TRANSPORT FOR NSW

Wollstonecraft Station - Transport Access Program

Traffic, Transport and Access Impact Assessment

APRIL 2020

Question today
Imagine tomorrow
Create for the future

Wollstonecraft Station - Transport Access Program
Traffic, Transport and Access Impact Assessment

Transport for NSW

WSP
Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001

Tel: +61 2 9272 5100
Fax: +61 2 9272 5101
wsp.com

REV	DATE	DETAILS
-	28/02/2020	Draft
A	12/03/2020	Response to TfNSW Comments
B	08/04/2020	Updated with the latest project description
C	21/04/2020	Updated with the latest project description

	NAME	DATE	SIGNATURE
Prepared by:	Sam McCormick	21/04/2020	
Reviewed by:	Chris Chun	21/04/2020	
Approved by:	Jarryd Barton	21/04/2020	

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

Transport for New South Wales (TfNSW) proposes to provide accessibility upgrades at Wollstonecraft Station (the Proposal). WSP has been engaged to undertake a Traffic, Transport and Access Impact Assessment to support the Review of Environment Factors (REF) for the proposal.

This Traffic, Transport and Access Impact Assessment report (the Report) has been prepared to assess the potential impacts to road and rail users and the wider community who may use the footpaths during the construction and operation stages of the Proposal and recommend measures to ameliorate or mitigate any impacts.

1.1 BACKGROUND

The NSW Government is committed to facilitating and encouraging use of public transport, such as trains, by upgrading stations to make them more accessible and improving interchanges around stations with other modes of transport such as buses, bicycles and cars.

The Transport Access Program (TAP) is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

Wollstonecraft Station has been identified for an accessibility upgrade as it does not currently meet key requirements of the *Commonwealth Disability Discrimination Act* 1992 (DDA) and associated requirements of the *Disability Standards for Accessible Public Transport* 2002 (DSAPT).

Non-compliant access points and paths to Wollstonecraft Station platforms do not facilitate equal access for people with reduced mobility, a disability, parents/carers with prams, or customers with luggage. There are no lift facilities and inadequate tactile ground surface indicators (TGSI's) to stairs and platforms.

The Proposal would provide safe and equitable access to the platforms and to the pedestrian network surrounding the station. Customer facilities and amenities would also be improved. The upgrades would provide an improved customer experience for existing and future users of the station.

Potential future increases in patronage have been taken into consideration during the design development.

1.2 KEY ELEMENTS OF THE PROPOSAL

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

- Construction of two new lifts connecting to Platform 1 and 2
- Reconfiguration of station building to accommodate one unisex family accessible toilet, two unisex ambulant toilets, maintaining cleaners' room and construction of new Main Switch Room
- Modification of waiting area on both platforms for accessible entry and level access
- Construction of new canopy at boarding assistance zones on Platform 1 and 2
- Raising, stabilisation and regrading of station platforms for compliance
- Modification of the Shirley Road Overbridge by widening and regrading the northern footpath along with new compliant handrails and accessible entry points
- One new kiss-and-ride bay and one DSAPT compliant car parking space on Shirley Road.

1.3 STUDY SCOPE

This report assesses the likely traffic, transport and access impacts during the construction and operation of the Proposal and identifies mitigation measures to reduce the likely impacts of the Proposal. More specifically, the following issues have been covered in this report:

- A review of the existing traffic, public transport, parking, pedestrian and cyclist conditions within the study area
- Station access issues relating to the proposed upgrades during construction
- Suggested improvements and mitigation measures that might be implemented to minimise the traffic and road safety related impacts created by the proposed upgrades.

WSP completed a site inspection on Thursday 23 January 2020 to understand the existing operation at Wollstonecraft Station as well as its surrounding condition, facilities and access.

1.4 REFERENCES

In preparing this report, reference has been made to the following:

- *North Sydney Council Local Environmental Plan (LEP) 2015*
- *North Sydney Council Development Control Plan (DCP) 2013*
- *Australian Standard, Parking Facilities, Part 1: Off-street car parking AS 2890.1:2004*
- *Australian Standard, Parking Facilities, Part 6: Off-street car parking for people with disabilities AS 2890.6:2009*
- *Crash and casualty statistics* through the interactive map TfNSW, Centre for Road Safety
- *Transport Access Program (TAP) 3 Package 1, Final Scoping Design for Wollstonecraft Station (SMEC, 2018).*

1.5 REPORT STRUCTURE

This report has the following structure:

- Chapter 1 Introduction. Describes the purpose of the Proposal and the study scope of this Report.
- Chapter 2 Existing Conditions. Describes the existing road network, traffic conditions, public transport and active transport networks in the study area.
- Chapter 3 Proposed Station upgrades. Describes the key features of the Proposal and construction activities.
- Chapter 4 Construction impacts. Describes the impacts to all users during construction.
- Chapter 5 Operational impacts. Presents the impacts of the proposed changes on all users.
- Chapter 6 Suggested improvements and mitigation measures. Identifies potential improvements and amelioration measures to minimise any identified Proposal related impacts.

2 EXISTING CONDITIONS

2.1 STUDY AREA

Wollstonecraft Station is located in the suburb of Wollstonecraft, within the North Sydney Council local government area (LGA), approximately seven kilometres north from Central Station.

Wollstonecraft Station is serviced by three lines for intercity and regional connections including North Shore and Western Line (T1), Northern Line (T9) and Central Coast and Newcastle Line (CCN). Platform 1 is located on the eastern side of the station, servicing trains travelling southbound towards the City. Platform 2 is located on the western side of the station, servicing northbound trains towards Chatswood and Central Coast region.

The Proposal would generally be located within the boundaries of the existing station as well as including the Shirley Road overbridge located on the southern side of the station. Figure 2.1 shows the location of the study area for this assessment which is shown with a red outline.

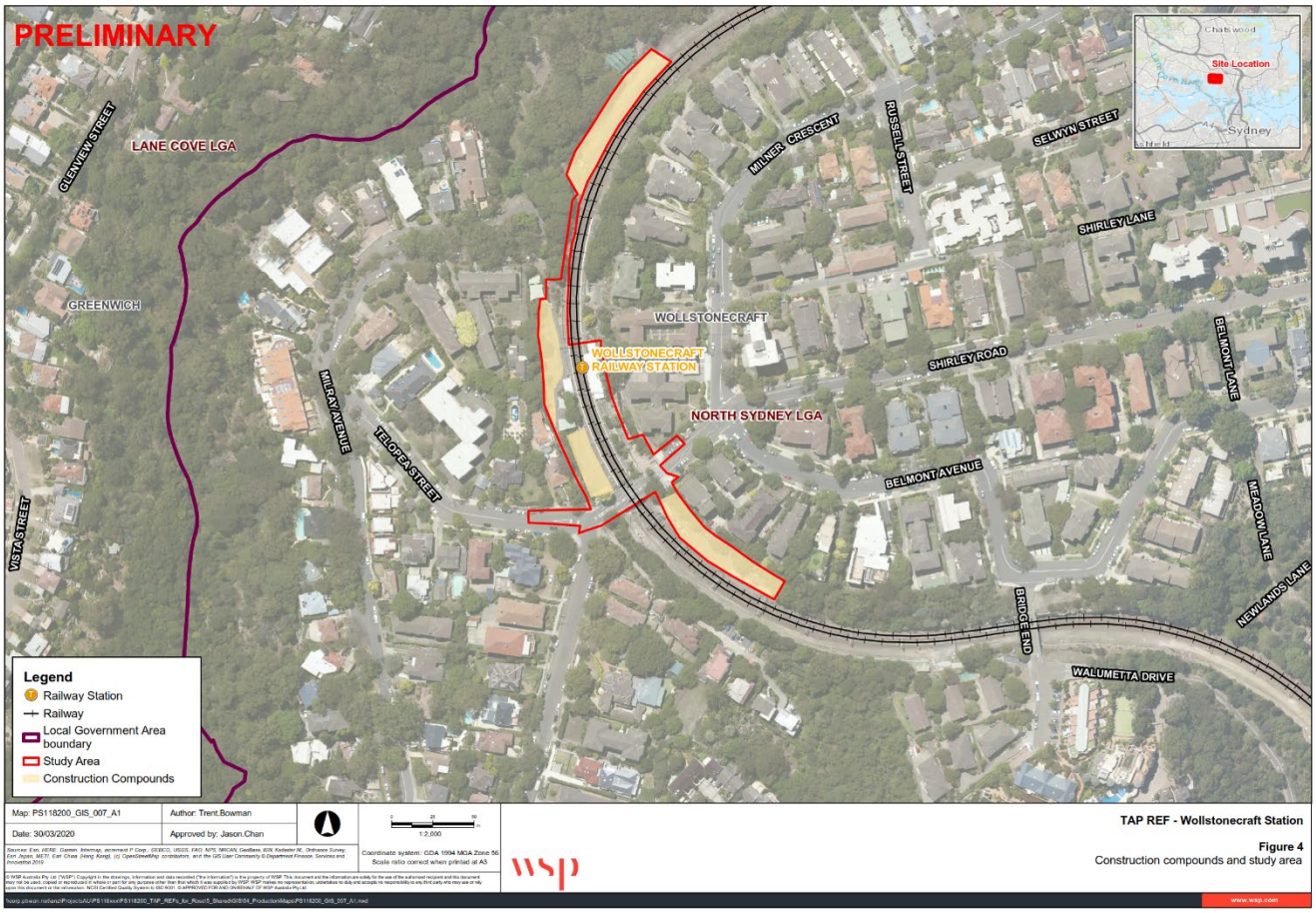
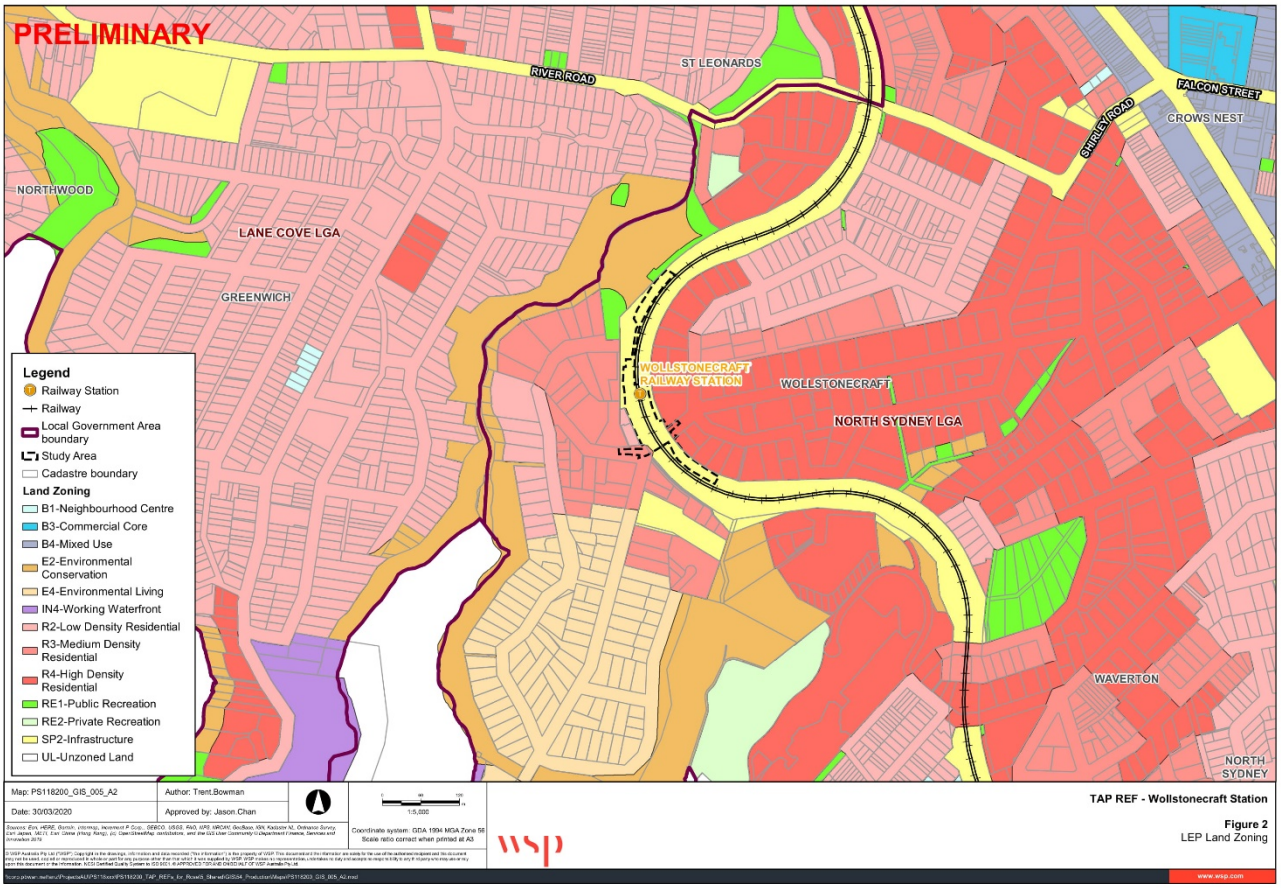


Figure 2.1 Wollstonecraft Station study area

Land uses surrounding the Proposal include the following and shown in Figure 2.2:

- Surrounding local area is predominantly low to high density residential (zoned R2, R3 and R4)
- North of the station includes public recreation (zoned RE1) and environment protection zones (zoned E2)
- The Proposal location is zoned as SP2 (Rail Infrastructure Facility) within the rail corridor.



Source: North Sydney Council Local Environmental Plan 2015

Figure 2.2 North Sydney Council Local Environmental Plan (LEP) Land Zoning

2.2 SURROUNDING ROAD NETWORK

Wollstonecraft Station is surrounded by local roads (residential streets). There is no school zone adjacent to the study area and all local roads have a posted speed limit of 50 km/h. Access to the station is available from multiple access points on Shirley Road, Milray Avenue and Milner Crescent. Traffic in this network is limited to commuters who park-and-ride and local, residential traffic.

Key features of roads surrounding the study area include:

- Shirley Road is a two-lane, two-way road which generally runs in an east-west direction on the eastern side of the station and north-south on the western side of the station, providing access from the Pacific Highway to Wollstonecraft Station and residential areas. It provides the only road crossing of the railway line adjacent to the station and provides access to the commuter car park and local residential area.
- Telopea Street is a two-lane, two-way road that intersects with Shirley Road and links residential areas on the western side of the railway line.
- Milray Avenue is a two-lane, two-way road runs in a north-south direction adjacent to the railway line on the western side of the study area and providing access to the pedestrian footpath on the eastern side of the station.
- Belmont Avenue/Milner Crescent are local roads which form give way controlled intersection with Shirley Road on the eastern side of the study area.
- Russel Street is a two-lane, two-way that intersects with Milner Crescent and providing access to River Road on the eastern side of the study area. There is no posted information provided on site regarding the height clearance of the rail overpass.

2.3 PARKING

Wollstonecraft Station has a dedicated commuter car park located south of Shirley Road along the eastern side of the railway line which can be accessed via Shirley Road as shown in Figure 2.3. It provides 36 unrestricted car parking spaces. There are no dedicated accessible spaces available within the commuter car park. Figure 2.4 shows the existing commuter car park.

Figure 2.3 Commuter car park entrance on Shirley Road

Figure 2.4 Existing commuter car park on the eastern side of railway line

The surrounding roads have mixed parking restrictions including areas of unrestricted as well as five-minute, one, two and four-hour restricted parking mainly for weekdays. The existing on-street parking restrictions on surrounding local roads are summarised in Table 2.1. Figure 2.5 also shows available on-street parking spaces within 200 metres from Wollstonecraft Station.

Table 2.1 Surrounding on-street parking condition

Road	On-Street parking	
	North/East side of the road	South/West Side of the road
Shirley Road – Between Telopea Street and Belmont Avenue	Mail zone, five-minute and ¼-hour restricted parking	Unrestricted
Shirley Road – Between Belmont Avenue and Newlands Street	Unrestricted	2-hour restricted parking (2P) – 8 am to 6 pm on weekdays
Milner Crescent	2 or 4-hour restricted parking (2P and 4P), No Stopping/Parking	2 or 4-hour restricted parking (2P and 4P), No Stopping/Parking
Belmont Avenue	Unrestricted	Unrestricted
Telopea Street	4-hour restricted parking (4P)	4-hour restricted parking (4P)
Milray Avenue	4-hour restricted parking (4P)	2-hour restricted parking (4P)

Figure 2.5 Existing on-street parking restrictions

2.4 PUBLIC TRANSPORT

2.4.1 RAIL

2.4.1.1 PATRONAGE

Table 2.2 includes a comparison of rail patronage data in 2017 and predicted patronage data for 2036 detailing the current and projected demand for this at this station.

Table 2.2 Wollstonecraft Station patronage

Period	2017	2036
Average weekday total	5471	6775
Average weekday peak 1 hour (8.00–9.00 am)	953	1181

Source: Transport Access Program (TAP) 3 Package 1, Final Scoping Design for Wollstonecraft Station (SMEC, 2018)

This data represents a 24 per cent increase in patronage over a 19-year period for both the average weekday total and average weekday peak hour.

2.4.1.2 SERVICES

Wollstonecraft Station is serviced by the T1 North Shore and Western Lines, the T9 Northern Line and the Central Coast Line (CCN). Trains operate between Berowra and the City via Gordon along the T1 line, between Hornsby and the North Shore via City on the T9 and between Newcastle and Central via Strathfield or Gordon along the Central Coast line. Trains service this station between 4.00 am and 2.00 am on weekdays. Journey time between Wollstonecraft and Central is approximately 15 to 20 minutes during peaks, providing quick and easy access between city and Wollstonecraft destinations. Table 2.3 summarises the existing train services at Wollstonecraft Station.

Table 2.3 Train service frequency at Roseville Station

Rail line	Services	Frequency of weekday services	
		AM peak (7.00–9.00 am)	PM peak (4.00–6.00 pm)
T1	North Shore: City to Berowra via Gordon (and reversed)	every 3–6 minutes	every 3–6 minutes
	Western Line: Emu Plains or Richmond to City (and reversed)	every 5–10 minutes	every 5–10 minutes
T9	Northern Line: North Shore to Hornsby via City (and reversed)	every 15 minutes	every 15 minutes
CCN	Central Coast Line: Central to Newcastle via Strathfield or Gordon (and reversed)	every 15 minutes	every 15 minutes

Source: Train timetable, https://transportnsw.info/

2.4.2 BUS SERVICES

There is only one bus that services Wollstonecraft station which is Route 265 operating between Lane Cove and North Sydney via Greenwich. There is a bus stop located on Milner Crescent (Stop ID 206511), about 100 metres from the entrance to the station. This service operates via the Milner Crescent stop on a half hourly frequency during the peaks (7.00–9.00 am and 4.00–6.00 pm) each weekday. The service operates on an hourly frequency during the day on Saturdays and does not operate on Sundays.

2.5 TAXI AND KISS-AND-RIDE FACILITIES

There are no formal taxi, or designated kiss-and-ride facilities at Wollstonecraft Station. It was observed during the site inspection that nearby no parking, 5-minutes and ¼ hour parking spaces on Shirley Road are used as areas for kiss-and-ride purposes, adjacent to the Shirley Road overbridge. Figure 2.6 and Figure 2.7 show these areas located on the eastern and western side of the station, respectively.

Figure 2.6 Area used for kiss-and-ride, Shirley Road east of Wollstonecraft Station

Figure 2.7 Area used for kiss-and-ride, Telopea Street west of Wollstonecraft Station

2.6 PEDESTRIAN ACCESS AND FACILITIES

Pedestrian access to and from Wollstonecraft Station is via footpaths with steep grades that connect to local roads. These footpaths grades were observed at a minimum of 5–10 per cent which is not compliant with 1:20 (5 per cent) grades and likely causes issues for mobility impaired customers. Figure 2.8 to Figure 2.13 below depict some of the grade conditions that are at the station. Some surrounding pedestrian facilities include:

- Pedestrian access routes between the station and local roads (reference e.g. A1 to Figure 2.10):
  - **A1.** Platform 1 (eastern side of railway track) and Milner Crescent
  - **A2.** Platform 1 and Shirley Road, south of the station
  - **A3.** Platform 2 (western side of railway track) and Shirley Road, south of the station
  - **A4.** Platform 2 and Milray Avenue
- A pedestrian underpass located at the northern end of the station providing access to both platforms
- A pedestrian crossing (zebra) on Shirley Road to the east of the station
- Pedestrian refuges on Shirley Road, Telopea Street and Milner Crescent as indicated in Figure 2.10.

There are four main access routes to this station indicated in Figure 2.8.

Figure 2.8 Station access routes

Figure 2.9 Station graded access between Shirley Road and Platform 2 (location P1 on Figure 2.8)

Figure 2.10 Station graded access between Platform 2 and underpass (location P2 on Figure 2.8)

Figure 2.11 Station graded access between underpass and Platform 1 (location P3 on Figure 2.8)

Figure 2.12 Station graded access between Milner Crescent and Platform 1 (location P4 on Figure 2.8)

Figure 2.13 Station graded access, north of Milray Avenue (location P5 on Figure 2.8)

2.7 ACTIVE TRANSPORT

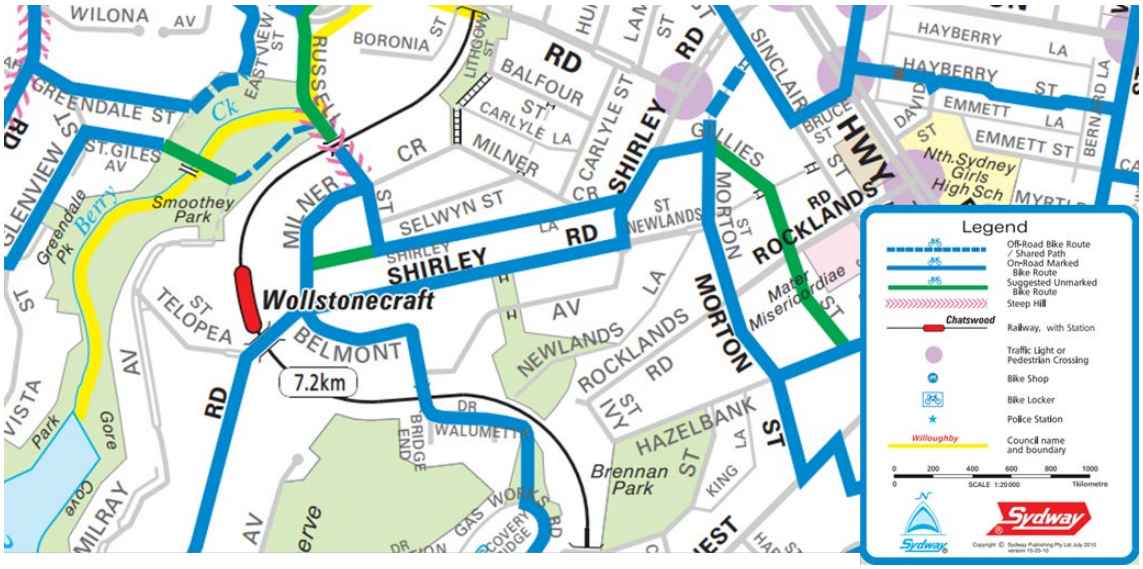
Bicycle racks are provided on both sides of the station, adjacent to the platform 1 entrances via Shirley Road and the western station access points via Milray Avenue as shown in Figure 2.14 and Figure 2.15.

The underpass to access either platform can also be used by cyclists.

Figure 2.14 Existing bike rack near Platform 1 entrance

Figure 2.15 Existing bike rack on the western side of the station, near Milray Avenue

Figure 2.16 shows that there are no dedicated cycleways but there are several on-road cycling routes within the vicinity of the station precinct.



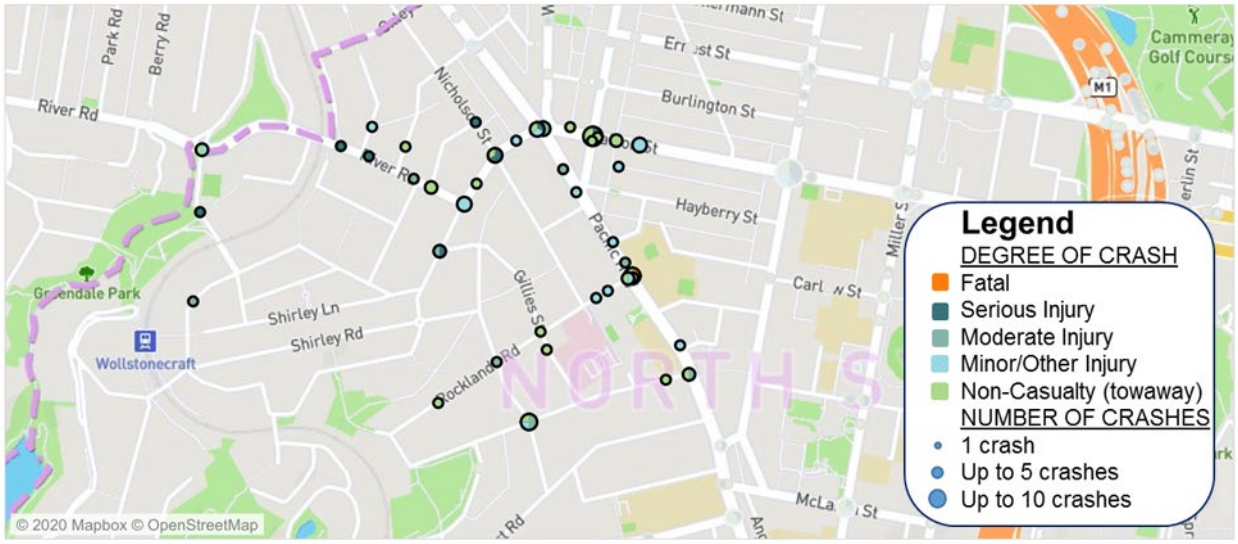
Source: North Sydney cycling map

Figure 2.16 North Sydney cycling map – Wollstonecraft

2.8 ROAD SAFETY

The area immediately surrounding Wollstonecraft Station including the potential haulage route (shown in Figure 4.2) has had no fatal incident within the five-year period between January 2014 and December 2018. A review of the crash data adjacent to Wollstonecraft Station indicates that one moderate injury crash was recorded at the curved section of Milner Crescent, approximately 150 m north of Shirley Road.

Figure 2.17 below shows the distribution of crashes in the area and along the proposed haulage routes including serious injury, moderate injury, minor/other injury and non-casualty (tow-away) crashes. Based on the minimal recorded incidents adjacent to the study area, there will be no concern for incidents during the Proposal even considering heavy vehicles and the haulage route.



Source: Crash and casualty statistics – interactive map TfNSW, Centre for Road Safety

Figure 2.17 Crash map

3 PROPOSED STATION UPGRADE

3.1 SCOPE OF WORKS

The following station upgrades are proposed at the Proposal to improve accessibility to public transport for all users. The scope of works identified include:

- Lifts and accessibility:
  - Construction of a new lift on Platform 1 connecting the Shirley Road entry
  - Accessible return ramp from Shirley Road and the Shirley Road Overbridge to Platform 1 lift
  - Construction of a new lift on Platform 2 connecting Telopea Road and the Shirley Road Overbridge
  - Accessible footbridge ramp from Shirley Road Overbridge to Platform 2 lift accessible path.
- Platform works:
  - Upgrading of the Boarding Assistance Zone on Platform 1 and 2 including new sheltered and wheelchair waiting areas
  - Stabilising and grading Platform 1 and 2 including new TGSIs and yellow line marking.
- Station building works including:
  - Reconfiguration of Platform 1 existing store room and toilets to accommodate one unisex family accessible toilet, two unisex ambulant toilets and maintaining the cleaners storeroom on Platform 1
  - Construction of a new Mains Switch Room at the southern end of the Platform 1 station building
  - Minor modification to upgrade the ventilation for the existing communications equipment room
  - Modifications to the Platform 1 waiting area to provide level access entry to the station
  - Floor levelling of the existing waiting room on Platform 2 to provide accessible entry.
- Shirley Road and Overbridge works including:
  - Widening and regrading of the footpath on the Shirley Road Overbridge into the carriageway
  - Removal of existing billboard advertisements
  - Reconfiguration and reduction in size of the existing overbridge traffic lanes and medians
  - Installation of new compliant handrails to the roadside of the footpath
  - Modifications to eastern and western access points on Shirley Road Overbridge approaches with ramps.
- Intermodal upgrades:
  - Provision of one new accessible car parking space and one kiss and ride bay on Shirley Road
  - Relocation of existing mail zone further east two car spaces from current location
  - Provision of new direct accessible path from the new kiss and ride bay and DDA car parking space to the proposed lifts
  - Relocation of the existing bike racks on the Platform 1 side of the station to accommodate a new Mains Switch Board and enclosure.

- Ancillary works including:
  - Provision of new TGSIs, safety zone markings, line marking and handrails
  - Provision of accessible seating on the eastern station entrance
  - Installation of additional CCTV cameras, hearing loops and upgrading of Public Address system to accommodate the new works
  - New wayfinding signage, Opal card readers, public telephones and rubbish bins
  - Provision of electrical upgrade to support the operation of the new lifts and station operations with installation of AusGrid transformer (about 3600 square metres) near Shirley Road entrance of Platform 1.

3.2 CONSTRUCTION ACTIVITIES

Subject to approval, construction is expected to commence in Q3 2020 and take around 18 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.

The proposed construction activities for the Proposal are identified in Table 3.1. This staging is indicative only and is based on the current concept design and may change once the detailed design methodology is finalised.

Table 3.1 Indicative construction staging for key activities

Stage	Activities	Timing (Indicative)
Activity 1: Site establishment and enabling work	— Establish site compounds (i.e. erecting fencing, tree protection zones, site offices, amenities and plant/material storage areas). — Establish temporary facilities as required (e.g. temporary access stairs, temporary toilets, temporary construction lights etc.). — Erect site hoarding/fencing as required. — Service location or relocation.	Standard hours, out of hours and night-works
Activity 2: Lift work	— Excavate and rock breaking for lift pits/foundations. — Waterproof (as required), install reinforcement, formwork and concrete to form the lift pit. — Erect glass and steel shaft structure. — Lift installation and commissioning. — Implement architectural fit-out around lift shaft including new awning over the lift.	Standard hours, night-works and rail possession period
Activity 3: Ramp upgrade	— Perform earthworks for new ramp grading. — Install ramp formwork and structure. — Install ramp fitout of new hand rails, seating and TGSI's.	Standard hours and out of hours
Activity 4: Kiss-and-ride and accessible car parking space	— Reconfigure the existing roadway (kerb, line marking, etc.) to accommodate the upgraded accessible parking and kiss-and-ride bays.	Standard hours and rail possession period

Stage	Activities	Timing (Indicative)
Activity 5: Shirley Road Overbridge work	— Realign traffic lane markings on Shirley Road Overbridge and tie in with west and east approaches. — Widen northern side footpath on bridge.	Standard hours and rail possession period
Activity 6: Station building works	Platform 1: — Construct new family accessible toilet, two unisex ambulant toilets and reconfigured cleaners storeroom — Install new ventilation in existing communications room — Upgrade the general station infrastructure including wayfinding signage, CCTV etc. where applicable — Install a new Switch Board room. Platform 1 and 2: — Install new shelters for Boarding Assistance Zones — Upgrade the general station infrastructure including DDA signage, CCTV etc. where applicable.	Standard hours and rail possession period
Activity 7: Platform stabilisation and upgrade work	Platform 1 and 2: — Excavate platforms and construct in-situ concrete surfaces including raising platform height and grading platform surface as required for accessible path — Floor lowering to existing entrances and shelters — Relocate platform furniture along accessible paths — Install new yellow line and tactiles along platforms.	Standard hours or rail possession period
Demobilisation	— Install other ancillary features and landscaping. — Remove hoardings. — Clear site. — Remove environmental, safety and traffic controls.	Standard hours

3.3 WORKING HOURS

Most of the works required for the Proposal would be undertaken during recommended standard (NSW) Environment Protection Authority (EPA) construction hours, which are as follows:

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

Certain works may need to occur outside recommended standard hours and would include night works and works during routine rail shutdowns, which are scheduled 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 works are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. It is estimated that approximately four rail shutdowns would be utilised to facilitate the following activities:

- Site survey and services location investigations within and around the rail corridor
- Piling, excavation of pits and installation of lift shafts
- stabilisation and grading of platforms
- Installation of electrical containment
- Services relocations.

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, Version 4.1 2019).

3.4 WORKFORCE

The peak number of construction vehicles and workforce for the Proposal is expected as follows:

- Light vehicles movements:
  - Ten per week throughout the duration of project
  - Twenty per possession
- Heavy vehicles movements:
  - Five per week throughout the duration of project
  - Fifteen per possession
- Construction workforce estimates:
  - Fifteen workers daily throughout the duration of project
  - One hundred workers per possession.

3.5 PLANT AND EQUIPMENT

An indicative list of the plant and equipment that would be required as part of the project is provided below. Additional equipment that would likely to be used would be identified during detailed design by the construction contractor.

- Trucks
- Jack hammer
- Chainsaw
- Piling rig
- Franna/mobile cranes
- Coring machine
- Water cart
- Suction trucks
- Hi-rail plant (flatbed trucks, hiab trucks, dump trucks)
- Rail mounted elevated
- Forklift
- Benders
- Vibrating roller/compaction plate
- Road rail excavator
- Bobcat
- Excavator
- Demolition saw
- Elevated work platform (ewp)
- Concrete pump and truck
- Lighting towers
- Hand tools
- Skip trucks
- Hammer drills
- Torque wrenches
- Impact wrenches
- Grinders.

4 CONSTRUCTION IMPACTS

4.1 SITE COMPOUND

Temporary construction compounds would be required to accommodate construction activities associated with the Proposal including a site office, amenities, laydown and storage area for materials, parking for workforce and storage of construction plant and equipment. The proposed construction compounds are shown in Figure 4.1 including:

- Main compound site, the existing commuter car park located along the eastern side of the railway line, south of Shirley Road. The site compound layout with the commuter car park has not been finalised yet, but it is expected that it will be set up at the southern end of the car park. During typical construction periods, the site compound will occupy half of the commuter car park leaving 18 car parking spaces for commuters. However, the site compound will occupy the entire commuter car park and access won't be allowed for commuters during possession periods.
- Additional sites, including grassed areas on the western side of Wollstonecraft Station.
- Additional site north of the station on TfNSW owned land which can be accessed from Russell Street (referred to the northern site compound in this Report).

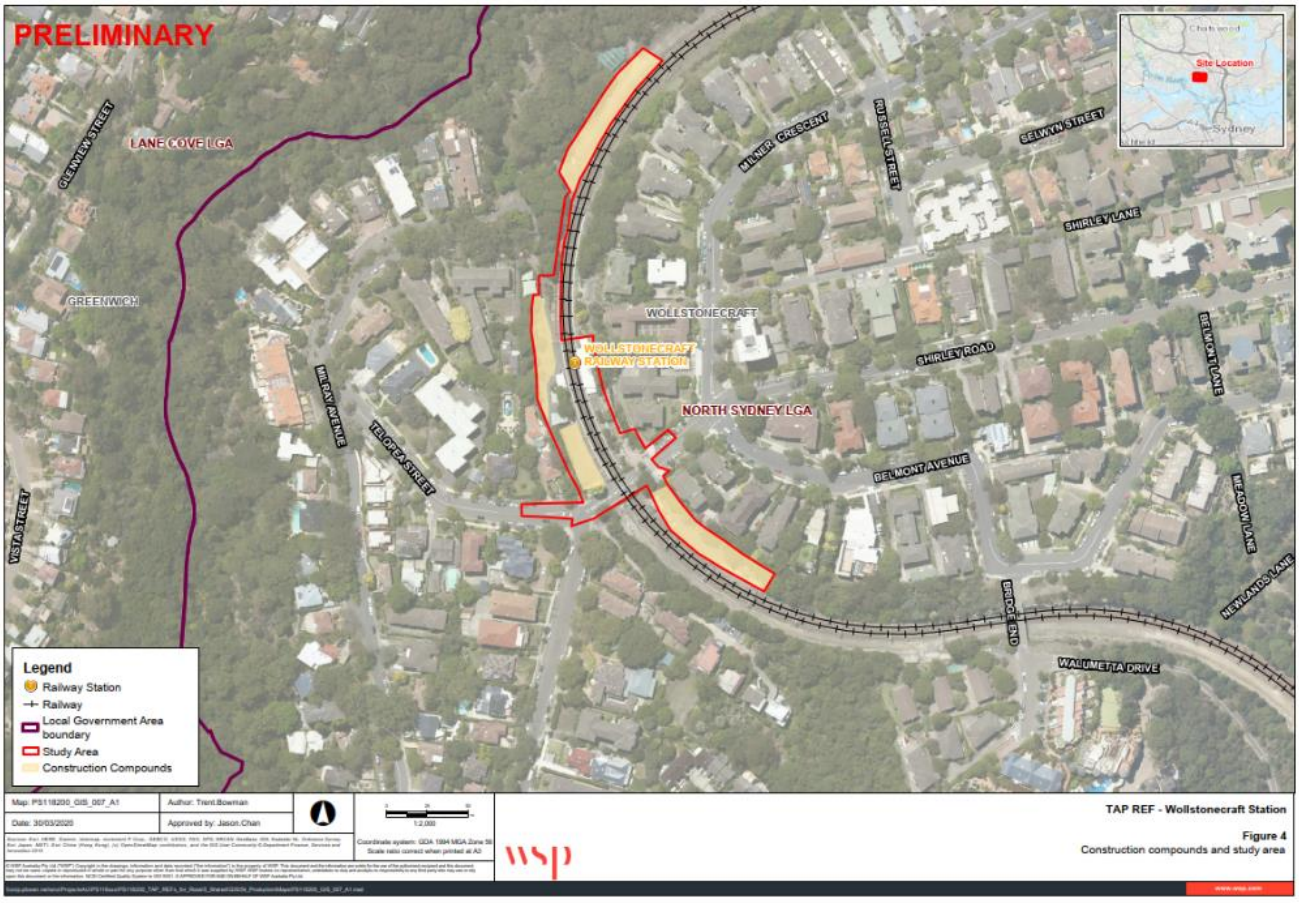


Figure 4.1 Proposed site compound locations

4.2 HAULAGE ROUTES

The road network around Wollstonecraft Station is restricted and may not be suitable to accommodate large heavy vehicles. With no definitive haulage route identified at this stage, Figure 4.2 outlines the potential haulage routes that can cater for heavy vehicle access to and from the compound site. The final construction haulage route would be determined by the nominated construction contractor during the detailed design of the proposal.

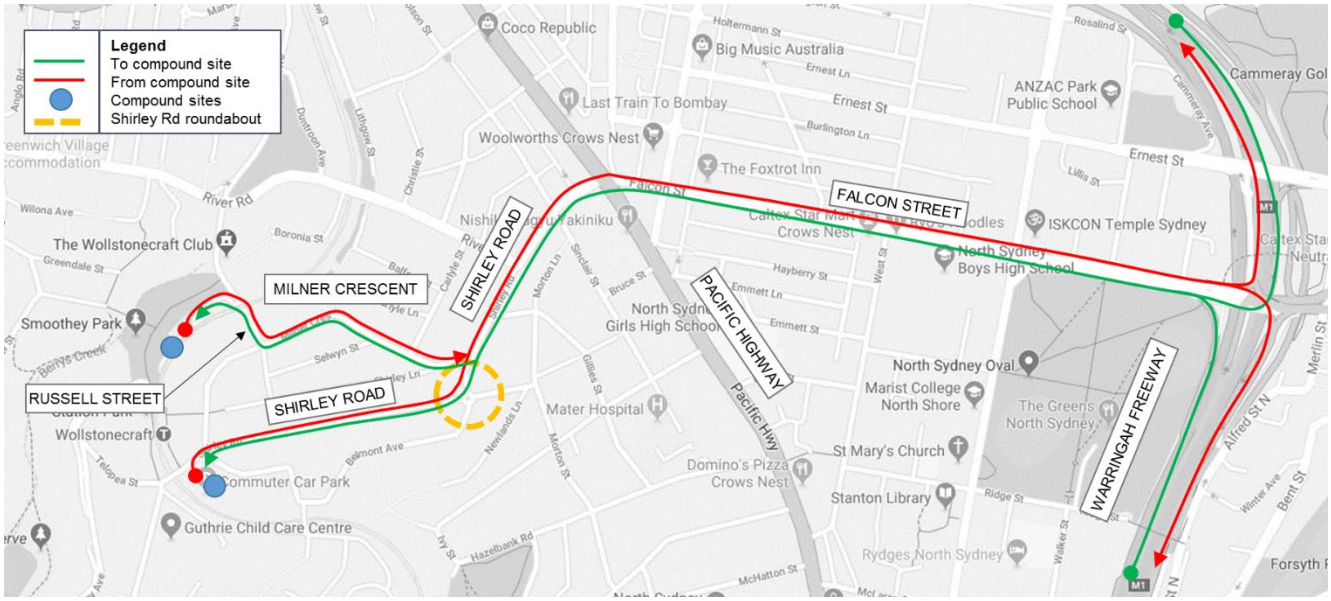


Figure 4.2 Potential haulage routes

The Pacific Highway between North Sydney and St Leonards is not identified as an approved 19-metre B-double route so the potential route involves accessing Shirley Road, Falcon Street and the Warringah Freeway as indicated in Figure 4.2. Additionally, turn movements from the Pacific Highway into Shirley Road would prove difficult to complete in large vehicles so have been avoided, with the more direct and straight alignment route to/from the Warringah Freeway via Falcon Street proposed.

The roundabout at the Shirley Road/Newlands Street/Belmont Avenue intersection (circled in Figure 4.2) may not be suitable for large heavy vehicles due to a tree (and associated canopy) located in the centre of the roundabout island.

The existing access between the northern site compound site and Russell Street would not typically be suitable for heavy vehicles due to the narrow road width and tight curve and height difference at the Russell Street intersection (shown in Figure 4.3). Heavy vehicle access plans would be prepared as a part of the construction traffic control management that would be implemented during the construction period.

These routes are preliminary options based on current information which does not include the design construction vehicles. These routes will be subject to swept path analysis using the design vehicle to ensure they are suitable. Until such time when the construction methodology and design vehicles are further established, these are the preferred option. This is reiterated in the mitigation strategy.

Figure 4.3 Tight curve and height difference at the Russell Street intersection

4.3 TRAFFIC IMPACTS

The vehicles generated by the proposed works are expected to be mostly light vehicles (including utility vans) from construction workers. Trips generated by heavy vehicles are expected to be minimal and infrequent and associated with the delivery and removal of materials, plants, and equipment as required. As in Chapter 3, the traffic generated as a part of the construction works is not expected to exceed 20 light vehicles and three heavy vehicles on average per day during the typical construction period.

During the rail possession period, it is expected that the construction contractor(s) would consider organising transport including the use of shuttle buses to/from the nearest open railway station to reduce the load on surrounding roads. Workers will also be encouraged to carpool. Incorporating these assumptions measures, it is expected that less than 50 light vehicle and 15 heavy vehicle movements would be generated per day during rail possession periods. Given the minimal traffic generated during construction, including both staff light vehicle trips and construction heavy vehicle trips, the surrounding road network and intersections would comfortably accommodate the project related vehicle trips and continue to perform within capacity.

The main traffic impact based on proposed construction and upgrades include the partial closure of Shirley Road which is the only access in and out of the area west of the station. Access along Shirley Road would mostly be maintained throughout construction however an eastbound lane closure would be required over the railway bridge during possession periods for works including lift installation involving a crane. As a result, travel time and congestion on Shirley Road would be increased and longer delays and queues would be expected at nearby intersections during the lane closure periods.

A site inspection was undertaken on 23 January 2020 during peak periods at Wollstonecraft Station indicating minimal traffic and congestion under current operation. This was during school holidays which may account for reduced traffic although it is assumed that what was observed is an accurate reflection of current operation and congestion based on anecdotal evidence. Where possible, lane closures would be utilised at night to minimise traffic impacts at busier times. Based on this, we envisage no significant queueing during periods of the Shirley Road lane closure, on the proviso that appropriate traffic management controls, such as traffic controllers directing traffic and closure warning signage, are in place.

4.4 PARKING IMPACTS

The main construction impact caused by the Proposal will be the full and partial closures of the commuter car park over the entire 18-month period. During typical construction periods, a partial closure will result in loss of up to 18 car parking spaces. The commuter car park will be fully closed during possession periods which result in a loss of 36 car parking spaces. There were no alternative sites found within a 500 m radius of Wollstonecraft Station to temporarily relocate the commuter car park. During the site inspection, it was observed that all car parking spaces in the commuter car park were fully occupied. With those 18 to 36 unrestricted parking spaces unavailable during construction, alternatives for commuter parking during construction are:

- Finding on-street parking as identified in Figure 2.5 resulting in an extended walk to the station and overall longer travel time – availability was noted during the site visit within the identified unrestricted areas
- Catching public transport from another station, changing the travel time likely making it longer.

Construction parking will be limited to the compound sites located within the existing commuter car park and also the northern site compound. Providing the shuttle service mentioned in section 4.3 between the nearest railway station or pick up point will reduce load on the commuter car park as there will be insufficient parking available for all 100 workers. Considering this, sufficient off-street parking would be provided for workers and Transport for NSW staff that travel to site inside of the compound site to ensure that there is no overspill onto on-street parking in nearby streets.

Based on the partial closure, there may be some limitations in commuter turning movements with the construction site and construction vehicles conflicting with commuter traffic and parking.

4.5 PEDESTRIAN IMPACTS

The existing access points to Wollstonecraft Station would be maintained during the typical construction work period. There will only be impacts to pedestrians outside of possession periods. Access will not be required during possession periods as there will be no train services so any closures will have minimal impacts. Impacts to pedestrians will only occur if one or more of the accesses are closed, requiring pedestrians to circle the station and enter via the alternative entrances, increasing overall trip journey time. Possible access closures would still allow for access to bus stops on Milner Crescent and access to either platform via the underpass. These closures would be managed with pedestrian detour measures including traffic controllers (for pedestrians) and detour signs directing pedestrians to alternative accesses.

Outside of the rail possessions, access on and to the stations would be maintained during construction and any works to be undertaken within these areas would be managed and controlled at all times to ensure that there is no impact to public safety.

Another minor impact is the lane closure on Shirley Road for the crane location as well as upgrades to the northern footpath along the Shirley Road bridge over railway lines. This will require pedestrians to use the southern kerb footpath which is very narrow as shown in Figure 4.4 and would likely require traffic control (pedestrian) and bollards/cones set up for safety.

Figure 4.4 Narrow southern footpath on Shirley Road Overbridge

4.6 CYCLIST IMPACTS

Impacts to cyclists will be minimal and only occur during the Shirley Road short-term and temporary lane closure for cranes and footpath upgrades as well as the relocation of cycle parking. All other roads and shared cycle paths will remain open and only need some traffic management as with general traffic. Considering cycle parking relocation, it will be necessary, during the short changeover period with limited formal parking for cyclists at the station, to find alternative parking areas for their equipment such as the cycle hoops north of the station.

4.7 PUBLIC TRANSPORT IMPACTS

Wollstonecraft Station and the nearby bus stop would remain operational during the normal day to day construction periods to ensure no impact on these services occurs.

During track possession periods, it is expected that bus replacement services will be provided to service rail customers. Public bus operation will not be affected by the proposed station upgrade works and will continue to run from Milner Crescent. No impacts are anticipated to existing bus or rail services operation during construction.

4.8 KISS AND RIDE IMPACTS

During construction, there may be temporary disruptions to access of the kiss and ride facilities around the station. However, the potential impacts would be expected to be short term. Passengers would be able to use time restricted, on-street parking spaces for this purpose.

4.9 EMERGENCY VEHICLE ACCESS

Access for emergency vehicles would be maintained at the construction sites in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes. Advice would include information about upcoming lane closure, traffic disruptions, anticipated delays to traffic, extended times of work and locations of any road possessions.

5 OPERATIONAL IMPACTS

5.1 TRAFFIC IMPACTS

Given that the proposed upgrade provides a higher level of station accessibility and usability at Wollstonecraft Station, the improved commuter experience is likely to attract greater commuter use. However, the proposed scope of works is not anticipated to have a direct increase in traffic generation during operation. Therefore, negligible traffic impacts are expected with the proposed upgrades.

5.2 PARKING IMPACTS

The existing commuter car park will fully reopen at the completion of construction and the number of car parking spaces would be maintained. All other on-street parking is to return to normal operation post upgrades. The proposed DDA accessible car parking spaces and kiss and ride bay on the northern side of Shirley Road are anticipated to have a positive impact for customers. As per the design snapshot in Figure 5.1, the proposed accessible parking space and kiss and ride bay will occupy on the existing mail zone and a ½P restricted parking space. While this will occupy up to two short term spaces, none of the commuters will be impacted.

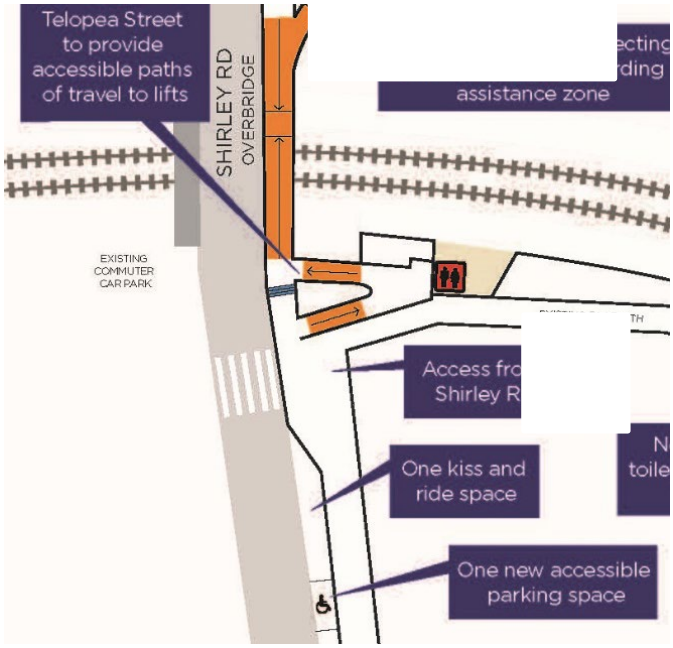


Figure 5.1 Proposed accessible parking

Current car park demand at the commuter car park and surrounding local streets are high. However, the proposal will result in minimal changes to the overall parking supply and thus have minimal impact on current users.

5.3 PEDESTRIAN AND CYCLIST IMPACTS

The proposed pedestrian facilities including the new lifts and ramps and upgraded stairs would present pedestrian benefits, particularly the user experience by providing improved facilities. Pedestrians and cyclists' access would be improved by providing DDA compliant ramps and stairs from street level to the station platform. This would improve the accessibility of the station for customers with disabilities, customers with less mobility, parents/carers with prams, and customers with luggage.

Once the proposal is constructed, it is anticipated that the pedestrian access and flow would remain generally consistent as the proposal has been designed to maintain/improve pedestrian manoeuvrability throughout the station precinct. The proposal will also allow for accessible movement within the precinct across all transport modes, in particular to and from the train station platform and external road network and bus stops.

The exact location for a bike rack and expected capacity is yet to be confirmed, but the bicycle storage facility at the Platform 1 entry adjacent to Milray Avenue will be relocated and provided in the station precinct.

5.4 PUBLIC TRANSPORT IMPACTS

The Proposal will not impact bus or rail operation. Improved station accessibility to bus and station by providing a lift could encourage public transport use and transfer from buses to trains.

6 SUMMARY

This report is being prepared to assess the impacts of the project for purposes of the REF. The following mitigation measures have been identified to minimise impacts during construction of the proposal and operation beyond this for the Wollstonecraft Station surrounds.

6.1 GENERAL MITIGATION MEASURES FOR CONSTRUCTION PERIOD

The following general mitigation measures can be implemented to minimise impacts during the construction of the proposal:

- Prior to the commencement of construction, a Construction Traffic Management Plan (CTMP) would be prepared as part of the Construction Environmental Management Plan and would include at a minimum:
  - Ensuring adequate regulatory road signage, line marking and all other traffic control devices necessary to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised.
  - Maintaining a reasonable level of public access across the rail corridor and to public transport services.
  - Ensuring access to the railway station is always maintained outside of the scheduled track possession periods.
  - Ensuring access to stations, businesses, and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made).
  - Managing impacts and changes to on and off-street parking and requirements for any temporary replacement provision.
  - Parking locations for construction workers to be limited within the site compound and details of how this will be monitored for compliance.
  - Routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses.
  - Consultation with the relevant roads authorities would be undertaken during preparation of the CTMP and obtaining necessary Road Occupancy Licences for temporary road closures. The performance of all project traffic arrangements must be monitored during construction.
- Communication would be provided to the community and residents to inform them of changes to parking, pedestrian or cyclist access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site works.
- Suitable vehicle, pedestrian and cyclist paths would be maintained throughout the construction of the proposed upgrade to ensure safe and easy access throughout the interchange outside of the scheduled track possession periods.
- Suitable pedestrian provisions would be made to ensure that pedestrian connectivity between bus stops is not impacted as a part of the works and that suitable and safe paths are provided.
- Qualified traffic controllers would be used during construction works to ensure safe and efficient movement of vehicle and pedestrian traffic on the external road as well as in and out of the construction site.
- Fencing and barriers would be installed between construction site and outside construction zone to ensure safe and easy navigation of pedestrians and cyclists.

6.2 SITE SPECIFIC MITIGATION MEASURES

The following proposed mitigation measures are to address and reduce the level of impact to station patrons using the existing facilities:

- Whilst not a specific part of a CTMP, conducting a drive-through assessment or swept path analysis is highly recommended to ensure that sufficient manoeuvring space is provided for the largest design vehicle along the proposed haulage routes.
- Heavy vehicle access plans would be prepared as a part of the construction traffic control management that would be implemented during the construction period for access between the northern compound site and Russell Street.
- A Traffic Control Plan (TCP) to be developed for any construction works that requires lane closure on Shirley Road. TCP implementation will ensure adequate warning and guidance is provided to road users, thus minimising road related traffic impacts. TCP would be required to be submitted to Transport Management Centre (TMC), Transport for NSW, where required. This could also include management of general and construction vehicles entering and exiting the commuter car park and site compounds.
- TfNSW to acquire a road occupancy license and crane permits for operating on road.
- In parallel with lift installation, existing ramp access to Wollstonecraft Station platform level should be maintained. If any closure of the existing ramp access would be required for the lift installation, the construction works should be programmed to undertake during a scheduled track possession period to minimise the impacts to pedestrians.
- Staging new DDA compliant ramps, lifts and stairs (including demolishing existing non-complaint path) is necessary to minimise the impacts to pedestrians and cyclists accessing the station from the proposed works.
- Suitable access must be maintained between Wollstonecraft Station and the Shirley Road and Milray Avenue entrances during works to provide pedestrians with safe passage through or bypass of the construction areas and construction vehicle movements.
- Adequate width of vehicular and pedestrian paths should be provided with a temporary delineation during the westbound lane closure period over the Shirley Road overbridge.
- Ensure priority building of relocated cycle racks to limit impacts to cyclists by minimising time without parking facilities.

6.3 OPERATION

The proposed upgrades to Wollstonecraft Station are expected to improve the accessibility for all passengers and help integrate various transport modes within the area. The upgrades are anticipated to provide a safer passage for all users between destination and across transport modes.

No specific mitigation measures during operation of the proposal have been identified.