

Victoria Street Station Upgrade

Traffic, Transport and Access Impact Assessment



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Client: Transport for New South Wales

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1.0 Introduction

1.1 Background

Transport for NSW (TfNSW) has proposed the upgrade of Victoria Street Station (the 'Proposal'). The Proposal forms part of the Transport Access Program (TAP), a NSW Government initiative to provide accessible, modern, secure and integrated transport infrastructure. The aim is to provide accessible station precincts for the mobility impaired, the elderly and parents/carers with prams and to meet the needs of a growing population. Interchange facilities must allow for seamless transfer between all modes, and for all customers, and safety must be given priority to all design options.

In 2015, GHD (commissioned by TfNSW) produced accessibility upgrades concept plans and undertook options development and assessment for the Victoria Street Station Precinct. The report developed alternative concept plans to address station precinct deficiencies and a preferred concept was identified using a Multi-Criteria Assessment methodology.

The preferred concept has since been refined and is being progressed towards construction and implementation. As part of the Review of Environmental Factors (REF), AECOM has been commissioned by TfNSW to undertake a Traffic, Transport and Access Impact Assessment of the construction and operation of the Proposal.

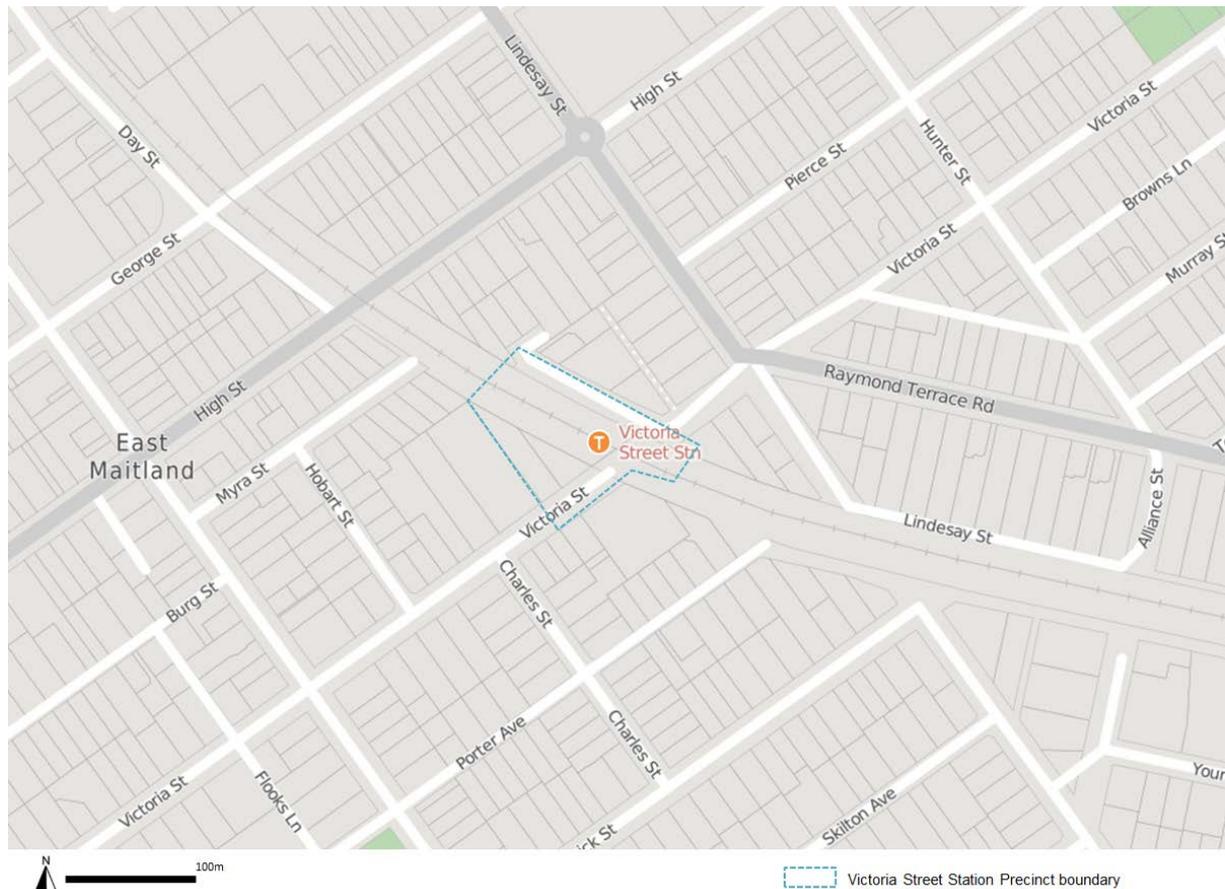
1.2 Proposal context

The objective of TfNSW's TAP is to "provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure". The program aims to provide station upgrades which will deliver components of this objective, as summarised below:

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

1.3 Study area

Victoria Street Station is located between Victoria Street (south) and Waller Street within the suburb of East Maitland. The Victoria Street Station Precinct includes the station, associated interchange facilities, gates, pedestrian and cycle access paths, pedestrian access, pedestrian linkages to the adjacent streets and bus stop, and commuter car parks. The indicative boundary definition of Victoria Street Precinct (i.e. study area) is shown in Figure 1. The broader East Maitland area was also considered in terms of the road network and potential traffic impacts on the northern and southern side of the station.

Figure 1 Location map

Source: AECOM, 2016

1.4 Proposed works

The Proposal involves an upgrade of Victoria Street Station to improve accessibility and amenities for customers. The Proposal would provide a number of improved features to provide an accessible station and improved interchange facilities, including:

- installation of three new lifts to provide access to the existing footbridge and island platform
- new canopies installed at both station entrances and along the existing footbridge, stairs, lift landings and platform
- upgrades to the northern and southern station entrances
- refurbishment of the Platform Building with a new family accessible toilet, staff amenities and communications room to replace existing facilities
- provision of new undercover bicycle racks on the northern and southern side of the station
- provision of a kiss and ride area and taxi rank on the northern side of the station on Waller Street
- provision of a new accessible parking space within Waller Street commuter car park on the northern side of the station
- new kerb ramps to provide an accessible path of travel to new and existing interchange facilities
- relocation of existing and installation of new services including communications systems and low and high voltage electrical cabling
- ancillary works including platform stabilisation and regrading, station power supply upgrade, minor drainage works, adjustments to lighting, upgrades to fencing and landscaping, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

A detailed description of the Proposal and its associated works are provided in Section 3 of the Victoria Street Station Upgrade Review of Environmental Factors (AECOM, 2017).

Construction is anticipated to commence mid-2017 and would take approximately 18 months to complete. It is likely that around six weekend rail shutdowns would be required.

The construction methodology would be further developed during the detailed design of the Proposal by the nominated contractor, in consultation with TfNSW.

1.5 Scope of the study

This Traffic, Transport and Access Impact Assessment provides a high level assessment of the potential impacts of the Proposal on transport, traffic, access and road safety. The purpose of this report is to:

- assess the existing traffic and transport conditions in and around Victoria Street Station Precinct
- evaluate the potential traffic generation caused by the Proposal and assess potential traffic impacts on the road network
- assess the impacts associated with construction and operation of the Proposal
- recommend mitigation measures to manage impacts, if required.

A site visit was undertaken on Wednesday 1 February 2017 to observe the existing conditions at the site. In addition, a number of technical documents were reviewed to inform the assessment of Victoria Street Station, including:

- Victoria Street Station Upgrade – Construction Staging Diagrams (Downer, 2016 and Arcadis, 2016)
- Victoria Street Station Upgrade – Pedestrian Modelling Report (Arcadis, 2016)
- Victoria Street Station Easy Access Upgrade – Concept Plan Report – Appendix M – Traffic, Transport and Access Impact Assessment (GHD, 2015).

2.0 Existing conditions

2.1 East Maitland context

The suburb of East Maitland is located approximately 30 kilometres northwest of Newcastle, within the Maitland Local Government Area (LGA).

East Maitland is bordered by the suburbs of South Maitland and Louth Park to the west, Metford and Ashtonfield to the east, Four Mile Creek to the south and Tenambit and Pitnacree to the north. The suburb is served by two stations, Victoria Street and East Maitland, both operating on the Hunter Line, providing connections to the Sydney Trains network (intercity and suburban).

The land use surrounding Victoria Street Station consists primarily of low density residential areas with a local centre to the west. Figure 2 illustrates some of the key roads and land use features in East Maitland, including community facilities, schools, parks and reserves.

Figure 2 East Maitland context



Source: AECOM, 2017

2.2 Victoria Street Station

Victoria Street Station is served by the Hunter Line providing train services between Hamilton and Dungog/Scone. Figure 3 shows Victoria Street Station on the Sydney Intercity Trains network.

Figure 3 Location of Victoria Street Station on the Sydney Trains network



Source: Sydney Trains, 2017 (modified by AECOM 2017)

The main station entrances are from Waller Street to the north and Victoria Street (south) to the south. The station divides Victoria Street and is currently accessed by non-DDA compliant stairs on either side of the existing footbridge, which crosses the railway. Stairs provide the only means of access from the existing footbridge to the island platform. The existing footbridge and stairs also provide an access point for pedestrians and cyclists to

cross the railway. There are also no canopies for weather protection above the existing footbridge and stairs and minimal canopies on the island platform.

The station consists of one island platform (Platform 1 and 2). Both platforms are currently used for through train services in each direction. The number of services at Victoria Street Station during the AM and PM two hour peak periods are shown in Table 1.

Table 1 Rail services at Victoria Street Station

Key Destination	AM Weekday Peak (07:00-09:00)	PM Weekday Peak(16:00-18:00)
Victoria Street to Hamilton	7 services	4 services
Victoria Street to Maitland	6 services	6 services

Source: Sydney Trains, 2017

2.2.1 Current train passenger travel demand

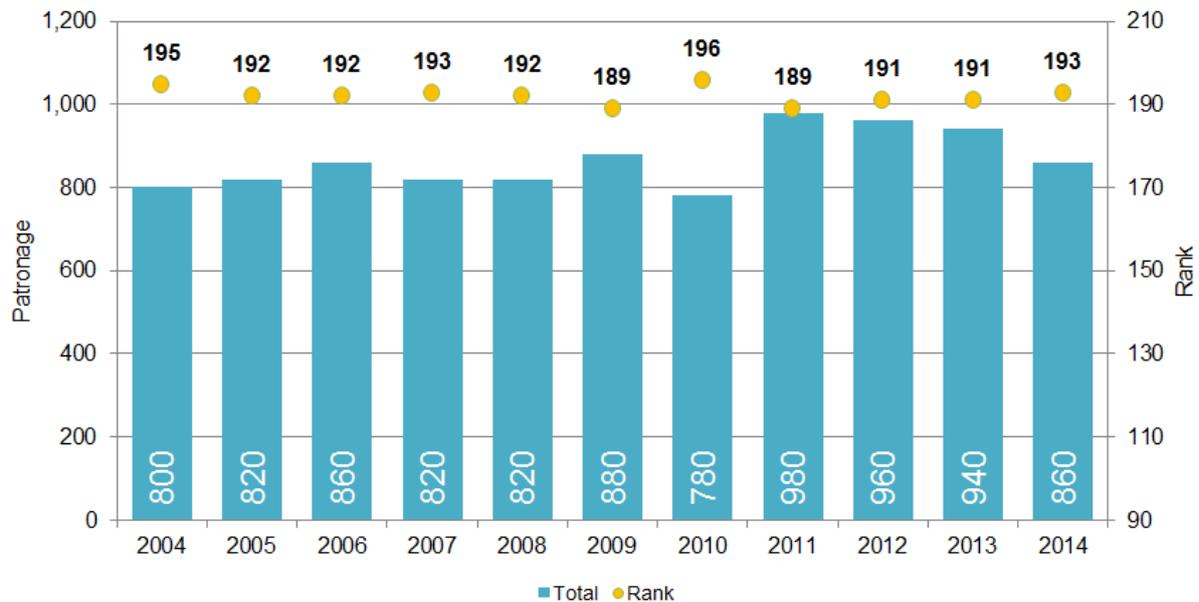
Station barrier counts obtained from the Bureau of Transport Statistics reveal Victoria Street Station is the 193rd busiest station on the Sydney Trains network with approximately 860 trips per average weekday recorded in 2014. A breakdown of the 2014 station entries and exits are provided in Table 2.

Table 2 Victoria Street Station 2014 barrier counts

Time period	In (number of customers)	Out (number of customers)
0200 – 0600	20	0
0600 – 0930	170	80
0930 – 1500	140	130
1500 – 1830	70	180
1830 – 0200	30	40
Total (24 hours)	430	430

Source: Station Barrier Counts – 2004 to 2014, Bureau of Transport Statistics, 2014

Historical patronage figures for Victoria Street Station are provided in Figure 4. The general trend in the data shows trips have fluctuated in the past 10 years with trips having gradually declined since 2011. The historical data reflects patronage prior to the closure of the Newcastle Line between Hamilton and Newcastle Station on 24 December 2014.

Figure 4 Historical patronage data at Victoria Street Station

Source: Station Barrier Counts – 2004 to 2014, Bureau of Transport Statistics, 2016

2.2.2 Access mode split

As part of the *Victoria Street Station Easy Access Upgrade – Traffic, Transport and Access Impact Assessment* (GHD, 2015), a Station Access Mode Survey was undertaken for Victoria Street Station on 15 December 2014 to determine how passengers accessed the station. The results are presented in Table 3, which show the primary mode of access is by foot, accounting for about half of trips during the AM peak.

Table 3 Victoria Street Station access modes - 2015

Access Mode	AM peak (06:30-09:30)
Walk	49 per cent
Bus	5 per cent
Commuter car park (park and ride)	20 per cent
Commuter car lift (kiss and ride)	20 per cent
Other	6 per cent

Source: GHD, 2015

2.2.3 Station accessibility

The station is located between Waller Street and Victoria Street, with access to the station provided via stairs and the existing footbridge over the railway. Access to Platforms 1 and 2 is via stairs from the existing footbridge.

The majority of the station facilities are located on the platform level and there are currently a number of interchange facilities provided at Victoria Street Station, as shown in Table 4.

Table 4 Victoria Street Station facilities

Accessibility	General facilities	Transport interchange
<ul style="list-style-type: none"> - Stairs - Hearing loop - Portable boarding ramp 	<ul style="list-style-type: none"> - Opal ticketing machine - Toilets - Payphone - Help point - Ticket office - Platform canopies and seating 	<ul style="list-style-type: none"> - Bus stop - Commuter car parks

Source: Sydney Trains, 2017

2.2.4 Pedestrian facilities

Pedestrian access to Victoria Street Station is provided from Waller Street and Victoria Street (south), via non-DDA compliant stairs and the existing footbridge over the railway. Footpaths are present along both sides of Victoria Street (south) and the western side of Victoria Street (north). No footpaths are present along Waller Street. There is also an off-road shared path provided along the southern boundary of the railway corridor between High Street and Victoria Street (south) and the corner of Brunswick Street and Fieldsend Street.

The existing footbridge and stairs provide an access point for pedestrians to cross the rail corridor from Waller Street to Victoria Street (south). The current form of access is currently restricted for mobility impaired persons due to the lack of accessible facilities as shown in Figure 5.

In addition, Tactile Ground Surface Indicators (TGSIs) have not been provided at the edge of the platform or stairs to assist the vision impaired.

Figure 5 Existing footbridge and stairs



Source: AECOM, 2017

Access to the station for pedestrians is facilitated by a network of footpaths within East Maitland. Figure 6 highlight some of the key pedestrian facilities in the vicinity of Victoria Street Station.

The Station Access Mode Survey undertaken by GHD showed access to/from the station was divided equally between the northern and southern sides.

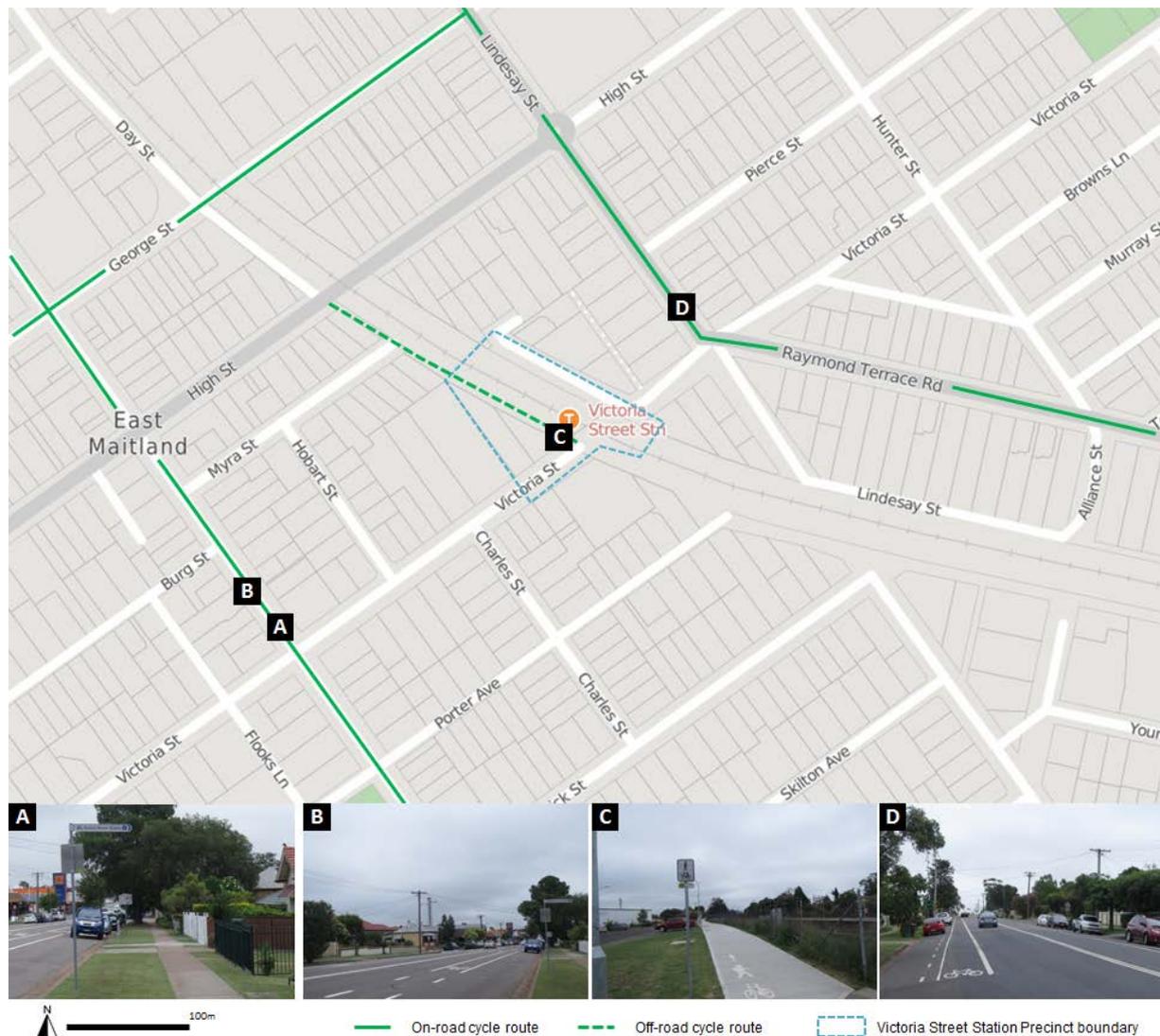
Figure 6 Pedestrian facilities



2.2.5 Cycling facilities

A network of on-street and off-street cycle paths provide cycle connectivity to Victoria Street Station. On-street cycle paths are provided along Lawes Street and Lindesay Street / Raymond Terrace Road, which links onto Victoria Street. An off-road shared path is provided along the southern boundary of the railway corridor between High Street and Victoria Street (south) and the corner of Brunswick Street and Fieldsend Street.

Although there are formal cycle routes in the vicinity of the station, there are currently no bicycle storage facilities provided within the station precinct. Figure 7 presents existing cycle routes in the vicinity of the Victoria Street Station Precinct.

Figure 7 Cycle routes around Victoria Street Station

Source: AECOM, 2017

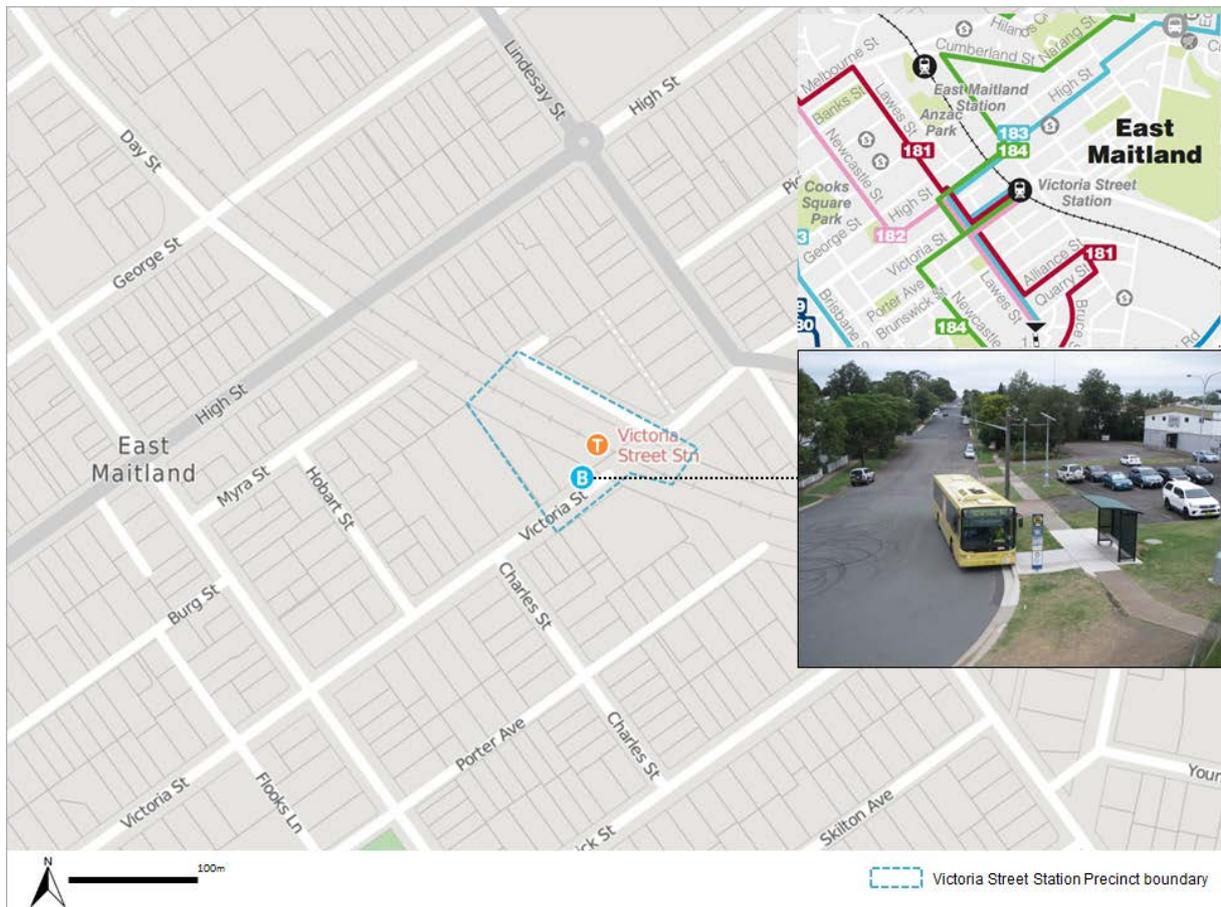
2.2.6 Bus services and facilities

Figure 8 presents the bus stop and bus services that serve Victoria Street Station. There is one bus stop located along Victoria Street (south) within walking distance to the station. Four bus routes serve the bus stop, which is operated by Hunter Valley Buses. These routes include:

- Route 181: Aberglasslyn to Woodberry via Rutherford, Maitland, East Maitland, Stockland Green Hills and Beresford
- Route 182: Rutherford to Thornton via Maitland, East Maitland, Stockland Green Hills and Ashtonfield
- Route 183: Rutherford to Tenambit via Maitland, East Maitland and Stockland Green Hills
- Route 184: Stockland Green Hills to Morpeth via East Maitland and Tenambit.

These bus routes connect residential areas to local transport interchanges, as well as employment and retail areas. The bus stop at Victoria Street (south) provides seating and shelter with an accessible wheelchair space.

Figure 8 Bus stops and services



Source: AECOM, 2017

2.2.7 Parking facilities

Commuter car parking facilities are currently provided on both sides of Victoria Street Station. An off-street commuter car park is located south of the station, along Victoria Street (south), providing 58 unrestricted car parking spaces. On-street (90 degree angle) parking is located north of the station, along Waller Street, providing 41 unrestricted car parking spaces. Unrestricted on-street parking is also provided along Victoria Street (south and north), Waller Street and on the surrounding local road network. There are currently no accessible car parking spaces provided at either car parking facility.

A review of the capacity of both car parking facilities was undertaken during the site visit on 1 February 2017. It was observed the northern and southern car park had spare capacity at around midday (during a weekday), operating at approximately 44 per cent and 22 per cent respectively.

Figure 9 Parking facilities

Source: AECOM, 2017

2.2.8 Kiss and ride facilities

There is currently no formal kiss and ride zone for Victoria Street Station, however there is sufficient on-street and off-street parking areas to facilitate the demand for drop-off and pick-up vehicles. Site observations showed that informal kiss and ride was performed near the station entrances.

2.2.9 Taxi facilities

There is currently no taxi rank provided at the station. Site observations showed taxi pick-up and drop-off occurred near the station entrances, as shown in Figure 10.

2.3 Road network

The key existing roads in the vicinity of the study area include Victoria Street (north and south), Waller Street, Lawes Street and Lindsay Street / Raymond Terrace Road as shown in Figure 1. This section outlines the road network with respect to the Victoria Street Station Precinct, providing a description of each key road.

2.3.1 Waller Street

Waller Street is a local cul-de-sac with one lane in each direction providing connectivity to Victoria Street Station from the north. The road continues as Victoria Street (north) to the northeast which intersects with Lindsay Street / Raymond Terrace Road. Figure 10 shows that the road provides on-street parking on either side of the road and serves the residential dwellings along the road. The default urban speed limit of 50km/h applies as there is no posted speed limit sign.

Figure 10 View of Waller Street (eastbound)



Source: AECOM, 2017

2.3.2 Victoria Street

Victoria Street is a local road which provides one traffic lane and one on-street parking lane in each direction. The road is divided by the station as Victoria Street (south) and Victoria Street (north) and provides connections to the main streets of East Maitland and the station entrances. Victoria Street provides direct pedestrian access to Victoria Street Station from both the north (via Waller Street) and south.

As shown in Figure 11, Victoria Street (south) provides access to the off-street Victoria Street commuter car park and bus stop and ends as a cul-de-sac allowing vehicles (including busses) to u-turn. Victoria Street (north) continues as Waller Street (refer to section 2.3.1). The default urban speed limit of 50km/h applies in the vicinity of the station as there is no posted speed limit sign.

Figure 11 View of Victoria Street (south) (northbound)



Source: AECOM, 2017

2.3.3 Raymond Terrace Road / Lindsay Street

Raymond Terrace Road, which continues onto Lindsay Street north-west bound is a Roads and Maritime Services (Roads and Maritime) State Road providing one traffic lane and one on-street parking lane in each direction and is located north of the station. The road provides a connection to Cumberland Street to the west and Seaham Road to the east. Close to the station, it has an advisory speed limit of 35km/h due to the crest of the road at Victoria Street (north). As shown in Figure 12, on-street cycle paths are provided along the road. To the south of this junction, Lindsay Street is not classified as a Roads and Maritime State Road.

Figure 12 Lindsay Street / Raymond Terrace Road (northbound)



Source: AECOM, 2017

2.3.4 Lawes Street

Lawes Street is a collector road providing one traffic lane and one on-street parking lane in each direction and is located west of the station. It has a posted speed of 50km/hr with the exception of a high pedestrian activity zone (40 km/h) near the local centre.

Figure 13 View of Lawes Street (southbound)



Source: AECOM, 2017

2.4 Travel mode choice

Travel data obtained from the Bureau of Transport Statistics provides an insight into the Journey to Work characteristics of residents in East Maitland. The Bureau of Transport Statistics uses the Australian Bureau of Statistics (ABS) data collected during the 2011 Census, which includes method of travel to work at a travel zone (TZ) level. TZ 6609 and 6610 represents the immediate catchment area (within about 800 metres of Victoria Street Station), with the data from these travel zones summarised in Table 5.

It should be noted that the first results of the 2016 Census will be released in April 2017 and as such were not available to inform this assessment.

Table 5 Journey to work data (TZ 6609 and 6610)

Mode of travel	East Maitland ¹ (Number)	East Maitland ¹ (per cent)
Train	84	5
Bus	10	1
Car – as driver	1,288	82
Car – as passenger	98	6
Walked only	45	3
Mode not stated	27	2
Other	15	1

Note 1: Excludes those who did not go to work

Source: Bureau of Transport Statistics, 2011

The 2011 Journey to Work data shows that the majority of trips from East Maitland were made by car, with approximately 88 per cent of trips attributable to this mode (including car drivers and passengers). Five per cent of trips were made by train.

The main destinations of the Journey to Work trips taken from East Maitland are shown in Table 6. The majority of trips from East Maitland are to Maitland (64 per cent). Other common destinations include Newcastle, Lower Hunter, Port Stephens and Lake Macquarie.

Table 6 Destination of journey to work travel

Destination of travel	Percentage
Maitland	64
Newcastle	13
Lower Hunter	9
Port Stephens	7
Lake Macquarie	6
Maitland	64
Other	1

Source: Bureau of Transport Statistics, 2011

3.0 Construction activities

3.1 Overview

The construction of the Proposal would include the following activities:

- establishment of site compound (erect fencing, tree protection zones, site offices, amenities and plant/material storage areas)
- establishment of temporary facilities as required (e.g. temporary pedestrian access to station, temporary toilets)
- removal of vegetation
- services relocation and installation including trenching along Victoria Street (north) and Lindesay Street for high voltage cabling
- platform modification, including piling and foundations for lift shafts
- construction of lift shafts, stairs, fencing and new canopies
- installation of lifts
- installation of fixtures, lighting, signage and CCTV cameras for the station areas
- reconfiguration of the Platform Building to allow for communications, staff facilities and toilets including a family accessible toilet
- refurbishment of the Platform Building
- provision of new accessible car spaces, taxi and kiss and ride zones and bicycle racks
- installation of wayfinding signage
- electrical and power supply upgrade works
- replanting/landscaping, fencing adjustments and bollards.

3.2 Construction vehicles

In facilitating these construction activities, various plant and equipment are likely to be required. These would include a combination of:

- | | | |
|------------------------------------|--------------------------|----------------------|
| - Trucks (semi-trailer and tipper) | - wacker packer | - manitou (forklift) |
| - generator | - nail gun | - scissor lift |
| - bobcat | - impact drill | - franna crane |
| - hand tools | - chainsaw | - lightning tower |
| - mulcher | - excavator (with auger) | - mobile crane |
| - concrete pump | - line marking truck | - bobcat |
| - piling rig | - coring machine | - slasher |
| - concrete truck | - demolition saw | - plate compactor |
| - hydreaama/hirail (type of truck) | - jack hammer | - vacuum truck |
| | - grinder | - mini excavator |

Minor volumes of heavy vehicles are likely to be generated during the construction phase when transportation of concrete, equipment, preformed structures etc. is required. Construction vehicles movements are expected to include approximately one to 12 vehicles per day Monday to Saturday and between five to 20 vehicles per day during weekend possessions.

The size of vehicles used for haulage would be consistent with the access route constraints, safety and any worksite constraints. Some construction activities (such as the delivery of precast sections) may require truck and

trailer combinations or semi-trailers. Access arrangements for these vehicles would be defined in the construction Traffic Management Plan (TMP) prepared by the contractor during detailed design.

3.3 Working hours

Construction is expected to commence mid-2017 and take around 18 months to complete. The majority of construction work at Victoria Street Station would be limited to the standard construction hours as recommended by the Environmental Protection Authority (EPA):

- Monday – Friday: 7:00 am – 6:00 pm
- Saturday: 8:00 am – 1:00 pm
- Sunday / Public holidays: No work without prior approval from TfNSW.

However, it may be necessary to undertake certain construction activities, such as overnight concrete pours and delivery of oversized materials, outside of the standard construction hours so as to facilitate structural design requirements and minimise traffic disruption. For any out of hours works, prior approval would need to be obtained from TfNSW by the contractor.

Weekend rail possessions may be necessary to undertake a number of construction activities, which would require prior approval from TfNSW as well as community notification.

The construction methodology would be further developed during the detailed design of the Proposal by the nominated contractor in consultation with TfNSW.

3.4 Site hoarding

The design of hoardings for worksite compounds would be carefully considered and installed, given the level of pedestrian activity that occurs during peak periods. All construction hoardings would:

- comply with relevant codes and standards
- have smooth surfaces particularly for areas adjacent to footpaths to allow pedestrians to brush past without snagging
- free of trip hazards at the base of the hoardings
- be clean and have a regular inspection of the surfaces
- have adequate lighting.

Worksite hoardings would discourage entry without approval and minimise vandalism. All access points to fenced compounds would have lockable gates and appropriate information signs would be provided at the worksites to identify the project, safety and communication protocols.

3.5 Ancillary facilities

Temporary construction compounds would be required to accommodate a site office, amenities, laydown and storage area for materials. The following locations are being considered for use as construction compounds:

- an area west of the Victoria Street commuter car park
- an area to the east of the Victoria Street (south) cul-de-sac.

Temporary storage/laydown areas may also be required on the station platform.

The areas nominated for the temporary construction compound and laydown areas are located on land owned by RailCorp (managed by Sydney Trains), Maitland City Council and Crown land. Impacts associated with utilising these areas have been considered in the environmental impact assessment, including requirements for rehabilitation.

Figure 14 shows the proposed works areas and the construction compound location.

Figure 14 Proposed works area



3.6 Construction vehicle routes

Figure 15 shows the potential access routes to each side of the station entrance, as well as Roads and Maritime Services approved B-double routes surrounding the station. The station is near the New England Highway, which is an approved B-double route. This route provides high clearances and sufficient road widths to accommodate larger vehicles, making them ideal for the haulage routes.

Heavy vehicle movements in proximity to the East Maitland Local Centre and local schools, including Maitland High School, would be restricted during peak times and school zone hours.

Figure 15 Proposed haulage routes (indicative only, subject to detailed design)



Source: AECOM, 2017

3.7 Site security, site access and signage

Access to work areas would consider:

- safety of travelling public
- safety of construction workers and equipment
- impact on local communities in terms of safety, noise and road damage
- ease of access for emergency vehicles
- site security, particularly outside work hours.

3.8 Worker induction

All workers and sub-contractors engaged during the construction phase would be inducted prior to any commencement of works. The induction would identify the construction haulage routes, local speed zones, worksite protocols, staff parking facilities / public transport availability / carpooling opportunities and emergency / incident management strategies. Workers would be encouraged to park away from the station during the works.

3.9 Temporary diversions

No temporary diversions have been identified. If required, the potential locations of temporary diversions will need to be identified in the construction TMP and Road Occupancy Licences would be sought as required.

4.0 Construction impacts

4.1 Public transport

Bus services in the vicinity of the Proposal would not be majorly affected during construction. Bus services along Victoria Street (south) would continue to operate during construction activities, however may experience minor impacts, such as delays when performing u-turns at the cul-de-sac as construction vehicles access the construction compound and the temporary relocation of the bus stop.

This would result in reduced speeds and potential diversions, however it is anticipated that buses would continue to service the bus stops as usual for the majority of the time. Any diversions or changes to bus services, or temporary relocation of bus stops, would be undertaken in consultation with bus service operators and would be adequately sign-posted with appropriate community notification of any changes.

4.2 Pedestrians

The station access stairs would be partially closed to facilitate upgrades which include upgrading and installation of safety features such as stair nosing, tactiles and handrails. Existing station access via the station access stairs (to both the island platform and across the railway line) would be maintained during construction.

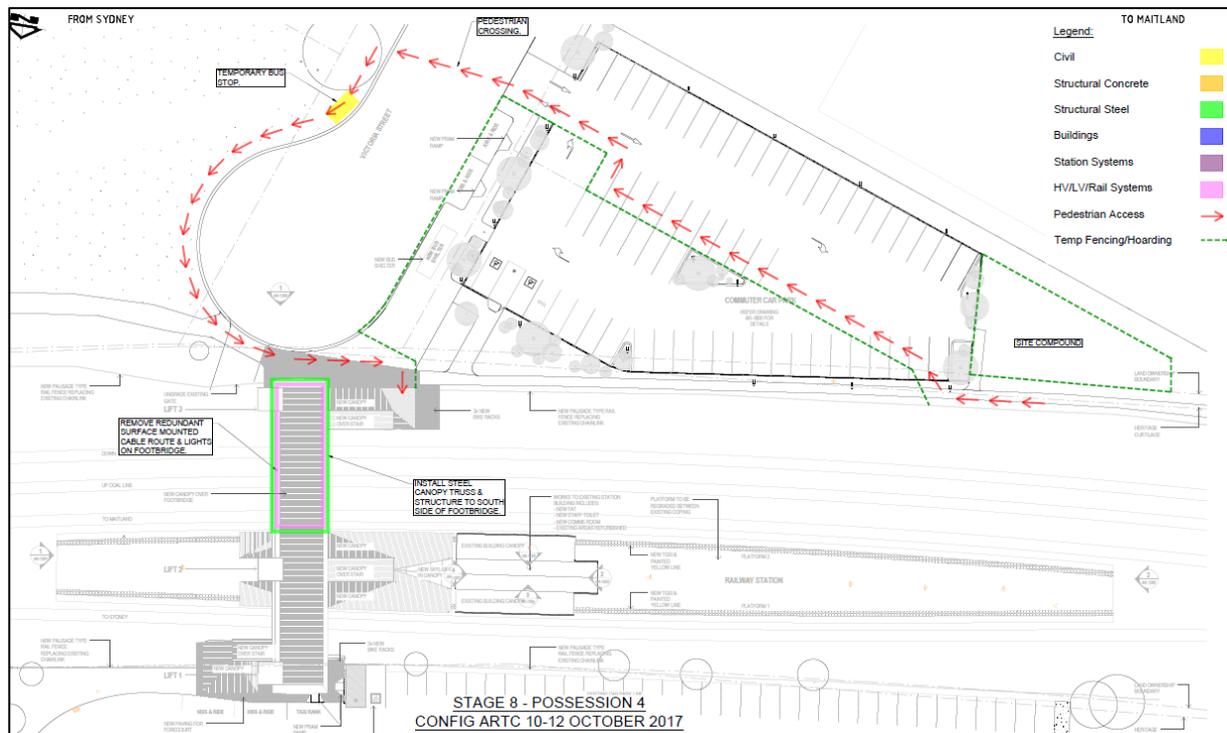
During construction, pedestrian movements on the island platform would be temporarily impacted due to the reduced amount of space from construction ancillary facilities where required. The reduced space on the platform may increase pedestrian congestion and reduce the amount of standing area for customers. However, the majority of proposed works on the platforms, particularly for the new lifts, would be restricted to the eastern end of the platform away from the Platform Building, canopies and seating where customers are likely to wait for trains. Appropriate directional signage would be provided to minimise any potential impacts to pedestrian movement on the platform.

Platform stabilisation and regrading works would also temporarily impact pedestrian access to, from and around the platform. During re-grading, temporary surfacing would be provided to eliminate trip hazards for customers using the platforms. Re-grading and re-surfacing works would also be scheduled to be completed during low pedestrian flows where appropriate.

Construction works would be undertaken in a manner to ensure that public access routes to the station are maintained. Temporary disruptions to the existing pedestrian facilities surrounding the station would be experienced, particularly for pedestrians accessing the station from Victoria Street (south) as construction works for the proposed interchange facilities are being undertaken as part of the Victoria Street commuter car park upgrade works. Trenching works along Victoria Street (north) and Lindesay Street would also have a temporary impact on pedestrian access along from Waller Street. This has the potential for increased safety risks for pedestrians, due to potential interactions with construction plant and vehicles. Appropriate signs or traffic controllers would be positioned to notify pedestrians of the temporary arrangements. Any interaction between construction vehicles and pedestrians would be managed and controlled by traffic controllers. Impacts to pedestrians during construction would be managed through the development of a construction TMP. There is an opportunity for the installation of a paved footpath along the eastern side of Victoria Street (north) following trenching works. This would provide an accessible path of travel on both side of Victoria Street (north) along this section of road improving access to Victoria Street Station. This will be considered during detailed design development.

An example of impacts to pedestrians during construction is shown Figure 16, which shows pedestrians being diverted during construction of the Victoria Street commuter car park upgrade. These works may occur at the same time as the Victoria Street Station upgrades but may require the temporary closure of a section of the shared path located south of the station.

Figure 16 Pedestrian access impact during construction



Source: Downer, 2016 and Arcadis, 2016

Mitigation measures would be subject to further consideration during detailed design and construction planning in consultation with the relevant authorities. Notification would be provided to the community on alternative transport arrangements (including changes to pedestrian access).

4.3 Cyclists

There may be a minor impact to cyclists accessing Victoria Street Station from the south as a section of the shared path south of the station is temporarily diverted as shown in Figure 16. Cyclists would be diverted around the construction area and access to the station would be maintained throughout construction.

4.4 Kiss and ride / taxi

There are currently no formal kiss and ride zone or taxi spaces provided near Victoria Street Station. Impacts to existing informal pick up and drop off activities are considered unlikely given the amount of available space surrounding the station.

4.5 Parking impacts

The operation of the northern commuter car park on Waller Street would be temporarily affected during the construction of the Proposal. The Victoria Street commuter car park (south) would may also be unavailable during upgrades. As a result, this would increase the demand for on-street parking within the local network in the short term.

Parking provisions are not proposed for staff vehicles within or adjacent to the construction site, instead construction workers would be encouraged to car-pool or use adjacent public transport services. However, it is expected a portion of workers would travel via private vehicles which may also marginally increase the demand for on-street parking within the surrounding local streets. Workers would not be permitted to park in untimed spaces on streets adjacent to the station. The construction TMP would be prepared to manage the impacts of construction traffic parking.

Overall, with the current availability of on-street and off-street parking surrounding Victoria Street Station, the impact of a decrease in on-street parking in the short term would be minor.

4.6 Traffic

Traffic generated by construction vehicles, including staff vehicles, is likely to be minimal given the nature of the works proposed and would fluctuate dependant on the construction stage. Construction vehicles movements are expected to include approximately one to 12 vehicles per day Monday to Saturday and between five to 20 vehicles per day during weekend possessions.

Work zones to construct the proposed interchange facilities along Waller Street and Victoria Street (south) (as part of the Victoria Street commuter car park upgrade works) may require temporary or partial lane closures and/or traffic diversions. Road Occupancy License(s) would be sought as required. Road works would be undertaken progressively and in the minimum area and timeframe required to undertake the particular phase of work. Signage would be displayed around work areas to inform the public.

It may also be necessary to undertake other construction activities, such as concrete pours and delivery of oversized materials, outside standard construction hours to minimise traffic disruption.

Access for emergency vehicles would be maintained in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes.

Overall, provided the proposed traffic management measures are implemented, the likely impact to traffic during construction is expected to be manageable and would not have a major impact on the level of service of the surrounding road network.

4.7 Property access

During construction, there is potential for temporary disruptions to private property access for residents along Waller Street, Victoria Street (north and south) and Lindesay Street. Given the availability of space in the Victoria Street cul-de-sac, temporary disruptions to private property access on the southern station are considered unlikely. Property access would be maintained, where possible, to minimise the impact to local residents. However, during activities such as the delivery and unloading of oversized materials, and trenching for the installation of new services, short term impacts to property access may be necessary. In such incidences, affected occupants would be notified in advance of the scheduled works.

4.8 Emergency vehicle access

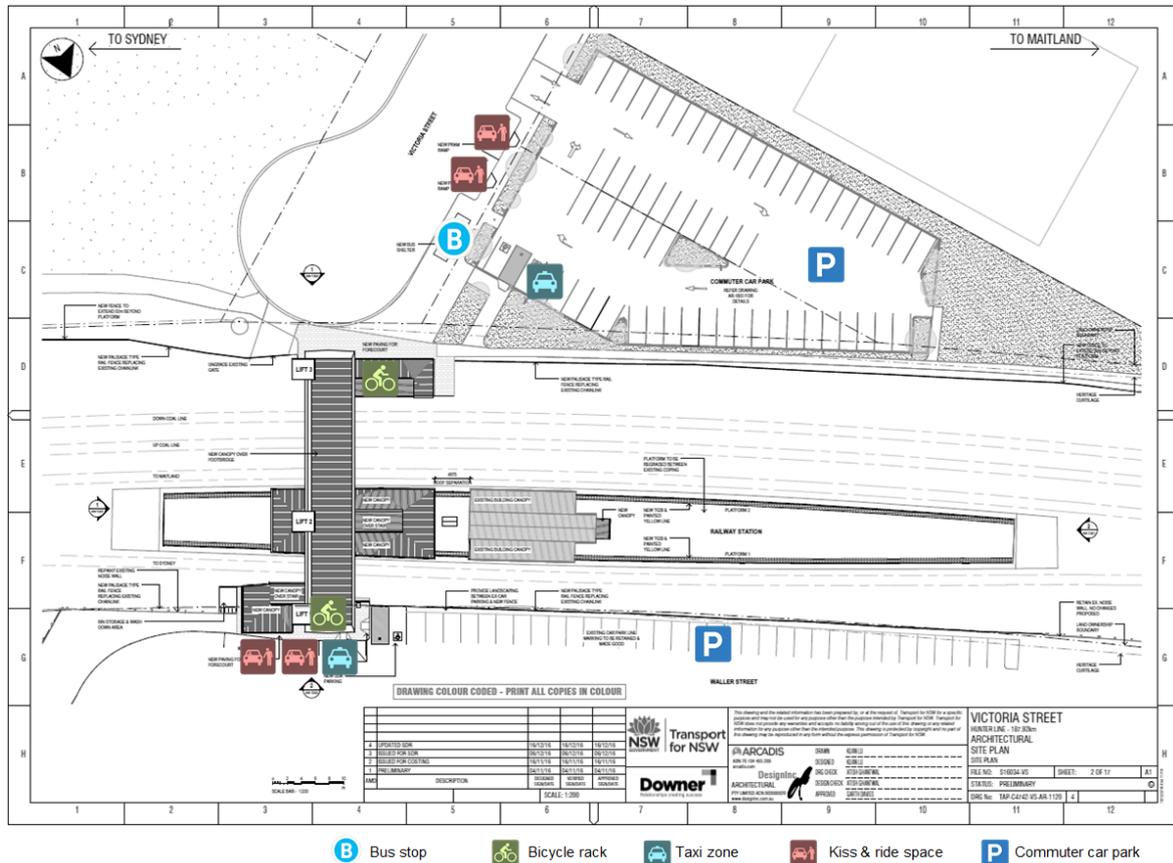
Access for emergency vehicles would be maintained at the construction sites in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes. Advice would include information about upcoming traffic disruptions,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

5.0 Operational impacts

5.1 The Proposal

The operational layout of interchange facilities for the Proposal on Waller Street and the Victoria Street commuter car park upgrade works are shown together to present the final interchange configuration in Figure 17.

Figure 17 Proposed interchange facilities



Source: Downer, 2016 and Design Inc, 2016

5.2 Future demand

The Bureau of Transport Statistics has provided patronage forecasts for Victoria Street Station based on its Strategic Travel Model, where it is expected daily patronage will increase to approximately 1,080 by 2036. For design assessment purposes, an additional 15 per cent has been used to account for the trips expected to be generated by the Victoria Street Station due to improvements in facilities as part of the proposed upgrades. The patronage forecasts are provided in Table 7.

Table 7 Patronage forecasts

Year	AM peak entries ²	AM peak exits ²	24 hour (entries and exits)
2014	170	80	860
2036	221	110	1,080
2036 (+15 per cent) ¹	254	127	1,242

Notes:

1 - an additional 15 per cent has been added to the forecast years for design assessment purposes

2 – period of 3.5 hours in the morning from 6am to 9.30am

Source: Arcadis and TfNSW, 2016

The Proposal has been designed to account for the predicted patronage forecasts. Detailed design would consider future patronage demands as part of the design considerations.

It is unknown whether the patronage forecasts have taken into consideration the truncation of the Newcastle Line as part of the *Newcastle Urban Renewal Strategy (2014)*, which removes the heavy rail line between Wickham and Newcastle Station for the provision of high frequency light rail services. For the purpose of this assessment, this has not been taken into consideration as it is unlikely to have a significant impact on patronage numbers at the station and therefore influence the Proposal design. Refer to Section 5.4 for the pedestrian modelling outcomes, which show the existing footbridge and stairs have the capacity to accommodate the forecast peak passenger demand.

5.3 Public transport

The Proposal does not include changes to bus/rail services as part of the works and would not impact on the operation (service operation or timetabling) of public transport in the vicinity of Victoria Street Station. The Proposal includes improved interchange facilities and improved pedestrian access to Victoria Street Station, which may increase rail patronage. It is anticipated that the additional rail patronage would mainly generate walking trips. However, with improved accessibility to Victoria Street Station and interchange facilities (on Victoria Street (south) and Waller Street), it is anticipated that the provision of formal kiss and ride facilities would be more frequently used by commuters in and around the precinct.

The existing bus stops on Victoria Street (south) shows TGSIs to indicate boarding points have been removed. These facilities are not proposed as part of the Proposal or Victoria Street commuter car park upgrade works, it is recommended that this be investigated as a potential additional improvement during detailed design.

5.4 Pedestrians

The Proposal would improve facilities and offer significant benefits to pedestrians, including:

- installation of three new lifts to provide an accessible path of travel to and from the station and across the railway line
- improvements to the forecourt area at both station entrances
- provision of TGSIs at the edge of the island platform and stairs landings
- provision of canopies along the existing footbridge and stairs to provide weather protection and help improve customer experience
- improved wayfinding signage.

The design shows TGSIs are to be provided at stair landings; however none are proposed at the top of the stairs. It is recommended that this be investigated as a potential additional improvement during detailed design.

The Proposal would improve the user experience in the vicinity of the station with the potential to encourage more customers to walk to the station. The pedestrian modelling undertaken for the Concept Design by Arcadis indicates that under conditions of the Proposal, the existing footbridge and stairs would achieve a level of service (LoS) C or better for the 2036 + 15 per cent patronage forecast during the PM peak which is considered the critical time period during the day. This LoS is considered acceptable under the National Construction Code as determined by the Building Code of Australia.

Table 8 Pedestrian modelling results

Year	Forecast peak minute passenger flow (2036)	Required width to achieve LoS C (metres)	Existing width (metres)
Platform 1/2 stairs	29	0.9 m	2.7 m
Station access stairs (south)	13	0.4 m	3.0 m
Station access stairs (south)	16	0.5 m	3.0 m
Existing footbridge (south)	27	0.5 m	3.0 m
Existing footbridge (north)	32	0.6 m	3.0 m

Source: Arcadis, 2016

5.5 Cyclists

The Proposal includes the provision of five undercover bicycle racks with a capacity for 10 bicycles each at both station entrances. A total of 20 undercover bicycle spaces would be provided.

Victoria Street Station is classified as a Level C interchange, which requires a minimum of 10 bicycle rack spaces. The provision of bicycle racks as part of the Proposal meets the bicycle storage requirements for the station, and is consistent with the objectives of the NSW Government's Bike and Ride initiative to encourage improved cycling facilities and transport interchanges.

The introduction of bicycle storage facilities in the vicinity of the station is likely to encourage active transport as a mode of access to the station precinct.

5.6 Kiss and ride / taxi

The Proposal includes the provision of two kiss and ride spaces to the north of the station. Two kiss and ride spaces would also be provided on the southern side of the station as part of the Victoria Street commuter car park upgrade works. Both kiss and ride zones are located close to the station entrances.

A formal taxi zone is also proposed as part of the Proposal, providing one space on the northern side of the station, adjacent to the kiss and ride zone on Waller Street. These changes would result in the loss of five on-street (90 degree angle) unrestricted parking spaces on Waller Street (north of the station). One taxi space would also be provided as part of the Victoria Street commuter car park upgrade works. In summary, the Proposal would provide formal area for kiss and ride and taxi activity to occur near Victoria Street Station, which are currently lacking.

5.7 Parking

The Proposal improves the provision of accessible parking at Victoria Street Station by providing accessible parking spaces within the Victoria Street Station Precinct.

One accessible parking space would be provided at the on-street (90 degree angle) parking on Waller Street. In total, the provision of interchange facilities on Waller Street (including the upgrade forecourt area, one accessible parking space, one taxi space and two kiss and ride spaces) would result in the loss of five on-street (90 degree angle) unrestricted parking spaces on Waller Street.

The loss of the short term on-street parking spaces would have a minor impact as there is currently spare capacity at both commuter car parks. While a net loss of parking is not ideal, the loss in parking would facilitate other transport interchange facilities for the station precinct.

As part of the Victoria Street commuter car park upgrade works, the off-street commuter car park along Victoria Street (south) is proposed to be upgraded to provide two accessible parking spaces, one taxi zone and 58 parking spaces. Other proposed upgrades to the off-street Victoria Street commuter car park include:

- consolidating the current two points of access to a single access point
- introduction of a one-way loop circulation system within the off-street commuter car park
- resurfacing, linemarking and provision of kerb ramps.

5.8 Traffic

The Proposal would assist in making public transport infrastructure more accessible to rail customers and provide an easier transition between transport modes, which would likely increase patronage. It is anticipated however that the additional rail patronage would mainly generate walking trips to the station (rather than additional traffic) and the improved kiss and ride facilities would provide formal areas for customer drop-off (reducing potential illegal drop-offs which may impede road traffic movements).

No additional commuter parking is proposed as part of The Proposal, so the increase in future road traffic is expected to be minimal and it is considered that the Proposal would have a negligible impact on traffic in the local road network.

5.9 Property access

No changes to private property access would be required as part of the operation of the Proposal.

6.0 Recommendations

Mitigation measures would be implemented to minimise traffic, transport and access impacts during construction and operation of the Proposal.

6.1 Construction Traffic Management Plan

Prior to the commencement of construction, a construction Traffic Management Plan (TMP) would be prepared as part of the Construction Environmental Management Plan and would include as a minimum:

- ensuring adequate road signage at construction work sites 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
- maximising safety and accessibility for pedestrians and cyclists
- ensuring adequate sight lines to allow for safe entry and exit from the site
- ensuring access to railway stations and residential properties is maintained (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
- restricting parking for construction workers in untimed spaces adjacent to the station and busy residential areas and details of how this will be monitored for compliance
- ensuring heavy vehicle movements in proximity to the East Maitland Local Centre and schools, including Maitland High School, would be restricted during peak times and school zone hours
- details for relocating bus stops, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired
- measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the construction TMP
- should parking be provided for staff it is recommended parking is provided on-site on open land within the rail corridor to mitigate the impact, with encouragement made for construction workers to carpool or use public transport.

Consultation with the relevant roads authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.

6.2 Mitigation measures

The following additional mitigation measures are recommended to minimise traffic, transport and access impacts:

- consideration should be given to providing a paved footpath along Victoria Street (north) to improve accessibility to the station
- an investigation into potential improvements to the station stairs should be undertaken during detailed design. This would include as a minimum the potential installation of Tactile Ground Surface Indicators (TGSIs) to identify stair edging
- communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site works
- Road Occupancy Licences for temporary road closures would be obtained, where required
- construction works would be scheduled to minimise temporary loss of interchange facilities and available parking, including during works on the new station entrances including bicycle racks, kiss and ride areas and parking upgrades.

References

AECOM, 2017, *Review of Environmental Factors – Victoria Street Upgrade, Sydney*

Arcadis, 2016, *Victoria Street Station Upgrade – Pedestrian Modelling Report*

Downer, 2016, *Victoria Street Station Upgrade – Reference Design Drawings*

GHD, 2015, *Victoria Street Station – Concept Plan Report – Appendix M – Traffic, Transport and Access Impact Assessment*

TfNSW, 2017, *Victoria Street Station Upgrade – Construction Methodology*