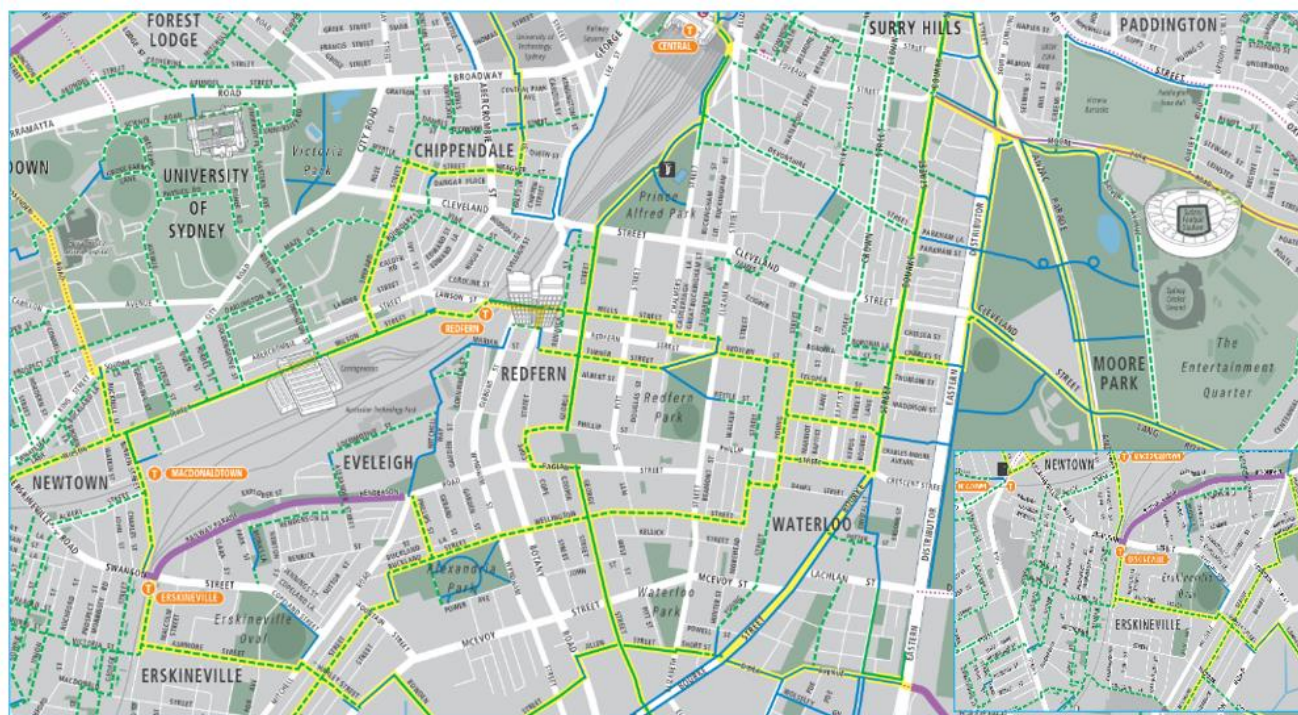


Figure 12: Bicycle network – regional context

Source: City of Sydney Council Website, November 2020

2.4 External transport network and interchange facilities

2.4.1 Rail

2.4.1.1 Services

Erskineville Station is part of T3 Bankstown Line and is well serviced by frequent trains travelling between Bankstown, Lidcombe and Central Station.

Figure 13 provides an overview of T3 Bankstown Line.



Figure 13: Location of Erskineville Station within Sydney Trains network

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

Service frequency of Erskineville Station is summarised in Table 2.

Destination	Operating Days	Service Frequency
Central / Bankstown	Monday to Friday	Peak: approx. 8-10 mins Off-peak: approx. 15 mins
	Weekends and public holidays	approx. 15 mins

Table 2: Erskineville Station service frequency

Source: <https://transportnsw.info/documents/timetables/93-T3-Bankstown-Line-20201025.pdf>

2.4.1.2 Patronage

Station patronage data provided by Transport for NSW indicates that the average weekday passenger demand for the AM peak hour (08:00am – 09:00am) at Erskineville Station was 822 persons in 2017.

2.4.2 Bus

2.4.2.1 Services and Stops

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

- two bus stops on Erskineville Road, to the west of Erskineville Station (stop ID: 204313 in the eastbound direction and stop ID: 204320)
- two bus stops on Swanson Street, to the east of Erskineville Station (stop ID: 204314 in the eastbound direction and stop ID: 204319 in the westbound direction).

The locations of these stops are shown in Figure 14.

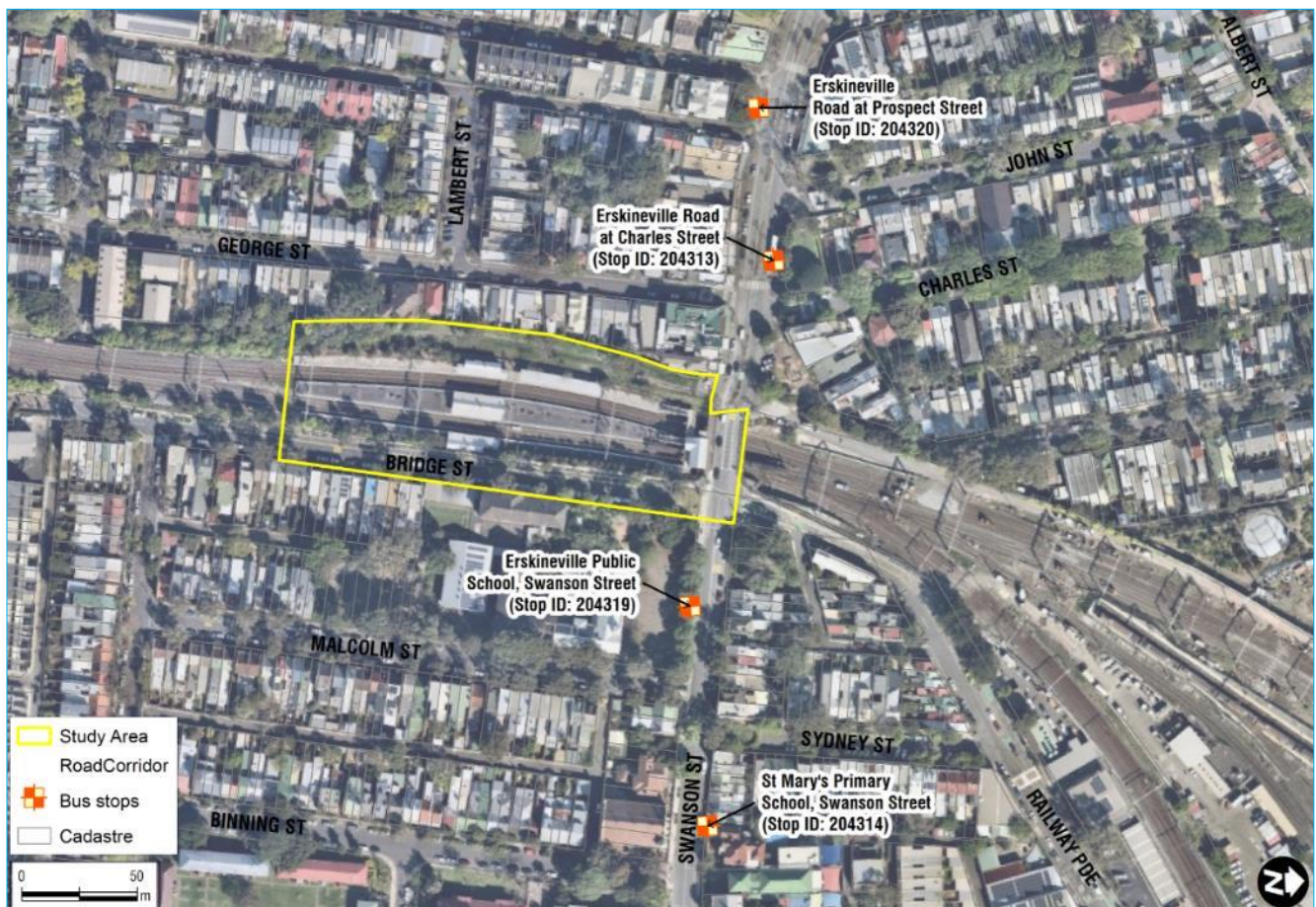


Figure 14: Bus stops adjacent to Erskineville Station

Base map source: Nearmap, 2020

Table 3 summarises the public bus routes that service these bus stops.

Service	Route	Bus Stop ID	Approximate Peak Hour Frequency	Approximate Off-Peak Hour Frequency
355	Marrickville Metro to Bondi Junction via Moore Park & Erskineville	204313 204320 204314 204319	20 minutes	30 minutes

Table 3: Erskineville Station nearby bus services (stop ID: 207332)

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

2.4.3 Kiss and ride and taxi zone

2.4.3.1 Facilities

A site inspection and desktop analysis revealed that there are two informal kiss and ride areas in the vicinity of Erskineville Station. However, these areas do not have parking signs or line marking and therefore considered not formal.

These informal kiss and ride areas are located in Bridge Street, Swanson Street and Erskineville Road, as follows:

1. there are two pick-up and drop-off spaces on Swanson Street for school children. These spaces are located across the road from Erskineville Public School, adjacent to 42 Swanson Street. The parking restriction at this location is “No Parking 8:00am-9:30am and 2:30pm-4:00pm”, meaning that these two spaces can operate as kiss and ride facilities for up to 3 hours a day, Monday to Friday. However, it is believed that these two spaces are intended for school children.
2. there are four 5-minute parking spaces in the northern end of Bridge Street, adjacent to the gates of Erskineville Public School. P5-minute restrictions are for a limited time and across weekdays only, from 8:00am to 9:30am and from 2:30pm to 4:00pm so these four spaces can operate as kiss and ride facilities for up to 3 hours a day, Monday to Friday. However, it is believed that these four spaces are intended for school children.

The two pick-up and drop-off facilities in Swanson Street and Bridge Street are shown in Figure 15.

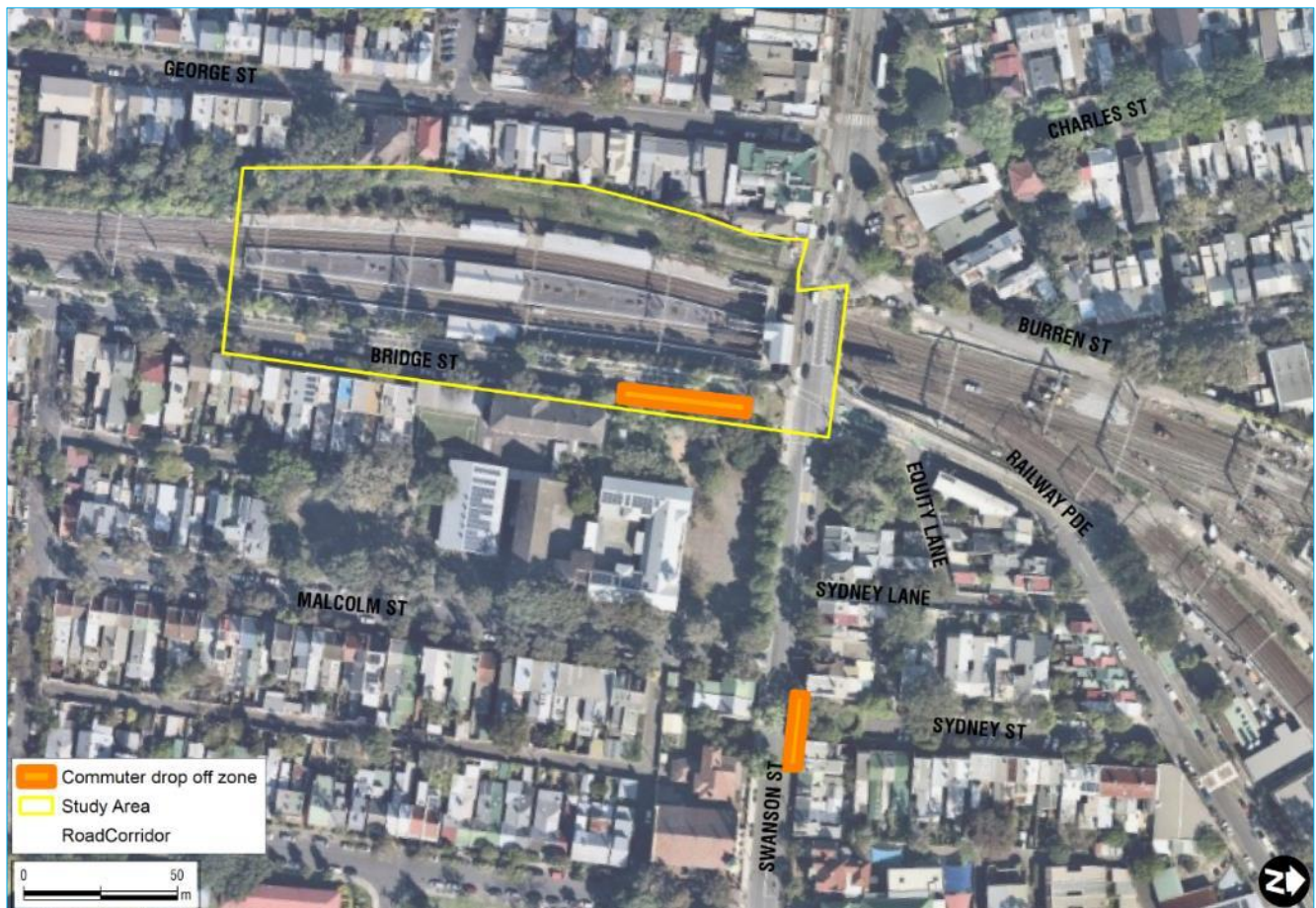


Figure 15: School Children Pick-Up and Drop-Off Zone

Base map source: Nearmap, 2020

A taxi zone space was identified on Erskineville Road to the west of Erskineville Station, within an approximate walking distance of 215m to the west of Erskineville Station.

2.4.4 Parking

There is no commuter car parking facility available to the users of Erskineville Station. A number of streets in the vicinity of Erskineville Station provide unrestricted parking, however on-street parking in the morning peak hour in Erskineville is typically limited.

2.5 Road safety

Crash statistics from the Transport for NSW Centre for Road Safety suggest there were no reported crashes that resulted in serious injuries or fatalities in the study area between 2014 and 2018. A total of 12 incidents were noted for the period of 2014-2018.

A summary of the crash history in the vicinity of Erskineville Station is illustrated in Figure 16.

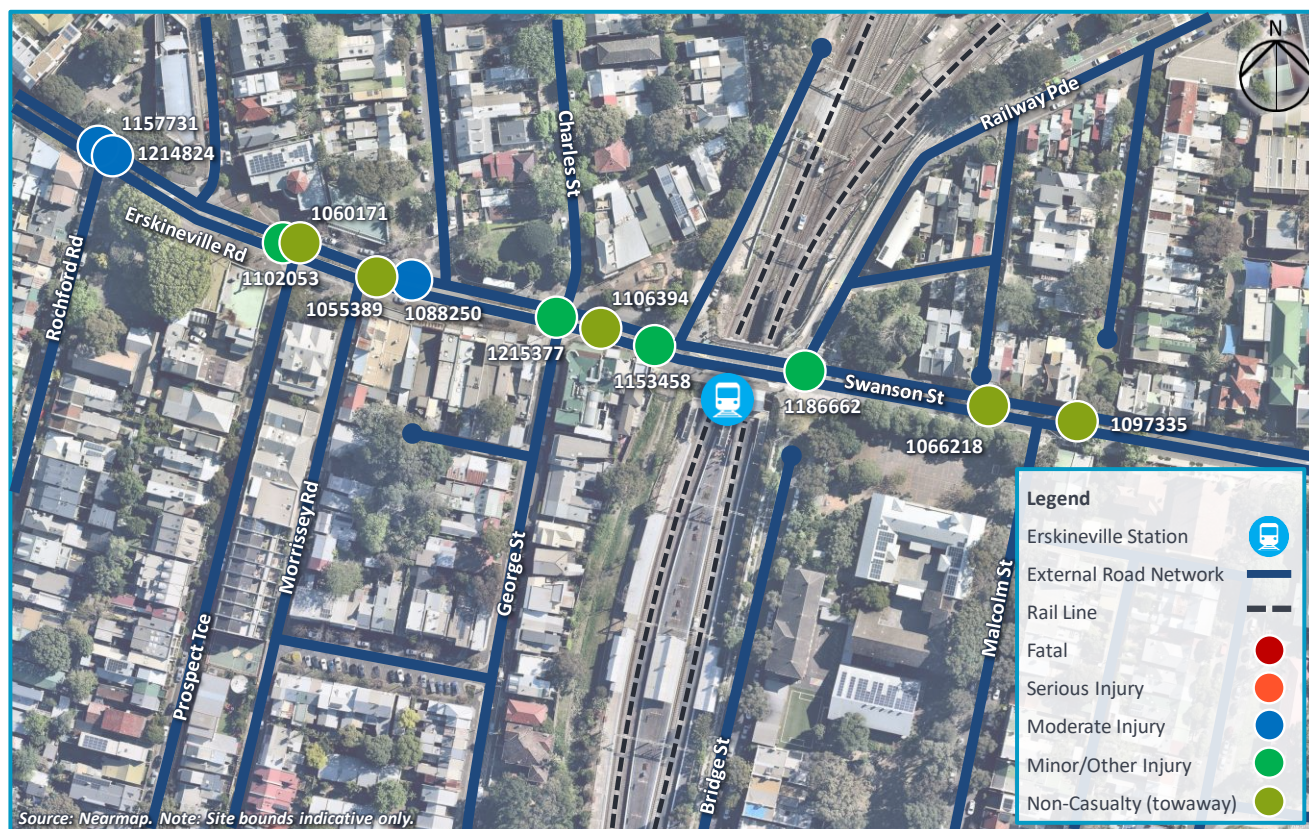


Figure 16: Transport for NSW crash history near Erskineville Station

Source: Transport for NSW, 2020

A detailed summary of this crash history and causes of crashes are provided in Table 4.

Location	Crash ID	Year	Severity	Road User Movement (RUM) Code ⁷	Description
Swanson Street	1097335	2016	Non-casualty (towaway)	71	Left off carriage way into object/parked vehicle
Swanson Street	1066218	2015	Non-casualty (towaway)	60	Parked
Swanson Street / Railway Parade	1186662	2018	Minor/Other Injury	30	Rear-end
Swanson Street	1153458	2017	Non-casualty (towaway)	71	Left off carriage way into object/parked vehicle
Erskineville Road	1106394	2016	Non-casualty (towaway)	71	Left off carriage way into object/parked vehicle
Erskineville Road / George Street / Charlie Street	1215377	2019	Minor/Other Injury	30	Rear-end
Erskineville Road / John Street	1088250	2015	Moderate Injury	63	Vehicle door
Erskineville Road / George Street	1055389	2015	Non-casualty (towaway)	63	Vehicle door
Erskineville Road / Prospect Terrace	1102053	2016	Minor/Other Injury	0	Ped nearside
Erskineville Road / Prospect Terrace	1060171	2015	Non-casualty (towaway)	16	Left near
Erskineville Road / Rochford Street	1157731	2017	Moderate Injury	53	Overtake turning
Erskineville Road / Rochford Street	1214824	2019	Moderate Injury	21	Right through

Table 4: Transport for NSW crash history in the vicinity of Erskineville Station

Source: Transport for NSW, 2020

A review of the recent crash data indicated there were two recurring types of crashes, as per below:

1. RUM code 71: vehicles veering left off the carriageway and colliding with parked objects or vehicles;
2. RUM code 63: vehicles colliding with other vehicles' open doors.

⁷ <https://roadsafety.transport.nsw.gov.au/statistics/interpret-data.html>

Crash data also indicated that there were no reported crashes on the station frontage and the majority of the crashes in the vicinity of Erskineville Station did not result in injuries and are consistent with urban situations.

Based on the above, the Proposal is not expected to have adverse impacts on the road safety in the area.

3 Proposal description

3.1 Station access upgrades

Details of the proposed work to take place at the station to improve accessibility are as follows:

- a new southern station entrance off Bridge Street including a new footbridge with three new lifts and stairs connecting to all platforms
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1 (whilst retaining the existing overhead booking office, footbridge, and stairs)
- one new kiss and ride area and one accessible parking space at the northern terminus of Bridge Street providing an accessible path of travel to the existing (northern) station entrance
- a new kiss and ride area with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance
- upgrade work along the footpaths approaching the northern and southern station entrances.

3.2 Station building and platform modifications

Modifications to the station buildings would include:

- new canopies on the platforms to provide weather protection
- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the family accessible toilet on Platform 1 for improved accessibility.

3.3 Ancillary work

The following ancillary works required as part of the upgrade work would include:

- kerb modifications and line marking at the southern station entrance to provide access to the new kiss and ride areas
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system modifications and new hearing induction loops
- localised platform regrading and the installation of new tactiles along the platforms
- improvements to station lighting and CCTV to improve safety and security
- landscaping work, tree removal and adjustments to wayfinding
- electrical upgrades for the new infrastructure and service relocations.

3.4 Interchange facilities including external movement networks

3.4.1 Pedestrians

Modifications to pedestrian access include the addition of a second station entrance with three new lifts and stairs connecting to all platforms.

3.4.2 Bicycle parking

The Proposal will provide four additional bicycle parking hoops under the stairs at the new Bridge Street entrance.

3.4.3 Public transport

No changes to the bus capacity or operation of the existing stops are proposed.

3.4.4 Kiss and ride and taxi facilities

The proposal comprises the provision of a total of three new kiss and ride areas on Bridge Street. Two of these kiss and ride areas would be provided at the new southern station entrance and another one at the northern end of Bridge Street cul-de-sac. It is noted that work may include kerb / footpath adjustments, new signage and line marking modifications.

3.4.5 Parking

The proposal comprises the provision of one new accessible parking space at the Bridge Street cul-de-sac providing an accessible path of travel to the northern Station entrance, which requires modifications to the Bridge Street Rest Area.

4 Construction impacts

4.1 Construction work and compounds

The key construction activities as part of the upgrade of Erskineville Station are expected to primarily consist of construction of a new southern footbridge with three lift shafts, extension of the existing northern footbridge with a new lift as well as the internal renovation of the station building and regrading of the areas adjacent to the proposed new Bridge Street station entrance.

Limited earthwork and excavation are expected as part of the work, including that for the following:

- piles for the new footbridge foundations
- construction of crane platform within the rail corridor adjacent to Platform 1
- construction of lift shafts
- construction of kiss and ride and accessible parking areas
- localised platform regrading / resurfacing work
- footpath upgrades
- other minor civil work including footings and foundations for structures, drainage / stormwater work, and trenching activities for service adjustments and relocations and drainage upgrade work.

The amount of excavated material is expected to be up to 150 – 250 cubic metres. Excavated material would be re-used on site where possible or disposed of in accordance with relevant legislative requirements.

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

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

Figure 17 indicates the proposed location of the “construction compound - 1” (site office and material lay down area), to be provided within the railway corridor with a vehicle access to / from Swanson Street.

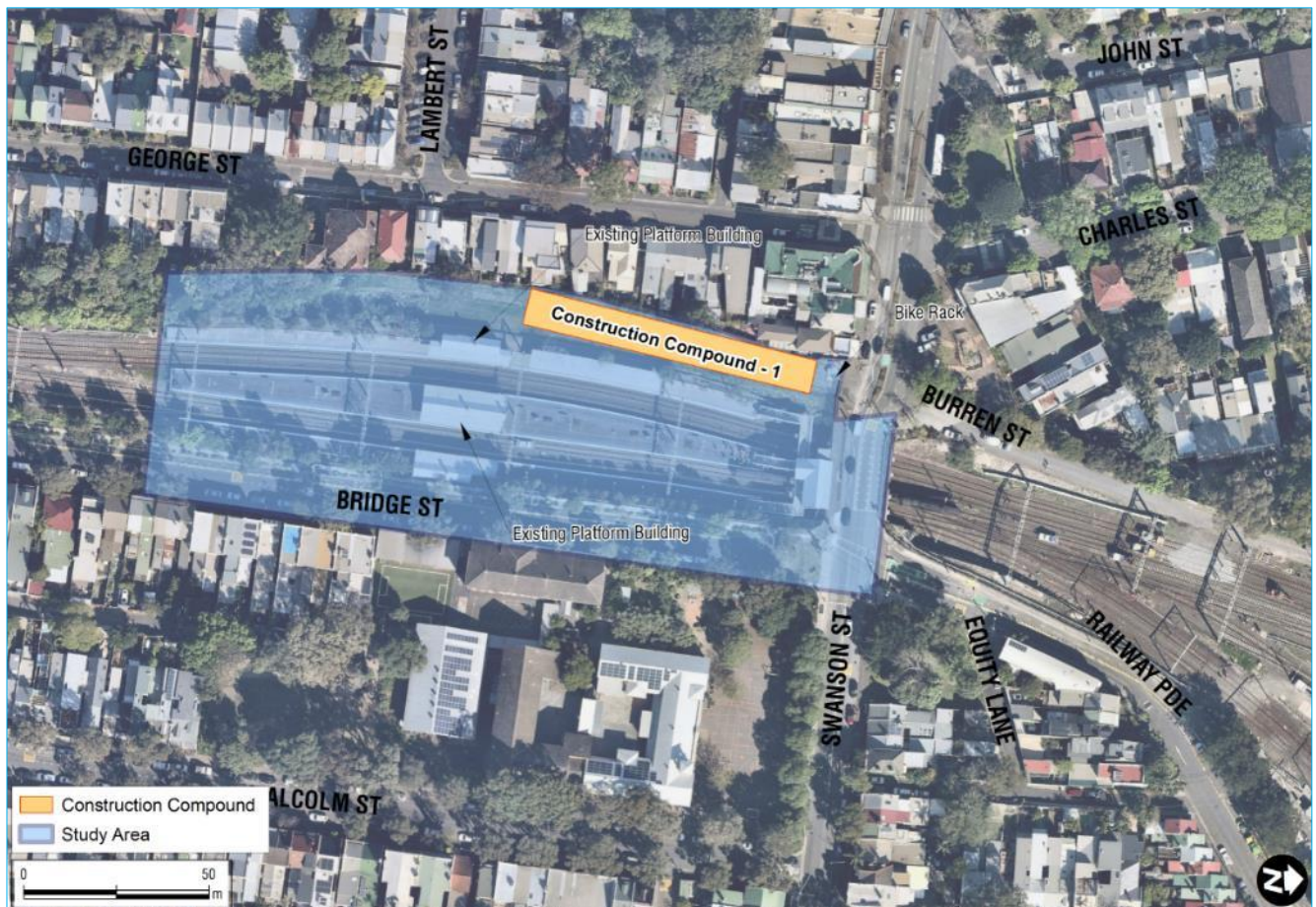


Figure 17: Construction compound 1 within Railway Reserve off Swanson Street

Base map source: Nearmap, 2020

Figure 18 indicates the proposed location of the “construction compound – 2” (material lay down area), within the railway corridor with a vehicle connection to / from Concord Street.



Figure 18: Construction compound 2 within railway corridor off Concord Street

Base map source: Nearmap, 2020

Neither construction compound 1 nor 2 would be able to accommodate any construction worker parking. A CTMP should be developed which confirms the location and arrangement for construction worker parking so as to ensure there are no impacts on local residents, businesses or commuters.

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

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

4.2 Hours of work

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

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

Certain work may need to occur outside standard hours and would include night work and work during up to nineteen rail shutdowns (which are scheduled closures that would occur regardless of the Proposal, when part of the rail network is temporarily closed and trains are not operating). A number of these track shutdowns would take place on weekends as well as on weekdays.

Out of hours work are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers, and to ensure the safety of railway workers and operational assets.

Proposed rail shutdowns are required to facilitate activities including the following:

- installation of the new footbridge piles, columns, bases, decking and staircases
- services, piling and lift shaft installation on the platforms
- relocation of underground services.

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

4.3 Construction timing

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

The proposed construction activities for the Proposal are identified in Table 5. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Each of the work identified in Table 5 can progress independently. As a general guide, however, footbridge construction is expected to be the most critical.

Stage / Duration	Activities
Site establishment and enabling work	<ul style="list-style-type: none"> establish site compound (erect fencing, site offices, amenities and plant/material storage areas etc.) remove required vegetation to allow for construction access, site compound and laydown area relocate or upgrade services / utilities where required install safety barriers and hoarding around the nominated work zones on the platform.
New southern footbridge	<ul style="list-style-type: none"> install piles within each platform excavate and install concrete bases install footbridge columns install footbridge concourse over tracks and Bridge Street install insitu concrete deck for the footbridge to reduce lifting loads install staircases install fire rated cables and cable route from new distribution board to footbridge lifts.
Lifts	<ul style="list-style-type: none"> construct lift foundations install lift shafts and upper lift landing install protection screens and external finishes install lift shaft services, lift cars and fit out lift cars install lighting / CCTV / PA services to lift landings.
Station entrance and interchange work	<ul style="list-style-type: none"> remove existing pavement at entrances to be regraded regrade pavements in localised areas construct kiss and ride zone and accessible parking install new signage for kiss and ride install new signage and road markings for accessible parking spaces install new wayfinding signage install new lighting as required.
Platform work	<ul style="list-style-type: none"> re-grade / resurface platform in localised areas platform finishing work (line markings, tactile indicators etc.) install new Opal card readers install cable routes to Opal card readers.
Building work	<ul style="list-style-type: none"> install new main switchboard install new cabling and containment to support LV and station system modifications building work and services / fit out for new family accessible toilet and ambulant toilets.

Stage / Duration	Activities
Site demobilisation	<ul style="list-style-type: none"> cutover / commission digital PA / hearing induction loops / TGSI test and commission CCTV cameras / station systems installation test and commission new lifts finishing work including fencing site demobilisation.

Table 5: Indicative construction staging for key activities

4.4 Haulage Routes

A review of route planner application in the National Heavy Vehicles Regulator (NHVR) website⁸ revealed that 19m articulated vehicles (AV) are permitted to approach & depart from Erskineville Station via a number of routes⁹.

These routes are summarised in Table 6.

Approach & Departure	Proposed Route
Approach from north-west	Approach from Princes Highway (A22) then Erskineville Road.
Approach from north-east	Approach from Botany Road, then McEvoy Street, Fountain Street, Mitchell Road and Swanson Street.
Approach from south-west	Approach from Princes Highway (A22) then Erskineville Road.
Approach from south-east	Approach from Princes Highway (A22) then Sydney Park Road, Euston Road, Fountain Street, Mitchell Road and Swanson Street.

Table 6: Proposed Haulage Routes

Figure 19 provides a visualisation of the summary provided in Table 6.

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

⁹ Subject to construction traffic management plan (CTMP)

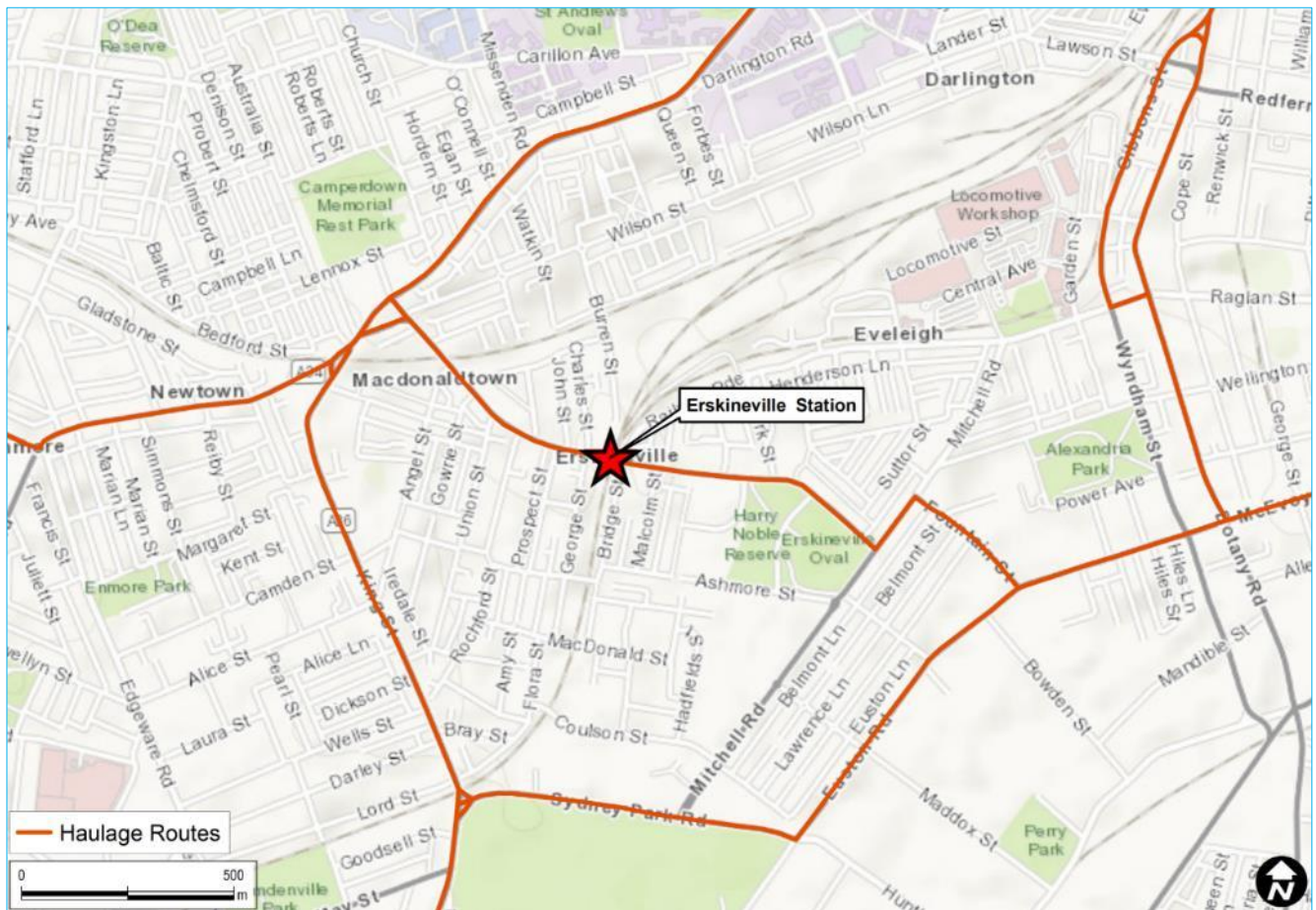


Figure 19: Proposed Haulage Routes for 19m Articulated Vehicles

4.5 Construction Vehicles Access

4.5.1 Access to Construction Compound - 1

Transport for NSW has identified two construction compounds as illustrated in Figure 17 and Figure 18.

Access to construction compound – 1 would be via Swanson Street in the westbound direction, i.e. left in / left out movements only. Small construction vehicles would be required to turn left and access the site via the driveway crossover and enter the compound through the secure gates.

Direct access to construction compound – 1 is illustrated in Figure 20 and Figure 21.



Figure 20: Access to construction compound – 1



Figure 21: Access to construction compound - 1

Direct access to construction compound – 2 would be via Concord Street. There is a crossover access to the railway corridor that is located in the two-way segment of Concord Street immediately opposite Bray Street.

The gate with access to the railway corridor is illustrated in Figure 22.



Figure 22: Access to construction compound – 2

Large construction vehicles would require active traffic management measures to enter and exit both compounds as they cannot perform some manoeuvres without otherwise conflicting with opposing traffic flows.

The information provided by Transport for NSW indicates that the largest vehicles making material deliveries to both compounds would be articulated vehicles (AV - 19m). Where articulated vehicles cannot perform safe manoeuvres due to narrow streets, heavy rigid vehicles (HRV - 12.5m) would be utilised.

SLR undertook a number of swept path assessments using AutoTURN for both construction design vehicles entering and exiting construction compounds 1 and 2. Swept path assessments confirm that the 19m AV design vehicle can enter and exit construction compound – 1 via the Swanson Street driveway crossover; although it requires a complex three-point-turn manoeuvre involving reversing across both directions of Swanson Street. Such a manoeuvre would require active traffic management measures and should desirably only be undertaken in off-peak periods so as to minimise or avoid congestion impacts. Demolition of the median strip is not strictly necessary as the AV could mount the median; however, existing street planting and signage located in the median would have to be removed to accommodate the manoeuvre.

Figure 23 illustrates the swept path assessment of an articulated vehicle entering and exiting construction compound – 1. Traffic management would be required to perform this manoeuvre.

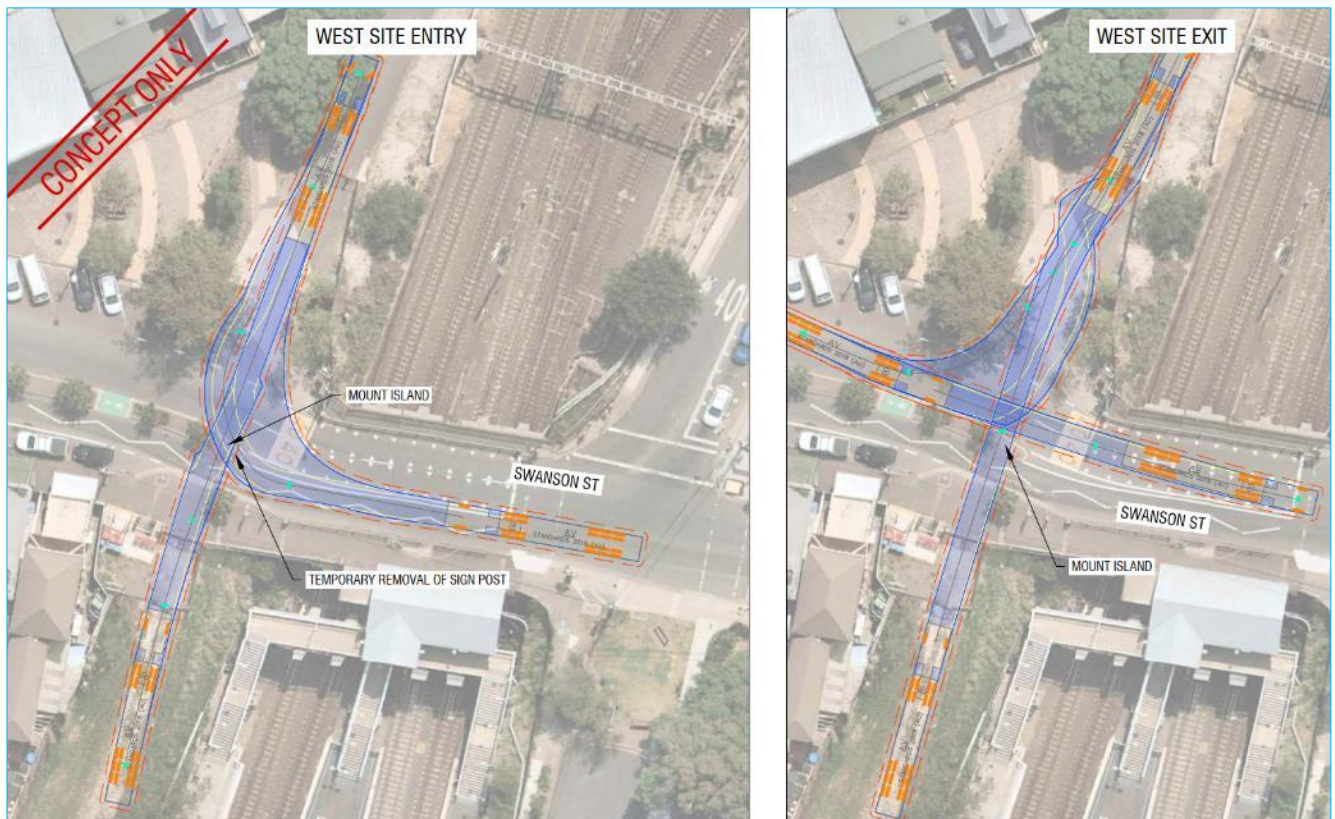


Figure 23: AV (19m) swept path assessment at construction compound - 1

Base Map Source: Nearmap, 2020

To enable the installation of a footbridge and three lift shafts, it is understood that a 200-ton crane would also be needed in construction compound – 1 and Bridge Street. This crane is expected to be approx. 14.7m in length (shorter than an AV) so it will be able to perform the same manoeuvres of an AV, as illustrated in Figure 24.

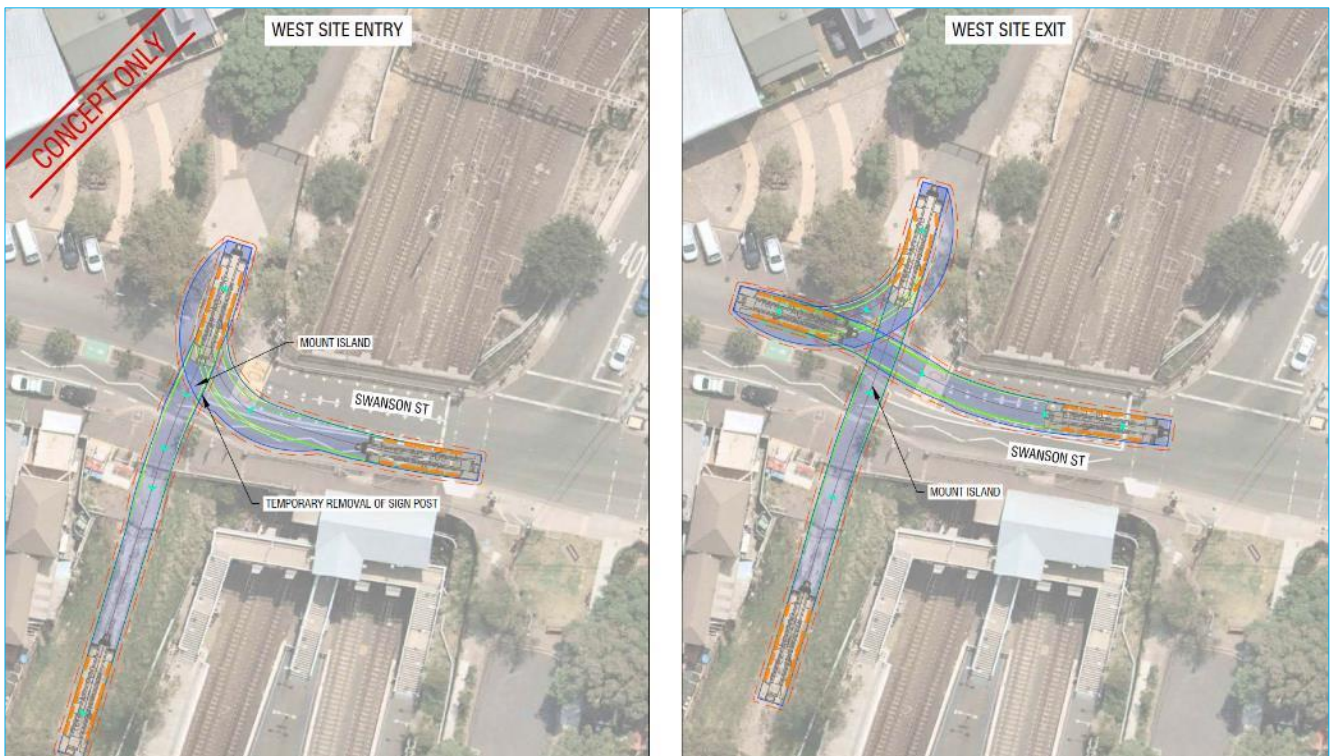


Figure 24: 200-tonnes Crane (14.7m) swept path assessment at construction compound – 1

Base Map Source: Nearmap, 2020

It should be noted that the existing ramp surface that would provide access to construction compound – 1 has a relatively steep slope as shown in Figure 25. There is a risk of truck rollover when reversing and measures to prevent a roll over should form part of any construction traffic management plan prior to use of construction compound – 1 is granted. The geological stability of the ramp surface and its ability to accommodate the design vehicles and loads should also be conducted prior to use.



Figure 25: Steep slope at the entrance of construction compound - 1

4.5.2 Access to Construction Compound - 2

The swept path assessment confirms that the 19 AV design vehicle cannot enter and exit construction compound – 2 in a forward direction due to the limited manoeuvring space available in the road and rail reserves. Accordingly, it is recommended that materials to construction compound – 2 are delivered by HRV or smaller vehicle only.

Figure 26 indicates that the HRV design vehicle can approach Bray Street from Princes Highway and enter and exit construction compound – 2 in a forward direction.

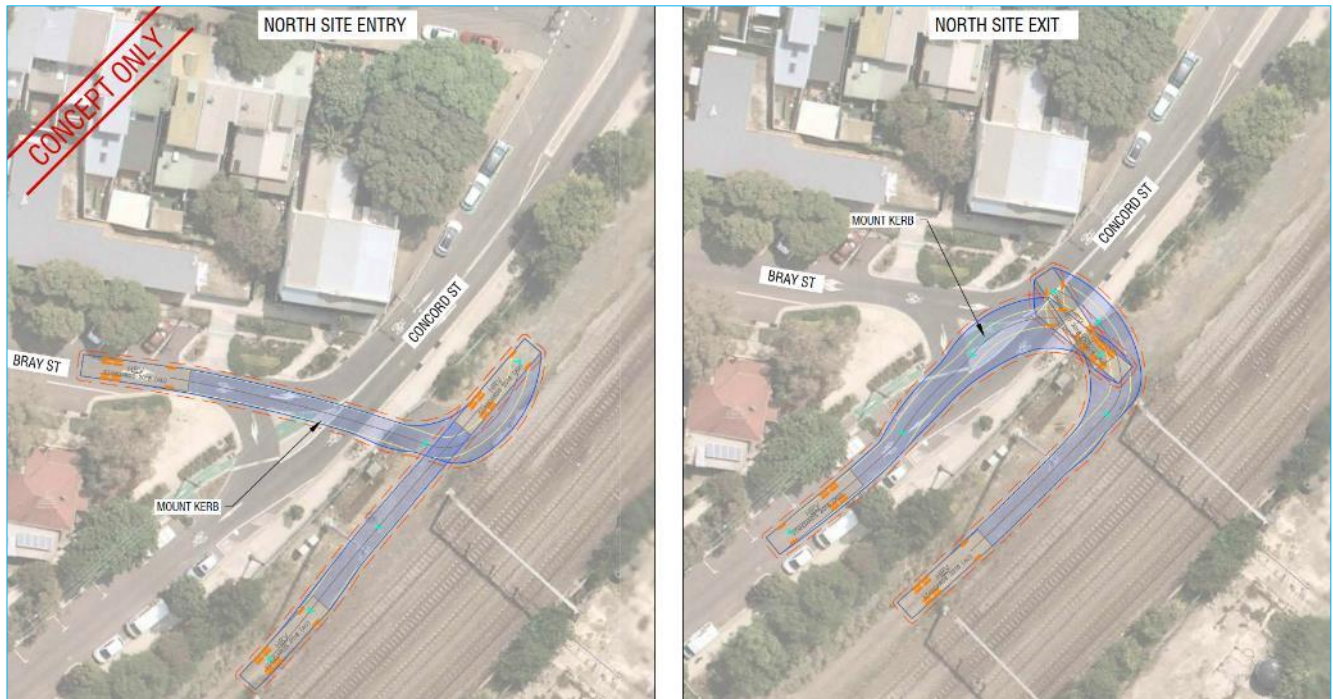


Figure 26: HRV (12.5m) swept path assessment at construction compound - 2

Base Map Source: Nearmap, 2020

The splitter island at Bray Street and Concord Street intersection is mountable and access to construction compound – 2 would require some construction vehicles mount on this splitter island, as illustrated on Figure 26.

It is noted that the right-turn movement into Bray Street from Princes Highway is not permitted during the weekday peak hours (6-10AM, 3-7PM). Alternatively, Concord Street could be accessed from Princes Highway although this would require active traffic control to enable construction vehicles to travel in the opposite direction along the one-way (east to west) Concord Street. In either scenario, active traffic control measures would be required.

4.5.3 Access to Bridge Street

Access to Bridge Street is necessary for the installation of the proposed new footbridge and the eastern lift shaft.

The swept path assessment confirms that the 19m AV and 200-tonnes crane design vehicles can access Bridge Street in a forward direction dependant on the temporary removal of a number of bollards and some possible trimming of lower level tree limbs outlined as follows.

Proposed route for access to Bridge Street is as follows:

1. Left turn into Ashmore Street from Mitchell Road
2. Through movement needs to be allowed temporarily on Ashmore Street with the temporary removal of a number of bollards, as shown in Figure 27.
3. Right turn into Bridge Street from Ashmore Street.

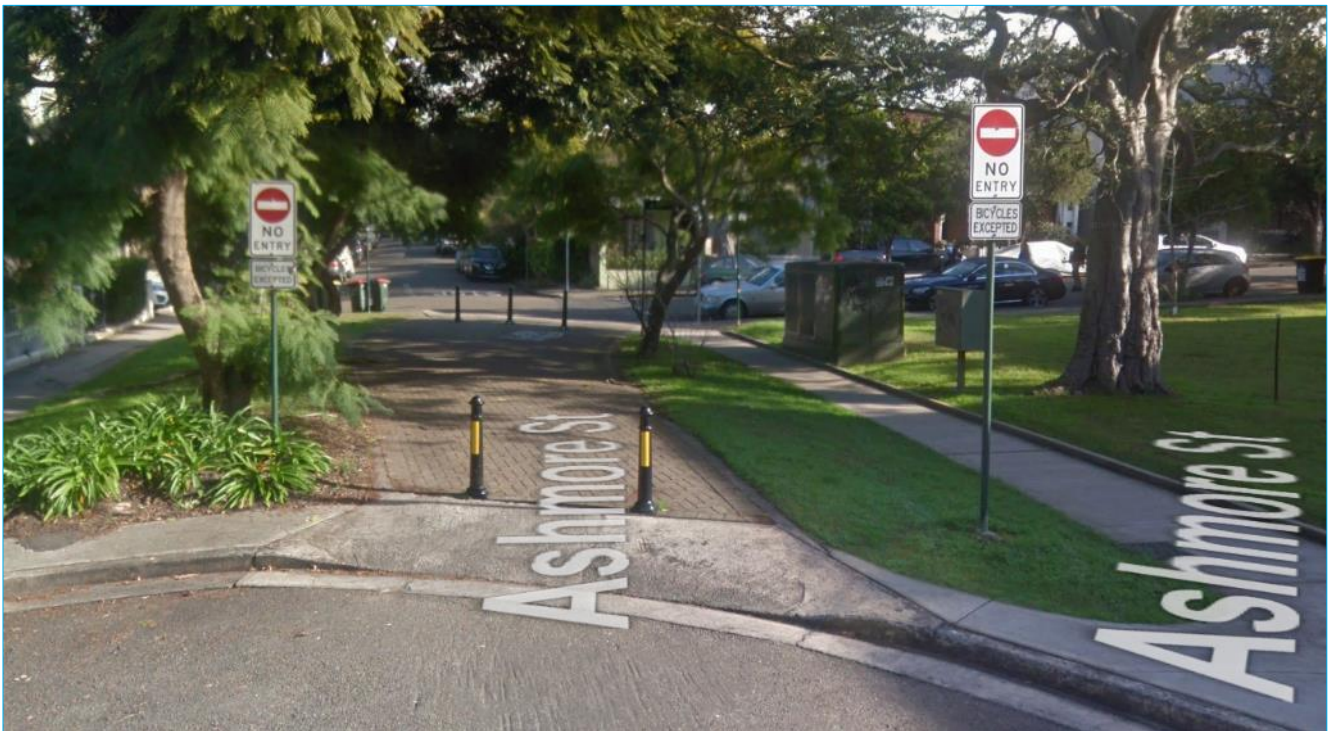


Figure 27: Temporary Removal of a number of bollards on Ashmore Street

Image Source: <http://maps.au.nearmap.com/>

Figure 28 illustrates the proposed construction vehicle movements at the intersection of Bridge Street and Ashmore Street.



Figure 28: AV and 200-tonnes crane at Bridge Street

Base Map Source: Nearmap, 2020

Figure 28 suggests that temporary removal of signposts and mounting on garden will be required. Given the nature of the mounting of verges and reversing distance along Bridge Street, active traffic control would be necessary.

Full-size plots of all swept path assessments discussed in this report are included in **Appendix A**.

Table 7 provides a summary of the swept path assessments SLR has undertaken at three locations where construction activities would be concentrated.

Construction compound	Travel Direction	19m AV	14.7m 200-tonnes Crane	12.5m HRV
Construction compound – 1 off Swanson Street	Eastbound on Swanson Street	Access is possible by utilising the driveway crossover of a separate construction compound across Erskineville Station. Active traffic management necessary.		
	Westbound on Swanson Street			
Construction compound – 2 off Concord Street	Southbound on Concord Street	Access is not possible due to narrow carriageways in Bray Street and Concord Street.	Not assessed. Not required.	Access is possible with active traffic management.
	Eastbound on Bray Street			
Bridge Street	Westbound from Ashmore Street	Access is possible with the removal of a number of bollards and other street furniture on Ashmore Street and Bridge Street with localised mounting of kerbs, verges, paths and street planting at the intersection of Bridge Street and Ashmore Street.		
	Eastbound from Victoria Street	Access is not possible due to railway underpass on Victoria Street. Height limits apply.		

Table 7: Summary of swept path assessments near Erskineville Station

It should be noted that the height of the overhead power lines and other major trees was not considered as part of the 2D swept path assessments.

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

4.6 Active transport impacts

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

- reduction in size of footpath (or closures) adjacent to Swanson Street and Bridge Street may require users to dismount and potentially deviate around construction work associated with the footbridge
- temporary closure of the cycle way in Bridge Street may be required due to parked construction vehicles and increased safety risk for pedestrians and cyclists
- increased safety risk due to the interaction of cyclists, pedestrians and construction vehicles at the proposed site compound access and / or parked construction vehicles on Swanson Street and Bridge Street
- uneven surfaces and detours required during footpath closures and platform resurfacing work
- increased platform congestion due to localised platform closures and dedications during the resurfacing and regrading of the platform surfaces

- potential confusion and loss of amenity for customers due to the temporary relocation of station accesses and facilities
- detours required for potential footpath closures on Bridge Street due to work associated with the footbridge and nearby informal kiss and ride facilities.

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

4.7 Public transport impacts

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

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

- reduced travel speeds as a result of traffic management could increase travel times for bus services on Erskineville Road and Swanson Street
- bus services may also be delayed due to the interaction with construction vehicles entering and exiting construction compound – 1 off Swanson Street.

4.8 Traffic impacts

Traffic generated by construction activities includes construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, and construction plant and equipment. It is expected that articulated vehicles (AV 19m) would be needed on a minimal basis, only while the footbridge, canopy and lift shafts are being delivered. Vehicle types and sizes would vary depending on the required use, but typically include medium and large rigid vehicles and articulated vehicles for import of bulk materials or spoil removal as well as for the transportation of plant and equipment.

The amount of fill material or spoil / demolition spoil would be minor due to the limited extent of excavation required for the Proposal. Specific oversize vehicles (i.e. 200-tonnes crane) may be required for prefabricated / precast elements such as footbridge, canopy, lift shaft structure components, and steel beams. In such cases, specific permits would be required, and advance route planning would need to be undertaken in order to ensure that a suitable route with sufficient geometric capacity to accommodate these vehicles is chosen.

Existing traffic demand data on Swanson Street and Erskineville Road was not provided to SLR however the traffic generated as part of the construction work is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during the peak construction periods. This construction demand is unlikely to cause significant impact to traffic flow or operational performance except when footbridge, canopy and lift shafts are being delivered as these activities may require the closure of traffic for a short period of time.

4.9 Parking impacts

As detailed in Section 4.1, it is proposed that two construction compounds would be made available to undertake the construction work.

As shown in Figure 17 and Figure 18, access to construction compounds is not expected to have an impact on parking in Swanson Street, Erskineville Road and Concord Street based on the swept path assessments SLR has undertaken.

Access to Bridge Street however may benefit from the temporary restriction of parking in a small number of spaces in the vicinity of the Bridge Street and Ashmore Street intersection to improve ease to the delivery of the footbridge. It should be noted that the swept path assessments strictly only require the removal of a number of signposts and bollards, but the short-term restriction of parking near this intersection would assist.

Parking arrangements for construction vehicles should be well planned to mitigate the influx of parking demand in the area. Construction workers would be required to park away from the station and construction compounds and are encouraged to carpool where practicable. Contractor's CTMP should be prepared consistent with these requirements.

4.10 Kiss and ride and taxi impacts

Construction of the Proposal is not expected to have an impact on any kiss and ride and taxi activities as there are no formal kiss and ride and taxi facilities in the vicinity of the proposed construction activities. However, the four P5 parking spaces at the northern end of Bridge Street may not be accessible on a temporary basis during the Bridge Street works.

4.11 Property access impacts

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

4.12 Construction impact mitigation

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

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

- necessary traffic control management activities for the delivery of footbridge, canopy and lift shafts
- necessary permits required for construction vehicles to enter streets which are subject to turn bans or travel in the opposite direction if required (i.e. right turn into Bray Street from Princes Highway or travel in the opposite direction in Concord Street to access construction compound – 2, if necessary)
- construction approach and staging
- additional traffic demands associated with the construction work

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

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

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

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

5 Operational impacts

5.1 Future demand

Forecast station patronage data provided by Transport for NSW indicates that the Erskineville Station annual customer demand will increase by 31% between 2017 and 2036 from 822 persons to 1,079 persons for the AM peak hour (08:00am – 09:00am).

An additional 15% has also been evaluated as a ‘factor of safety’ to ensure a conservative assessment. As such, the forecast daily design patronage for a 2036-time horizon is 1,241 persons.

The projected passenger demands are summarised in Table 8.

Year	AM Peak Hour Demand	Assumed Peak Train (AM boarding)	Assumed Peak Train (PM alighting)
2017	822	Not Available	Not Available
2036	1,079	107	124
Design (2036 + 15%)	1,241	123	142

Table 8: Erskineville Station patronage demand and forecasts

Source: Erskineville Station Network Intermodal Integration Report, Arcadis, dated 20/11/2020.

5.2 Public transport

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

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

5.3 Pedestrians

5.3.1 Pedestrian improvements

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

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

The proposed external footpath upgrades on Bridge Street and Swanson Street between the existing station entrance and the pocket park at the northern end of Bridge Street (Bridge Street Rest Area) would also provide similar benefits through eliminating trip hazards as well as enhancing circulation.

5.3.2 Capacity assessment

Pedestrian capacity assessments have been undertaken as part of the Concept Design development in accordance with RailCorp's Engineering Standard: Stations and Buildings - Station Design Standard Requirements: ESB 003 - Station Functional Spaces, which mandates a minimum standard of Level of Service (LOS) C as determined by the Fruin Theory.

Fruin's theory assesses capacity in terms of pedestrian throughput within a certain width, in this case pedestrians per metre per minute (pmm), and then classifies the results according to the categories specified in Table 9.

Fruin's Level of Service	Walkways (Platforms / Footbridges) Pedestrian Flow Rate (pmm)	Staircases Pedestrian Flow Rate (pmm)
A	0-23	0-16
B	23-33	16-23
C	33-49	23-33
D	49-66	33-43
E	66-82	43-56
F	>82	>56

Table 9: Pedestrian level of service using the Fruin Theory

These pedestrian capacity assessments were undertaken to determine whether it would be possible to achieve Pedestrian Level of Service C in 2036 in the following sections of Erskineville Station:

- platforms
- staircases
- footbridges.

With assumed pedestrian forecast 2036 demand including +15% contingency, results of the assessment indicated that all elements of the station would operate at Level of Service C or better under the current timetable arrangements. Any congestion issues would be mitigated with the high frequency rail services that will be introduced by 2030 as part of the More Trains More Services (MTMS) program.

5.4 Cyclists

The Proposal will provide four additional bicycle parking hoops under the stairs at the new Bridge Street entrance in addition to the existing 12 bicycle parking spaces at the Swanson Street Station Entrance.

Based on current station patronage and observed demand for the existing parking, this supply is considered reasonable and can accommodate the existing and any projected increase attributable to the Proposal.

5.5 Kiss and ride and taxi facilities

The proposal comprises the provision of a total of three new kiss and ride areas on Bridge Street. Two of these kiss and ride areas would be provided at the new southern station entrance and another one at the northern end of Bridge Street cul-de-sac. No modifications are proposed to the operations of the existing school drop-off and pick-up facilities on Swanson Street (across the road from public school) and Bridge Street (adjacent to school gates).

The proposed new Bridge Street station entrance would improve the safety and amenity for motorists and loading / unloading passengers as it is expected to result in reduced passenger and drop-off & pick-up activity near the busy Swanson Street Station Entrance.

5.6 Parking

The Proposal includes the provision of one new accessible parking space at the northern end of Bridge Street cul-de-sac. The design of the new accessible parking space and the associated passenger loading areas should be refined in the detailed design stage and should accord with AS2890.6.

Figure 29 indicates the location of the proposed disabled parking spaces.

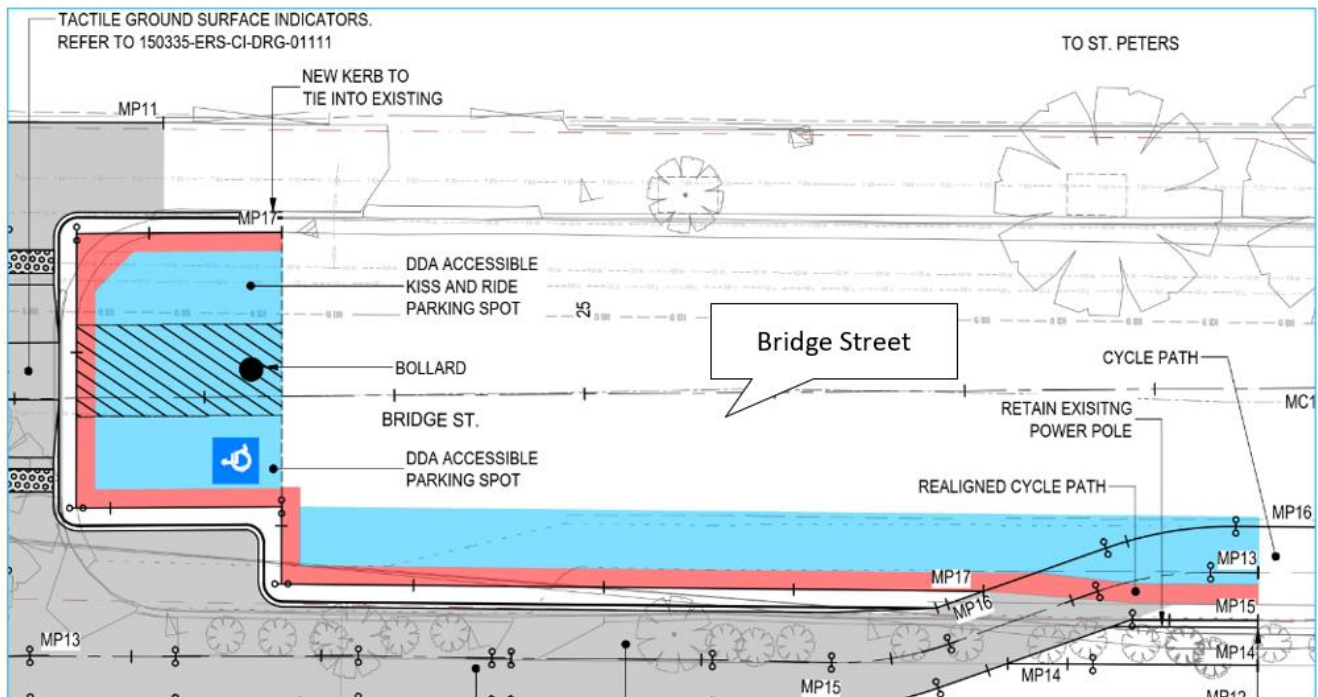


Figure 29: Proposed disabled parking space in Bridge Street

SLR has undertaken high-level swept path assessments for the proposed kiss and ride area and accessible parking space at this location. It is recommended that the proposed design is reviewed in detail in relation to vehicle manoeuvres to avoid vehicles swinging into the pop-up cycleway and mounting nearby school's driveway.

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

5.7 Traffic impacts

The Proposal is not projected to generate a material volume of additional traffic movements that would impact on the existing operational performance or capacity of the surrounding road network.

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

5.8 Property access

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

5.9 Safety

The Proposal is expected to improve pedestrian safety and mobility to / from and surrounding the station with the installation of a new footbridge and lifts. The provision of new kiss and ride facilities in Bridge Street is also likely to improve the safety by minimising conflicts between pedestrians and vehicles.

6 Summary, conclusions and recommendations

The Proposal would include the following key elements:

- a new southern station entrance off Bridge Street including a new footbridge with three new lifts and stairs connecting to all platforms
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1 (whilst retaining the existing overhead booking office, footbridge, and stairs)
- one new kiss and ride area and one accessible parking space at the northern terminus of Bridge Street providing an accessible path of travel to the existing (northern) station entrance
- a new kiss and ride area with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance
- new canopies on the platforms to provide weather protection
- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the family accessible toilet on Platform 1 for improved accessibility
- upgrade work along the footpaths approaching the northern and southern station entrances
- kerb modifications and line marking at the southern station entrance to provide access to the new kiss and ride areas
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system modifications and new hearing induction loops
- localised platform regrading and the installation of new tactiles along the platforms
- improvements to station lighting and CCTV to improve safety and security
- landscaping work, tree removal and adjustments to wayfinding
- electrical upgrades for the new infrastructure and service relocations.

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

- increased construction vehicle traffic including light and heavy vehicles within the station precinct and along proximity roads and streets including Swanson Street, Erskineville Road, Bridge Street and Concord Street for movement to / from the two proposed construction compounds
- some inconvenience for pedestrian and cyclist movements due to the construction zones and barriers along the footpath on Erskineville Road, Swanson Street and Bridge Street
- temporary closure of pop-up cycle way in Bridge Street when a crane or an articulated vehicle park in Bridge Street
- temporary loss of parking near the intersection of Bridge Street and Ashmore Street
- the traffic generated as a part of the construction work is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during peak construction periods. This construction demand is unlikely to cause significant impact to traffic flow or operational performance except when footbridge, canopy and lift shafts are being delivered as these activities may require the closure of traffic for a short period of time.

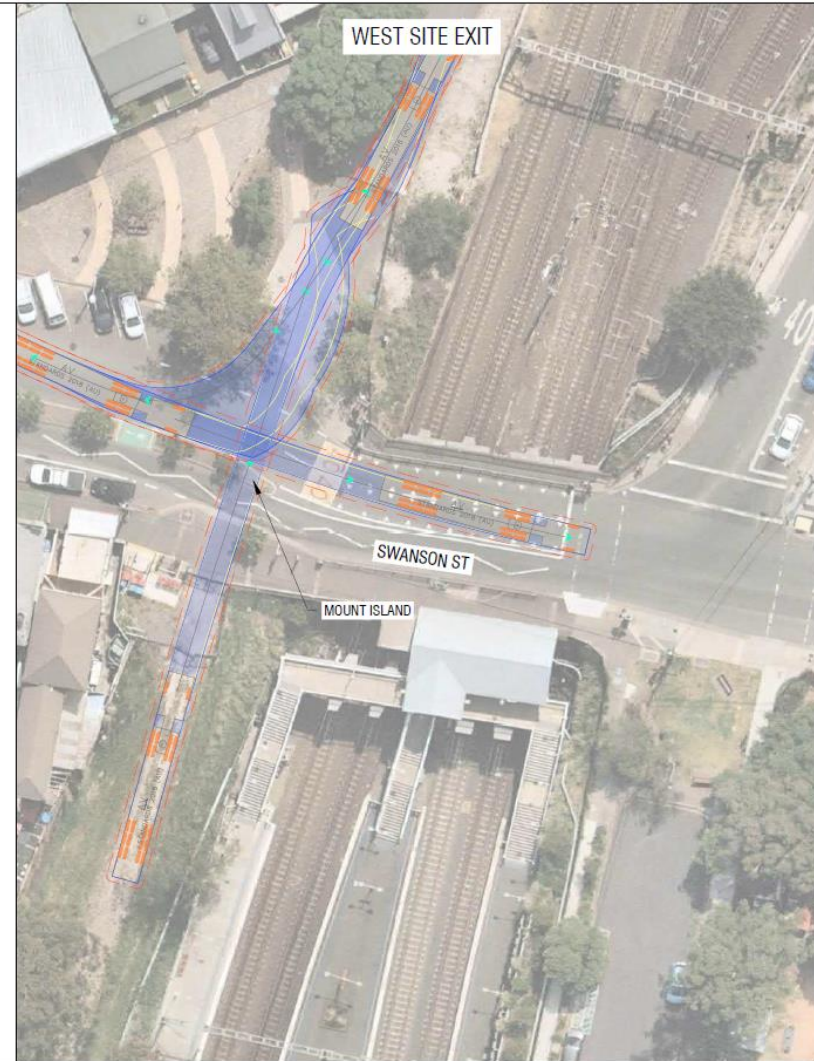
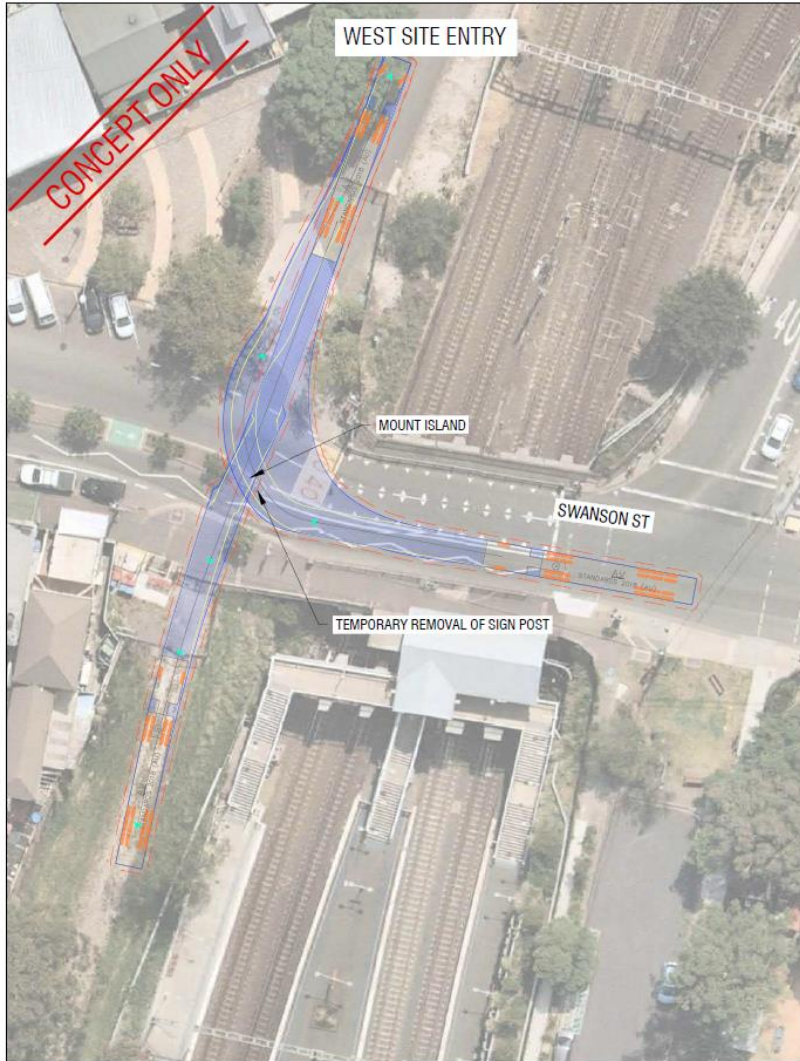
-
- potential confusion and loss of amenity to customers accessing the station via temporary and changed facilities during construction
 - short-term occupation of kerbside parking, cycleways, and footpaths by cranes facilitating construction
 - minor travel delays on account of likely TCP implementation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

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

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

APPENDIX A

Swept Path Assessments



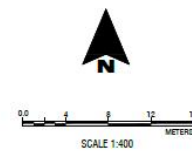
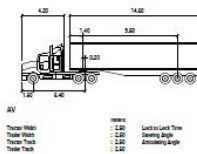
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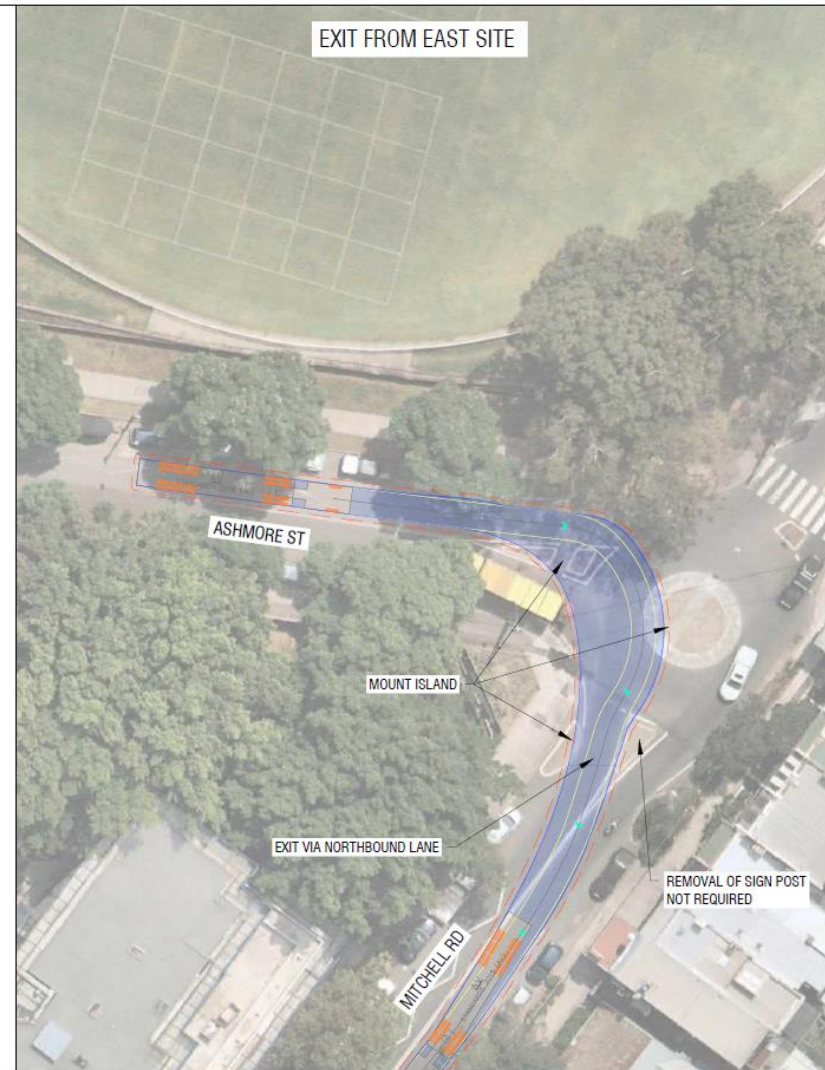
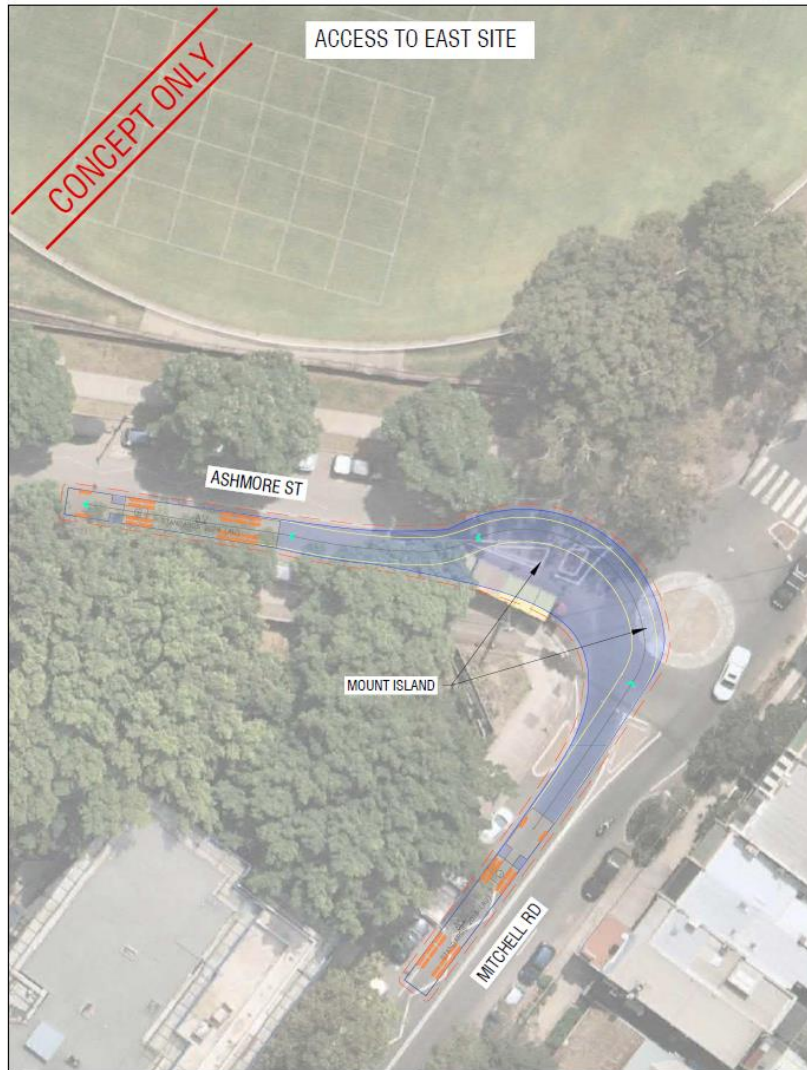
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SWEEP PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Road Wheels



TfNSW Transport Access Program
Erskineville Station
**Swept Path Assessment
AV**
FIGURE SK01-1



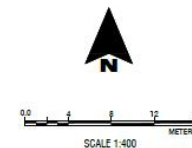
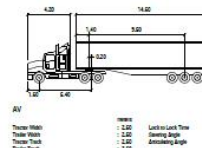
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SWEEP PATH LEGEND

- Vehicle Path
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- Body Clearance
- Road Widths



TfNSW Transport Access Program

Erskineville Station

Swept Path Assessment
AV

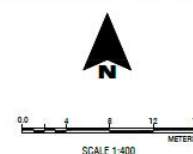
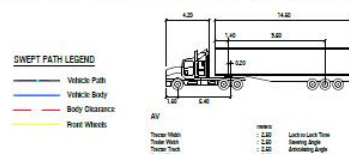
FIGURE SK01-2



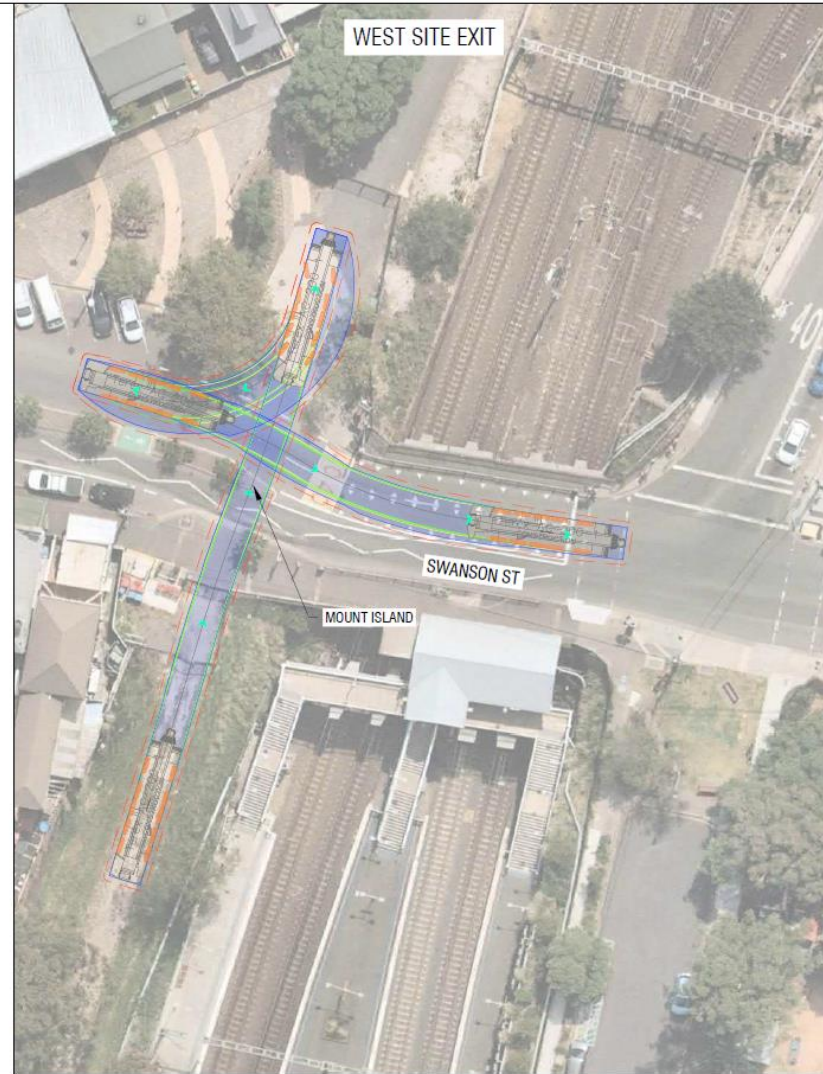
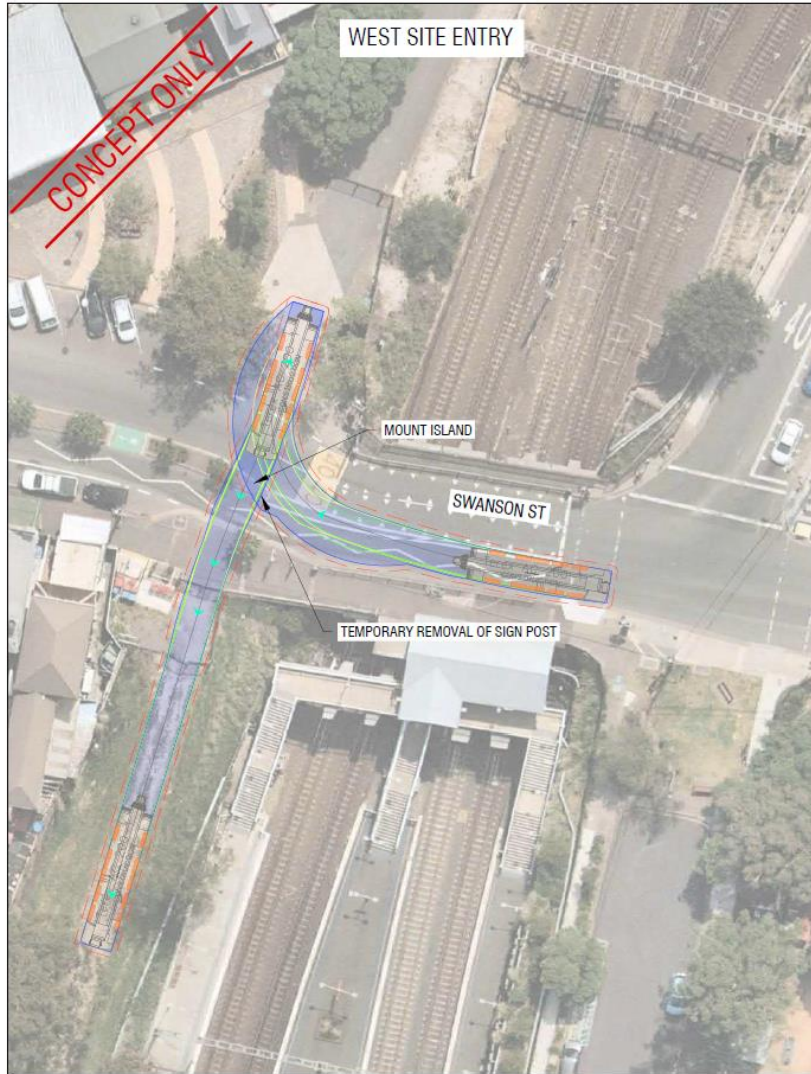
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TfNSW Transport Access Program
Erskinvillie Station
Swept Path Assessment
AV
FIGURE SK01-3



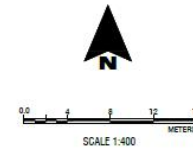
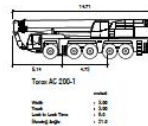
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SWEEP PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Road Widths
- Road Wheel



TfNSW Transport Access Program

Erskineville Station

**Swept Path Assessment
200t Crane**

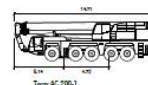
FIGURE SK02-1



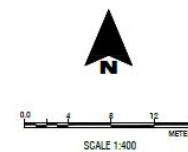
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Projection:

SWEEP PATH LEGEND
 — Vehicle Path
 — Vehicle Body
 — Body Clearance
 — Front Wheels
 — Rear Wheels



Terex AC 200-1
 Height: 14.2m
 Load to Hook: 200t
 Turning Radius: 10.0m



TfNSW Transport Access Program

Erskiville Station

**Swept Path Assessment
200t Crane**

FIGURE SK02-2

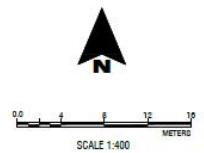
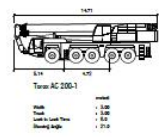


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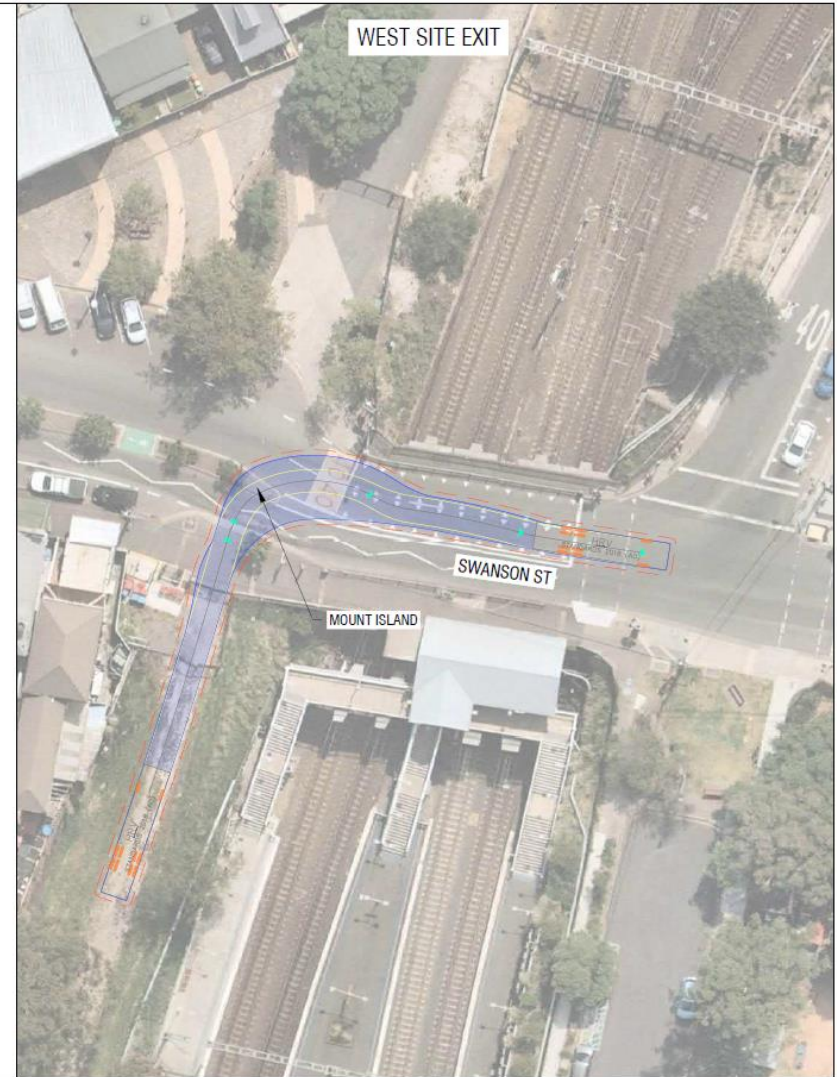
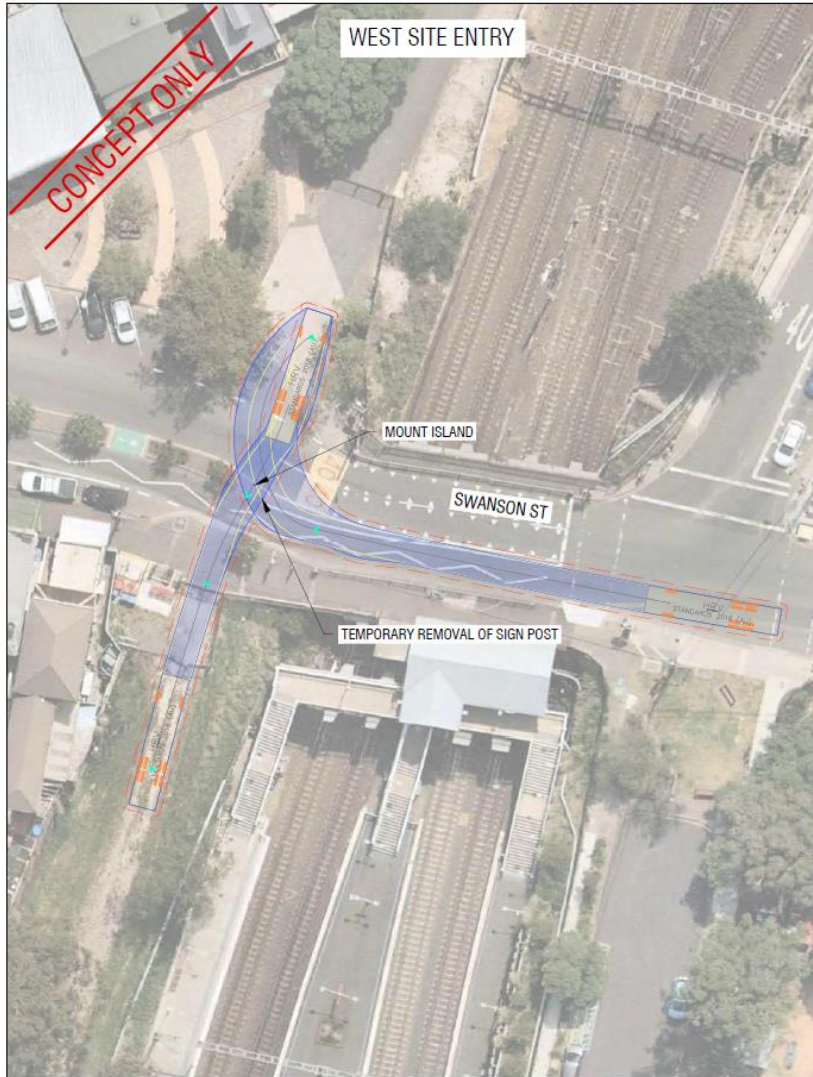
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- SWEPT PATH LEGEND**
- Vehicle Path
 - Vehicle Body
 - Body Clearance
 - Rear Wheel
 - Rear Wheel



TNSW Transport Access Program
Erskineville Station
**Swept Path Assessment
200t Crane**
FIGURE SK02-3



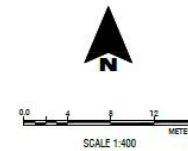
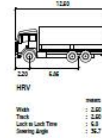


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SWEEP PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Road Widths



TfNSW Transport Access Program

Erskineville Station

**Swept Path Assessment
HRV**

FIGURE SK03-1

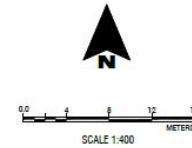


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SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels

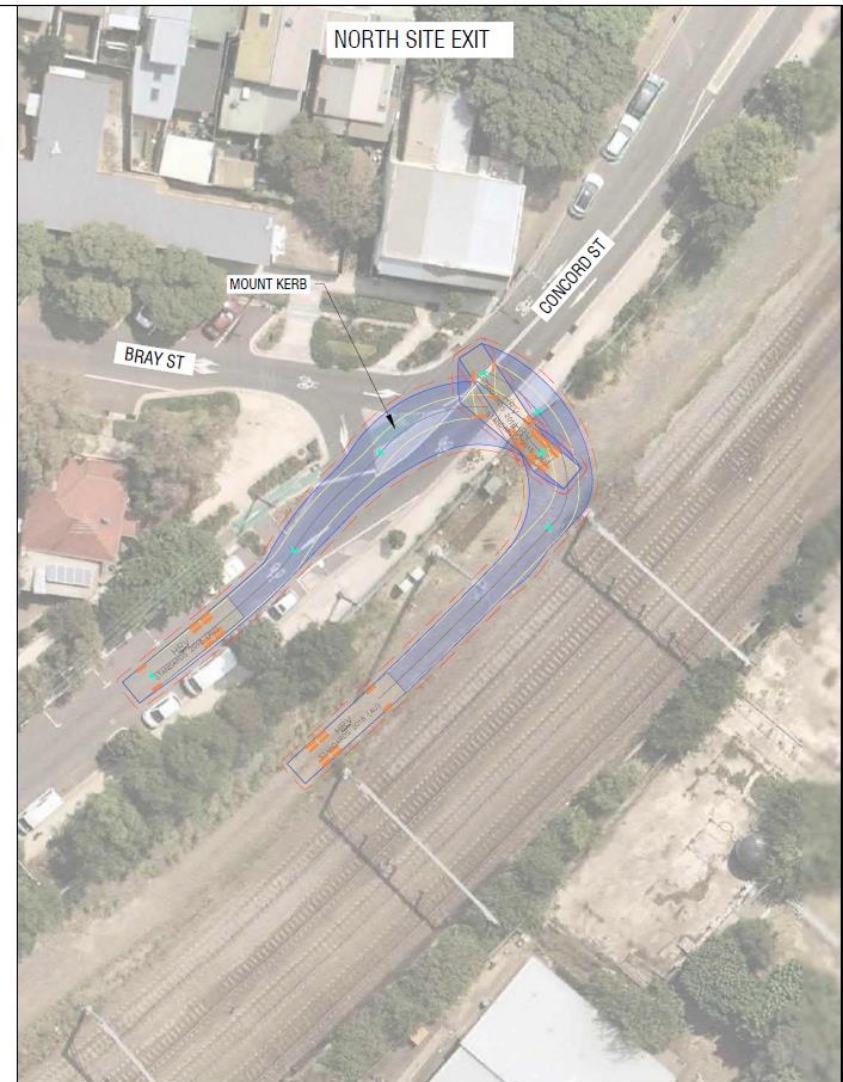
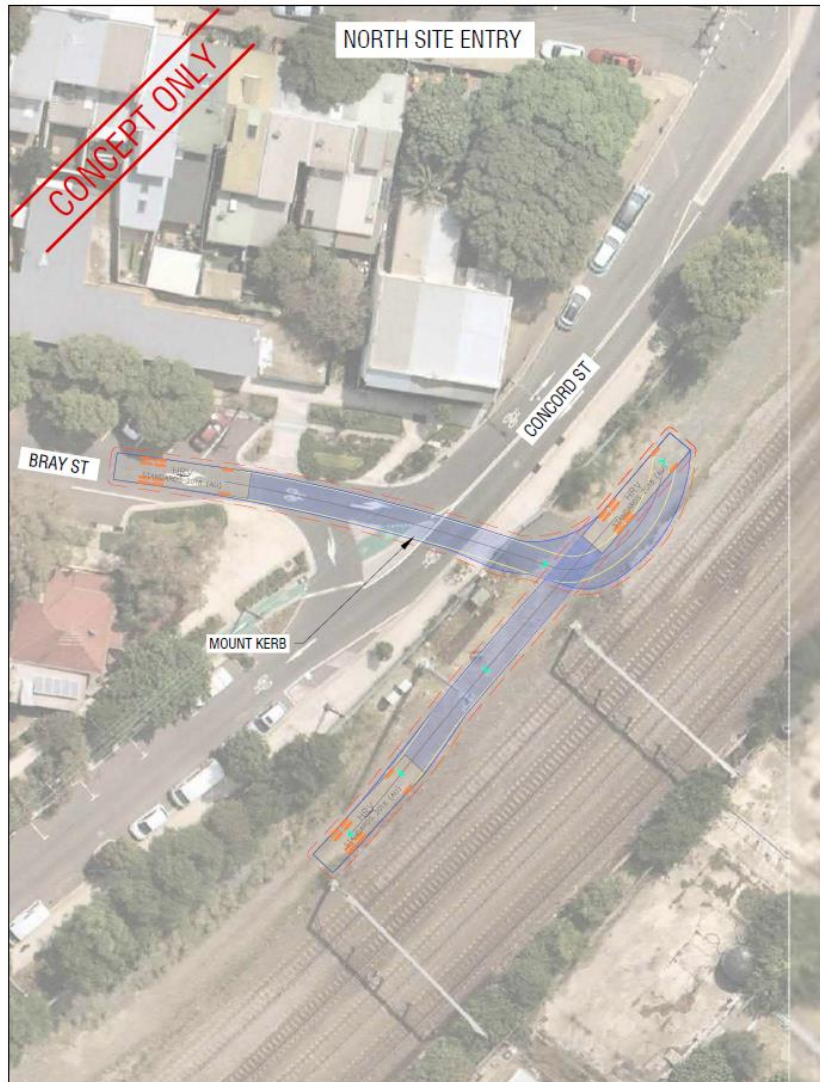


TfNSW Transport Access Program

Erskinvale Station

**Swept Path Assessment
HRV**

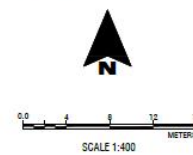
FIGURE SK03-2



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SWEEP PATH LEGEND
Vehicle Path
Vehicle Body
Body Clearance
Front Wheels

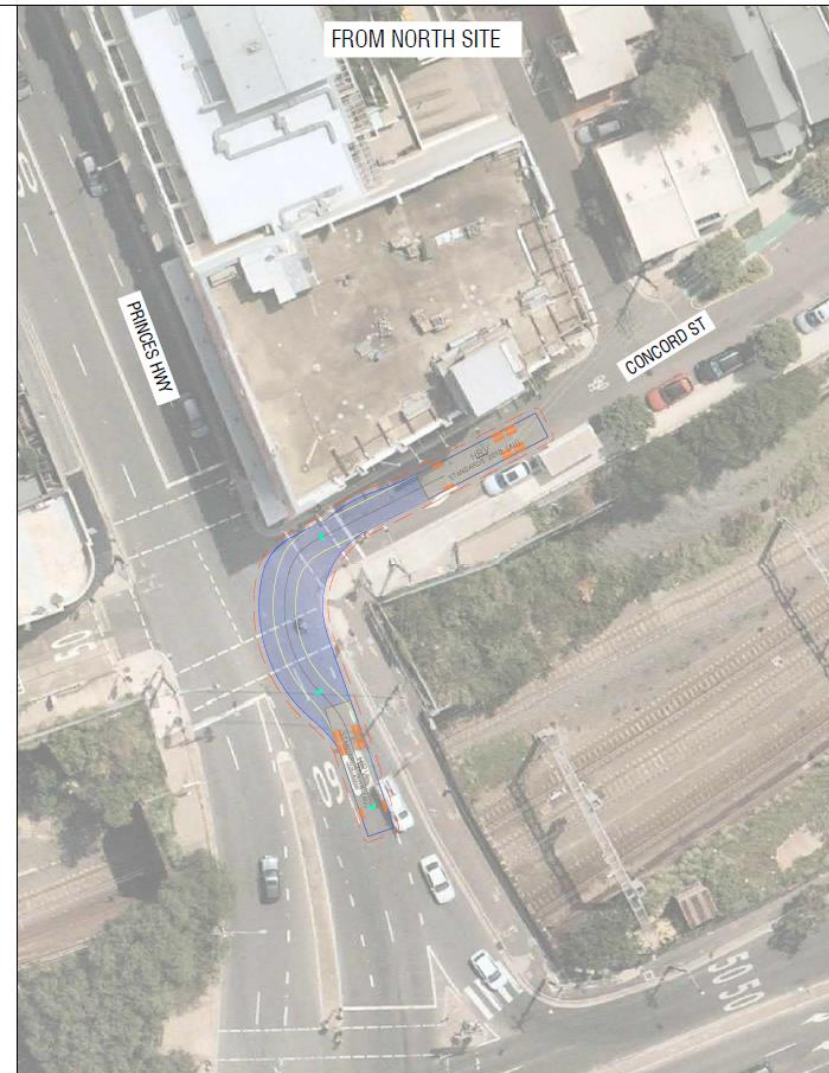


TfNSW Transport Access Program

St Peters Station

**Swept Path Assessment
HRV**

FIGURE SK03-4

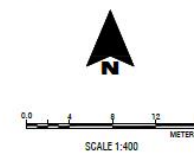


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SWEEP PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Road Width

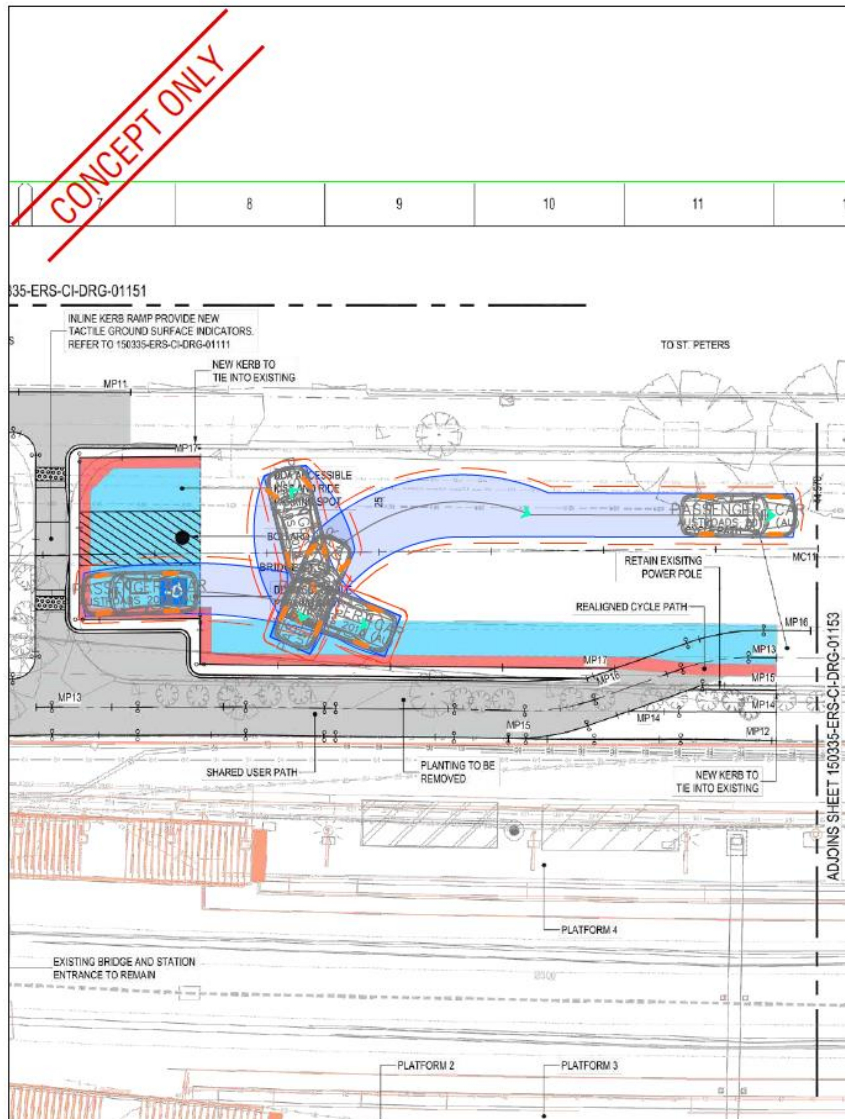


TfNSW Transport Access Program

St Peters Station

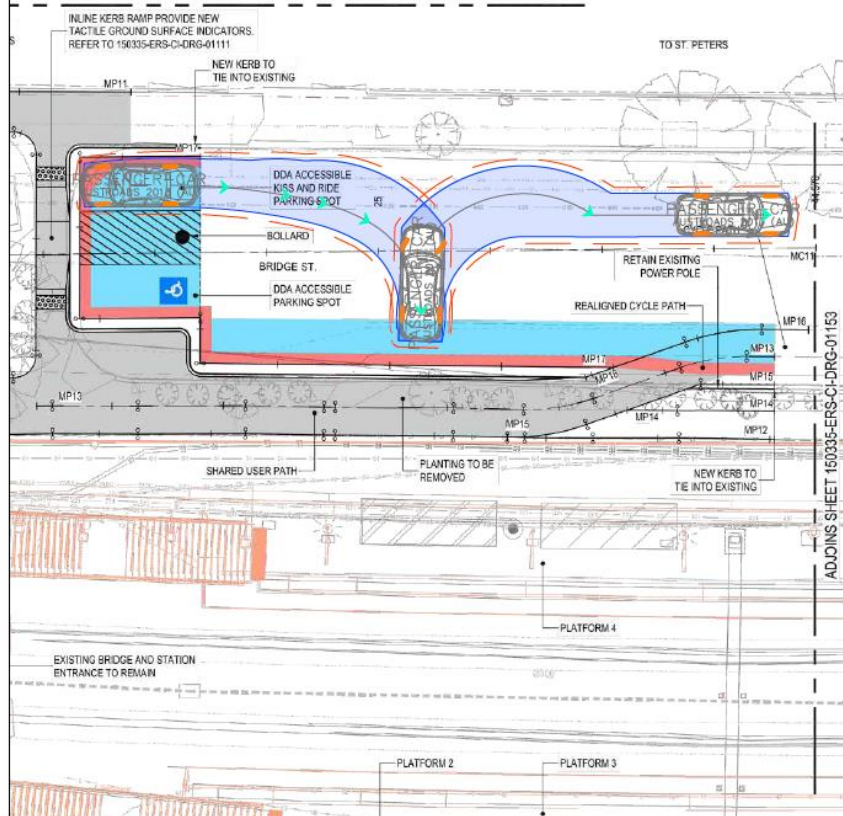
**Swept Path Assessment
HRV**

FIGURE SK03-5



CONCEPT ONLY

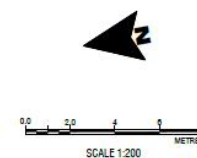
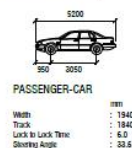
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SWEEP PATH LEGEND
 Vehicle Path
 Vehicle Body
 Body Clearance



TfNSW Transport Access Program

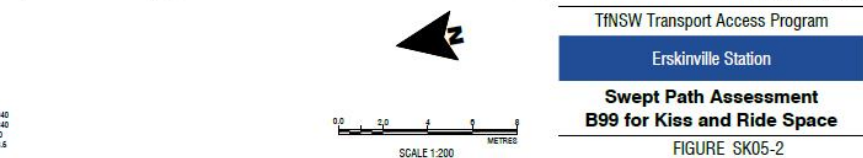
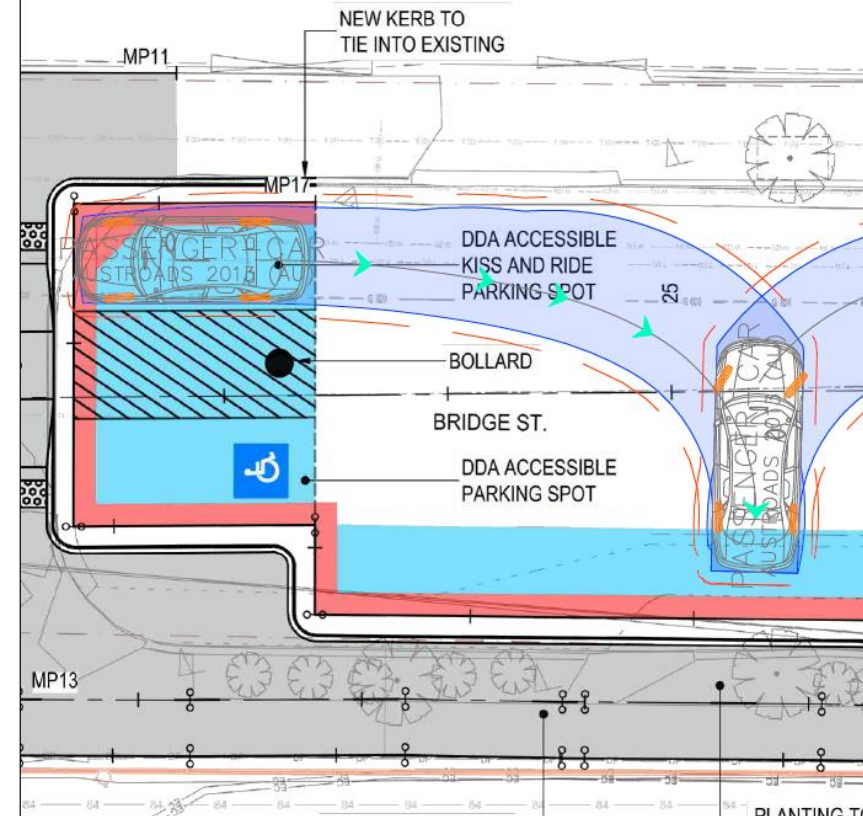
Erskineville Station

**Sweep Path Assessment
 B99 for Kiss and Ride Space**

FIGURE SK05-2

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INLINE KERB RAMP PROVIDE NEW
 TACTILE GROUND SURFACE INDICATORS.
 REFER TO 150335-ERS-CI-DRG-01111



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