



Transport  
for NSW

# Wentworthville Station Easy Access Upgrade Review of Environmental Factors Transport Access Program



# Contents

<b>Executive summary</b>	<b>8</b>
1.1 Overview of the Proposal	12
1.2 Location of the Proposal	12
1.3 Existing infrastructure and land uses	15
1.4 Purpose of this Review of Environmental Factors	17
<b>2. Need for the Proposal</b>	<b>18</b>
2.1 Strategic justification	18
2.2 Alternative options considered	19
2.3 Justification for the preferred option	22
<b>3. Description of the Proposal</b>	<b>23</b>
3.1 The Proposal	23
3.2 Construction activities	30
3.3 Site provision	35
<b>4. Statutory considerations</b>	<b>36</b>
4.1 Commonwealth legislation	36
4.2 State legislation and regulations	36
4.3 NSW Government policies and strategies	39
4.4 State Environmental Planning Policies	41
4.5 Local Environmental Plans and Strategies	42
<b>5. Community and stakeholder consultation</b>	<b>46</b>
5.1 Consultation requirement	46
5.2 Consultation strategy	47
5.3 Consultation tools and activities	48
5.4 Public display period	48
5.5 Aboriginal community involvement	48
5.6 Government agency and stakeholder involvement	49
5.7 Ongoing consultation	50
<b>6. Environmental impact assessment</b>	<b>52</b>
6.1 Traffic and transport	52
6.2 Urban design, landscape and visual amenity	60

6.3	Noise and vibration	71
6.4	Indigenous heritage	80
6.5	Non-indigenous Heritage	81
6.6	Socio-economic impacts	90
6.7	Biodiversity	92
6.8	Contamination, landform, geology and soils	97
6.9	Hydrology and water quality	98
6.10	Air quality	100
6.11	Cumulative impacts	102
6.12	Climate change and sustainability	103
<b>7.</b>	<b>Environmental management</b>	<b>104</b>
7.1	Environmental management plans	104
7.2	Mitigation measures	104
<b>8.</b>	<b>Conclusion</b>	<b>113</b>
<b>References</b>		<b>114</b>
<b>Appendix 1 – Consideration of Clause 228 factors</b>		<b>116</b>
<b>Appendix 2 – Consideration of matters of national environmental significance</b>		<b>118</b>
<b>Appendix 3 – Results of noise modelling</b>		<b>119</b>

**Author:** Oliver Edgson  
**Reviewer:** Dennis Emery, Sarah Gartsky, Monique Roser, Jeremy Kidd, Ben Groth  
**Version:** 3.0  
**Date of issue:** December 2014

## Figures

Figure 1:	Planning approval and consultation process for the Proposal	11
Figure 2:	Regional context	13
Figure 3:	Proposed works footprint	13
Figure 4:	Elements of key works included as part of the Wentworthville Station Easy Access Upgrade	25
Figure 5:	Existing view of Wentworthville Station from Station Street	29
Figure 6:	Artists impression of the Proposal from Station Street	29
Figure 7:	Existing aerial view of Wentworthville Station	30
Figure 8:	Artists impression of the Proposal from an aerial perspective	31
Figure 9:	Holroyd LEP 2013 zoning map. Approximate footprint of the proposal is identified in blue.	45
Figure 10:	Parramatta LEP 2011 zoning map. Approximate footprint of the Proposal is identified in blue.	47
Figure 11:	Planning approval and consultation process	54
Figure 12:	Likely construction vehicle routes (northern station precinct)	59
Figure 13:	Likely construction vehicle routes (southern station precinct)	59
Figure 14:	Proposal viewshed	67
Figure 15:	Receiver locations for Visual Impact Assessment	68
Figure 16:	Sensitive receivers and noise monitoring locations	77
Figure 17:	Wentworthville Station heritage curtilage	86
Figure 18:	Wentworthville Memorial Fountain	87
Figure 19:	“Dobson House” No.6 and No.8 Station Street	87
Figure 20:	Vegetation impacts as a result of the Proposal	98

## Tables

Table 1:	Existing transport interchange arrangements	14
Table 2:	Indicative construction staging and works for key activities	34
Table 3:	Indicative construction plant and equipment	36
Table 4:	Other relevant legislation applicable to the Proposal	40
Table 5:	Relevant NSW Government policies/strategies	42
Table 6:	Relevant HELP 2013 aspects applicable to the Proposal	46
Table 7:	Relevant PELP 2011 aspects applicable to the proposal	47
Table 8:	Infrastructure SEPP consultation requirements	49
Table 9:	Bus service frequency at Wentworthville Station	57
Table 10:	Visual Significance Matrix	69
Table 11:	Sensitive receivers within the vicinity of the Proposal	76
Table 12:	Noise Management Levels developed in line with ICNG	78
Table 13:	Estimated vibration levels	81
Table 14:	Heritage items within the vicinity of the works	84
Table 15:	Impact of the Proposal on heritage items	88
Table 16:	Impact of the Proposal on biodiversity	96
Table 17:	Tree removal assessment	97
Table 18:	Daily air quality results for Sydney East region in August 2014	103
Table 19:	Proposed mitigation measures	107

# Abbreviations

<b>AHIMS</b>	Aboriginal Heritage Information Management System
<b>BCA</b>	Building Code of Australia
<b>CCP</b>	Commuter Car Park
<b>CEMP</b>	Construction Environmental Management Plan
<b>CPTED</b>	Crime Prevention Through Environmental Design
<b>CTMP</b>	Construction Traffic Management Plan
<b>DDA</b>	<i>Disability Discrimination Act 1992</i> (Commonwealth)
<b>DPE</b>	NSW Department of Planning and Environment
<b>DSI</b>	Detailed Site Investigation (Phase II Contamination Investigation)
<b>EPA</b>	Environment Protection Authority
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act 1979</i>
<b>EP&amp;A Regulation</b>	<i>Environmental Planning and Assessment Regulation 2000</i>
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
<b>ESD</b>	Ecologically Sustainable Development (refer to Definitions)
<b>FM Act</b>	<i>Fisheries Management Act 1994</i>
<b>Heritage Act</b>	<i>Heritage Act 1977</i>
<b>Infrastructure SEPP</b>	<i>State Environmental Planning Policy (Infrastructure) 2007</i>
<b>LEP</b>	Local Environmental Plan
<b>LGA</b>	Local Government Area
<b>LoS</b>	Level of Service
<b>MWL</b>	Main West Line
<b>NES</b>	National Environmental Significance
<b>Noxious Weeds Act</b>	<i>Noxious Weeds Act 1993</i>
<b>NPW Act</b>	<i>National Parks and Wildlife Act 1974</i>
<b>PA system</b>	Public Address System
<b>PID</b>	Passenger Information Display
<b>POEO Act</b>	<i>Protection of the Environment Operations Act 1997</i>
<b>OEH</b>	Office of the Environment and Heritage
<b>RailCorp</b>	former Rail Corporation of NSW (now Sydney Trains)
<b>RAP</b>	Remediation Action Plan
<b>REF</b>	Review of Environmental Factors
<b>RMS</b>	Roads and Maritime Services (formerly Roads and Traffic Authority)
<b>SEPP</b>	State Environmental Planning Policy
<b>TPD</b>	Transport Projects Division (TfNSW)
<b>TfNSW</b>	Transport for NSW
<b>TCP</b>	Traffic Control Plan
<b>TSC Act</b>	<i>Threatened Species Conservation Act 1995</i>
<b>TVM</b>	Ticket Vending Machine

# Definitions

**Ecologically Sustainable Development** Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased (refer to Section 4.2.2).

**The Proposal** The construction and operation of the Wentworthville Station Easy Access Upgrade works.

**Sydney Trains** From 1 July 2013, Sydney Trains replaced RailCorp as the new rail operator. Sydney Trains is tasked with delivering metropolitan rail customers a better service.

# Executive summary

Transport for NSW (TfNSW) is the proponent for the Wentworthville Station Easy Access Upgrade Project (the Proposal). TfNSW is the government agency responsible for the delivery of major transport infrastructure projects in NSW.

The Proposal is part of the Transport Access Program which is a NSW Government initiative to deliver accessible, modern, secure and integrated transport infrastructure where it is needed most.

This Review of Environmental Factors (REF) has been prepared to assess the environmental impacts associated with the construction and operation of the Proposal under the provisions of Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

## Description of the Proposal

The Proposal is designed to improve pedestrian access to and from the station, increase Wentworthville Stations ability to cope with the predicted future patronage demands, improve pedestrian flow, passenger information services and wayfinding between transport modes.

The Proposal would include the following key features:

- retention, repairs and repainting of the existing footbridge structure
- retention of the existing ramps
- installation of four new lifts:
  - one at each station entrance
  - one to Platform 1/2
  - one to Platform 3/4
- replacement of all stairs with new stairs
- widening of the existing footbridge between the new platform lifts
- provision of passenger information displays and ticket vending machines
- demolition of the existing retail concession on the footbridge to allow for the platform lift
- station building upgrades to provide accessible customer and staff areas and facilities including waiting rooms, family accessible toilet, and new male/female amenities
- pedestrian access and transport interchange improvements in the Kingsway and Wentworth Avenue.

Construction is anticipated to commence in mid 2015 and would take up to two years to complete.

## Need for the Proposal

Improving transport customer experience is the focus of the NSW Government's transport initiatives. Transport interchanges, train station and commuter car parks are important gateways to the transport system and as such play a critical role in shaping the customers' experience and perception of public transport.

TfNSW carried out a series of assessments to identify the need for improved amenity and accessibility at stations and interchanges across the network. The need for improved access at Wentworthville Station was identified through this process.

The *NSW Long Term Transport Master Plan* (TfNSW, 2012b) is a comprehensive plan for all modes of transport across NSW. The plan provides a clear direction for transport over the next 20 years, while building on current commitments. *The Long Term Transport Master Plan* complements and builds on the visions and goals established in *NSW 2021* and this Proposal would support growth and improvements in the safe and efficient management of transport in the Sydney region.

A scoping study was prepared by Cardno (2014) to identify the needs at Wentworthville Station and Interchange. As a result, options to provide improved access to the station were developed leading to the identification of a preferred option (the preferred option being the subject of this REF).

The Proposal was selected as the preferred design as it:

- provided equitable access to the station and the platforms compliant with the *Disability Discrimination Act 1992* (DDA)
- improves customer experience through the widened concourse area which allows space for a retail kiosk, real-time information provision and ticket machines
- improves legibility, wayfinding and station entrance from both northern and southern approaches
- consolidates lift and stair access from both street entrances
- improves the interchange environment for bus passengers, kiss and ride, and taxi passengers and additional cycle storage provided at both street entrances
- provided a time and cost efficient way to address the required accessibility improvements that are currently required at Wentworthville Station in order to improve the customer experience

## **Statutory considerations**

The EP&A Act provides for the environmental impact assessment of development in NSW. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under the EP&A Act.

*State Environmental Planning Policy (Infrastructure) 2007* (the Infrastructure SEPP) is the primary environmental planning instrument relevant to the proposed development. Clause 79 of the Infrastructure SEPP allows for the development of 'rail infrastructure facilities' by or on behalf of a public authority without consent on any land.

As TfNSW is a public authority and the proposed activity falls within the definition of Rail Infrastructure Facilities under Infrastructure SEPP, the Proposal is permissible without consent. Consequently the environmental impacts of the Proposal have been assessed by TfNSW under Part 5 of the EP&A Act.

This REF has been prepared to assess the construction and operational environmental impacts of the Proposal. The REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (the EP&A Regulation).

In accordance with Section 111 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

## Community and stakeholder consultation

Under the Infrastructure SEPP, consultation is required with local councils or public authorities in certain circumstances, including where council managed infrastructure is affected. Communication with both Holroyd City Council and Parramatta City Council would be maintained throughout the development of the Proposal.

TfNSW is also proposing to undertake the following consultation for the Proposal:

- direct notification to other community stakeholders
- public display of the REF.

Community consultation activities for the Proposal would be undertaken during the public display period of this REF. The REF would be displayed for a period of approximately two weeks. Further information about these specific activities is included in Section 5 of this document.

During this period, the REF would also be available for viewing at the Wentworthville Library, Parramatta City Library, Holroyd City Council Customer Service Centre, Transport for NSW (TfNSW) Community Information Centre, and via download from TfNSW's website. Furthermore, an information line (1800 664 490) would be available for the public to make enquires about the Proposal.

TfNSW would review and assess all feedback received during the public display period, prior to determining whether or not to proceed with the Proposal.

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure 1 presents an overview of the consultation and planning process and the current status of the Proposal.

## Environmental impact assessment

- This REF identifies the potential environmental benefits and impacts of the Proposal and outlines the mitigation measures to reduce the identified impacts.
- The following key impacts have the potential to occur during construction should the Proposal proceed:
  - heritage impacts to Wentworthville Station and the Wentworthville Memorial Fountain
  - temporary noise and vibration impacts
  - minor temporary delays on the adjacent road network
  - temporary changes to access arrangements including pedestrian diversions
  - tree removal and visual impacts.

Once the Proposal is constructed, there would be improved access for people with disabilities, ageing and parents with prams. The Proposal, through provision of four lifts and enhancement to interchange facilities, would improve access to public transport, as well as access across the rail corridor, for the community in Wentworthville. Improved facilities and access to Wentworthville Station would service the community and encourage public transport use.



Figure 1: Planning approval and consultation process for the Proposal

## Conclusion

This REF has been prepared having regard to sections 111 and 112 of the EP&A Act, and clause 228 of the EP&A Regulation, to ensure that TfNSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The Proposal would be designed in accordance with the Transport for NSW's Sustainable Design Guidelines and would take into account the principles of ecologically sustainable development (ESD). Initiatives would be considered during the detailed design, construction and operational phases of the Proposal.

Should the Proposal proceed, the potential impacts would be appropriately managed in accordance with the mitigation measures outlined in this REF. Based on the assessment of environmental impacts contained in this REF, TfNSW has concluded that the Proposal is not likely to have a significant impact on the environment including threatened species, populations, endangered ecological communities and their habitats. Accordingly, an environmental impact statement is not required for the Proposal, nor is the approval of the Minister for Planning.

# 1 Introduction

Transport for NSW (TfNSW) was established in 2011 as the lead agency for integrated delivery of public transport services across all modes of transport in NSW. TfNSW is the proponent for the Wentworthville Station Easy Access Upgrade (the Proposal), to be delivered by the Transport Projects Division (TPD).

## 1.1 Overview of the Proposal

The Proposal is designed to improve pedestrian access to and from the station, increase Wentworthville Station's ability to cope with the predicted future patronage demands, and improve pedestrian flow, passenger information services and wayfinding between transport modes.

The Proposal would include the installation of a lift at each entrance, to provide access to the overhead footbridge and station concourse from street level frontages on the northern and southern sides of the station. A lift would be installed on each platform to provide access between the concourse and the platforms. The existing footbridge would be retained and extended to provide landings for the lifts, with the removal of the existing retail concession above Platform 1/2. The existing ramps on entry to the station would remain in place but the entry stairs on both sides of the station would be replaced with new stairs with canopies. The stairs and canopy to each of the platforms would also be replaced.

A new concourse area would be created at footbridge level between the lifts to the platforms and would accommodate passenger information displays, ticket vending machines relocated from the platforms and space for a small retail concession. Station building internal refurbishment would be undertaken to provide accessible customer and staff areas and facilities including waiting rooms, family accessible toilet and new male/female amenities.

A number of interchange upgrades would be undertaken on both Wentworth Avenue and The Kingsway to improve accessibility, convenience, and wayfinding between transport modes. These upgrades include kiss and ride areas, upgraded bus stop and taxi stand waiting areas and traffic calming measures.

Construction is anticipated to commence in mid 2015 and it is anticipated that it would take up to two years to complete.

A detailed scope of works is provided in Section 3.2.

## 1.2 Location of the Proposal

Wentworthville Station provides access to the Sydney Trains network via the T1 Western line and the T5 Cumberland Line. Wentworthville Station is approximately 26km from Central Station, and serves the established and growing residential suburb of Wentworthville (Figure 2 and 3).

Wentworthville Station is located on the boundary between the local government areas (LGAs) of the City of Parramatta and the City of Holroyd. Parramatta City Council is responsible for the northern part of the rail corridor and land to the north, and Holroyd City Council is responsible for the southern part of the rail corridor and land to the south. The rail corridor is bounded by Wentworth Avenue to the north, and The Kingsway to the south.

Wentworthville is currently the 86th busiest railway station on the CityRail network with approximately 6,000 trips recorded at the station on an average weekday in 2011. Trips recorded at the station has steadily increased over the seven years from a daily patronage of 2,200 trips per day in 2004.

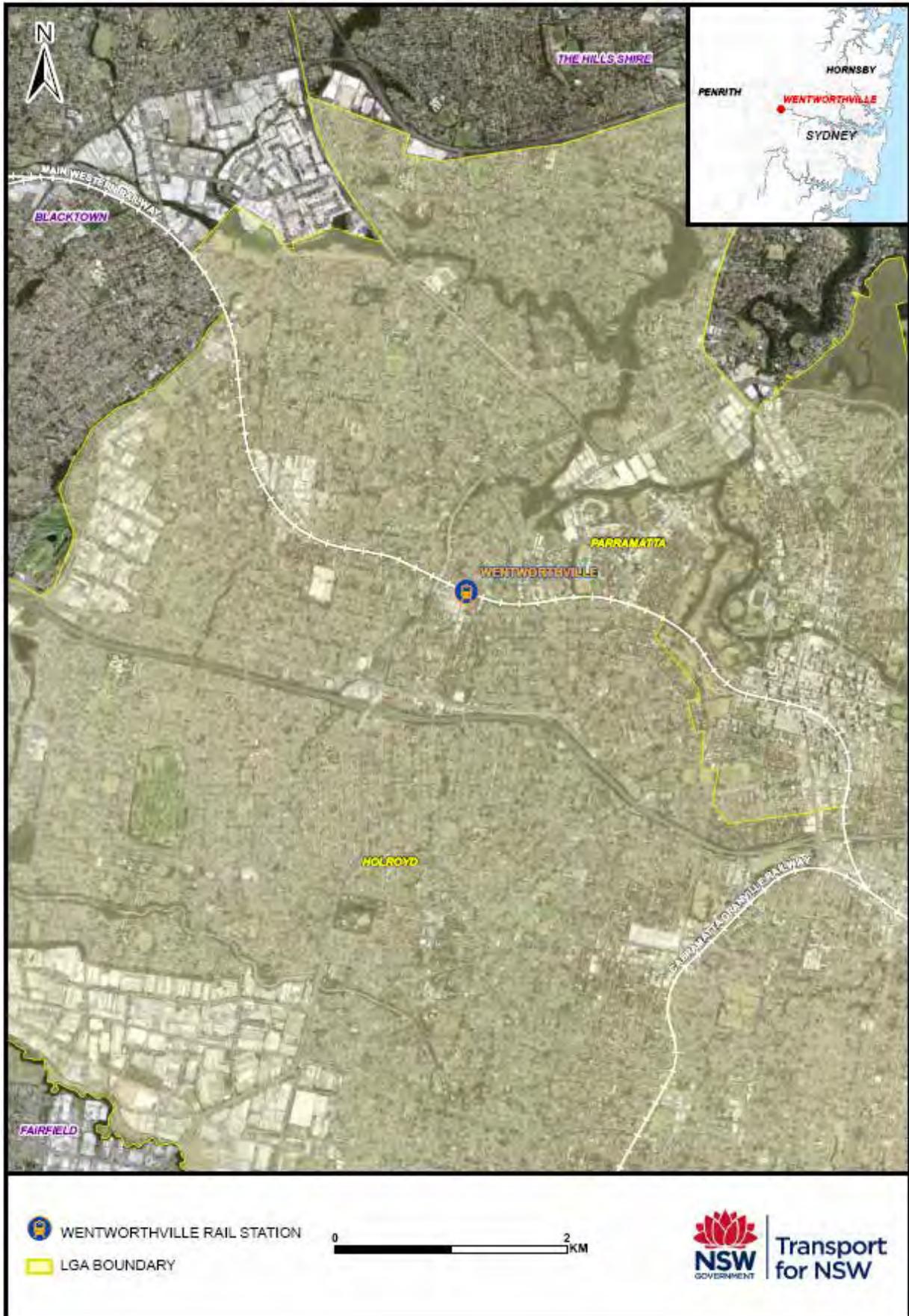


Figure 2: Regional context



Figure 3: Proposed works footprint

### 1.3 Existing infrastructure and land uses

Wentworthville Station consists of two island platforms. Access to the platforms is via an overhead walkway which also facilitates cross-corridor movements from the retail precinct to the south of the rail corridor to residential areas in the north.

The overhead footbridge provides connection between the two sides of the railway corridor and provides access to both island platforms. There is no passenger information display available on the footbridge to indicate real-time arrival or departure times for trains at the platforms.

The northern island platform (Platform 1/2) includes the ticket office and a ticket machine as well as vending machines, rubbish bins, an enclosed waiting area, passenger information display with real-time rail information and male and female toilets. Passengers must request admittance to the toilets from the station staff on Platform 1/2. The southern island platform (Platform 3/4) includes a ticket machine and another enclosed waiting area.

Current interchange facilities within the station precinct include a commuter car park (located on The Kingsway to the west of the station), bike racks, a taxi rank, bus stops and a kiss and ride zone. The stations existing interchange facilities are outlined in Table 1.

Table 1: Existing transport interchange arrangements

Transport	Details
Train	Wentworthville Station is served by the T1 Western Line and the T5 Cumberland Line. All trains to the city leave from the same island platform (Platforms 1 and 2) with trains to Blacktown leaving from Platforms 3 and 4. The main line has mixed passenger and freight traffic.
Bus	<p>Wentworthville Station is serviced by bus routes on both sides of the station. The bus stop on the northern side of the station is directly adjacent to the station entrance but on the southern side the bus stops are one block south of the station entrance, and are not able to be viewed directly from the station. Bus stops include weather protection, timetable information and seating for waiting passengers.</p> <p>The following three routes service Wentworthville Station:</p> <ul style="list-style-type: none"> <li>• Route 705: services between Parramatta and Blacktown stopping along Dunmore Street south of the station.</li> <li>• Route 711: services between Parramatta and Blacktown stopping along Wentworth Avenue north of the station.</li> <li>• Route 818: services between Merrylands and Westmead</li> </ul>
Commuter car parking	A TfNSW commuter car park is accessed via the roundabout at the western end of The Kingsway approximately 50m west of the station. Paved pedestrian footpaths adjacent to the rail corridor facilitate Park & Ride pedestrian access. The car park includes 159 all day commuter parking spots and is adjacent to the Cumberland Highway, although the only access is via The Kingsway. A Holroyd Council town centre car park is provided between the commuter car park and the station off The Kingsway. This car park is time restricted to two hours.

Transport	Details
Taxi	A taxi rank is provided to the south of the station, adjacent to the pedestrian ramp. An awning and seating is provided for people waiting for taxis. There is space for up to four taxis at the stand. There is no taxi rank on the northern side.
Bicycle facilities	A temporary bicycle rack is provided on the southern side of the station below the pedestrian ramp on The Kingsway with space for up to five bikes. No bicycle parking is provided on the northern side of the station however informal parking occurs along the fence at the front of the temporary police station on Wentworth Avenue.
Pedestrian access and movements	<p>The pedestrian infrastructure includes footpaths and zebra crossings on the approach to both station entrances with signalised pedestrian crossings to the south at the intersection of Station Street and Dunmore Avenue in the Wentworthville town centre.</p> <p>The stations overhead footbridge extends between The Kingsway on the southern side of the station and Wentworth Avenue on the northern side and includes both ramps and stair access. It provides an important public pedestrian connection over the railway line, including for non-rail passengers, as it is aligned with the retail destinations on the southern side of the station. The existing ramps however do not comply with the current disability Standards and Codes.</p>
Kiss and ride	<p>Informal Kiss and Ride facilities are available on both sides of the station. Although it is not signposted as 'Kiss and Ride', there is a 'no parking' area provided on The Kingsway in front of the taxi rank that allows private vehicles to wait to pick up alighting or drop off departing train passengers. The awning and the seating for the taxi rank continue through to the kiss and ride area providing shelter for people waiting to be picked up.</p> <p>Informal Kiss and ride also occurs along Wentworth Avenue on the northern side of the station. During the PM peak, cars will wait close to the station entrance and bus stop to meet alighting train passengers.</p>

The rail corridor is bound by The Kingsway to the south west, privately owned properties along the south eastern side, and by Wentworth Avenue to the north. Commercial and retail properties extend along The Kingsway opposite the station. Residential development is the dominant land use on the northern side of the station although a temporary police station and small scale retail are also present on the northern side of Wentworth Avenue.

Wentworthville town centre, to the south of the station, is the main commercial centre for the area. The adjacent stations, Pendle Hill and Westmead, are approximately 1.5km away and while they have smaller commercial centres, they provide access to employment, secondary and tertiary education and regional medical services.

## 1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the construction and operation of the Proposal. For the purposes of these works, TfNSW is the proponent and the determining authority under Part 5 of the EP&A Act.

The purpose of this REF is to describe the Proposal, to assess the likely impacts of the Proposal having regard to the provisions of section 111 of the EP&A Act, and to identify mitigation measures to reduce the potential impacts of the Proposal. This REF has been prepared in accordance with clause 228 of the EP&A Regulation.

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Threatened Species Conservation Act 1995* (TSC Act), *Fisheries Management Act 1994* (FM Act) and the *Roads Act 1993* (Roads Act).

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to significantly impact a matter of national environmental significance (NES) or Commonwealth land and the need to make a referral to the Commonwealth Department of the Environment (DoE) for any necessary approvals under the EPBC Act.

## 2 Need for the Proposal

---

Chapter 2 discusses the need and objectives of the Proposal, having regard to the objectives of the Transport Access Program (TAP) and the specific objectives of the Proposal, and why the preferred option has been chosen.

### 2.1 Strategic justification

Improving transport customer experience is the focus of the NSW Government's transport initiatives. Transport interchanges and train stations are the important gateways to the transport system and as such play a critical role in shaping the customer's experience and perception of public transport.

The proposed Wentworthville Station Easy Access Upgrade, the subject of this REF, forms part of the Transport Access Program. This program is designed to drive a stronger customer experience to deliver seamless travel to and between modes, encourage greater public transport use and better integrate station interchanges with the role and function of town centres within the metropolitan area and developing urban centres in regional areas of NSW.

The Proposal is consistent with the NSW Government's commitment to deliver an efficient and effective transport system around Sydney and NSW as detailed in *NSW 2021 – A Plan to Make NSW Number One* (Department of Premier and Cabinet 2011); the *2012-17 Disability Action Plan*; and the *Long Term Transport Master Plan*.

*NSW 2021* is the NSW Government's ten year plan to guide budget and decision making in NSW. *NSW 2021* includes the following goals, targets and priority actions relevant to the Proposal:

- reduce travel times
- minimise public transport waiting times for customers
- improve co-ordination and integration between transport modes
- grow patronage on public transport
- improve public transport reliability
- improve customer experience with transport services.

The NSW Government developed the *Long Term Transport Master Plan* (TfNSW, 2012b) to provide a clear direction for transport over the next 20 years, while building on current commitments. The *Long Term Transport Master Plan* (TfNSW, 2012b) complements and builds on the visions and goals established in *NSW 2021* and this Proposal would support growth and improvements in the safe and efficient management of transport in the Sydney region.

The *2012-17 Disability Action Plan* (TfNSW, 2012f) was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Disability Action Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job, and provides a solid and practical foundation for future progress over the next five years. The Proposal has been developed in consideration of the objectives outlined in this Plan.

Further details of the application of NSW Government policies and strategies are discussed in Section 4.3 of this REF.

### 2.1.1 Objectives of the Transport Access Program

The Transport Access Program is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure where it is needed most. The program aims to provide:

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

### 2.1.2 Objectives of the Proposal

The objectives of the Proposal are to:

- improve the accessibility of Wentworthville Station in accordance with the *Disability Discrimination Act 1992* (DDA)
- upgrade station precinct facilities by providing upgraded kiss and ride zone, taxi rank, parking and bus interchange
- improve customer experience (specifically weather protection, better interchange facilities and cosmetic appearance)
- minimise pedestrian conflict points, crowding points and queuing at station facilities
- maximise safety and security
- accommodate growth in patronage and changing travel patterns
- improve integration with surrounding precinct
- minimise construction impacts to passengers and station operations
- improve amenity for rail staff and commuters
- minimise the cost of ownership and maintenance.

## 2.2 Alternative options considered

A scoping assessment of the Proposal was undertaken to identify key constraints and needs at Wentworthville Station (Cardno, 2014). This process included investigations, consultation, options development, options assessment, and refinement of the preferred option.

Three upgrade options were developed to address access issues and deficiencies. Each option provided equitable access to the station concourse and platforms and improved interchange between modes. A number of components of the upgrades are common to all options, but the three options vary in the extent of work and access configuration, and have the following distinguishing features:

1. Option 1 retains the existing footbridge and ramps, and provides four new lifts at the station, one to each platform and one to each street entrance, with new stairs to Wentworth Avenue and upgrades to all other stairs.
2. Option 2 has four new lifts as per Option 1, but also includes an extension to the central portion of the footbridge between the platforms to provide improved customer information and ticket vending machines, and replaces all existing stairs.
3. Option 3 has the widened portion of the footbridge and new stairs as per Option 2, but replaces the existing ramps with new compliant ramps, and only has two lifts, one to each platform.

Each option included a number of common features:

- new canopies on the stairs to the platforms and the street entrances
- demolition of the retail kiosk on the overhead footbridge at the top of the stairs to Platform 1/2 to allow for the new platform lift
- improvements to the intersections at Wentworth Avenue and Railway Street and The Kingsway and Station Street including landscaping
- provision of kiss and ride on Wentworth Avenue
- provision of 20 bicycle racks (10 at each entrance)
- extension of the footpath east of the stairs on Wentworth Avenue
- relocation of the heritage listed memorial fountain further east on The Kingsway
- upgrade to staff facilities and provision of a family accessible toilet (FAT) in the building on Platform 1/2.

### 2.2.1 Option 1

Option 1 provides for DDA compliant access between the station entrances and the platforms.

Key features of Option 1 include:

- retention of the existing overhead footbridge
- retention of the ramps at both entrances. The ramps are too steep to be compliant, but are well used, and provide an alternative route for access to the station from both streets and facilitate cross-corridor movement
- installation of four new lifts with extension of the footbridge to provide lift landings for the following lifts:
  - one at each station entrance (approx.17 person lift)
  - one to Platform 1/2 (approx. 27 person lift)
  - one to Platform 3/4 (approx. 27 person lift)
- replacement of the stairs at the station's northern entrance to achieve Building Code of Australia (BCA) compliance
- remedial work on the southern entrance and platform stairs to achieve BCA compliance.

### 2.2.2 Option 2

Option 2 provides DDA compliant access between the station entrances and the platforms and includes many of the same upgrades to Option 1, with the key differences being that Option 2 includes:

- widening of the existing overhead footbridge between the platforms for increased circulation space and provision of passenger information and relocated ticket vending machines
- replacement of all of the existing stairs, compared with Option 1 which replaces only the stairs to Wentworth Avenue, and refurbishes the other stairs.

Option 2 provides additional customer facilities on the footbridge with additional space for ticket machines and passenger information displays, enabling passengers to access ticketing and real-time information on train services before they reach the platform.

Key features of Option 2 include:

- widening a portion of the existing footbridge between the new platform lifts to create an area to provide passenger information displays and ticket vending machines.
- retention of the ramps at both entrances. The ramps exceed the compliance gradient, but are well used, and provide an alternative route for access to the station from both streets and facilitate cross-corridor movement
- installation of four new lifts with extensions of the footbridge to provide lift landings for the following lifts:
  - one at each station entrance (17 person lift)
  - one to Platform 1/2 (approx. 27 person lift)
  - one to Platform 3/4 (approx. 27 person lift)
- replacement of all stairs at both station entrances and both platforms to achieve BCA compliance.

### 2.2.3 Option 3

Option 3 provides DDA compliant access between the station entrances and the platforms, and includes many of the same upgrades to Option 2, with the key differences of Option 3 being:

- the existing ramps would be replaced by longer ramps to meet the compliant gradient of maximum 1(V):14(H). These ramps would connect to the footbridge in the same location as the current ramps, but would connect to the street closer to the stairs than the current ramps, as they would wrap around each other
- two lifts would be provided to the platforms, with no lifts to the street entrances as compliant access is provided at both station entrances through the replacement of the existing ramps.

Option 3 also provides additional customer facilities on the footbridge with additional space for ticket machines and passenger information displays, enabling passengers to access ticketing and real-time information on train services before they reach the platform.

Key features of Option 3 include:

- widening of the existing footbridge between the new platform lifts to create an area to provide passenger information displays and ticket vending machines
- replacement of the ramps at both entrances. The new ramps would be longer and would meet the compliance gradient, to provide an accessible route to the station from both streets and to facilitate cross-corridor movement
- installation of two new lifts with extensions of the footbridge to provide lift landings for the following lifts:
  - one to Platform 1/2 (approx. 27 person lift)
  - one to Platform 3/4 (approx. 27 person lift)
- replacement of all stairs at both station entrances and both platforms.

#### **2.2.4 The ‘do-nothing’ option**

The ‘do nothing’ option was not considered a feasible alternative as it is inconsistent with NSW Government objectives, and would not improve station accessibility for mobility impaired patrons, or help encourage the use of public transport, and would not meet the immediate needs of the community. The NSW Government has identified the need for improvements to Wentworthville Station as a priority under the Transport Access Program.

### **2.3 Justification for the preferred option**

Option 2 was considered the preferred option and further developed as it provides:

- DDA compliant access to the station and the platforms
- improved customer experience through the widened concourse space, which allows space for a small retail concession/ kiosk, real-time passenger information and ticket machines
- improved legibility, wayfinding and station entrances from both northern and southern approaches
- consolidated lift and stair access from both street entrances
- improved interchange environment for bus passengers, kiss and ride, and taxi passengers
- new bicycle parking facilities near both street entrances.

Option 1 does not provide improved customer experience through the widened concourse space, real-time information provision and ticket machines.

Option 3 does not consolidate lift and stair access from both of the street entrances and the overall length of the longer DDA compliant ramps would not be desirable and would likely be difficult to use for many elderly and mobility impaired customers.

The do-nothing option does not meet any of the objectives of the Proposal.

# 3 Description of the Proposal

---

Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities.

## 3.1 The Proposal

The Proposal is designed to improve pedestrian access to and from the station, increase Wentworthville Stations ability to cope with the predicted future patronage demands, improve pedestrian flow, passenger information services and wayfinding between transport modes.

The Proposal would include the following key features:

- retention, repairs and repainting of the existing footbridge structure
- retention of the existing ramps
- installation of four new lifts:
  - one at each station entrance
  - one to Platform 1/2
  - one to Platform 3/4
- replacement of all stairs with new stairs
- widening of the existing footbridge between the new platform lifts
- provision of passenger information displays and ticket vending machines
- demolition of the existing retail concession on the footbridge to allow for the platform lift
- station building upgrades to provide accessible customer and staff areas and facilities including waiting rooms, family accessible toilet, and new male/female amenities
- pedestrian access and transport interchange improvements in the Kingsway and Wentworth Avenue.

Construction is anticipated to commence in mid 2015 and would take up to two years to complete.

A more detailed description of the Proposal is provided below.

Figure 4 shows the general arrangement of the key elements of the Proposal. This design is indicative only and subject to further detailed design.

### 3.1.1 Design features

The proposed works have been grouped into four main elements:

- lifts, stairs, footbridge, canopies and associated works
- station interchange, streetscape works and facilities
- platform works, ticketing facilities, rail systems
- utility works.

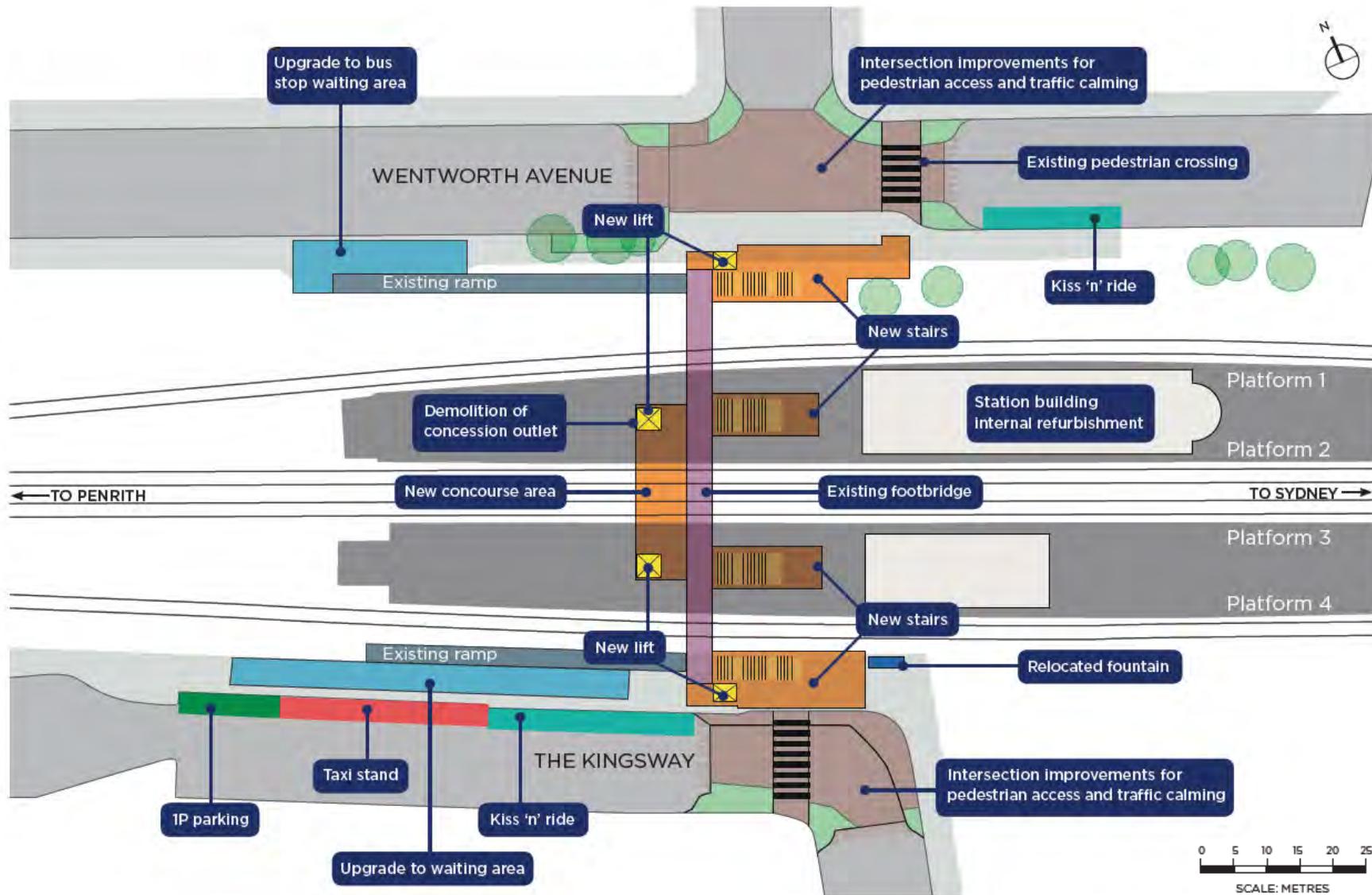


Figure 4: Elements of key works included as part of the Wentworthville Station Easy Access Upgrade  
(Design is indicative only and is subject to detailed design)

**Lifts, stairs, footbridge, canopies and associated works:**

- retention of the existing footbridge and access ramps
- demolition and removal of existing stairs, associated structures and canopies, existing retail outlet on the footbridge, brick walls and fencing at new entrance areas, and other demolition works as required
- new station access incorporating lift and stair access to both The Kingsway and Wentworth Avenue station entrances, with associated landings and supports structures, and canopies to stairs, base of stairs, and entrance areas
- new lifts and stair access to both island platforms with associated landings and support structures
- creation of a new station concourse area between the platform lifts, including services provision for a future small retail concession on the new concourse
- bridge structure repairs and repainting, including:
  - surface preparation including abrasive blast and painter-painting of steelwork for all exposed areas of the bridge substructure, including trestles and main girders
  - minor steel repairs
  - repairs to the underside of the deck where required
- new extended platform canopies to match in with full width of existing station building canopies to the underside of the footbridge, with associated drainage provisions
- incorporation of anti-throw screens within canopies as required to full length of the footbridge, the widened concourse and lift landing areas, and on the stairs to both The Kingsway and Wentworth Avenue
- works to achieve BCA compliance including treatment for fire rating of existing structures, potential fire hydrant system and other fire safety provisions.

**Station interchange, streetscape work and facilities:**

- improvements to the Wentworth Avenue and Railway Street intersection, including enhancement to the existing pedestrian crossing provisions and traffic calming measures (as required and in consideration of the new pedestrian crossing installed by Council in 2014)
- enhancement to interchange facilities in Wentworth Avenue including:
  - provision for accessible car parking spaces (existing to be retained or additional provided), and a kiss and ride car parking zone within close proximity to the station entrance
  - weather protected storage for approximately ten (10) bicycles
  - upgrade to the bus stop area with new street furniture including seating and rubbish bins
- treatment of The Kingsway and Station Street intersection, including enhancement to the existing pedestrian crossing provisions and traffic calming measures, and maintaining vehicular access to private property adjacent to rail corridor
- enhancement to interchange facilities in The Kingsway including:
  - removal of existing and provision of new full width footpath from the station entrance to the end of the shelter structure on the western side of the station entrance

- reconfigured parking to provide a formal kiss and ride zone, taxi rank, and time restricted parking for any displaced parking from Station Street
- removal of existing bicycle rack, and provision for new weather protected storage for approximately ten (10) bicycles close to the station entrance, with modifications to the existing boundary brick wall
- upgrade of the interchange area with new street furniture including seating to replace existing, rubbish bins, removal of the shelter backing board and replacement with suitable see-through material to improve visibility, and repainting of the shelter structure
- provision for continuous accessible paths of travel between the station entrances and adjacent streets, accessible parking, kiss and ride areas, taxi rank, and the bus stop area
- relocation of the Wentworthville Memorial Fountain and adjacent 'First Train to Stop at Wentworthville' plaque and 'Train Wheel' in The Kingsway as required and in accordance with heritage approval and stakeholder requirements
- upgrade of existing and provision of new wayfinding signage and provision of other signage including statutory / regulatory signage.

**Platform works, ticketing facilities, rail systems:**

- provision for passenger information systems and ticketing facilities in the new concourse, including relocation of the existing two ticket vending machines on the platform to the new concourse area
- Platform 1/2 building modifications (and required services, finishes and fitout) to provide accessible customer and staff areas and facilities including accessible ticket window, new family accessible toilet, new staff toilet and new public amenities
- collision protection to existing and new structures adjacent to the tracks as required
- modifications to provide DDA compliant access to the existing waiting room on Platform 3/4
- adjustment of station platforms to provide compliant cross falls (where required) and provision of tactile ground surface indicators along platform edges, for stairs and other required locations, and other works to achieve DDA compliance.

**Utility works:**

- services diversion and/or relocation, including stormwater drainage adjustments, to accommodate the new infrastructure
- potential relocation of the Sydney Trains 11kV aerial feeder on the southern side (adjacent to The Kingsway) of the corridor, and the Endeavour Energy high voltage aerial feeder on Wentworth Avenue, clear of the new infrastructure
- station power supply and electrical upgrade, works including new platform substation and adjustment to lighting
- augmentation and relocation of station communication systems associated with the new infrastructure, including CCTV security, passenger information displays, ticketing and other station communication systems
- relocation of existing station communications equipment on Platform 1/2 to the existing communications equipment room on Platform 3/4.

The photomontages in Figures 5 to 8 illustrate the Wentworthville Station Easy Access Upgrade and are indicative only and subject to Detailed Design.



Figure 5: Existing view of Wentworthville Station from Station Street



Figure 6: Artists impression of the Proposal from Station Street (indicative only – subject to Detailed Design)

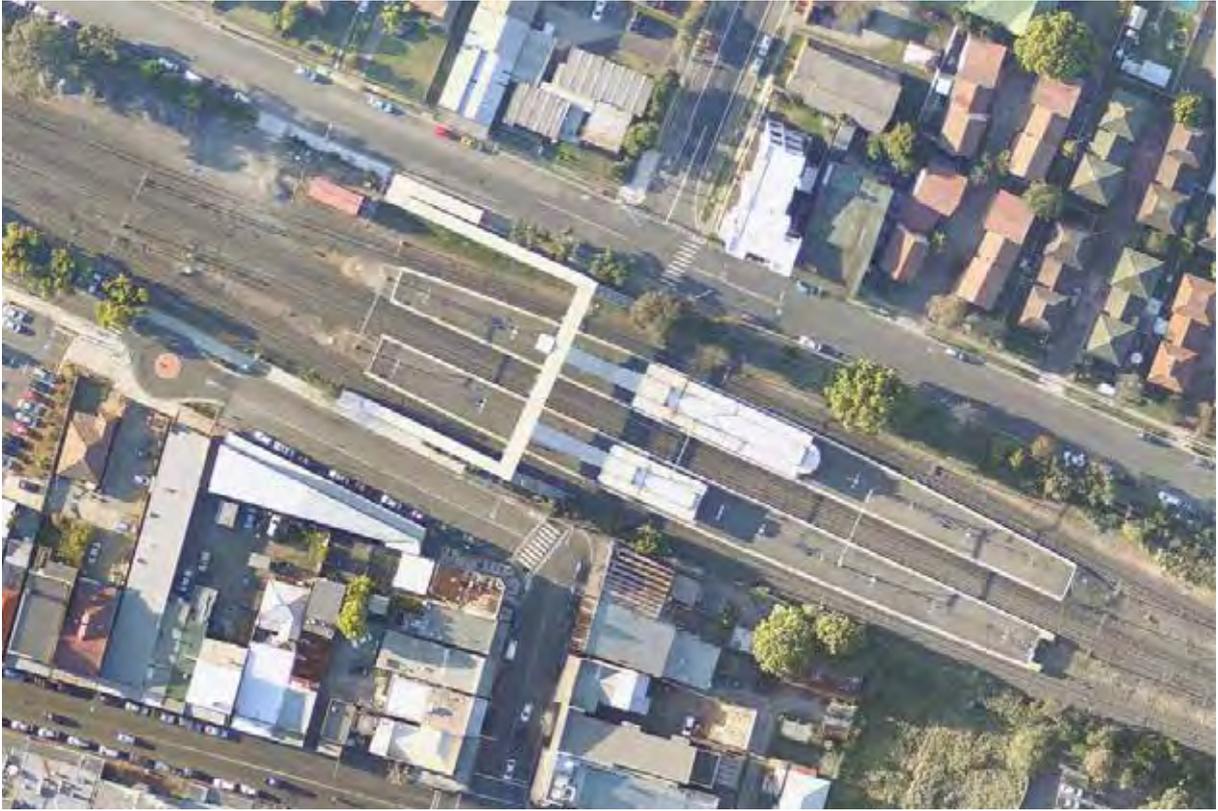


Figure 7: Existing aerial view of Wentworthville Station

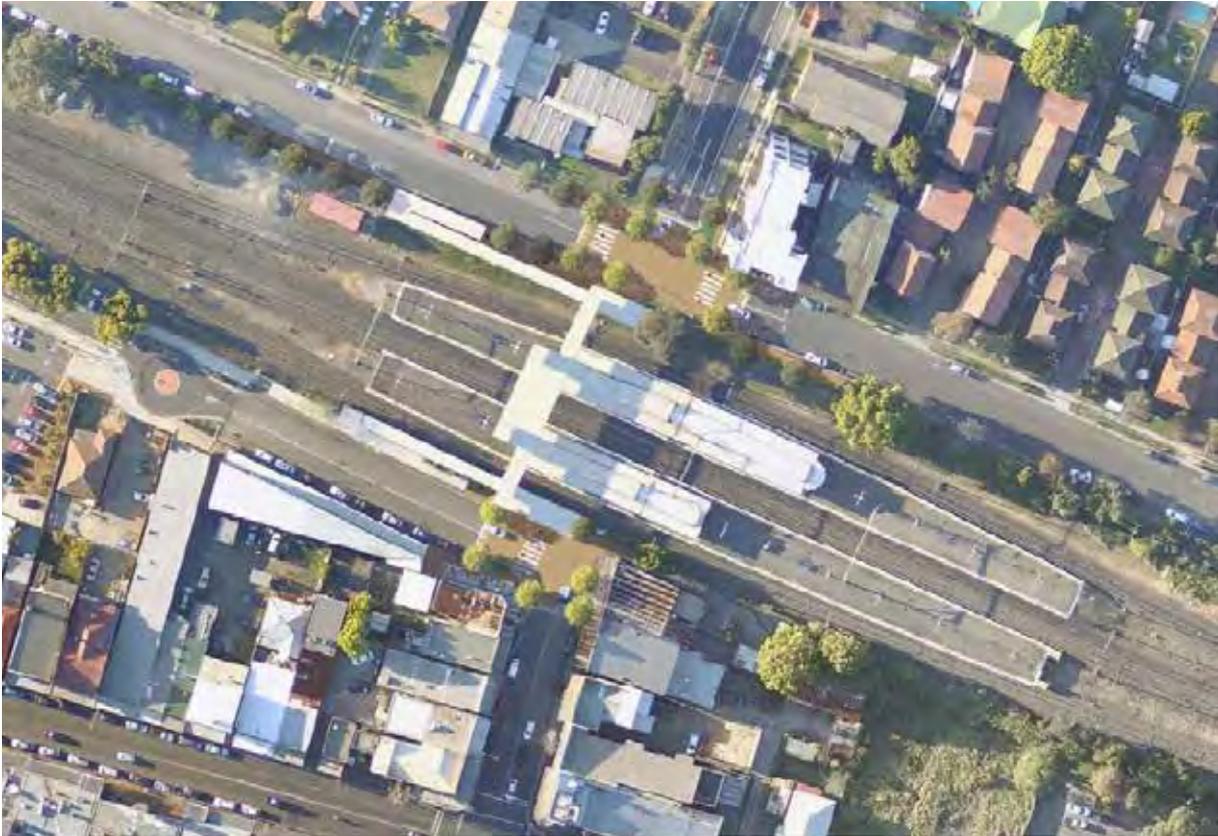


Figure 8: Artists impression of the Proposal from an aerial perspective (indicative only – subject to Detailed Design)

### 3.1.2 Engineering constraints

There are a number of constraints which have influenced development of the initial design of the proposed upgrade. These constraints include accessibility constraints, available space, property access requirements, heritage items, utilities, operational and stakeholder requirements. These are further outlined below.

#### **Accessibility and BCA constraints**

Many existing key features of Wentworthville Station are not DDA and/or BCA compliant including:

- ramps at the station entrances are BCA / DDA non-compliant due to their steep gradient and lack of rest point landings
- there are non-compliant accessible paths from public domain footpaths to station entries, including a narrow footpath on the northern side of The Kingsway between the station entrance and the kiss and ride / taxi waiting area, and the footpath between stairs and ramp entries on the southern side of Wentworth Avenue is cluttered
- no lift or ramp access is provided to the station platforms
- stairs to the street are BCA non-compliant
- platform toilets, ticket office window, ticket vending machines and staff facilities are not DDA compliant.

#### **Space constraints**

The placement and integrity of existing structures would need to be considered during the development of the design. These structures include the island platform, canopies and pedestrian overbridge, presence of overhead power cables along both street boundaries, and commercial and residential buildings along the south east boundary.

#### **Heritage**

The station is listed as a heritage item on the Sydney Trains section 170 Heritage Register and the *Holroyd Local Environmental Plan 2013* (LEP). The Wentworthville Memorial Fountain, located on The Kingsway at the southern edge of the railway station, is also listed as a heritage item on the Holroyd LEP.

#### **Hazardous materials**

Given the age of the station and its buildings, there is the potential for asbestos and lead paint to be encountered during construction.

#### **Utilities**

A number of utilities are located in the vicinity of the proposed works including:

- overhead high-voltage electricity cables are located on both sides of the rail corridor
- underground electricity is located within the southern side of The Kingsway and within Station Street on both sides
- a sewer main is located within The Kingsway and Station Street
- potable water mains are located within The Kingsway, Station Street and Wentworth Avenue
- a major Optic Fibre Network (Optus) is located along the northern side of the rail corridor or southern side of Wentworth Avenue
- low-pressure gas mains are located within The Kingsway, Station Street and Wentworth Avenue.

### 3.1.3 Technical requirements and design standards

The Proposal would be designed having regard to the following:

- Sydney Trains Design Standards
- Transport for NSW Sustainable Design Guidelines
- Disability Standards for Accessible Public Transport (2002) (issued under the Commonwealth *Disability Discrimination Act 1992*)
- relevant Australian Standards, including AS2890.1 *Parking Facilities*
- Crime Prevention Through Environmental Design (CPTED) principles
- Building Code of Australia
- Transport for NSW Guidelines for development of transport interchange facilities
- Assets Standards Authority standards.

### 3.1.4 Sustainability in design

The design of the Proposal would be undertaken in accordance with the project targets identified in TfNSW's Environmental Management System (EMS) and the *NSW Sustainable Design Guidelines for Rail (Version 3.0)* (TfNSW, 2013) which groups sustainability into seven themes:

- energy and greenhouse gases
- climate resilience
- materials and waste
- biodiversity and heritage
- water
- pollution control
- community benefit.

Within each theme, potential initiatives are prioritised into two categories of requirements:

- **Compulsory** – the initiative is required to be implemented when applicable to the project as they refer to a corporate target, or are fundamental to the delivery of sustainable assets)
- **Discretionary** – the initiative has benefits to be implemented, however may not be the most appropriate.

The Guidelines also specify a minimum level of compliance within each category: 100 percent of applicable Compulsory initiatives, and 50 percent of the applicable Discretionary points are to be adopted on the project.

These sustainable design initiatives would be considered further during detailed design.

## 3.2 Construction activities

### 3.2.1 Work methodology

Construction of the Proposal is estimated to commence mid 2015 and take up to two years.

To minimise impacts on commuters and the local community, it is proposed that the construction program would be staged. The work methodology would be developed

further, by the construction contractor and in consultation with TfNSW. The staging, as outlined in Table 2, is indicative only and is subject to change during the detailed design stages, and dependant on the contractor's program and sequencing of the work.

The Proposal would need to be constructed within railway operating constraints and the track possession schedule. Some works would be required during weekend track possessions and during night periods to minimise impacts to commuters and local traffic. The footbridge and platforms would remain accessible by commuters at all times during the normal train operations, and either closed or controlled during the relevant possession works.

Table 2 identifies an indicative outline of the preliminary construction methodology for key activities based on the current concept design.

Table 2: Indicative construction staging and works for key activities

Activity
<p><b>Site establishment, temporary works and enabling works:</b></p> <ul style="list-style-type: none"> <li>• establishment of site boundaries</li> <li>• establish compound area</li> <li>• site delineation fencing</li> <li>• services location</li> <li>• utilities works</li> <li>• stormwater drainage works</li> <li>• install temporary ticket office (if required) and relocate Ticket Vending Machine (TVM) to concourse level</li> <li>• install temporary ablution block</li> <li>• Construct temporary pedestrian crossing</li> </ul>
<p><b>Undergrounding of high voltage cabling (Endeavour Energy feeder on Wentworth Avenue and Sydney Trains feeder on The Kingsway):</b></p> <ul style="list-style-type: none"> <li>• trenching and duct work</li> <li>• installation of new HV poles and anchors</li> <li>• install a new padmount 11kV substation including retaining walls and concrete pad for Sydney Trains feeder</li> <li>• Construct new 415V power supply for station</li> <li>• pulling cables through trench to new HV poles and coil in preparation for cutover of 11kV cables</li> <li>• cutover and new 11kV route commissioning</li> <li>• remove existing HV poles and infrastructure.</li> </ul>

## Activity

### **Construct of lift and stairs between station entries and concourse (Wentworth Avenue and The Kingsway):**

- demolish existing stairs and path
- remove trees and lightpoles
- relocate heritage listed Wentworthville Memorial Fountain
- excavate trench for services to lift pits
- excavate lift pits and footings for new stairs
- install prefabricated stairs in a single possession period to maintain station access
- install lift and commission
- complete all new pedestrian pathway works
- complete new crossing and roadwork
- install new canopies and signage
- demobilise hoarding and open station entries.

### **Construct lift shaft and footings between platforms and concourse (Platform 1 / 2 and Platform 3 / 4):**

- install lift and commission
- install concrete deck for entry to new lift shaft
- install hoarding to concourse level entry to lift.

### **Extension and modifications to the existing concourse structure:**

- lift in pre-fabricated spans between Platforms 1/2 and 3/4 (widening of concourse between lifts)
- bridge structure repairs and repainting
- install light weight frame for concourse structure, including wall and roof frames, box gutters and down pipes
- remove existing roof and install new roofing
- new cable routes, conduits and cabling to support Ticket Vending Machines (TVMs) and card readers
- cutover machines, card readers and other communications systems
- demolish existing retail kiosk.

### **New stairs to Platform 1/2 and 3/4:**

- remove existing stairs, including roof, treads, and steel supports
- install pre-cast stairs and landings
- install roof sheeting.

### **Building works on Platform 1/2:**

- new structural and services fit-out, including plumbing, electrical and communications
- furniture and systems fit-out
- cutover, remove temporary facilities and bring new building into use.

Table 3 provides a consolidated list of typical equipment which would be used during construction based on the above listed construction staging and works activities.

Table 3: Indicative construction plant and equipment

Construction equipment	
• excavators	• welder
• excavators with hammer attachment	• grinder
• trucks for delivery/removal	• impact driver (on nuts /bolts)
• smooth drum roller	• generators
• bobcat / sweeper	• hi-rail dumper
• line marking plant	• hand tools
• mobile crane	• elevated working platform
• concrete pump	• jackhammer
• concrete saw	• piling rig
• concrete truck / agitator	• piling rig (bored)
• concrete vibrator	• paving plant
• masonry hammer drill	

### 3.2.2 Working hours

Construction would take up to two years and commence in mid 2015. The standard construction hours would be as follows:

- 7am to 6pm Monday to Friday
- 8am to 1pm Saturdays
- no work on Sundays or public holidays.

The Proposal as designed is capable of being staged to be constructed within railway operating constraints and a track possession schedule. The majority of works are able to be undertaken in non-possession times using appropriate means of safe working to protect the live network. Therefore the majority of works would be conducted during standard working hours between 7am and 6pm Monday to Friday, and 8am to 1pm on Saturdays.

However, some works outside of standard hours would be required during evening, night periods and weekends during track possessions, and for key activities (including partial closures of on-street parking in The Kingsway and Wentworth Avenue and the construction of the new stairs) to minimise impacts to commuters and pedestrians. It is estimated that a total of eight possession periods would be required for the Proposal.

Where out of hours works are required, approval from TfNSW would be required and the affected community would be advised as outlined in the TfNSW's *Construction Noise Strategy* (TfNSW, 2012), and as per the Wentworthville *Environmental Noise and Vibration Impact Assessment* (ERM, 2014).

### 3.2.3 Earthworks

Excavations and earthworks would be minor. There would be some excavations required along The Kingsway and Wentworth Avenue associated with intersection improvements, footpath works, trenching activities and landscaping. Excavation would also be required in preparation for the installation of the lifts at the station entrances and on the platforms, and other minor civil work including footings and foundations for structures.

Excavated material would be reused on site where possible or disposed of in accordance with relevant legislative requirements.

### 3.2.4 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal, and would consider the requirements of the *TfNSW Sustainable Design Guidelines (Version 3.0)*. Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

### 3.2.5 Traffic access and vehicle movements

Traffic and access arrangements during construction of the Proposal are discussed in detail in Section 6.1 of this REF. A detailed construction methodology and associated management plan would be developed as part of the detailed design phase.

The potential traffic and access impacts expected during the construction of the Proposal include:

- temporary impacts to pedestrian access along The Kingsway and Wentworth Avenue as a result of short-term diversions during footpath works
- temporary parking displacement
- potential for temporary road closures.

Measures which would be employed to mitigate or minimise these potential impacts are further discussed in Section 6.1.

### 3.2.6 Ancillary facilities

During construction, a construction compound would be required and would include:

- a site office and amenities
- plant and equipment storage areas
- stockpile areas.

The compound would be located within the rail corridor boundary to the north west of Wentworthville Station assessed off Wentworth Avenue. The proposed compound area (Figure 3) is approximately 600 square metres (12 metres x 50 metres). The proposed compound location is an existing lay down area, is relatively flat with existing hardstand providing a stabilised access and preventing erosion and sedimentation. Access to the compound is via a secure gate off Wentworth Avenue. The proposed compound would be used for both the Proposal and Pendle Hill Easy Access Upgrade located approximately 1.5 kilometres west.

It is unlikely that there would be excavation or tree removal in addition to that required for the Proposal to establish ancillary facilities.

At times materials may be temporarily stored at other locations within the project footprint of the Proposal. Should facilities be required to be placed outside of the footprint, additional assessment would be undertaken.

### 3.2.7 Public utility adjustments

A utility investigation, including Dial Before You Dig (DBYD) enquiries, has been undertaken during preliminary design stages, but in some areas was inconclusive. Further investigation would be required, although the Proposal is designed to minimise relocation of services.

The following utilities exist within the Proposal area:

- Endeavour Energy power supply and lighting
- Telstra and Optus - telecommunications
- Sydney Water Corporation - water and sewerage
- Jemena - gas
- Holroyd and Parramatta City Councils – stormwater
- RailCorp – communication systems, signalling and electrical.

The appropriate utility providers would be consulted during the detailed design phase.

It is likely some additional services may require relocation. Such relocation is unlikely to occur outside of the work footprint assessed in this REF. In the event that works would be required outside of this footprint, further assessment would be undertaken.

### 3.3 Site provision

The majority of the proposed works including the construction compound are within the RailCorp land ownership corridor and access to these areas will be via standing license arrangements for construction activities between TfNSW and RailCorp.

A portion of the works will be located on Parramatta City Council and Holroyd City Council roads adjoining the RailCorp land ownership corridor on either side of the station on Wentworth Avenue and The Kingsway.

TfNSW will access the adjoining road areas temporarily for construction purposes including both verge and traffic areas utilising its Public Authority status under Schedule 2 of the Roads Act 1993 relating to Section 138.

Small portions of road on both sides of the station will be required permanently to site lift and stairway infrastructure and this land is expected to be acquired by agreement from the respective road authority council's utilising the powers in the Land Acquisition Just Terms Act and the Roads Act. These matters will be dealt with in direct discussion with the relevant councils.

## 4 Statutory considerations

---

Chapter 4 provides a summary of the statutory considerations relating to the Proposal including a consideration of Commonwealth legislation, NSW legislation (particularly the EP&A Act), NSW Government policies/strategies and environmental planning instruments.

### 4.1 Commonwealth legislation

#### 4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act requires Commonwealth assessment and approval for a Proposal that has a significant impact on matters of National Environmental Significance (NES) or impacts on Commonwealth land.

These matters are considered in full in Appendix 2.

The Proposal would not impact on any matters of NES or on Commonwealth land. Therefore a referral to the Commonwealth Minister for the Environment is not required.

### 4.2 State legislation and regulations

#### 4.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Part 5 of the EP&A Act. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under Part 4 of the Act.

In accordance with section 111 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal. Having regard to these provisions, TfNSW has determined that no significant environmental impact is likely, and as a consequence an environmental impact statement is not required, nor is the approval of the Minister for Planning.

Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Part 5 of the EP&A Act has a significant impact on the environment.

Chapter 6 of this REF provides an environmental impact assessment of the Proposal in accordance with clause 228. Appendix 1 specifically responds to the factors for consideration under clause 228.

#### 4.2.2 Ecologically sustainable development

TfNSW is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ecologically sustainable development (ESD) outlined in Section 6(2) of the NSW *Protection of the Environment Administration Act 1991* and Schedule 2 of the EP&A Regulation.

The principles of ESD are:

- **the precautionary principle** – If there are threats of serious or irreversible damage, a lack of full scientific uncertainty should not be used as a reason for postponing measures to prevent environmental degradation
- **intergenerational equity** – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
- **conservation of biological diversity and ecological integrity** – the diversity of genes, species, populations and their communities, as well as the ecosystems and habitats they belong to, should be maintained or improved to ensure their survival
- **improved valuation, pricing and incentive mechanisms** – environmental factors should be included in the valuation of assets and services.

The principles of ESD have been adopted by TfNSW throughout the development and assessment of the Wentworthville Station Easy Access Upgrade. Section 3.1.4 summarises how ESD would further be incorporated during the detailed design development of the proposal. Section 6.12 includes an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction and operation of the Proposal.

#### 4.2.3 Other NSW legislation and regulations

Table 4 provides a list of other relevant legislation applicable to the Proposal.

Table 4: Other relevant legislation applicable to the Proposal

Legislation	Requirements for the Proposal
<i>Heritage Act 1977 (NSW)</i>	<p>Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted.</p> <p>Sections 139 and 140 (permit) where relics are likely to be exposed.</p> <p>Section 170A: <i>Heritage management by government instrumentalities</i>, where items listed on a government agency Heritage and Conservation Register are to be impacted.</p> <p>Wentworthville Railway Station Group is listed on the RailCorp Section 170 register. No heritage approvals are required under the Act, but a government instrumentality must give the Heritage Council not less than 14 days written notice before the government instrumentality removes any item from its register under Section 170.</p> <p>Transport agencies are responsible for conserving heritage places under their stewardship, as well as provide equitable access under the Disability Discrimination Act (DDA) and relevant transport standards.</p> <p>The Proposal aims to ensure equitable access outcomes are achieved in a way that conserves heritage values and minimises impacts on heritage significance.</p>
<i>National Parks and Wildlife Act 1974 (NSW)</i>	<p>Sections 86, 87 and 90 require consent from the Office of Environment and Heritage (OEH) for the destruction or damage of Aboriginal objects.</p> <p>The Proposal is unlikely to disturb any Aboriginal objects.</p>

Legislation	Requirements for the Proposal
<i>Threatened Species Conservation Act 1995 (NSW)</i>	The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer to Section 6.7).
<i>Fisheries Management Act 1994 (NSW)</i>	Adequate stormwater quality measures would prevent any adverse impacts on any natural watercourse.  The Proposal would not affect any listed threatened species, marine vegetation or involve dredging or dam works.
<i>Contaminated Land Management Act 1997 (NSW)</i>	The site has not been declared under the CLM Act as being significantly contaminated.
<i>Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)</i>	The proposed works are not included as a scheduled activity under the PoEO Act. Therefore an environment protection licence under this Act is not required.  Part 5 provides a Duty to notify the EPA in the event of a pollution incident occurring.
<i>Water Management Act 2000 (NSW)</i>	The Proposal would not involve any marked increase in water consumption, water management works, drainage or flood works, controlled activities or aquifer interference.
<i>Waste Avoidance and Resource Recovery Act 2001 (NSW)</i>	TfNSW would carry out the construction of the Proposal in accordance with the objects of this Act. A Waste Management Plan would be prepared and implemented during construction.
<i>Native Title Act 1993 (Commonwealth)</i>	The proposed site is unlikely to be affected by any native title holders or claim.
<i>Disability Discrimination Act 1992 (DDA) (Commonwealth); Disability Services Act 1993 (NSW); Disability Standards for Accessible Public Transport 2002 (DSAPT) (Commonwealth)</i>	The objects of the DDA are to eliminate, as far as possible, discrimination against persons on the grounds of disability, including in the provision of services.  The Proposal would promote the objectives of TfNSW's Disability Action Plan 2012-2017 which aims to eliminate, as far as practicable, direct and indirect discrimination in the provision of transport services to NSW residents and visitors.  The Plan requires all new and refurbished transport infrastructure to meet customer focussed design standards and comply with DDA requirements.
<i>Noxious Weeds Act (NSW)</i>	Noxious weeds identified as occurring on site are discussed in Section 6.7.
<i>Crown Lands Act (NSW)</i>	The site does not comprise Crown Land.
<i>Sydney Water Act 1994 (NSW)</i>	The Proposal does not involve discharge of wastewater

### 4.3 NSW Government policies and strategies

In addition to statutory requirements, several NSW Government policies and strategies are relevant to the Proposal. Table 5 summarises the NSW Government policies and strategies applicable to the Proposal.

Table 5: Relevant NSW Government policies/strategies

Policy/Strategy	Commitment	Comment
<b>Metropolitan Plan for Sydney 2036</b>	<p>In 2010 the <i>Metropolitan Strategy</i> was updated and integrated with the <i>Metropolitan Transport Plan</i> to deliver a new 25-year <i>Metropolitan Plan for Sydney 2036</i>.</p> <p>The Metropolitan Plan was designed to meet the targets in the updated NSW State Plan—notably in integrated transport and land use planning.</p> <p>The <i>Draft Metropolitan Strategy for Sydney 2031</i> (Department of Planning &amp; Infrastructure, 2013) is currently being finalised along with updated subregional delivery plans. The new delivery plan for the Sydney south region is likely to have revised housing and employment targets, although with similar increasing growth trends over the coming decades.</p> <p>The <i>Metropolitan Transport Plan - Connecting the City of Cities</i> (February 2010) was the NSW Government's response to the specific challenges of passenger travel and transport within and across Sydney identified in the Metropolitan Strategy. This Transport Plan has been integrated into the Metropolitan Plan.</p> <p>The Transport Plan identifies a number of initiatives to be delivered over the next decade. One of these initiatives is 'to improve passenger connections between buses and trains through upgrades to essential interchanges' across the greater Sydney Metropolitan area.</p>	<p>This Proposal supports the following Strategic Directions in the Metropolitan Strategy:</p> <p>A10.1 Develop Sydney's transport system to support its role as a global city</p> <p>C2.2 Develop modal strategies including rail, bus, walking and roads to respond to growth in demand</p> <p>E3.3 Strengthen existing freight and industry clusters and support emergence of new clusters</p> <p>H3.1 Design and plan for healthy, safe, accessible and inclusive places</p>

Policy/Strategy	Commitment	Comment
<p><b>Rebuilding NSW</b> State Infrastructure Strategy 2014</p>	<p><i>Rebuilding NSW</i> is a plan to deliver \$20 billion in new productive infrastructure to sustain productivity growth in our major centres and regional communities.</p> <p><i>Rebuilding NSW</i> will support overall population growth in Sydney and NSW.</p> <p>Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.</p>	<p>The Proposal supports massive investment in rail infrastructure, and aligns with the reservation of \$8.9 billion for urban public transport to support Sydney's population, that is expected to reach almost 6 billion by 2031.</p>
<p><b>NSW 2021</b></p>	<p>NSW 2021 is the NSW Government's ten year plan to guide budget and decision making in NSW. NSW 2021 includes the following goals, targets and priority actions relevant to the Proposal:</p> <ul style="list-style-type: none"> <li>• reduce travel times</li> <li>• minimise public transport waiting times for customers</li> <li>• improve co-ordination and integration between transport modes</li> <li>• grow patronage on public transport</li> <li>• improve public transport reliability</li> <li>• improve customer experience with transport services.</li> </ul> <p>On 21 December 2012, the Government released the South Western (and Western Sydney and Blue Mountains) Regional Action Plans. These Plans outline the immediate actions the Government will take to address the priorities identified by the community.</p>	<p>The Proposal is consistent with the NSW Government's commitment to:</p> <ul style="list-style-type: none"> <li>• grow patronage on public transport, and</li> <li>• improve customer experience with transport services.</li> <li>• increase opportunities for people with a disability, by improving transport access</li> <li>• build liveable centres.</li> <li>• reduce travel times.</li> </ul> <p>The Proposal also supports active transport by contributing to the development of cycle facilities as part of an integrated local network.</p>

Policy/Strategy	Commitment	Comment
<b>NSW Transport Master Plan</b>	<p>The <i>NSW Long Term Transport Master Plan</i> (December 2012) identifies a planned and coordinated set of actions to address transport challenges. It will guide the NSW Government's transport funding priorities over the next 20 years.</p> <p>The Long Term Master Plan will meet a number of challenges to building an integrated transport system for Sydney and NSW, including:</p> <ul style="list-style-type: none"> <li>• customer-focussed integrated transport planning</li> <li>• integrated modes to meet customer needs</li> <li>• getting Sydney Moving Again</li> <li>• sustaining Growth in Greater Sydney.</li> </ul> <p>The Master Plan links to <i>NSW 2021</i>, the <i>Metropolitan Strategy for Sydney</i>, the <i>State Infrastructure Strategy</i>, regional and sub-regional strategies, and national plans.</p>	<p>The Proposal implements key themes in the Master Plan:</p> <ul style="list-style-type: none"> <li>• improving customers' journey experience</li> <li>• making better use of existing assets</li> <li>• providing accessible transport to help address social exclusion.</li> </ul>

## 4.4 State Environmental Planning Policies

### 4.4.1 State Environmental Planning Policy (Infrastructure) 2007

The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) is the key environmental planning instrument which determines the permissibility of the Proposal.

Clause 79 of the Infrastructure SEPP allows for the development of rail infrastructure facilities by or on behalf of a public authority without consent on any land. Clause 78 defines 'rail infrastructure facilities' as including 'associated public transport facilities for railway stations' which includes 'car parks intended to be used by commuters' in accordance with Clause 5. Consequently, development consent is not required. However the environmental impacts of the Proposal have been assessed under the provisions of Part 5 of the EP&A Act.

In addition, Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils prior to the commencement of certain types of development. Section 5.1 of this REF discusses the consultation undertaken with Council during the development of the Proposal.

It is noted that the Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (Major Development) 2005*, *State Environmental Planning Policy No 14 - Coastal Wetlands* or *State Environmental Planning Policy No 26 - Littoral Rainforest* applies. However, none of these SEPPs apply to the Proposal.

## 4.5 Local Environmental Plans and Strategies

### 4.5.1 Holroyd Local Environmental Plan 2013

The southern part of Wentworthville Station falls within the Holroyd LGA and is covered by the *Holroyd Local Environmental Plan 2013* (HLEP). The HLEP 2013 provides the statutory framework for all planning within the area and also contains provisions to conserve local heritage and protect sensitive land. The operation of the Infrastructure SEPP means that the HLEP does not apply to the proposal.

Under the HLEP 2013, the rail related infrastructure of Wentworthville Station is zoned Special Purposes 2 – Infrastructure. Wentworthville town centre to the south is zoned B2 Local Centre and surrounded by land zoned R4 High Density Residential and R2 Low Density Residential.

Refer to Figure 9 below for the zoning of Wentworthville Station Precinct under the HLEP 2013.

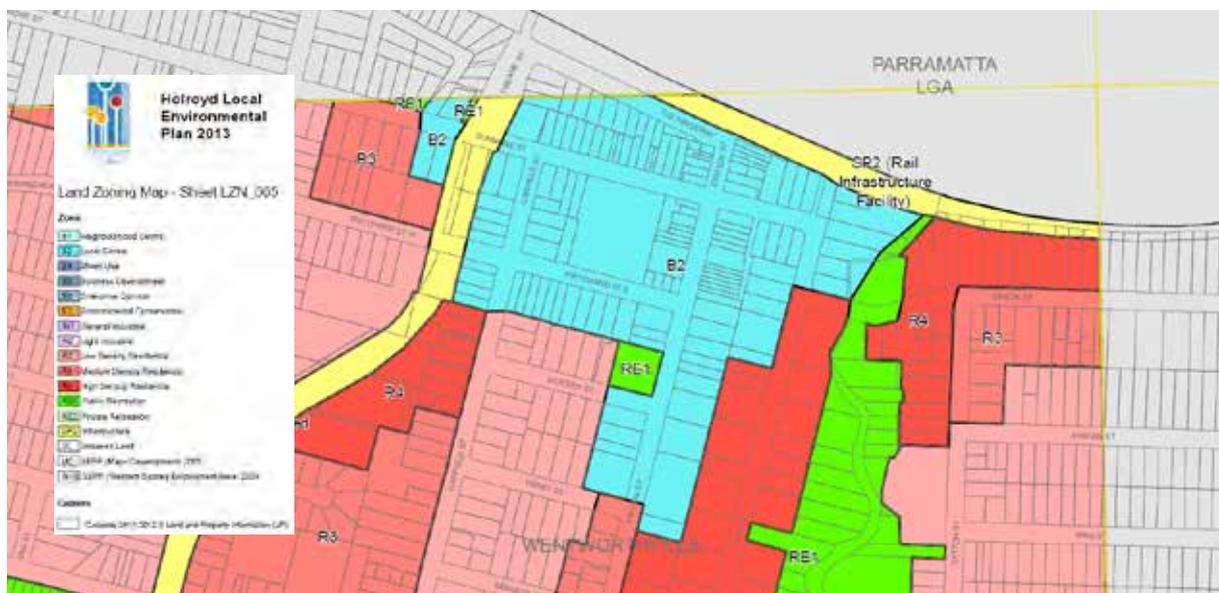


Figure 9: Holroyd LEP 2013 zoning map. Approximate footprint of the proposal is identified in blue.

Table 6 summarises the relevant aspects of the HLEP 2013 applicable to the Proposal.

Table 6: Relevant HELP 2013 aspects applicable to the Proposal

Description	Comment
Zoning	<p>Wentworthville Railway Station and its adjacent land is zoned SP2 Railway. The Kingsway, Station Street and land to the south is zoned as B2 Local Centre.</p> <p>Land within the works footprint (refer Figure 9) is zoned as SP2 Railway Infrastructure and B2 Local Centre.</p>
Zone objectives and development control	<p>Majority of the works would be undertaken with land zoned as SP2 Railway. The works would be in line with the objectives of this zone in that they would improve amenity for commuters and promote the use of public transport.</p> <p>Works would also meet the objectives of surrounding zones, specifically with reference to the following objectives:</p> <ul style="list-style-type: none"> <li>• To maximise public transport patronage and encourage walking and cycling.</li> <li>• To enhance the viability, vitality and amenity of local centres.</li> </ul>
Consent requirements	<p>Development for the purposes of rail infrastructure is permissible with consent under the provisions of the zoning table. However, as the provisions of the Infrastructure SEPP prevail over the HLEP 2013, development consent is not required (refer to Section 4.2.3).</p>
Restrictions applying to heritage items	<p>Clause 5.10 of the HLEP 2013 provides for the protection of items, places, and archaeological sites which have been identified in HLEP 2013 as having heritage significance.</p>
Development in the vicinity of the heritage items	<p>Wentworthville Railway Station Group is heritage listed on the HLEP 2013.</p> <p>The Wentworthville Memorial Fountain located on The Kingsway, immediately adjacent to Wentworthville Station, is heritage listed on HLEP 2013. The Memorial Fountain would require relocation to facilitate the construction of the Proposal.</p> <p>The Inter-war shop front with Federation influences, located at 2-4 Station Street, and 'Dobson House' Federation/Interwar period shopfront, located at 6-8 Station Street, are both located adjacent to the proposed works and heritage listed on HLEP 2013 but would not be impacted.</p> <p>These issues are further assessed in section 6.5</p>

#### 4.5.2 Parramatta Local Environmental Plan 2011

The northern part of Wentworthville Station falls within the Parramatta LGA and is subject to the *Parramatta Local Environmental Plan 2011* (PLEP 2011). The PLEP 2011 provides the statutory framework for all planning within the area and also contains provisions to conserve local heritage and protect sensitive land. The operation of the Infrastructure SEPP means that the PLEP does not apply to the Proposal.

Under PLEP 2011 the rail related infrastructure of Wentworthville Station is zoned Special Purposes 2 - Infrastructure (SP2). The area immediately north of the station is land zoned as High Density Residential (R4).

Refer to Figure 10 below for the zoning of the Wentworthville Station Precinct under PLEP 2011.



Figure 10: Parramatta LEP 2011 zoning map. Approximate footprint of the Proposal is identified in blue.

Table 7 summarises the relevant aspects of the PLEP 2011 applicable to the proposal.

Table 7: Relevant PELP 2011 aspects applicable to the proposal

Description	Comment
Zoning	<p>Wentworthville Railway Station and its adjacent land is zoned SP2 Railway. Wentworth Avenue and land to the north is zoned as R4 High Density Residential.</p> <p>Land within the works footprint (refer Figure 10) is zoned as SP2 Railway Infrastructure and R4 High Density Residential.</p>
Zone objectives and development control	<p>Majority of the works would be undertaken with land zoned as SP2 Railway. The works would be in line with the objectives of this zone in that they would improve amenity for commuters and promote the use of public transport.</p> <p>Works would also meet the objectives of surrounding zones, specifically with reference to the following objectives:</p> <ul style="list-style-type: none"> <li>• To maximise public transport patronage and encourage walking and cycling.</li> <li>• To enhance the viability, vitality and amenity of local centres.</li> </ul>
Consent requirements	<p>Development for the purposes of rail infrastructure is permissible with consent under the provisions of the zoning table. However as the provisions of the Infrastructure SEPP prevail over the PLEP 2011, development consent is not required (refer to Section 4.2.3).</p>

Description	Comment
Restrictions applying to heritage items	Clause 5.10 of the PLEP 2011 provides for the protection of items, places, and archaeological sites which have been identified as having heritage significance.
Development in the vicinity of the heritage items	<p>Wentworthville Cottage located at 59 Wentworthville Avenue (lot 10 section 3 DP976563), nearby Wentworthville Station, is listed as a local item of heritage under Schedule 5 of the PLEP 2011. The Cottage would not be impacted as a result of the Proposal.</p> <p>These issues are further assessed in section 6.5</p>

# 5 Community and stakeholder consultation

Chapter 5 discusses the consultation undertaken to date for the Proposal and the consultation proposed for the future. This chapter discusses the consultation strategy adopted for the Proposal and the results of consultation with the community, relevant government agencies and stakeholders.

## 5.1 Consultation requirement

Table 8 provides details of consultation requirements under the Infrastructure SEPP. Where consultation is required, notification has allowed for a 21 day response period, with all responses being considered in design. Refer to Section 5.6 below for a summary of response received during this notification period.

Table 8: Infrastructure SEPP consultation requirements

Consultation with Councils – development with impacts on council related infrastructure and services	Relevance to the Proposal
<p>Where works would:</p> <ul style="list-style-type: none"> <li>• substantially impact on storm water management services</li> <li>• place a local road system under strain</li> <li>• involve connection to or impact on a council owned sewerage system</li> <li>• involve connection to and substantial use of council owned water supply</li> <li>• significantly disrupt pedestrian or vehicle movement</li> <li>• involve significant excavation to a road surface or footpath for which Council has responsibility.</li> </ul>	<p>The Proposal would involve minor, temporary impact on council-owned footpaths and roads, and would include minor adjustment to stormwater infrastructure.</p> <p>Access would be maintained throughout majority of the works.</p> <p>Consultation with Holroyd and Parramatta Council has been undertaken and would continue throughout the Proposal.</p>
Consultation with Councils – development with impacts on local heritage	Relevance to the Proposal
<p>Where railway station works:</p> <ul style="list-style-type: none"> <li>• substantially impact on local heritage item (if not also a State heritage item)</li> <li>• substantially impact on a heritage conservation area.</li> </ul>	<p>The proposal would involve upgrades to Wentworthville Station and the likely relocation of the Wentworthville Memorial Fountain, both of which are heritage listed under the HLEP 2013.</p> <p>Consultation with Holroyd Council has been undertaken with regards to the impact to the fountain.</p>

Consultation with Councils – development with impacts on flood liable land	Relevance to the Proposal
<p>Where railway station works:</p> <ul style="list-style-type: none"> <li>• impact on land that is susceptible to flooding – reference would be made to ‘Floodplain Development Manual: the management of flood liable land’.</li> </ul>	<p>The proposed site is not susceptible to flooding. Accordingly, consultation with Council is not required in regard to this aspect. Refer to Section 6.9</p>
Consultation with public authorities other than Councils	Relevance to the Proposal
<p>Where development is undertaken adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>, OEH and other agencies specified by the Infrastructure SEPP where relevant. Although not a specific Infrastructure SEPP requirement, other agencies TfNSW may consult would include:</p> <ul style="list-style-type: none"> <li>• Roads and Maritime Services (RMS)</li> <li>• Sydney Trains</li> <li>• Office of Environment and Heritage (OEH)</li> </ul>	<p>Does not apply to the Proposal.</p>

## 5.2 Consultation strategy

TfNSW’s overall approach to stakeholder engagement is built on a philosophy of ‘no surprises’. Ensuring the community and key stakeholders are fully informed and given the opportunity to provide feedback during the planning process is fundamental to the success of a project.

The consultation strategy for the Proposal was developed to encourage stakeholder and community involvement and foster interaction between stakeholders, the community and the project team. The consultation strategy that was developed, having regard to the requirements of the planning process ensures that stakeholders, customers and the community are informed of the Proposal and have the opportunity to provide input.

The objectives of the consultation strategy are to:

- provide accurate and timely information about the Proposal and REF process to relevant stakeholders
- raise awareness of the various components of the Proposal and the specialist environmental investigations
- provide opportunities for stakeholders and the community to express their view about the Proposal
- understand and access valuable local knowledge from the community and stakeholders
- record the details and input from community engagement activities
- ensure a comprehensive and transparent approach.

### 5.3 Consultation tools and activities

The consultation strategy adopts a range of information sources to communicate the Proposal, including:

- public display of the REF
- distribution of flyers about the Proposal notifying of the REF display period via letterbox drops up to a radius of approximately 500 metres to the station
- distribution of notification flyers at Wentworthville Station to the local community and commuters
- advertisement of REF public display in local newspapers with a link to the TfNSW website that includes a summary of the Proposal and information on how to provide feedback
- direct consultation with Council, Sydney Trains and other non-community stakeholders
- advertisement of the REF public display on posters installed at the station.

### 5.4 Public display period

The REF (this document) would be on public display for two weeks. The display period of the REF would be advertised in the week that the public display commences and flyers distributed on the first day of public display.

The REF will be placed on public display at the following locations:

1. Wentworthville Library  
2 Lane Street Wentworthville, NSW 2150
2. Parramatta City Library  
1 Civic Place, Parramatta, NSW 2150
3. Holroyd City Council Customer Service Centre  
16 Memorial Avenue, Merrylands, NSW 2160
4. Transport for NSW  
Community Information Centre  
388 George Street  
Sydney NSW 2000.

The REF will also be available on the TfNSW website: [www.transport.nsw.gov.au/projects](http://www.transport.nsw.gov.au/projects). Information on the Proposal will be available through the Project Infoline (1800 684 490) or by email ([projects@transport.nsw.gov.au](mailto:projects@transport.nsw.gov.au)).

During this time feedback is invited. Following consideration of feedback received during the public display period, TfNSW will determine whether to proceed with the Proposal.

### 5.5 Aboriginal community involvement

An Aboriginal Heritage Inventory Management System (AHIMS) search was undertaken for Wentworthville Railway Station and surrounding lands within a 200 metre radius. The search did not identify any Aboriginal sites recorded in or near the subject location, and no Aboriginal places have been declared in or near the subject location. Therefore it was not considered necessary to undertake specific Aboriginal consultation.

## 5.6 Government agency and stakeholder involvement

Meetings and workshops would be held with key stakeholders during the detailed design process. These may include but not be limited to:

- Holroyd City Council
- Parramatta City Council
- Sydney Trains.

Meetings with both Holroyd and Parramatta City Councils were held on 18 September 2013 during the concept development stage of the Proposal. The purpose of these meetings was to brief them on the Proposal and to provide them with an opportunity to provide feedback. Both councils expressed their general support for the Proposal. The key points of the discussion are outlined below:

- Wentworthville town centre is being proposed by Holroyd Council to be included on the Urban Activation Precinct program. Regardless of this, the Council plans to upgrade the town centre within the next five years. The Council will encourage improved integration with the station, and could have an additional 2,000 residents. The Holroyd City Council 2013 LEP allows approximately 15 storeys for the town centre and will include higher densities
- heritage of the memorial fountain is significant, and the preference would be to leave the memorial undisturbed
- on street parking is in high demand in the area. Any loss of parking will be a concern for Holroyd Council. A Local Area Traffic Management assessment had been undertaken around the town centre, with the intention to provide a 40km/h 'high pedestrian activity zone' within the town centre. An application for Blackspot funding has been made in order to improve pedestrian safety along Dunmore Street
- Holroyd Council would prefer to retain the ramps accessing the station if possible.
- the stairs on the southern side provide more direct access for pedestrians accessing from Dunmore Street, and the preference would be to retain the stairs in this location
- the footbridge as a cross-corridor connection is important for residents accessing the town centre. The ends of the bridge should be kept open if possible to allow for future extensions into development particularly south of the rail corridor
- Parramatta City Council would prefer to retain the stairs on the northern side of the station
- additional on-street parking would be welcomed on Wentworth Avenue west of the station, but the preference would be 45 degree rather than 90 degree parking
- Parramatta City Council would encourage improved bus ridership, and strongly supports the proposed intersection upgrades and public transport improvements.

Following this, a subsequent meeting was held with Holroyd and Parramatta City Councils on 7 November 2014. The key points of the discussion are outlined below:

- all stairs would be replaced and temporary access provided during construction
- parking loss would be minimised as far as reasonably practicable
- detailed design of the station would include future proofing so that a wider footbridge could be accommodated into the upgraded station to cater for future demand if required

- the design of the station should reflect the identity of the community, to be reflected in the design and use of materials in the architectural and urban design detail
- the pedestrian zones and intersection treatments on approach to both entrances would favour pedestrians and slow traffic
- it was requested for swept paths of larger servicing vehicles at The Kingsway to be included during detailed design.
- concerns were raised regarding sightlines and treatment of The Kingsway and Station Street intersection. The traffic committee would need to be consulted regarding final layout
- an opportunity would be sought to enhance the setting and prominence of the memorial fountain to be relocated, to be undertaken in consultation with Holroyd Council and its heritage committee
- bike storage areas would be covered by a canopy, the final designs would need to include this.

A meeting was also held with Holroyd City Council on 2 October 2014 regarding the need to relocate the Wentworthville Memorial Fountain, for which Holroyd City Council has not objected.

Council was encouraged to formally submit feedback about the design and construction of the Proposal during the public display period. Any additional feedback would be further considered and discussed with Council where practicable, to incorporate into the design.

## **5.7 Ongoing consultation**

At the conclusion of the public display period for this REF, TfNSW would acknowledge receipt of feedback from each respective respondent. The issues raised by the respondents would be considered by TfNSW before determining whether to proceed with the Proposal.

Should TfNSW determine to proceed with the Proposal, the determination report would be made available on the TfNSW website and would summarise the key impacts identified in this REF, demonstrate how TfNSW considered issues raised during the public display period, and include a summary of mitigation measures proposed to minimise the impacts of the Proposal. See Figure 11 for the planning approval and consultation process.

During construction the project team would keep the community, councils and other key stakeholders informed of the process, identify any further issues as they arise, and develop additional mitigation measures to minimise the impacts of the Proposal. The interaction with the community throughout the construction phase would be undertaken in accordance with a community liaison plan (CLP) to be developed prior to the commencement of construction.



Figure 11: Planning approval and consultation process

## 6 Environmental impact assessment

---

Chapter 6 of the REF provides a detailed description of the likely environmental impacts associated with the construction and operation of the Proposal. For each likely impact, the existing environment is characterised and then an assessment is undertaken as to how the Proposal would impact on the existing environment.

This environmental impact assessment has been undertaken in accordance with clause 228 of the EP&A Regulation. A checklist of clause 228 factors and how they have been specifically addressed in this REF is included at Appendix 1.

### 6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment (TTAIA) for the Proposal was prepared by GTA Consultants Pty Ltd in November 2014. The results of the TTAIA are summarised below.

#### 6.1.1 Existing environment

##### **Road network and traffic**

###### Southern station precinct

The Kingsway is a two-lane single carriageway with approximately 3.5 metre lane widths and is generally aligned in an east-west direction. It is located on the southern side of Wentworthville station and serves as a local street, continuing as Station Street to the east and accommodating a small roundabout to the west. The roundabout primarily facilitates U-turn movements for set-down and pick-up activity and connects to the commuter car park to the west. The Kingsway accommodates a raised pedestrian crossing at the intersection with Station Street and another crossing immediately to the west of the small roundabout. It also accommodates a taxi rank on the northern side, adjacent to the station access ramp, with '1P' parking permitted on the southern side.

Station Street is a two-lane single carriageway with approximately 4.5 metre lane widths and is generally aligned in a north-south direction. It is located on the southern side of Wentworthville Station and serves as a local street forming a signalised intersection with Dunmore Street. It accommodates a raised pedestrian crossing on its intersection with The Kingsway and signalised pedestrian crossings at Dunmore Street. '1P' parking is permitted along both sides, including one accessible parking bay on each side of the road towards the intersection.

Key traffic movements:

- two-way peak hourly traffic flows on The Kingsway were in the order of 210 vehicles, during the AM peak (7:00am-8:00am)
- the PM peak flows along The Kingsway were similar to the AM
- set-down and pick-up accounted for 30-40% of all traffic along The Kingsway during the peak periods.

###### Northern station precinct

Wentworth Avenue is a two-lane single carriageway with approximately 3.5 metre lane widths and is generally aligned in an east-west direction. It traverses parallel to the station on the northern side and forms a priority intersection with Railway Street opposite the station access steps. It also forms a priority intersection with Hill Street

approximately 150m west of the station. It accommodates a designated on-street bike route to Toongabbie and Blacktown, which cuts across the Cumberland Highway to the west. Wentworth Avenue accommodates a raised pedestrian crossing on the eastern side of the Railway Street intersection, connecting eastern and northern footpaths of Railway Street and Wentworth Avenue respectively. It accommodates a mix of '2P' and unrestricted parking on both sides east of the Railway Street intersection. A mix of '1/2P', '2P' and unrestricted parking is available on the northern side of Wentworth Avenue, along with a bus zone, two disabled bays and unrestricted parking on the southern side west of the Railway Street intersection up to the Cumberland Highway.

Railway Street is a two-lane single carriageway with approximately 3.0 metre lane widths and is generally aligned in a north-south direction. It forms priority T-intersections with Wentworth Avenue to the south and Short Street to the north, approximately 130m from the station. Railway Street accommodates a designated on-street bike route to Winston Hills and permits a mix of '1/4P', '2P' and unrestricted parking along its length on both sides. A '1/4P' parking restriction is limited to approximately two parking spaces located outside two childcare centres, one on each side of the street.

Key traffic movements:

- Two-way peak hourly traffic flows on Wentworth Avenue were in the order of 280 vehicles, occurring east of Railway Street during the PM peak (5:15pm-6:15pm)
- Two-way flows west of Railway Street were typically 50% less than those occurring east
- The AM peak flows along Wentworth Avenue were approximately 15% less than the PM
- Set-down and pick-up accounted for less than 5% of all traffic on Wentworth Avenue during the peak periods.

### **Existing parking availability**

One car park located on The Kingsway facilitates commuter parking in the vicinity of Wentworthville Railway Station. Additionally, ample on-street parallel car parking with '1/4P', '1/2P', '1P' and '2P' restrictions is available. Unrestricted parking is also available on both the northern and southern sides of the station. Parking availability and demand at Wentworthville Station is summarised below, based on parking counts undertaken by GTA Consultants within the vicinity of the site.

#### Southern station precinct

- 240 spaces are available in the southern station precinct, including 6 accessible spaces.
- Approximately 168 (70%) of the parking supply is unrestricted.
- The peak parking demand was 81% at 9:00am, with no spare capacity available in unrestricted parking areas.

#### Northern station precinct

- 239 spaces are available in the northern station precinct, including 2 accessible spaces.
- Approximately 202 (85%) of the parking supply is unrestricted.
- The peak parking demand was 76% at 9:00am, with approximately 30 unoccupied spaces.

Overall, the peak parking demand for unrestricted parking was approximately 90%, which is indicative of the strong commuter parking activity surrounding Wentworthville Station. The eight accessible parking spaces experience poor utilisation. It is expected that this is as a result of the non-compliant facilities at the station and the undesirable layout of the parking spaces themselves, particularly on Wentworth Avenue.

### Bus operations

Bus stops have been provided within a typical walking distance from Wentworthville Station, including Wentworth Avenue (north of the station) and Dunmore Street to the south. The buses are operated by Hillsbus and Transit Systems, providing services linking Blacktown with Parramatta (Route 705, 711), and Merrylands with Westmead (Route 818).

The bus frequencies are detailed in Table 9.

Table 9: Bus service frequency at Wentworthville Station

Route	Frequency
705 (Hillsbus)	20 services per day
711 (Hillsbus)	35 services per day
818 (Transit System)	11 services per day
Total	66 service per day

Buses replace trains during weekend possession periods. These buses pick up and drop off along The Kingsway.

### Pedestrian access

The stations overhead footbridge extends between The Kingsway on the southern side of the station and Wentworth Avenue on the northern side. It provides an important public pedestrian connection over the railway line, including for non-rail passengers, as it is aligned with the retail destinations on the southern side of the station. It is one of only three railway line crossing points in the local area for pedestrians within a 500 metre radius of the station.

Direct access to the station platforms is available through ramps and stairs on Wentworth Avenue and The Kingsway. The ramps and stairs are connected to an elevated footbridge located at the western end of the station that facilitates access to the platforms by stairs only.

The key pedestrian desire lines are via the established footpaths along both sides of Railway Street, Station Street and The Kingsway. However, the footpaths along the southern side of Wentworth Avenue do not extend the length of commuter parking in both directions. As a result, pedestrians travelling along this desire line have to walk along the carriageway, alongside parked vehicles.

The pedestrian crossing on The Kingsway accommodates the majority of pedestrian movements to and from the station on the southern side of the station. Similarly, a marked pedestrian crossing on Wentworth Avenue connects pedestrians with the station on the northern side of the rail corridor.

The Wentworth Avenue pedestrian crossing does not accommodate pedestrian demand for the station access ramp, which is located approximately 50m west of the stairs. As a result, mid-block pedestrian activity was prominent in the northern station precinct, particularly at this location.

## **Cycleways and bicycle access**

Railway Street and Wentworth Avenue are recognised as on-road cycle routes by Parramatta City Council, with cycle logos regularly positioned on the pavement of both roads. Additional wayfinding signage is also provided to promote the cycling connections.

Bicycle facilities at the station include bike racks in the southern station precinct with capacity for five bicycles. Bicycle parking is generally underutilised. There are no bicycle facilities in the northern station precinct however informal bicycle parking is occurring on the northern side of Wentworth Avenue.

## **Kiss and ride and taxi facilities**

There is no formal kiss and ride facility within the vicinity of Wentworthville Station. Set-down and pick-up activity on the southern side of the station occurs at the following two locations:

- taxi rank, No Parking zone on the northern side of The Kingsway
- '1P' parking spaces along southern side of The Kingsway.

Set-down and pick-up activity on the northern side of the station occurs at the following three locations:

- accessible parking and bus zone on Wentworth Avenue
- '2P' parking spaces along southern side of Wentworth Avenue (east)
- '2P' parking spaces along eastern side of Railway Street.

The majority of vehicles undertaking set-down and pick-up activity were observed to take a U-turn across double white lines on Wentworthville Avenue on northern side, whereas U-turn movements along the Kingsway are catered by the small roundabout to the west.

A formal taxi rank is located adjacent to the station access ramps on the Kingsway. However, there is no taxi rank on the northern side of the station.

## **6.1.2 Potential impacts**

### **Construction phase**

#### Construction vehicle routes

The surrounding road network is well established and would provide direct access to and from the site. Figure 12 and Figure 13 have been prepared to illustrate the likely access routes for each side of the railway line.

It is anticipated that rail corridor lands located at the western end of the station would be used as the primary site compound, with access via Wentworth Avenue. The layout for the site compound would ensure access by the largest design vehicle.

It is anticipated that construction vehicles would also make use of the northern kerbside lane along The Kingsway to cater for temporary works in this area.

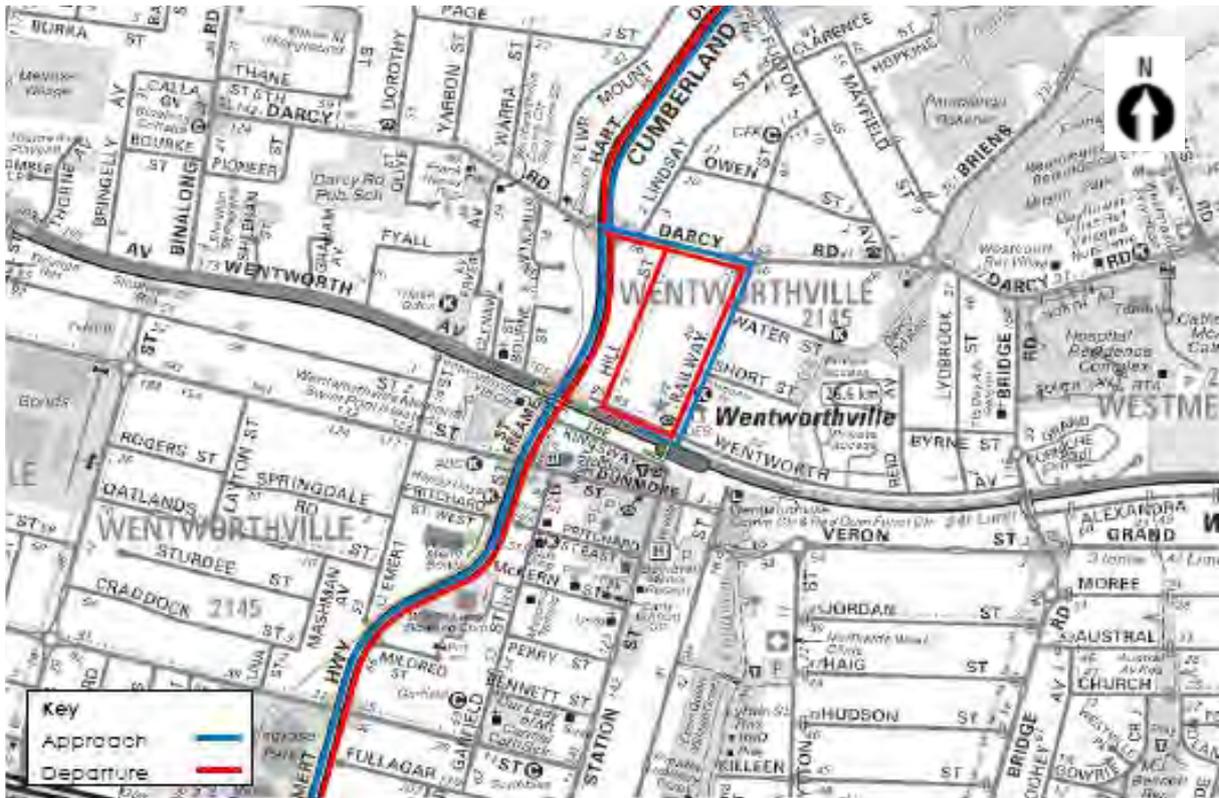


Figure 12: Likely construction vehicle routes (northern station precinct) (GTA, 2014)

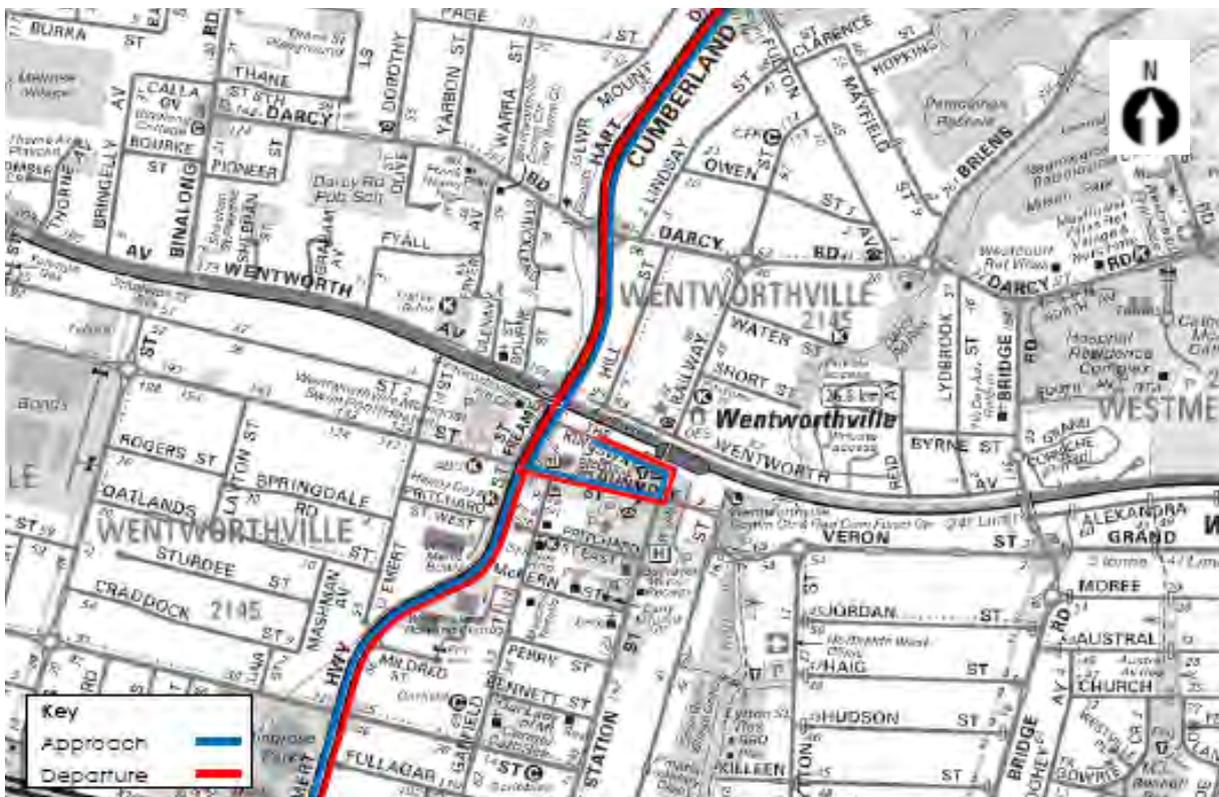


Figure 13: Likely construction vehicle routes (southern station precinct) (GTA, 2014)

### Traffic impacts

Traffic generated by the construction works includes construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, plant and equipment. Vehicle types and sizes would vary depending on the required use, but include medium and large rigid vehicles and articulated vehicles for import of bulk materials or spoil removal, as well as concrete trucks. The amount of fill material or spoil would be minor as the site is for the most part level and paved.

The traffic generated by construction at the site is unknown at this stage, however given the size of the proposed works, construction traffic generation is expected to be minor and have a negligible impact on existing traffic conditions. The interaction between the work site and street frontages (including traffic and pedestrians) would be managed by qualified personnel to ensure safety for all users at all times.

Some works, including the delivery of large structures such as lifts and the existing overbridge, have the potential to require temporary partial road closures. These would likely occur outside of peak periods, during weekend possessions and would be subject to Council approval. Access to The Kingsway would be maintained, particularly on weekdays to provide access to and from the commuter car park located at the western end. During partial road closures, it is anticipated that Stop/Slow traffic control or similar would be required to manage traffic at this location.

### Parking impacts

Partial road closures along The Kingsway and Wentworth Avenue would have the potential to result in a minor loss of on-street parking however any partial road closure would normally occur outside of peak periods or during weekend possessions and therefore would not be during a high parking demand period. Access would be maintained along The Kingsway to provide access to and from the commuter car park located at the western end.

Construction workers would be encouraged to car pool and/or use the available public transport for travel to and from the site. A small amount of parking may be possible on-site throughout the works programme however this should be clearly separated from commuter parking areas.

### Pedestrian Access and other impacts

During the station interchange works, pedestrian access will at times be temporarily restricted along the footpath of The Kingsway and Wentworthville Avenue. Construction works in the vicinity of any pedestrian and cyclist desire lines would be managed and controlled at all times to ensure that there is no impact to public safety.

At times during construction, particularly during possession periods, access to the stations overhead footbridge would be restricted resulting in a loss of direct access between the northern and southern station precincts. During these periods, diversion signage would direct pedestrian traffic to one of the other two alternate rail crossings located within a 500 metre proximity of the station.

Construction activities would not typically present significant impacts on the surrounding area and users. This includes rail operations, bus operations and general traffic. There would be negligible impact on access to surrounding properties during construction.

## **Operational phase**

### Pedestrian access

The Proposal would offer considerable pedestrian benefits particularly by improving the user experience through the provision of new and improved facilities. Provision of lifts to the overbridge and platforms would allow disability access, as well as access for elderly and people with prams or suitcases.

The proposed impacts to pedestrian crossing facilities on Wentworth Avenue and The Kingsway are expected to enhance pedestrian safety by constraining the carriageway. This would result in reduced vehicle travel speeds and reduced crossing widths to ensure a safer road environment.

It is considered that the upgraded access points at Wentworthville Station would be adequate to accommodate the expected growth in passenger demand. Overall, the access footpaths would be expected to operate well with minimal (if any) queuing or delay at any time or location.

### Station facilities

Five bicycle rails or racks would be provided on either side of the station, with capacity for 20 bicycles. With consideration for the existing demand, particularly in the northern station precinct, it is anticipated that this would be adequate to accommodate future demand.

The Proposal includes provision of formalised kiss and ride facilities in the northern and southern precinct, including capacity for approximately two vehicles to the north and approximately four vehicles to the south. The kiss and ride facilities would be located in close proximity to the primary access points, where informal kiss and ride activity is occurring under existing arrangements.

The kiss and ride and taxi rank locations are close to the lifts, stairs and ramps and thereby provide improved accessibility. The provision of two 1P parking spaces along the northern side of The Kingsway is expected to reduce the taxi rank by two spaces. Based on the existing utilisation of the taxi rank, it is anticipated that there would be adequate capacity for taxi storage in this area.

### Traffic generation and parking demand

Given that the Proposal provides a higher level of station accessibility and usability at Wentworthville Station, the improved commuter experience and upgraded facilities are likely to attract greater commuter use, particularly in relation to kiss and ride. As a result, traffic activity is anticipated to marginally increase, with a negligible impact on the surrounding road network. The anticipated growth in patronage would also result in increased traffic accessing the station. This may put some minor further pressure on the Dunmore Street corridor. This corridor is likely to require further consideration by Council in the context of future town centre operation.

### Property access

The proposed station upgrade is not expected to have any impact on existing access to properties in the vicinity of the site.

### 6.1.3 Mitigation measures

The following mitigation measures are proposed to manage traffic, transport and access impacts:

- prior to the commencement of works, a construction traffic management plan (CTMP) would be prepared and provided to Council for information. Specifically the TMP would discuss:
  - traffic management
  - locations of access to and from the local road network
  - pedestrian management - including wayfinding signage, traffic controllers and fencing
  - routes and turning movements of heavy vehicles
  - loading/delivery zones including queuing
  - parking (construction worker and commuter)
  - an Emergency Response Plan.
- a Road Safety Audit would be undertaken during detailed design and design amendments made as required.
- heavy vehicles would be restricted to specified routes, with the aim of minimising impacts on local roads.
- the impacts of construction traffic on the local road network and the impacts on intersection operation would be minimised by undertaking construction vehicle traffic movements outside of peak road traffic periods and outside of school peak periods where practicable
- the queuing and idling of construction vehicles in residential streets would be minimised through staging of deliveries where practicable
- where required, communication would be provided to the community and local residents to inform them of impacts to vehicle movements and anticipated effects on the local road network relating to site works
- access to all private properties and businesses adjacent to the works would be maintained during construction, unless otherwise agreed by relevant property owners
- signage would be erected to warn vehicles of construction activities and heavy vehicle movements
- should road closures be required, signage would clearly delineate alternative access, and that nearby businesses would operate as normal
- pedestrian access to and from the station and across the station footbridge would be maintained at all times during construction during non-possession periods
- during possession periods, where the station footbridge is restricted, temporary diversions would be established to direct pedestrian traffic to an alternate crossing
- road occupancy licences for temporary closure of roads would be obtained, where required.

## 6.2 Urban design, landscape and visual amenity

A Visual Impact Assessment (VIA) was undertaken by Green Bean Design for the Proposal (Green Bean Design, 2014). The findings of this assessment are summarised in this section.

### 6.2.1 Existing environment

The general urban landscape character surrounding Wentworthville Station is typical of both a residential, suburban setting and that of a main line rail corridor with mixed development within a local commercial centre. Residential areas to the north of Wentworthville Station extending along Wentworth Avenue and Railway Street are defined by a mix of single storey detached dwellings with front and rear gardens and medium to high residential developments. Dwellings are set back from street frontages with tree planting along nature strips.

By contrast the general urban landscape character south of the rail corridor is defined by the Wentworthville commercial centre with a range of shops and services extending along The Kingsway, Station Street and Dunmore Street. There is a constant level of vehicular and pedestrian activity throughout the local commercial area and a visual diversity of colour, line and form associated with buildings and signage.

The existing station is comprised of a number of key visual elements:

- east and west bound rail lines (main and suburban), electrical conductors and steel gantries
- two island platforms (four platforms)
- footbridge with ramp and step access with railings
- station buildings, ticket office and passenger shelters/amenities
- utility poles and wires
- shelters with seating for bus stop (north of rail line) and taxi rank (south of rail line)
- various security and safety fencing
- directional and informative signage.

The station precinct and adjoining road corridors contain mature native and exotic tree planting which provides some degree of screening within proximity to, and beyond the station. Tree planting continues along local residential street nature strips and throughout residential garden areas.

Temporary receivers include road traffic, pedestrians and train customers. Other permanent receivers include:

- residential dwellings to the north on Wentworth Avenue and Railway Street and to the south on Dunmore Street and The Kingsway
- commercial properties to the south on The Kingsway, Station Street and Dunmore Street
- the police station on Wentworth Avenue and Wentworthville Community Centre on Dunmore Street.

## 6.2.2 Potential impacts

### Construction phase

Whilst construction activities would tend to be more visible than the operational stage of the Proposal, the construction activities would be temporary and transient in nature. Views toward construction activities would be partially restricted by existing tree cover surrounding the station precinct. New elements typically introduced into the visual environment would include:

- temporary fencing and hoardings
- road barriers and signage
- scaffolding
- pedestrian fencing
- temporary site office and amenities.

Some construction activities, such as night works would require lighting installation for operational, safety and security purposes. Lighting installations would be placed to avoid light spill to adjoining road corridors and residential areas.

### Operational phase

#### Urban landscape effects

Visual Absorption Capability (VAC) is a classification system used to describe the relative ability of the urban landscape to accept modifications and alterations without the loss of character or deterioration of visual amenity. VAC relates to the physical characteristics of the urban landscape that are often inherent and quite static in the long term. In essence the VAC indicates the ability of an urban landscape setting to 'hide' development.

The VAC of an urban landscape is largely determined by inherent physical factors which include:

- the degree of visual penetration (view distance without obstruction) through surrounding buildings and tree cover
- the complexity of the urban landscape through bulk, scale, form and line.

Urban landscapes with a low visual penetration will have higher visual absorption capability values. Complex urban landscapes which include a mix of scale, form and line (together with some degree of vegetative screening) will also have high visual absorption capability values. The VAC of the urban landscape surrounding the Wentworthville Station and the area of proposed works exhibits a relatively high value.

The Proposal and its associated infrastructure would have an overall low (and predominantly beneficial) impact upon the urban landscape character of the station precinct and surrounding environment. The bulk and scale of constructed elements will be partially visually contained by existing mature tree planting within and beyond the station precinct as well as existing development within the Wentworthville local commercial centre. The Proposal design incorporates various architectural and engineered outcomes that visually minimise bulk and scale of constructed elements through modulation and articulation of structures.

Building form and height also responds to both existing constructed elements within and adjacent to the station precinct including existing station buildings, the footbridge and ramps. The Proposal is unlikely to form any significant skyline view from surrounding receiver locations.

The Proposal results in a seamless integration to the existing station precinct and, as an upgrade to existing transport facilities, retains the stations existing function and purpose in its relation to surrounding land use. The proposal integrates a high level of urban design and presents a rational approach to pedestrian and vehicular movement within the station precinct and connectivity to adjoining areas.

The Proposal is considered to result in an overall beneficial visual outcome where contemporary design, modern materials and sympathetic colours to the existing station precinct will combine to create a legible and high visual amenity asset within the surrounding urban landscape.

#### Viewshed and potential impacts to receivers

The viewshed is defined as the area of land surrounding and beyond the Proposal area which could be potentially affected by the Proposal. The viewshed is illustrated in Figure 14.

The visual significance of the Proposal on surrounding view locations would result primarily from a combination of the potential visibility of the Proposal and the characteristics of the landscape of the surrounding area. The potential degree of visibility and resultant visual significance is then partly determined by a combination of factors including:

- distance between view location and various elements within the Proposal
- duration of view from receiver locations toward various constructed elements
- predicted impact of the pProposal on existing visual amenity
- nature of predicted visual impacts
- visual sensitivity of locations from which views toward the proposal exist.

An assessment of significance was undertaken of the visual impact from 12 different receiver locations, with regard to above criteria, to determine an overall level of significance at each location. The level of visual significance is classified as high, moderate, low or negligible. The results of the assessment are displayed in the Visual Significance Matrix reproduced at Table 10. The location of the receivers included in the assessment is shown in Figure 15.

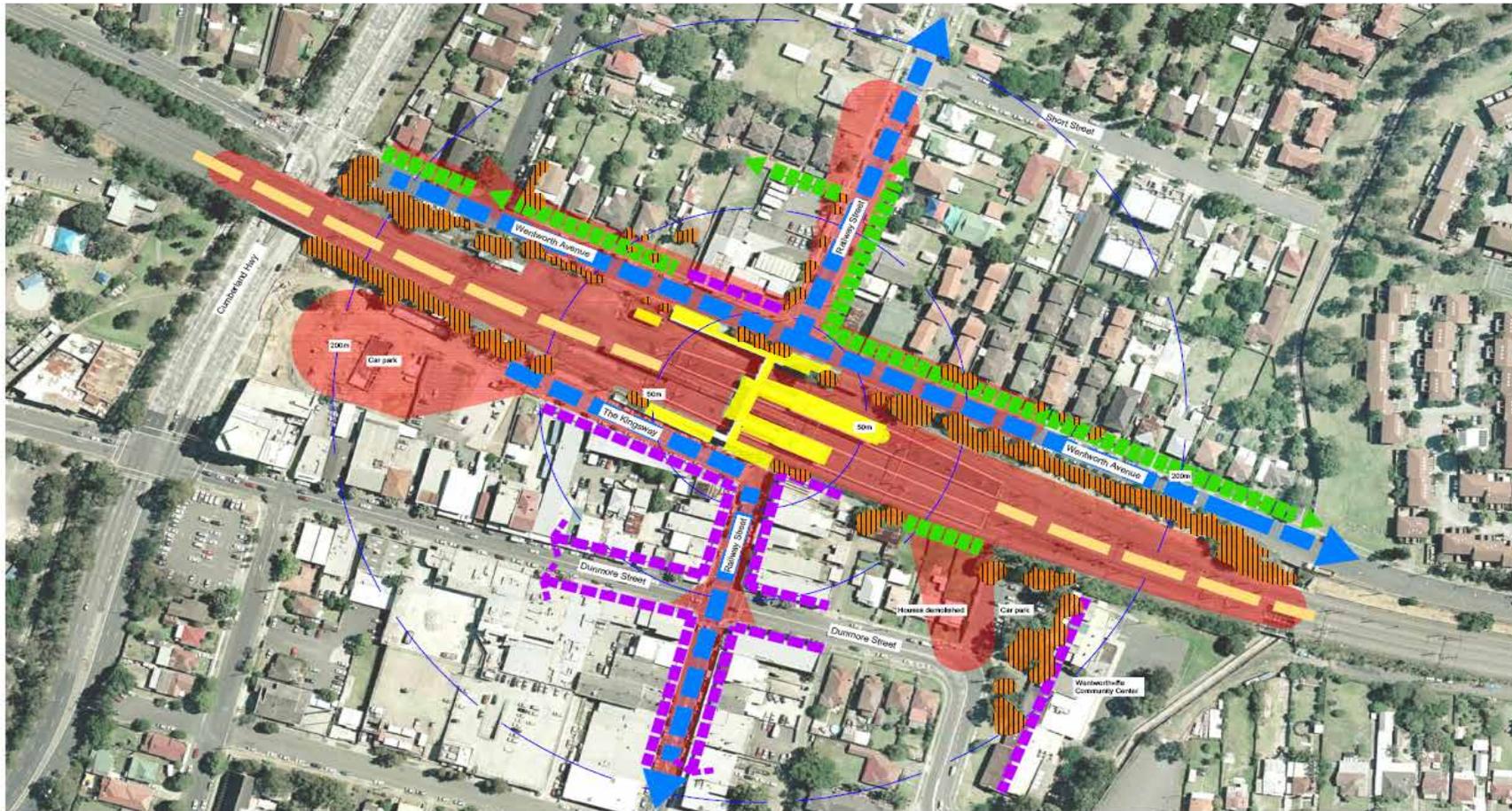
The majority of receiver locations, including private residential dwellings, road corridors and public spaces beyond the station precinct have been determined to have an overall negligible to low visual significance with regard to the Proposal and its associated infrastructure. The negligible to low visual significance largely results from the screening effect of existing tree planting alongside the rail corridor and the distribution of commercial development within the Wentworthville local centre.

The proposed upgrade works are considered to have an overall beneficial impact for commercial properties as well as views from road corridors, where works will enhance and create a positive outcome for existing views.

#### Other impacts

Some Proposal infrastructure will require lighting installation for operational, safety, security and maintenance purposes. Night lighting will include building and pole mounted directional spot lighting and pole mounted pedestrian lighting. The Proposal will avoid broad area or floodlighting where possible. The majority of infrastructure areas associated with the Proposal will be unlikely to require additional lighting, or lighting that will result in a direct line of sight from surrounding view locations. Lighting installations will avoid light spill to adjoining road corridors and residential areas.

The location of proposed works in relation to the offset distance to public domain, road corridors and residential areas, will result in the majority of shadows cast by the proposal infrastructure being contained within the station precinct boundary. Some overshadowing will extend along the south boundary of the station precinct and across The Kingsway road corridor, but is unlikely to extend to commercial properties on the south side of The Kingsway



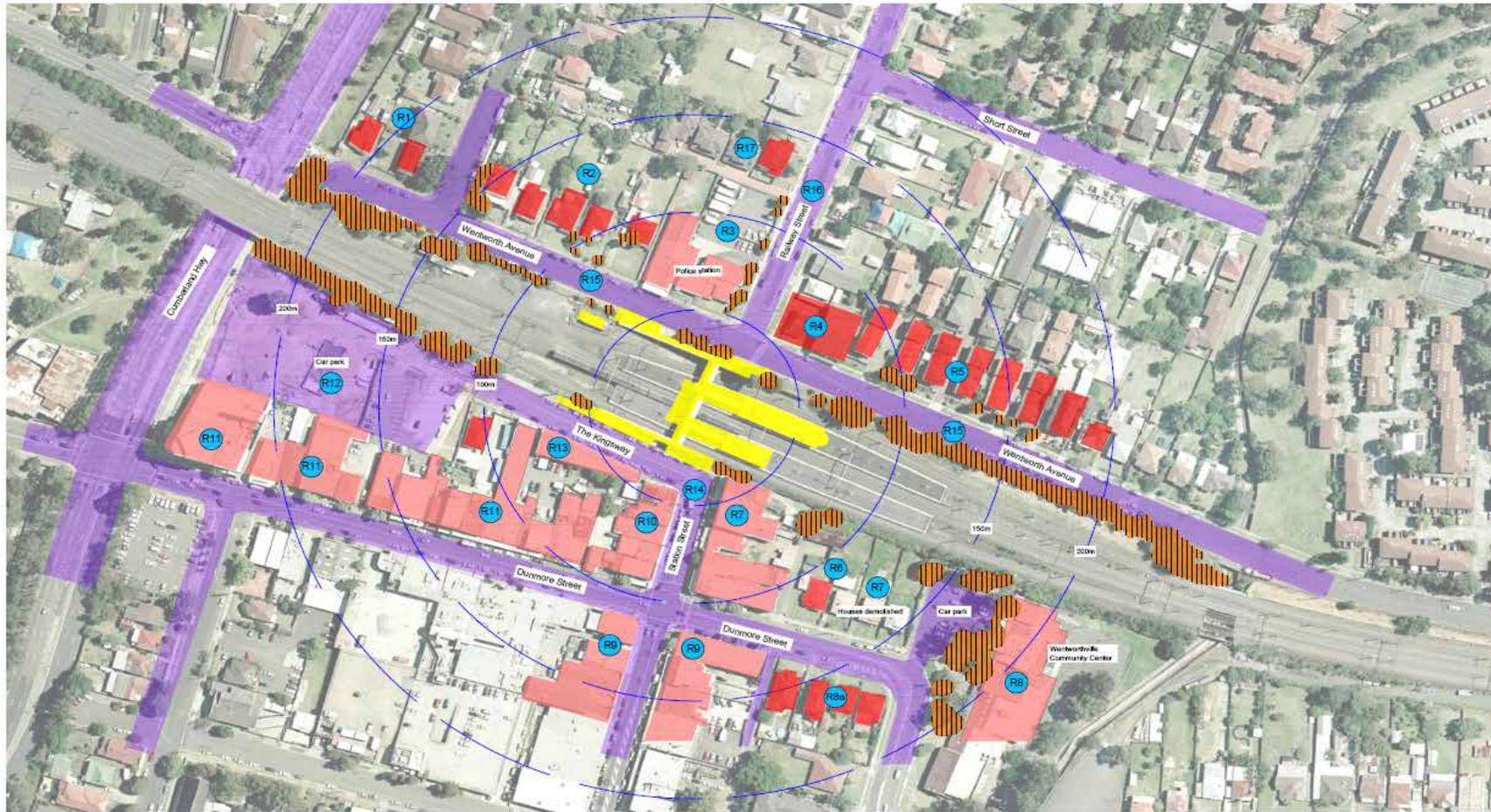
Legend

- Wentworthville Station footprint
- Rail corridor/view
- Building line blocking view beyond
- Primary view shed
- Tree cover with screening potential
- Road corridor view
- Residential interface



# Wentworthville Station Upgrade

Figure 14: Proposal viewshed (Green Bean Design, 2014)



Legend

- |   |                                     |   |                         |   |               |
|---|-------------------------------------|---|-------------------------|---|---------------|
|  | Wentworthville Station footprint    |  | Local Center/commercial |  | Road corridor |
|  | Tree cover with screening potential |  | Residential dwelling    |   |               |

0km 50m



# Wentworthville Station Upgrade

Figure 15: Receiver locations for Visual Impact Assessment (Green Bean Design, 2014)

Table 10: Visual Significance Matrix (GBD, 2014)

Receiver viewpoint (Figure 15)	View direction and distance to proposal	Description	Distance	Duration	Predicted impacts	Nature of impacts	Magnitude	Sensitivity	Significance
R1 Residential dwellings	South east – around 200 metres	Views toward the Wentworthville Station and the proposed works from residential dwellings bounded by Wentworth Avenue and Hill Street are partially blocked by dwellings and nature strip as well as tree planting to the south of the Wentworth Avenue road corridor.	Long	Long term	Neutral	Irreversible	Neutral	High	Negligible
R2 Residential dwellings	South to south east – between 100 and 150 metres	Views toward the Wentworthville Station and the proposed works from residential dwellings to the west of the Police Station are partially screened and filtered by street tree planting south of Wentworth Avenue. Potential for indirect views toward the proposed station structures.	Long	Long term	Beneficial	Irreversible	Low	High	Low
R3 Police Station	South – between 50 and 100 metres	Views toward the Wentworthville Station and proposed works from the Police Station building are partially screened by tree cover alongside Wentworth Avenue.	Medium	Long term	Beneficial	Irreversible	Low	Medium	Negligible
R4 Residential dwellings/unit	South – between 50 and 100 metres	Views toward the Wentworthville Station and proposed works are direct from south and south west facing windows, with an increased level of visibility from upper storey levels. The removal of an existing mature gum tree adjoining the works will open views both toward and from the residential unit.	Medium	Long term	Neutral	Irreversible	Medium	High	Moderate

Receiver viewpoint (Figure 15)	View direction and distance to proposal	Description	Distance	Duration	Predicted impacts	Nature of impacts	Magnitude	Sensitivity	Significance
R5 Residential dwellings/ units	South west - between 100 and 200 metres	Both indirect and direct views toward the Wentworthville Station and the proposed works are partially screened by tree planting along the north boundary of the rail corridor.	Medium	Long term	Neutral	Irreversible	Low	High	Low
R6 Residential dwelling	North west - around 100 metres	Indirect views toward the Wentworthville Station and the proposed works are screened by tree planting and commercial properties along Station Street.	Long	Long term	Neutral	Irreversible	Neutral	High	Negligible
R7 Potential future residential units	North west - between 100 and 150 metres	Views toward the Wentworthville Station and proposed works are partially screened by tree planting adjoining the property, although views from a multi storey development are likely to extend toward the station from north and west facing windows.	Long	Long term	Neutral	Irreversible	Neutral	High	Negligible
R8 Community Centre	North west - around 200 meters	Views toward the Wentworthville Station and proposed works from the Community Centre complex are largely restricted to the car park located on the west side of the buildings. Views from within the Community Centre toward the station precinct are partially filtered and/or screened by mature tree planting to the west of the Community Centre.	Short	Long term	Neutral	Irreversible	Neutral	Medium	Negligible

Receiver viewpoint (Figure 15)	View direction and distance to proposal	Description	Distance	Duration	Predicted impacts	Nature of impacts	Magnitude	Sensitivity	Significance
R8a Residential dwellings	North west - between 100 and 150 meters	Views toward the Wentworthville Station and proposed works from residential dwellings to the south of Dunmore Street will be screened by commercial development along the east side of Station Street and tree planting adjoining the rail corridor.	Long	Long term	Neutral	Irreversible	Neutral	High	Negligible
R9 Commercial property	North - between 100 and 200 metres	Views toward the Wentworthville Station and the proposed works from commercial properties south of the Dunmore Street and Station Street intersection are indirect and screened by adjoining development.	Long	Long term	Neutral	Irreversible	Neutral	Medium	Negligible
R10 Commercial property	North - between 50 and 100 metres	Views toward the Wentworthville Station and the proposed works from commercial properties to the east and west of Station Street will be both direct and indirect offering views toward relocated memorial features the proposed stair and lift access arrangement and from The Kingsway.	Medium	Long term	Beneficial	Irreversible	Medium	Medium	Moderate
R11 Commercial property and offices	North to north east - between 100 and in excess of 200 metres	Views toward the Wentworthville Station and proposed works from commercial properties along Dunmore Street (north side) are largely restricted to rear access and parking areas. Views from offices on the Dunmore Road and Cumberland Highway intersection will extend toward and beyond the station precinct.	Medium	Short term	Neutral	Irreversible	Low	Low	Low

Receiver viewpoint (Figure 15)	View direction and distance to proposal	Description	Distance	Duration	Predicted impacts	Nature of impacts	Magnitude	Sensitivity	Significance
R12 Kingsway public car park	East to south east - between 90 and 150 metres	Views from The Kingsway public car park toward the Wentworthville Station are partially filtered by existing mature tree planting alongside the south boundary of the rail corridor.	Medium	Short term	Neutral	Irreversible	Low	Low	Negligible
R13 Commercial properties	North- between 50 and 100 metres	Views toward the Wentworthville Station and the proposed works from commercial properties to the south of The Kingsway will be direct and offer views toward the station upgrade works along the south boundary of the station precinct.	Short	Long term	Beneficial	Irreversible	Moderate	Medium	Moderate
R14 Station Street and The Kingsway road corridors	North - adjoining station boundary to in excess of 100 meters	Views toward the Wentworthville Station and the proposed works will extend north and terminate views along the Station Street view corridor. Views from The Kingsway road corridor will extend toward the station and proposed works along the north side of the road corridor.		Short term	Beneficial	Irreversible	Moderate	Low	Low
R15 Wentworth Avenue road corridor	South - adjoining station boundary to in excess of 100 meters	The south side of the Wentworth Avenue road corridor extends alongside the rail line corridor and existing station pedestrian access points/bus stop.		Short term	Beneficial	Irreversible	Moderate	Low	Low

Receiver viewpoint (Figure 15)	View direction and distance to proposal	Description	Distance	Duration	Predicted impacts	Nature of impacts	Magnitude	Sensitivity	Significance
R16 Railway Street road corridor	South-between 50 and 200 metres	Views toward the Wentworthville Station and proposed works from the Railway Street corridor extend south and directly toward the station, including views toward the proposed lift and stair access arrangements.	Medium	Short term	Beneficial	Irreversible	Low	Low	Low
R17 Residential dwelling	South - between 100 and 150 meters	Views toward the Wentworthville Station and proposed works are partially screened by the Police Station buildings and tree planting within the Railway Street nature strip (west side). Upper storey views extend toward the station over and above the adjoining Police Station.	Long	Long term	Neutral	Irreversible	Low	High	Low

### 6.2.3 Mitigation measures

The following mitigation measures are proposed to manage impacts to visual amenity:

- Minimise light spill from the rail corridor into adjacent visually sensitive properties by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution
- Temporary hoardings, barriers, traffic management and signage would be removed when no longer required
- Work/site compounds would be screened, with shade cloth (or similar material) (where necessary) to minimise visual impacts from identified sensitive visual receivers
- All lighting would be designed and installed in accordance with the requirements of *AS4282 Control of the Obtrusive Effects of Outdoor Lighting*
- Unnecessary loss or damage to vegetation partially affected or unaffected by the Proposal would be avoided by protecting trees prior to construction and/or trimming vegetation where possible to avoid total removal
- Rehabilitation planting would be undertaken as early as possible to replace vegetation that provided screening to adjacent residential properties and sensitive visual receivers
- Specifically designed lighting equipment would be used to minimise the upward spread of light near to and above the horizontal. Care would be taken when selecting luminaries to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum
- Graffiti would be removed in accordance with TfNSW's standard requirements
- A landscape plan would be prepared for the proposed new elements. It would aim to provide some integration between the new structure and the existing vegetation. It would consider the long term replacement of tree planting within the station precinct to maintain visual filtering and screening of external views.

## 6.3 Noise and vibration

An environmental Noise and Vibration Impact Assessment (NVIA) was undertaken by Environmental Resources Management (ERM) Pty Ltd in November 2014. The results of this NVIA are summarised below.

### 6.3.1 Existing environment

#### **Ambient noise environment**

The ambient noise environment in the vicinity of residential and commercial receptors is best described as 'urban', being largely dominated by transportation noise from local roads and rail, as well as commercial and industrial emissions.

The three primary noise metrics used to describe construction noise emissions include:

- $LA1_{(1\text{minute})}$  the "typical maximum noise level" for an event, used in the assessment of potential sleep disturbance during night-time periods. Alternatively, assessment may be conducted using the  $LA_{\text{max}}$  or maximum noise level
- $LAeq_{(15\text{minute})}$  the "energy average noise level" evaluated over a 15-minute period. This parameter is used to assess the potential construction noise impacts

- $L_{A90}$  the “background noise level” in the absence of construction activities. This parameter represents the average minimum noise level during the daytime, evening and night-time periods respectively. The  $L_{Aeq(15\text{ minute})}$  construction Noise Management Levels (NMLs) are based on the  $L_{A90}$  background noise levels

The subscript “A” indicates that the noise levels are filtered to match normal human hearing characteristics (ie A-weighted).

### **Sensitive receivers**

Sensitive receivers within close proximity to the works comprise of residential receptors along Wentworth Avenue, to the north of the station, and a combination mixed residential and commercial receivers on Station Street and The Kingsway, to the south of the station. Other sensitive receivers include a medical clinic and Wentworthville Police Station.

Several of the nearest sensitive receivers were selected as suitable locations to undertake noise monitoring, both attended and unattended. These locations were selected as they were considered representative of the range of the potentially highest impacted receivers. Accessibility and potential acoustic influences were also considered when selecting these locations.

Operator-attended noise monitoring was undertaken on Tuesday 4 November 2014 at four locations (A1 to A4 on Figure 16) providing a representation of residential dwellings in close proximity to the Proposal.

Unattended noise monitoring was undertaken at one location (L1 on Figure 16). This location was selected for logging as it allowed the measurement of existing ambient and background noise levels that are considered representative of the broader acoustical environment at the majority of residential receptors situated in close proximity to Wentworthville Station. The logging device was set to record acoustical and statistical parameters at 15 minute intervals for a period of ten days.

An additional 31 receivers were identified as being the closest receivers to the Proposal, which could be used to make a conservative prediction of potential noise impacts using an acoustic model. These receivers have been labelled as R1 to R31 and are listed in Table 11 and shown in Figure 16.

Table 11: Sensitive receivers within the vicinity of the Proposal (ERM, 2014)

ID	Description	ID	Description
R1c	Commercial Receptor (Police Station)	R17	Receptor (Dwelling)
R2	Receptor (Dwelling)	R18	Receptor (Dwelling)
R3c	Commercial Receptor (Convenience Store)	R19c	Mixed Use Receptor (Shop/Dwelling)
R4	Receptor (Dwelling)	R20	Mixed Use Receptor (Shop/Dwelling)
R5	Receptor (Dwelling)	R21	Mixed Use Receptor (Shop/Dwelling)
R6	Receptor (Dwelling)	R22c	Mixed Use Receptor (Shop/Dwelling)
R7	Receptor (Dwelling)	R23c	Mixed Use Receptor (Shop/Dwelling)
R8	Receptor (Dwelling)	R24c	Mixed Use Receptor (Shop/Dwelling)
R9	Receptor (Dwelling)	R25c	Mixed Use Receptor (Shop/Dwelling)
R10	Receptor (Dwelling)	R26c	Mixed Use Receptor (Shop/Dwelling)
R11	Receptor (Dwelling)	R27	Receptor (Dwelling)
R12	Receptor (Dwelling)	R28	Receptor (Dwelling)
R13	Receptor (Dwelling)	R29c	Commercial Receptor (Medical Clinic)
R14	Commercial Receptor (Community Centre)	R30	Receptor (Dwelling)
R15	Receptor (Dwelling)	R31c	Commercial Receptor (Warehouse)
R16	Receptor (Dwelling)		

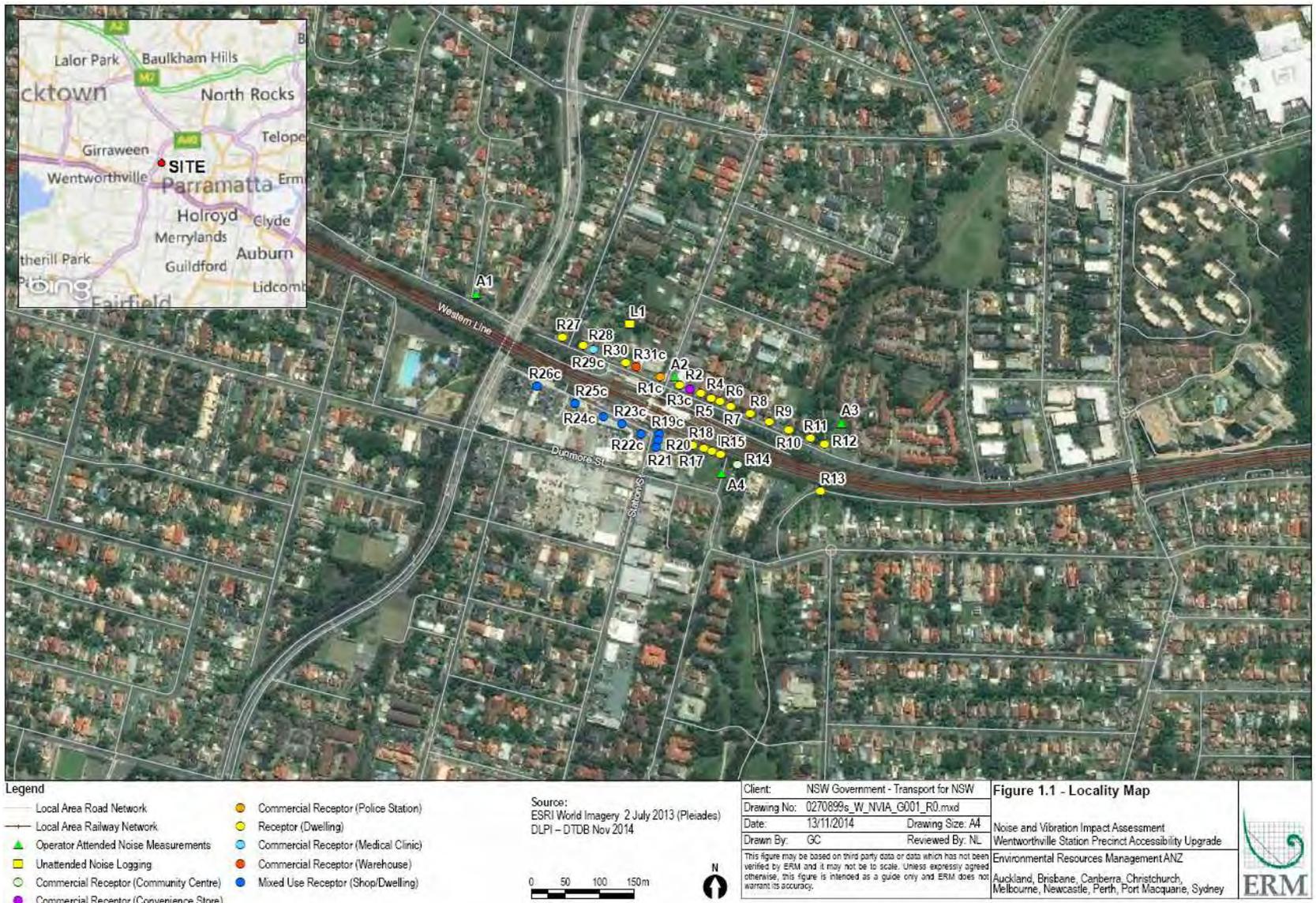


Figure 16: Sensitive receivers and noise monitoring locations (ERM, 2014)

### 6.3.2 Associated policies and guidelines

#### Construction phase noise

The Interim Construction Noise Guideline (ICNG) (DECC, 2009) provides a framework for the assessment of construction noise impacts on residences and other sensitive land uses. It does this by presenting assessment approaches that are tailored to the scale of construction projects.

##### Residential receivers

For construction work during standard hours, a Noise Management Level (NML) of the rating background level (RBL) + 10 dBA applies for residential receivers. This is representative of the level above which there may be some community reaction to construction noise. Refer to Table 12 for the daytime NMLs at the nearest residential receivers.

Where the predicted levels exceed the NML, all feasible and reasonable work practices should be applied to minimise the potential noise impacts. Where construction noise levels are predicted to exceed 75 dBA, a receiver may be considered “highly noise affected” and additional measures, such as the implementation of respite periods, may be implemented.

Table 12: Noise Management Levels developed in line with ICNG (ERM, 2014)

Location	Measurement Descriptor	Standard Hours (SH)		Out-of-hours (OOH)	
		Daytime	Daytime	Evening	Night
R2, R4-R13, R15-R28, R30	RBL	40	40	38	33
	NML	50	45	43	38
R1c, R3c, R31	RBL	40	40	38	33
	NML	70	70	70	70
R14, R29c	RBL	40	40	38	33
	NML	65	65	65	65

SH Daytime - 0700-1800 Monday to Friday and Saturday 0800-1300

OOH Daytime - Saturday 1300-1800 and Sunday 0700-1800

Evening - 1800-2200

Night - 2200-0700

##### Sleep disturbance

Where construction noise works are required during the night time period the ‘Application Notes - NSW Industrial Noise Policy’ guidance for sleep disturbance or sleep arousal would be applied to assess the proposed works. The EPA’s Application Notes states the following:

‘EPA reviewed research on sleep disturbance in the *NSW Environmental Criteria for Road Traffic Noise* (ECRTN) (1999). This review concluded that the range of results is sufficiently diverse that it was not reasonable to issue new noise criteria for sleep disturbance.’

Sleep disturbance and sleep arousal are subjective responses varying for individuals. With reference to the EPA guidance, potential for internal disturbance from construction noise is expected to be minimised where construction noise levels are within the night time RBL + 15 dB.

This correlates to an external sleep disturbance screening criterion of 47 dB(A) LA1, (1 minute) (residential receivers R3, R4, R5 and R6) and 53 dB(A) LA1, (1 minute) (residential receivers R8 and R9).

The *Road Noise Policy (RNP)* contains additional advice relating to potential sleep disturbance impacts. The RNP provides a review of research into sleep disturbance. From the research to date, the RNP concludes that:

- maximum internal noise levels below 50 dB(A) to 55 dB(A) are unlikely to awaken people from sleep
- one or two events per night, with maximum internal noise levels of 65 dB(A) to 70 dB(A), are not likely to affect health and wellbeing significantly.

#### Commercial receivers

The ICNG identifies that due to the broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining management levels is separated into three categories:

- industrial premises: external LAeq<sub>(15minute)</sub> 75 dBA
- offices, retail outlets: external LAeq<sub>(15minute)</sub> 70 dBA
- community centres: external LAeq<sub>(15minute)</sub> 65 dBA

#### **Construction phase vibration**

Project-specific vibration criteria have been determined with regard to the:

- German Institute for Standardisation – DIN 4150 (1999-02) Part 3 (DIN4150-3) – *Structural Vibration - Effects of Vibration on Structures*
- NSW Department of Environment and Conservation – NSW Environmental Noise Management – *Assessing Vibration: a Technical Guideline* (the NSW Vibration Guideline), February 2006.

Consideration was also given to British Standard BS7385: Part 2-1993 (BS 7385) - *Evaluation and Measurement for Vibration in Buildings – Part 2 - Guide to Damage Levels from Ground-borne Vibration*, dated 1993. However DIN 4150-3 provides a more conservative method by which structural damage can be assessed. Compliance with DIN4150-3 structural damage guideline values also identifies compliance with the BS 7385 transient vibration guide values for cosmetic damage.

Tables 4.2, 4.3 and 4.4 of the NVIA identify all project-specific vibration criteria, which are summarised as:

- structural damage limiting criteria – minimum criteria value of 5 mm/s for dwellings and buildings of similar design and/or use
- human comfort limiting impulsive criteria – minimum criteria value of 2.8 mm/s for residences (worst case night time value)
- human comfort limiting intermittent criteria – preferred vibration dose value of 0.13 m/s<sup>1.75</sup> for residences (worst case night time value).

### 6.3.3 Potential impacts

#### Construction phase noise impacts

In order to quantify noise emission from the proposed constructions, a quantitative construction noise impact assessment was completed by predicting noise levels via modelling and by estimating vibration levels based on ERM test data. The predictions were completed for the anticipated construction scenarios of the Proposal. Resultant noise and vibration levels were then compared to project-specific criteria or management levels at each receptor location. Exceedances of the applicable noise affected and highly noise affected management levels have been identified (Appendix 3).

The daytime Noise Affected Management Level (50 dB) applicable at residential (dwelling) receptors for works within the recommended standard hours of construction would be exceeded by up to 41 dB(A) at the most affected receptor. On average, noise levels would exceed this criteria by up to 16 dB for all assessed construction scenarios.

For 19 of the assessed construction scenarios, the Highly Noise Affected Management Level (75 dB) applicable at residential (dwelling) receptors during the daytime would be exceeded, with the exceedances being by up to 16 dB(A) at the most affected receptor.

The predicted noise levels identified above are typical of construction works and activities undertaken in the vicinity of and in close proximity to residential and commercial precincts.

Although a number of exceedances are identified, these are associated with predicted 15 minute noise values calculated via modelling for the purposes of the assessment, in accordance with the ICNG and the *TfNSW Construction Noise Strategy*. These values represent a 'worst case' scenario with all plant operating simultaneously and therefore do not represent a constant noise emission that would be experienced by the community on a daily basis throughout the project schedule. The predicted noise levels would only be experienced for limited periods of time when works are occurring.

In order to minimise the potential noise and vibration impacts upon nearby sensitive receivers, most construction works are proposed to be undertaken during standard daytime construction periods (7am to 6pm Monday to Friday and 8.00 am to 1.00 pm on Saturdays).

However, some works outside of standard hours would be required during evening, night periods and weekends during track possessions, and for key activities to minimise impacts to commuters and pedestrians. Any out of hours works (OOHW) would be subject to a separate assessment on a case-by-case basis and would require approval by TfNSW and appropriate community notification. It is estimated that a total of eight possession periods would be required for the Proposal.

Some noise from construction sites is inevitable, such that the ICNG focuses on minimising construction noise impacts, rather than only on achieving numeric noise levels. These results and noted exceedances identify that best-practice construction noise management and control techniques would be required to reduce noise levels as far as reasonably practicable. To minimise impacts additional noise control, mitigation and management measures are also warranted. These would be implemented in conjunction with a community and stakeholder consultation and notification processes.

TfNSW has developed its own best-practice techniques for managing construction noise and vibration, and implementing feasible and reasonable mitigation measures. These are documented in the *TfNSW Construction Noise Strategy* which also identifies the thresholds by which impacts can be qualified and the level of mitigation and management

required for each stage of works. These thresholds also identify the level of community consultation required. The mitigation and management measures provided by TfNSW are consistent with the intent and recommendations of the ICNG developed for managing construction noise and vibration, and implementing feasible and reasonable mitigation measures.

In accordance with the requirements of the ICNG and the TfNSW Construction Noise Strategy suitable mitigation measures, which can be practically implemented on site, are provided in Section 6.3.4 of this REF. Construction noise levels would be reduced and impacts minimised with the successful implementation of these recommendations. Impacts may not be reduced to negligible levels for all receptors during all construction activities. However the recommendations are designed to ensure that any residual impacts are minimised as far as is practically achievable.

### Construction phase vibration impacts

The Proposal involves activities with the potential to generate vibrations. In this case these potential activities are limited to jack hammering and excavators with hammer attachments.

Peak particle velocity (PPV) levels have been calculated for potential vibration generating activities, as identified in Table 13.

Table 13: Estimated vibration levels

Distance (m)	Estimated vibration level (PPV, mm/s) (Jack hammering, excavation hammering or similar activities)
1	2.5
2	2.4
5	2.0
10	1.5
15	1.2
20	0.9
25	0.7
30	0.5
50	0.2
70	0.1
100	0.0
150	0.0
200	0.0

Perceptible vibration levels refer to the value at which a receiver or building occupant may 'feel' the vibration generated by an activity and 0.2mm/s is typically considered to be the human threshold for perception of vibration.

The results presented above identify that the potential for perceptible levels of vibration to occur is minimal for works more than 50 metres from a receptor. Where works are completed within 50 metres of a receptor, perceptible levels of vibration may be generated but would remain below the preferred minimum criteria as follows:

- human comfort limiting impulsive criteria – minimum criteria value of 2.8mm/s for residences at night time
- structural damage limiting criteria – minimum criteria value of 5mm/s for dwellings and buildings of similar design and/or use.

### **Operational phase**

An assessment was undertaken of the proposed operational emission sources associated with the Proposal to determine any potential impacts. This review focused on the location and potential emission of any new or upgraded sources, and the likely change in acoustical environment that the source could generate.

This review has identified that operational activities associated with the upgrade have limited or no potential to generate noise and vibration that would be perceptible at the closest and/or potentially most affected sensitive receptors or structures located off-site.

### **6.3.4 Mitigation measures**

The following mitigation measures are proposed to manage noise and vibration impacts:

- Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Construction Noise Strategy (TfNSW, 2012a) and the Noise and Vibration Impact Assessment for the Wentworthville Station Easy Access Upgrade (ERM, 2014). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable
- Works would be carried out during normal work hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Works outside these hours may be undertaken if approved by TfNSW. An Out of Hours Work approval would need to be obtained from TfNSW for any works outside normal work hours
- Works would be carried out in accordance with the requirements of the Construction Noise Strategy (TfNSW, 2012a), ICNG and the Noise and Vibration Impact Assessment for the Wentworthville Station Easy Access Upgrade (ERM, 2014)
- To reduce the construction noise impact from human activities, reasonable and feasible noise mitigation options should be considered, including:
  - regularly training workers and contractors (such as at toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise
  - ensuring spoil is placed and not dropped into awaiting trucks
  - switching off any equipment not in use for extended periods e.g. heavy vehicles engines should be switched off whilst being unloaded
  - avoiding deliveries at night/evenings wherever possible
  - no idling of delivery trucks
  - keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site
  - minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios on site. No dropping of materials from height where practicable, throwing of metal items and slamming of doors.

- To reduce the construction noise and vibration impacts from mechanical activities, reasonable and feasible noise mitigation options should be considered, including:
  - maximising the offset distance between noisy plant and adjacent sensitive receivers
  - directing noise-emitting plant away from sensitive receivers
  - regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc.
  - using non-“beeper” reversing/movement alarms such as broadband (non tonal) alarms or ambient noise-sensing alarms for all plant and vehicles regularly used on site (greater than one day)
  - fitting mufflers/silencers to pneumatic tools (e.g. breakers) and use residential grade mufflers on plant
  - use of quieter and less vibration emitting construction methods where feasible and reasonable
- Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding should take into consideration the location of residential receivers to ensure that ‘line of sight’ is broken, where feasible
- Noise and vibration emissions shall be qualitatively assessed throughout works and additional measures shall be implemented to prevent jeopardising the intelligibility of the station public address (PA) system and the safety of commuters and staff as a result.

## 6.4 Indigenous heritage

### 6.4.1 Existing environment

A search of OEH’s Aboriginal Heritage Information Management System Web Services (AHIMS) was undertaken on 29 September 2014. This search indicated that no Aboriginal sites are recorded, and no Aboriginal places have been declared in or near the Proposal.

The Proposal is located in an area that has been highly modified for a range of uses. The site has low archaeological potential and therefore it is considered unlikely that any Indigenous heritage items would be located in the vicinity of the proposal, due to the past history of disturbance.

### 6.4.2 Potential impacts

#### **Construction phase**

The Proposal is unlikely to affect Indigenous heritage during construction, as no known Indigenous heritage items are located in the vicinity and the potential for unknown items is low.

#### **Operational phase**

The Proposal is unlikely to affect Indigenous heritage during operation, as no known Indigenous heritage items are located in the vicinity and the potential for unknown items is low.

### 6.4.3 Mitigation measures

The following mitigation measures are proposed to manage impacts to indigenous heritage:

- all construction staff would receive basic training in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to both the Indigenous and non-Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites
- in the event Aboriginal objects are located during works, all works must stop in the vicinity of the find, and the NSW Office of Environment and Heritage, LALC and an archaeologist would be notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained before works recommence.

Refer to the Table 19 for a list of proposed mitigation measures.

## 6.5 Non-indigenous Heritage

A Statement of Heritage Impact (SoHI) was prepared by MWH Australia Pty Ltd and Cosmos Archaeology Pty Ltd in November 2014. The following is a summary of the results of the investigation.

### 6.5.1 Existing environment

The statutory listed heritage items within the vicinity of the works are summarised in Table 14.

Table 14: Heritage items within the vicinity of the works

Name	Address	Register	Significance
Wentworthville Railway Station Group	The Kingsway, Wentworthville	RailCorp s170 Register, Holroyd LEP 2013	Local
Wentworthville Memorial Fountain	The Kingsway, Wentworthville	Holroyd LEP 2013	Local
“Dobson House”, Federation/Inter-war period shopfront	6-8 Station Street, Wentworthville	Holroyd LEP 2013	Local
Inter-war shopfront with Federation influences	2-4 Station Street, Wentworthville	Holroyd LEP 2013	Local
Wentworthville Cottage	59 Wentworthville Avenue, Wentworthville	Parramatta LEP 2013	Local

## Wentworthville Station

Wentworthville Railway Station is an intact example of mid-century railway architecture in western Sydney. The station is significant to the NSW Railways as one of Sydney's early rail links and is a focus of local community activity. The original station buildings were built in 1924, though in 1943 these were removed for the construction of the existing brick station buildings. These existing station buildings have a high degree of integrity and intactness externally and are connected by an overhead walkway. The buildings have low integrity internally due to the removal of the interior fit-out. There is no evidence of the original 1920s station buildings remaining.

The station building on Platform 1/2 is of a post war Functionalist style and its external fabric is highly intact. It is of face brick construction with a low pitched gabled roof and brick parapets at each end. Centrally located on each parapet is an Art Deco style projecting vertical masonry fin, constructed of heeler bricks in a contrasting colour. The original roof has been replaced with Colorbond sheeting which extends as awnings on all sides of the building. This platform consists of two original ticket windows, one remaining in use whilst the other has been bricked up. A contemporary canopy connects the building from the underside of the stairs to the footbridge. Internally, the building has a linear layout with series of rooms in various sizes including the store room, waiting room, toilets and staff area. The entire original interior fit-out has been removed.

The station building on Platform 3/4 is approximately half the size of the Platform 1/2 building featuring the same detailing and architectural style with the exception of the curved bay on one end. This building also had two ticket windows but both are now blocked. Early timber doors are extant. The entire original interior fit-out has also been removed and replaced by a new linear floor layout. This building is currently used for storage purposes.

The two island platforms have brick faces with concrete deck and asphalt surfaces, which is still largely intact. Modern aluminium palisade fencing, timber bench seating, lighting and signage have been added to both of the platforms over the years.

The footbridge from 1941 is largely intact steel beam structure with concrete decking and rolled steel joist steel supports. From this footbridge are stairs to each platform and a ramp to street level on each side. It is of a simple structure with no ornamentation representing economic policies of the time.

The small timber clad and gabled roofed kiosk from 1954 is in good condition and was originally built as a bookstall. The booking office on Platform 3/4 has an original timber counter. Inside this booking office is an older style, Ajax manufacturing company upright safe fixed on a concrete base that is relocatable.

The heritage curtilage for the Wentworthville Railway Station Group is determined by the length of Platforms 1 and 2; and includes the ramps, stairs, footbridge and kiosk (see Figure 17).



Figure 17: Wentworthville Station heritage curtilage (Source: Sydney Trains s.170 register)

### **Wentworthville Memorial Fountain**

The fountain is located on the southern side of the railway station on The Kingsway, located near the current pedestrian crossing at the intersection of Station Street and The Kingsway. The memorial fountain consists of a brick, sandstone and tile memorial that includes a bronze plaque at the top and commemorative garden directly adjacent. The fountain is in a prominent position adjacent to the entry to the train station with a simple Art Deco design (Figure 18).

The memorial fountain commemorates local drowning victims Jack Stanton and James Tomlinson. Both boys were residents of Wentworthville and were members of a Sunday School party which had gone to Scarborough at the coast for a picnic. When other members of the party got into difficulties in the water, the boys went to their help but the undertow swept them both out to sea. The fountain was erected in a public place to maximise local exposure for the boys and their families. It is located immediately adjacent to The Kingsway entry to Wentworthville Station.

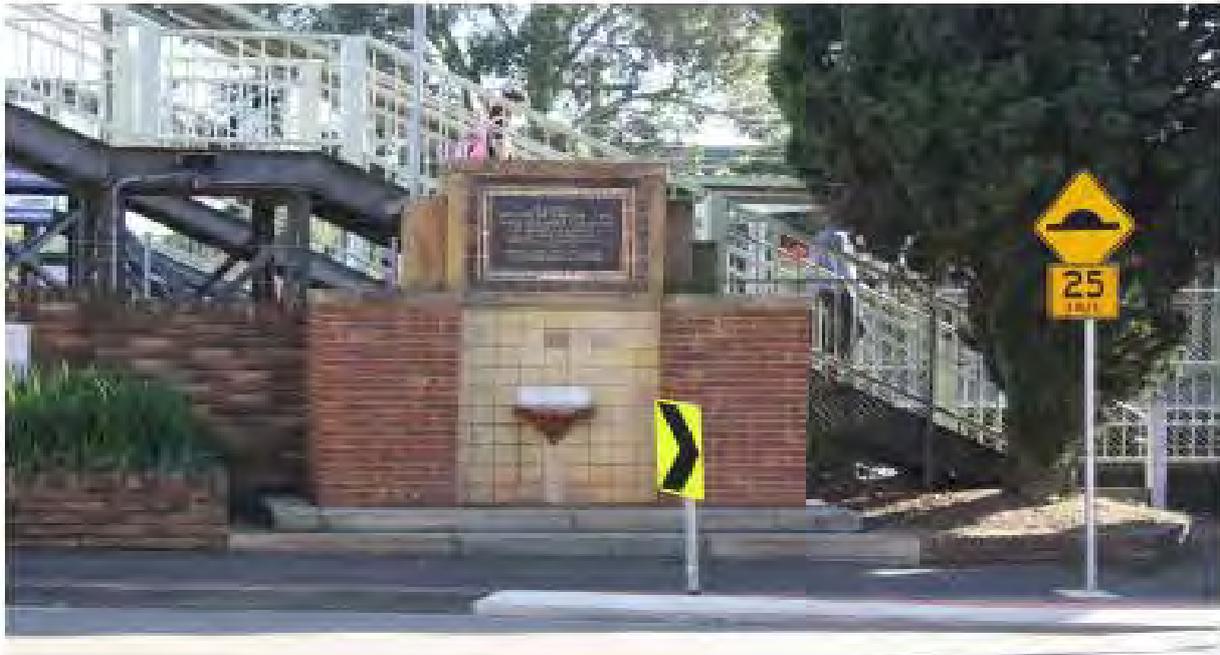


Figure 18: Wentworthville Memorial Fountain (MWH Australia / Cosmos Archaeology, 2014)

#### **No.2 and No.4 Station Street**

The building that houses 2 and 4 Station Street was constructed in 1929 and is located on the eastern side of Station Street, at the intersection of Station Street and The Kingsway. The building is located immediately adjacent to the train line with a walkway present on the northern side of the building. The building is a two storey structure with face brick and Arts and Craft detailing above the awning and contemporary aluminium shopfront below the awning (Figure 19).



Figure 19: "Dobson House" No.6 and No.8 Station Street (MWH Australia / Cosmos Archaeology, 2014)

## No.6 and No.8 Station Street

The building that houses No.6 and No.8 Station Street is located adjoining No.2 and No.4, immediately to the south. This building is a two storey painted rendered brick façade that includes a continuation of the aluminium and steel awning from No.2 and No.4 (Figure 19). The above section of the brick façade appears original and in good condition.

## Wentworth Cottage

The cottage was built in 1906 and is one of a former row now replaced by townhouse developments. The cottage is a single storey, timber framed weatherboard and corrugated galvanised iron cottage, with steep pitched hipped roof with skillions and attached gable pavilion at rear. Bullnose iron verandah across front with turned posts and brackets. Verandah has turned timber posts on brick base, with rendered brick steps and balustrade to entry.

### 6.5.2 Potential impacts

The proposed works would directly impact on both Wentworthville Station and the adjacent Wentworthville Memorial Fountain.

The two heritage buildings in Station Street and the Wentworthville Cottage, within proximity of Wentworthville Station, would not be directly impacted by these works as they are immediately outside of the works zone. However, there would be indirect visual impacts on these buildings as a result of the proposed works.

Table 15 below outlines all the heritage elements and the proposed change as a result of the Proposal.

Table 15: Impact of the Proposal on heritage items

Heritage element	Change to heritage element as a result of the Proposal
Wentworthville railway station access: Stairs	Demolition and removal of existing stairs and associated structures and canopies, brick walls and fencing at new entrance areas, and other demolition works as required.  Incorporation of anti-throw screens within canopies as required on the live rail side of the stairs to both The Kingsway and Wentworth Avenue.
Wentworthville railway station access: Access ramps	No works proposed; other than interface works.
Wentworthville railway station access: New lifts	New station access incorporating lift and stair access to both The Kingsway and Wentworth Avenue station entrances, with associated landings and supports structures, and canopies to stairs, base of stairs, and entrance areas.  New lifts and stair access to both island platforms with associated landings and support structures.
Roofing platforms	New extended platform canopies to match in with full width of existing station building canopies to underside of footbridge, with associated drainage provisions.

Heritage element	Change to heritage element as a result of the Proposal
New concourse	<p>Creation of a new concourse between the platform lifts, including new canopy over the widened concourse, and services provision for a future retail concession booth on the new concourse.</p> <p>Provision for passenger information systems and ticketing facilities in the new concourse, including relocation of the existing two ticket vending machines on the platform to the new concourse.</p>
Footbridge	<p>Incorporation of anti-throw screens within canopies as required to full length of the footbridge, to the widened concourse and lift landing areas, and on the live rail side of the stairs to both The Kingsway and Wentworth Avenue. Demolition of existing retail kiosk on the footbridge. Repair and repainting of the footbridge and structure.</p>
Platform 1 and 2	<p>Building modifications (and required services, finishes and fitout) to provide accessible customer and staff areas and facilities including accessible ticket window, new family accessible toilet, new staff toilet and new public amenities.</p> <p>Adjustment of station platforms to provide compliant cross falls (where required) and provision of Tactile Ground Surface Indicators (TGSIs) along platform edges, for stairs and other required locations.</p>
Platform 3 and 4	<p>Modifications to provide DDA compliant access to the existing waiting room on platform 3/4.</p> <p>Adjustment of station platforms to provide compliant cross falls (where required) and provision of tactile ground surface indicators along platform edges, for stairs and other required locations.</p> <p>Relocation of existing station communications equipment on Platform 1/2 to the existing communications equipment room (CER) on Platform 3/4.</p>
Overall services upgrading to station and surrounds	<p>Services diversion and/or relocation, including stormwater drainage adjustments, to accommodate the new infrastructure.</p> <p>Potential relocation of the Sydney Trains 11kV aerial feeder on the Down side of the corridor, and the Endeavour Energy HV aerial feeder on Wentworth Ave, clear of the new infrastructure.</p> <p>Station power supply upgrade, adjustment to lighting, and augmentation and relocation of station communication systems associated with the new infrastructure.</p>

Heritage element	Change to heritage element as a result of the Proposal
Wentworth Avenue frontage	<p>Treatment of the Wentworth Avenue and Railway Street intersection, including pedestrian crossing provisions and traffic calming measures.</p> <p>Enhancement to interchange facilities in Wentworth Avenue including:</p> <ul style="list-style-type: none"> <li>• provision for accessible car parking spaces (upgrade existing or provide new) and a kiss and ride car parking zone within close proximity to the station entrance</li> <li>• weather protected storage for bicycles</li> <li>• upgrade to the bus stop area with new street furniture including seating and rubbish bins, removal of the damaged backing board and replacement with suitable see-through material to improve visibility, and repainting of the shelter structure treatment of The Kingsway and Station Street intersection including enhancement to existing pedestrian crossing provisions and traffic calming measures, and maintaining vehicular access to private property adjacent to rail corridor.</li> </ul> <p>Upgrade of existing and provision of new wayfinding signage and provision of other signage including statutory / regulatory signage.</p>
The Kingsway / Station Street frontage	<p>Enhancement to interchange facilities in The Kingsway including:</p> <ul style="list-style-type: none"> <li>• removal of existing and provision of new full width footpath from station entrance to the end of the shelter structure on the western side of the station entrance</li> <li>• reconfigured parking to provide a formal kiss and ride car parking zone, taxi rank, and time restricted parking for any displaced parking from Station Street</li> <li>• removal of existing bicycle rack, and new weather protected storage for bicycles close to the station entrance</li> <li>• upgrade of the waiting area with new street furniture including seating to replace existing, rubbish bins, removal of the shelter backing board and replacement with suitable see-through material to improve visibility, and repainting of the shelter structure.</li> </ul> <p>Provision for continuous accessible paths of travel between the station entrances and adjacent streets, accessible parking, kiss and ride areas, taxi rank, and the bus stop area.</p> <p>Upgrade of existing and provision of new wayfinding signage and provision of other signage including statutory / regulatory signage.</p>
Memorial fountain	<p>Protection and relocation of the Memorial Fountain and adjacent “First Train to Stop at Wentworthville” plaque and ‘Train Wheel’ in The Kingsway to a position of equal prominence to its existing position and near to the entrance to Wentworthville Station.</p>

### Wentworthville Station

While the upgrading works are extensive and apply to the approaches to the Wentworthville Station as well as internally and externally to the station buildings on Platforms 1/2 and 3/4; it is noted that the proposed works would generally be sympathetic with the heritage values of the station. Positive outcomes of the Proposal

include that the ramps will be retained, the footbridge will be retained and only minor changes are planned for the platform buildings themselves. Changes to the footbridge canopies at platform level will not affect the heritage significance as the existing footbridge canopy is a later addition. The internal layout of the station buildings will remain similar in size and scale with minimal room changes. The exterior of the platform buildings will also be retained, which are the more significant elements.

The Proposal would change the views and vistas of the Wentworthville Station approaches on both Wentworth Avenue and The Kingsway. However, given the visual clutter of street signage in these areas, these changes would not have a detrimental effect on the heritage significance of Wentworthville Station.

The assessed impact is therefore regarded as being acceptable to the local heritage significance of Wentworthville Station.

It is unlikely that any archaeology relating to the former 1920s Wentworthville Station will be impacted as a result of these works.

### **Memorial fountain**

The proposed removal and replacement will have an impact to the heritage significance of the Wentworthville Memorial Fountain as it will need to be dismantled and reassembled. However, the proposed works are sympathetic to the heritage significance of the item in that they allow it to be retained, in an enhanced position and to be better appreciated and viewed by pedestrians in The Kingsway / Station Street intersection and approach to Wentworthville Station.

With the implementation of an archival recording, undertaken prior to the proposed works, the impact to the cultural heritage significance of Wentworthville Memorial Fountain is considered to be an acceptable impact. Consultation has been undertaken with Holroyd City Council who did not have any objections to the fountains relocation.

### **Station Street shops**

The proposed works will change existing pedestrian access and footpath and road surface treatments in the streetscape adjacent to 2-4 and 6-8 Station Street, Wentworthville. The addition of traffic calming treatments, street plantings and bollards will increase the pedestrian area at the main entry to Wentworthville Station. These changes however will be a positive change to the streetscape and allow for an improvement in the views and vistas to the buildings at 2-4 and 6-8 Station Street, Wentworthville.

The proposed works are considered sympathetic to the heritage significance of 2-4 and 6-8 Station Street, in that the building facades, which form the basis of the heritage significance, will be enhanced by the streetscape improvements. As noted above, the expansion of pedestrian areas in this vicinity will allow better appreciation of the buildings by visitors to Wentworthville and the Railway Station. As such, the proposed impact to the cultural heritage significance of the 2-4 and 6-8 Station Street, Wentworthville is considered to be an acceptable impact.

### **Wentworth Cottage**

It is considered that the Proposal is a sufficient distance from Wentworth Cottage and as such ensures that there would be no impact as a result of the works.

### 6.5.3 Mitigation measures

The following mitigation measures are proposed to manage impacts to non-indigenous heritage:

- A suitably qualified and experienced heritage architect/consultant will be engaged to provide input to, and review of the detailed design of the Proposal
- The detailed design of the Proposal would aim to be as sympathetic as possible to the existing character of the study area in order to minimise visual impacts. Wentworthville is designed in the Inter-War Period Stripped Functionalist style, and additional items should echo these architectural philosophies by incorporating minimalist designs, curved corner details and horizontal lines, and respond to the existing colour schemes and material palette to those associated with the precinct today. The use of unobtrusive, modern, light materials, such as glass panelling and slim frame elements would reduce the bulk of the Proposal, reducing the visual impact of the additional items
- Consideration should be given to create visual gaps between the awnings and canopies. At a minimum, a short visual gap should be retained between old and new fabric
- Detailed design will include identification of existing heritage features within the existing platform buildings for conservation, and internal alterations are to be guided by the advice of the heritage architect/consultant
- Following the development of detailed design, and prior to the commencement of construction works, Sydney Trains and Holroyd City Council would be notified of the Proposal. A copy of the SoHI prepared by MWH and Cosmos Archaeology would be provided
- An archival recording of the Wentworthville Memorial Fountain, in accordance with the NSW Heritage Division guidelines for Archival Recordings, would be undertaken prior to its dismantling and reconstruction. This recording would be placed in Holroyd City Council Library so that a complete record of the Memorial Fountain is available for public access
- Archival recording of the bridge in its current condition and relationship to the surrounding station precinct would be undertaken in accordance with Heritage Division Guidelines prior to the proposed works commencing to mitigate impacts to the heritage significance of the study area
- The proposed methodology for the relocation of the fountain will be developed in consultation with a suitably qualified and experienced heritage professional for approval by TfNSW prior to the commencement of the relocation works. The methodology is to consider any feedback from Holroyd City Council referred to in Section 5.6
- The existing railway commemorative plaque, erected in 1985, and memorial garden, would be relocated by an experienced craftsperson so that it remains with the Wentworthville Memorial Fountain and is associated with the Wentworthville Station
- In the event that any unanticipated archaeological deposits are identified within the project site during construction, work likely to impact on the deposit would cease immediately and a suitably qualified heritage consultant would be contacted and directed by TfNSW. Where it is required further, archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location

- During detailed design, a heritage interpretation strategy would be developed which provides information on the heritage of the area. This would include heritage interpretive signage in relation to the removed ramps. Interpretive signage would be positioned in an area regularly used by Wentworthville Station commuters and placed in a logical context associated with the location of the ramps and the station precinct. For example, signage could be located near the existing station buildings, facing the footbridge, or within the portion of the footbridge proposed to be retained
- A heritage induction would be provided to workers before construction begins, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction
- non-Indigenous heritage items would be identified on the construction contractor's Environmental Control maps

## 6.6 Socio-economic impacts

### 6.6.1 Existing environment

Wentworthville is located approximately 26km from Sydney and is within both the Holroyd and Parramatta local government areas. Wentworthville is within the West Central Subregion (WSC) as described in the *Metropolitan Strategy for Sydney*. The West Central Subregion contains the second largest CBD in Sydney, Parramatta, as well as Sydney Olympic Park which boasts sporting and major event facilities of a world class standard. The Proposal is also in close proximity to the South Wentworthville employment centre situated on the Great Western Highway comprising a combination of retail and service based businesses.

The subregion is considered to have a strong specialisation in key industries such as manufacturing, wholesaling, transport, storage, construction trade services, motor vehicle retailing and servicing. With the development of corporate centres, such as Parramatta, there is also significant growth in the number of managers, administrators and professionals is experiencing considerable growth. It is anticipated that by 2031, the number of jobs in the subregion will have increased by 61,000 jobs (20%) of which 27,000 are expected to be within the Parramatta LGA and 1,000 in the Holroyd LGA.

The Proposal is situated within the Wentworthville town centre which is characterised by local commercial uses, with the key commercial area being located along Station Street and Dunmore Street on the southern side of the station.

The adjacent stations, Pendle Hill and Westmead, are approximately 1.5km away and while they have smaller commercial centres, they provide access to employment, secondary and tertiary education and regional medical services.

### 6.6.2 Potential impacts

#### Construction phase

The Proposal has the potential to impact commercial and residential uses within the vicinity of the works through:

- noise and vibration impacts
- minor delays on the adjacent road network
- temporary displacement of parking should road closure be required
- changes to access arrangements including pedestrian diversions.

Construction activities would predominantly be confined to within the site and the adjoining roadway. Residents, businesses, Council and Sydney Trains would be notified of the works and where practicable consulted with regards to staging and timing, road closures and any required detours.

Construction could potentially require at times the temporary closure of The Kingsway, Station Street or Wentworth Avenue. This could potentially include during peak retail trading periods and result in access constraints and the temporary displacement of parking. This could have the potential to impact upon nearby businesses.

Targeted consultation with nearby business would be undertaken throughout the duration of works. Signage would be provided with suitable notification to alert commuters and customers that access would be maintained and trading would be as normal.

No temporary acquisitions would be required for the construction stage of the Proposal.

### **Operational phase**

The longer term social and economic impacts of the Proposal would be positive for both residents and businesses of Wentworthville, and particularly for commuters who frequent Wentworthville Station.

There would be an improvement in the accessibility of Wentworthville Station for commuters as well as an improvement in safety and access for pedestrians. It is likely that such initiatives would help to encourage more people to use public transport.

As a result, it is expected that the Proposal would have a potential positive impact on nearby businesses.

No property acquisition would be required as a result of the Proposal.

### **6.6.3 Mitigation measures**

Refer to Sections 6.1, 6.2 and 6.3 for discussion on the potential traffic, transport, visual and noise impacts arising from construction of the Proposal. In addition, the following mitigation measures are proposed to manage socio-economic impacts:

- The proposed sustainability criteria for the project would encourage the contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.
- The community liaison plan (refer to Section 5) would identify all potential stakeholders and the best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible.
- Feedback through the submissions process would be encouraged and facilitate opportunities for the community and stakeholders to have input into the project, where possible.
- The community would be kept informed of construction progress, activities and potential impacts in accordance with a community liaison plan to be developed prior to construction.
- Contact details for a 24-hour construction response line, project infoline and email address would be provided for ongoing stakeholder contact throughout the construction phase.

## 6.7 Biodiversity

A Flora and Fauna Assessment for the Proposal was undertaken by Biosis Pty Ltd in November 2014. The following is a summary of the results of the investigations.

### Existing environment

#### Flora

The study area has experienced considerable modification and a long history of disturbances which have resulted in the clearance of native vegetation and invasion by exotic trees and noxious and environmental weeds in the ground and shrub layer. Some parts of the study area have been treated as a garden or landscape area with regularly spaced plantings of monocultures e.g. the northern side of the rail corridor.

#### Northern side of rail corridor

A narrow band of vegetation borders the northern corridor of the railway line. This includes a large multi-stemmed Grey Gum, around 14m in height, immediately adjacent to the east of the existing stairs between the Wentworth Avenue and the station overbridge. This area also contains a row of Bottlebrushes (*Callistemon sp.*) around 8m in height.

Further east, is a large multi-stemmed Camphor Laurel (*Cinnamm camphora*) at around 10m in height and a Sweet Pittosporum (*Pittosporum undulara*) around 4m in height. At shrub level there is a range of garden plants and environmental weeds including Lantana (*Lantana sinese*), Large-leaved Privet (*Ligustrum lucidum*), Small-leaved Privet (*Ligustrum sinense*) and Green Cestrum (*Cestrum parqui*).

#### Southern side of rail corridor

Beneath the existing ramps between The Kingsway and the rail overbridge are a number of small Camphor Laurel and Large-leaved Privet specimens with an understorey of garden plants and environmental weeds. At the foot of the stairs on either side of the pathway is a large Mediterranean Cypress tree around 8m in height. To the east exists a row of Camphor laurels, Green cestrum, Lantana, Small leaved privet and Dolichos Pea (*Dipogan lignosus*). West of the stairs a small memorial has been planted out with Dietes (*Dietes sp.*) with some Ochna (*Ochna surrelata*) also being present. Further west a row of Black Locust (*Robinia pseudoacacia*) around 8m in height are present with Moth Vine (*Araujia sericifera*), Green Cestrum and Paddys Lucerne. Camphor Laurels occur adjacent to the roundabout on The Kingsway.

#### Fauna and fauna habitat

No fauna species were observed within the study area during the site inspection in October 2014. However during a previous site inspection undertaken by Biosis in 2013 as part of the concept design development, the study area was found to support a small assemblage of native and exotic fauna species, including the Rainbow Lorikeet, Red Wattlebird and Noisy Miner, all of which are considered to have adapted well to modified urban environments.

A few larger, mature trees with fauna habitat value remain in the study area. These comprise the Grey Gum and the adjacent large Bottlebrushes, which provide nectar resources, and some of the large Camphor Laurel trees, which can develop hollows suitable for use by Common Brush-tail Possums and other fauna.

The ramps, steps and concourse do not contain suitable cracks or holes that could be used by fauna species.

Due to the limited habitat available and lack of connectivity to other areas of habitat, overall diversity is expected to be low. The threatened Grey-headed Flying-fox and Little Lorikeet may visit the study area to forage on the Grey Gum and when flowering and some threatened micro-bat species may forage while flying over the study area.

### Threatened species and endangered ecological communities

No threatened flora or ecological communities nor suitable habitat for such was found during the Wentworthville Station site assessment. A summary of those species with a medium or higher likelihood of occurring in the study area is provided in Table 16.

Table 16: Impact of the Proposal on biodiversity

Species name	Legislation	Section of the study area providing potential habitat
Grey-headed flying fox	EPBC Act, TSC Act	The large Grey Gum located at the base of the overbridge stairs on the northern side the rail corridor could act as nocturnal foraging habitat during flowering period.
Eastern Bentwing-bat	TSC Act	The Eastern Bentwing-bat could potentially forage while flying over the study area or periodically roost in any culverts under the road or rail corridor near the study area.
East Coast Freetail-bat	TSC Act	The East Coast Freetail-bat could potentially forage while flying over the study area.
Little Lorikeet	TSC Act	The large Grey Gum located at the base of the overbridge stairs on the northern side the rail corridor could act as nocturnal foraging habitat during flowering period.

### Noxious weeds

Three weed species listed as noxious within the Holroyd and Parramatta LGAs were identified within the site boundary including Green Cestrum, Lantana, Small-leaved Privet and Large-leaved Privet.

## 6.7.2 Potential impacts

### Flora

The Proposal would result in the removal of 2 trees (refer to Table 17) with the potential to remove another 5-7 trees depending on the detailed design. These trees, with the exception of the grey gum, appear to have been planted for landscape purposes and therefore do not constitute a particular native vegetation community. Environmental input during the detailed design process would seek to limit the impacts to flora and to reduce the extent of vegetation removal, with particular attention given to retaining trees 3 and 4 as listed in Table 17 where feasible.

Figure 20 illustrates the location of the trees outlined in Table 17.

Table 17: Tree removal assessment

Tree number (Figure 20)	Quantity	Species	Common name	Height	Offset required if removed	Note
1	1	Cupressus sempervirens	Mediterranean Cypress	8m	4	For removal
2	1	Cupressus sempervirens	Mediterranean Cypress	8m	4	For removal
3	1	Eucalyptus punctata	Grey gum	14m	8	Potential removal
4	4-6	Callistemon sp.	Bottlebrush	8m	4 per tree	Potential removal

No threatened flora species, populations or ecological communities, as classified under the EPBC Act or the TSC Act, would be removed.

### Vegetation offsets

TfNSW has prepared a Vegetation Offset Guide (TfNSW, 2012e) to assist in meeting the biodiversity sustainability target and to provide a framework for a consistent approach to offset impacts to vegetation on applicable TfNSW projects. The following ratios for the provision of replacement trees were applied:

- eight trees for every tree with a diameter at breast height (DBH) greater than 60cm
- four planted trees for every tree with a DBH of 15cm-60cm
- two trees for every tree with a DBH less than 15cm.

The Vegetation Offset Guide would be applied to the Proposal during detailed development of the landscape plan to identify any potential to offset within the bounds of the site. Additional offset vegetation planting would be planted at an alternative site in consultation with Council.

### Noxious weeds

Due consideration would be given to the presence of the noxious weeds within the disturbance footprint including the appropriate disposal of noxious weed material cleared as a result of the Proposal, taking precautions to ensure that the proposed works do not result in their spread into new habitats.

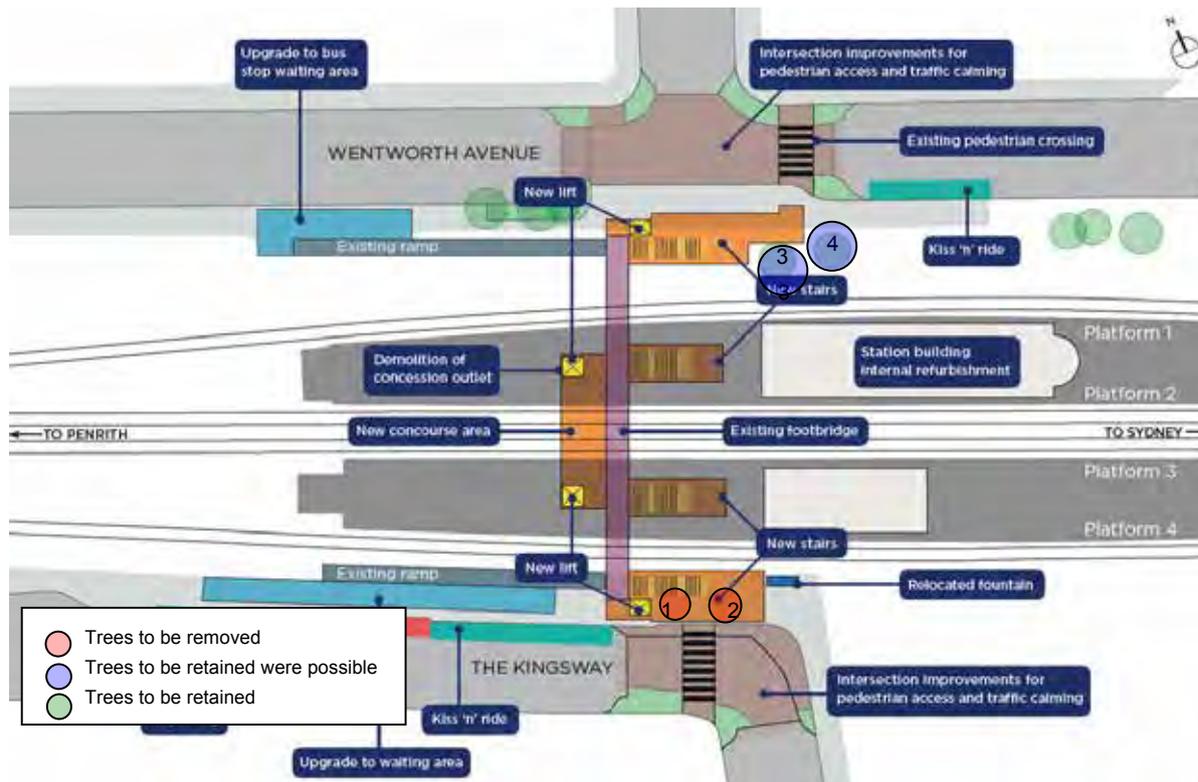


Figure 20: Vegetation impacts as a result of the Proposal (indicative only, subject to Detailed Design) (TfNSW, 2014)

### Fauna and fauna habitat

No threatened fauna species were detected within the study area, however the Grey Gum and adjacent Bottlebrushes near the existing stairs on the north side of the rail corridor provide a small amount of potential foraging habitat for the threatened species Grey-headed Flying Fox and Little Lorikeet. The Grey Gum may also provide a small amount of potential roosting habitat for the East Coast Freetail-bat. The removal of these trees would result in a minor loss of potential foraging habitat, however these losses are considered so minor as to not require a formal impact assessment.

The ramps, steps and concourses do not contain suitable cracks or holes that could be used by fauna species such as micro-bats or birds. However, changes in lighting including the installation of artificial lighting during construction and operation, have the potential to influence the foraging behaviour of microbats.

The Grey Gum is considered a Koala feed tree species, as listed under SEPP No. 44. However, since the vegetated area to be cleared is far less than one hectare, SEPP 44 would not apply to the Proposal.

### 6.7.3 Mitigation measures

The following mitigation measures are proposed to manage impacts to biodiversity:

- disturbance of vegetation would be limited to the minimum amount necessary for the Proposal
- trees to be removed would be clearly demarcated on site prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected

through exclusion fencing or Tree Protection Zones (TPZs) in accordance with Australian Standard AS4970-2009

- there would be no pedestrian or vehicular access to TPZs. No building activities should take place within the TPZ, including storage or stockpiling. Runoff from the site would not be allowed to enter the tree protection zones. Toolbox talks would inform workers of these zones and the restrictions applied
- in the event of any tree to be retained becoming damaged during construction, an arborist would be informed immediately to inspect and provide advice on remedial action where possible
- impacts to the Grey Gum located at the northern staircase are to be avoided where possible. If options for retention of the Grey Gum are not deemed feasible during the detailed design process, and pruning or removal would require a qualified ecologist to be present during tree removal to salvage any roosting microbats that may be present beneath the exfoliating bark of the tree
- to minimise impacts to resident fauna, if Lantana thickets are planned for removal, these should be inspected for nesting birds prior to clearing. If nesting birds are present, consideration should be given to allow these birds to move on at their own pace
- landscaping designs should aim to maintain and improve the current biodiversity values present by enhancing fauna habitat through establishment of dense native shrubs and grasses to provide resources for small native birds as well as the planting of winter flowering trees suitable to the location
- offsets and/ or landscaping would be undertaken in accordance with TfNSW Vegetation Offset Guidelines. Detailed design would see the landscape plan include provision of as much native vegetation within the Proposal as is feasible. Remaining vegetation to be offset would be undertaken in consultation with the relevant council
- strategies to manage the light pollution including appropriate selection of luminaries to manage light spill through strategic positioning will be adopted during detailed design
- weed control measures would be developed and implemented in the CEMP to manage the dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal in accordance with the *Noxious Weeds Act 1993*
- vehicles and other equipment to be used on site would be cleaned to minimise seeds and plant material entering the site to prevent the introduction of further exotic plant species
- all workers would be provided with an environmental induction prior to commencing work on-site. This induction would include information on the protection measures to be implemented to protect vegetation and penalties for breaches
- should onsite works determine the removal or trimming of any additional trees, TfNSW Tree Removal Application Form would need to be completed and submitted to TfNSW for approval.

## 6.8 Contamination, landform, geology and soils

Contamination and geotechnical investigations for the proposed area were undertaken by Environmental Investigation Services (EIS) and J&K Geotechnology, respectively, in July 2014. The following is a summary of the results of the investigations.

### 6.8.1 Existing environment

#### Soils and geology

The Penrith 1:100,000 Geological Series Sheet (Chapman & Murphy, 1989) indicates that the site is underlain by Ashfield Shale of the Wianamatta Group, which comprises dark-grey to black claystone and fine sandstone siltstone laminite. The underlying bedrock consists of poor quality weathered shale considered to be extremely low strength improving to medium strength with increasing depth.

Fill material was encountered during geotechnical investigation typically comprised silty clay or sandy gravel with inclusions of shale, sandstone, and igneous gravels, root, root fibres, glass, plastic, concrete, brick and slag fragments.

The site is not located in an Acid Sulfate Soil (ASS) risk area as mapped by the Department of Land and Water Conservation (1997).

Though asbestos was not encountered in the boreholes, it may still be present beneath the platforms as asbestos was commonly used as building material in the past within the rail environment.

#### Landform

The site is located within a gently undulating topography, with the site itself located on a slope grading towards the north at no more than 2 degrees.

The nearest water body is Finlayson Creek located approximately 120 metres south east of the station. Finlayson Creek drains into the Parramatta River which drains into Sydney Harbour.

#### Contamination

The geotechnical investigation and desktop contamination review did not identify any obvious soil contamination issues or potential soil contamination sources at the site. Odours or obvious fragments of potential asbestos containing materials (ACM) were not encountered in the boreholes.

The fill soils contained various inclusions that may be indicative of potential contamination. The presence of demolition rubble such as brick, concrete and glass fragments is often a precursor to ACM. The presence of slag may be indicative of heavy metals, petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs).

### 6.8.2 Potential impacts

The Proposal would require some excavation work for the construction of the lifts pits. It is estimated that the excavation would be approximately 4m x 4m area and would extend to a depth of approximately two metres below surface level.

The excavated spoil may require removal off site where it cannot be reused. As indicated by the targeted soil contamination assessment by EIS (2014), it is likely that the spoil would be classified as General Solid Waste (non-putrescible) as there were no significant contaminants found, however could be classified as Restricted Solid Waste or Hazardous Waste if significant contamination was identified during excavation. Overall the soils on the site are not considered to pose a significant health risk to current and future

occupants of the site or construction workers during the proposed redevelopment of the site for the Proposal.

During construction works, there is also the potential for soil to become contaminated through incidental chemical or fuel spills and leaks from construction plant and equipment.

There is the potential for erosion and sedimentation impacts as a result of water moving into and across the construction site during construction works. These potential impacts would be mitigated by the measures proposed below.

### 6.8.3 Mitigation measures

The following mitigation measures are proposed to manage impacts as a result of soils and contamination:

- prior to commencement of works, erosion and sediment control plans would be prepared and implemented in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom/Department of Housing) (The 'Blue Book'). stabilised surfaces would be reinstated as quickly as practicable after construction
- in the event of an incident, works would cease in the immediate vicinity and the EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act
- an appropriate Unexpected Finds Protocol, incorporating asbestos and other potential contaminants, would be included in the Construction Environment Management Plan. This would include procedures for handling asbestos contaminated materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal would be undertaken in accordance with WorkCover requirements
- all fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards and EPA Guidelines
- construction plant, vehicles and equipment would be refuelled off-site, or in a designated refuelling area.
- vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks
- the existing Sydney Trains and council drainage systems would remain operational throughout the construction of the project
- emergency spill kits would be kept on-site at all times. All staff would be made aware of the location of the spill kit and be trained in its use.

## 6.9 Hydrology and water quality

### 6.9.1 Existing environment

The nearest water body is Finlayson Creek located approximately 120 metres south east of the station. Finlayson Creek drains into the Parramatta River which drains into Sydney Harbour.

The site is located within a gently undulating topography, with the site itself located on a slope grading towards the north at no more than 2 degrees.

Wentworth Avenue generally grades to the east at approximately at 3-4%. The intersection of Wentworth Avenue and Railway Street is located approximately 60m from a road crest. The intersection is free draining and does not have any stormwater drainage.

Stormwater drainage is located further east along Wentworth Avenue away from the station entrance. Stormwater drainage on Wentworth Avenue is managed by Parramatta City Council and consists mainly of at-grade stormwater drainage pits, connected to an underground pipe network.

The Kingsway generally grades to the east at approximately 3% and Station Street generally grades to the north at approximately 1% which creates a sag point at the intersection of both roads near the existing pedestrian crossing. There is an existing overland flow path through the existing driveway and along the driveway access between the corridor and the existing buildings. Stormwater drainage pits and pipes are located at this intersection, which drain below the access driveway and eventually discharging into Finlaysons Creek. Stormwater drainage on The Kingsway is managed by Holroyd City Council and consists mainly of at-grade stormwater drainage pits, connected to an underground pipe network.

Groundwater testing was unable to be undertaken at three of the four boreholes as resistance was experienced while hand augering and washboring was required in order to achieve the required depth. No groundwater was detected during geotechnical investigations (J&K Geotechnics, 2014). No long term groundwater monitoring was undertaken.

### **6.9.2 Potential impacts**

With the footpath widening on Wentworth Avenue, gutter flows would be maintained by the provision of grated trench drain on both sides. No additional stormwater drainage is proposed within Wentworth Avenue.

Stormwater drainage pits and pipes are located at the intersection of The Kingsway and Station Street which is within an existing sag point. It drains to the east below the access driveway. Due to the footpath widening and realignment of the pedestrian crossing in The Kingsway, additional stormwater pits would be provided on both sides of the road on both approaches to the pedestrian crossing to drain surface runoff. The low level footpaths created by the footpath widening, would incorporate grated trench drains to drain the footpath. The overland flow path to east along the driveway access would be retained.

Without appropriate safeguards, pollutants (fuel, chemicals or wastewater from accidental spills, and sediment from excavations and stockpiles) could potentially reach nearby stormwater drains. A range of mitigation measures to reduce the incidence of water quality impacts are proposed below and in Chapter 7.

The Proposal is unlikely to impact upon the hydrology of the surrounding area. The detailed design would take stormwater management into consideration. The new design does not result in a significant increase in impervious areas. As such, the Proposal is unlikely to significantly impact upon Council's drainage infrastructure.

Stormwater and drainage systems would be designed in accordance with the relevant Sydney Trains, Sydney Water and Council standards and requirements.

Activities which would disturb soil during construction work (such as tree removal and excavation for footings) have the potential to impact upon local water quality as a result of erosion and run off sedimentation. There is also potential to contaminate local water quality as a result of incidental spills, particularly during periods of rainfall. Mitigation measures have been provided below to minimise the potential for these impacts.

### 6.9.3 Mitigation measures

In addition to the measures describe in Section 6.8.3 above, the following measures would also be included in the Erosion and Sediment Control Plan:

- all stormwater drainage systems south of the corridor for public roads surface drainage would be designed in accordance with Holroyd Council Stormwater Drainage Requirements. This will be for an average recurrence interval (ARI) of 1 in 20 years
- all stormwater drainage systems north of the corridor for public roads surface drainage will be designed in accordance with Parramatta Council Stormwater Drainage Requirements. This will be for an Average Recurrence Interval (ARI) of 1 in 20 years
- adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW *Chemical Storage and Spill Management Guidelines* during the construction phase. All staff would be made aware of the location of the spill kit and be trained in its use
- temporary scour protection and energy dissipation measures would be designed and implemented to protect receiving environments from erosion
- should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (DECCW 2009) and *Water Discharge and Reuse Guideline* (TfNSW, 2011).

## 6.10 Air quality

### 6.10.1 Existing environment

OEH undertakes air quality monitoring across NSW. The site is located within the Sydney East monitoring region with air quality monitored at four fixed sites. Prospect is the closest monitoring site to the Proposal. A search of the daily regional air quality index for the Sydney East region for the month of August, 2014 showed that the region generally experienced 'Good' air quality values with some outlying values of 'Poor' and 'Hazardous' air quality (Table 18).

Table 18: Daily air quality results for Sydney East region in August 2014

Air quality	Very good	Good	Fair	Poor	Very poor	Hazardous
Number of days in August 2014	0	28	0	1	0	2

A search of the National Pollutant Inventory database (NPI) 2012/13 data within Wentworthville (postcode 2145) indicate that there are three nearby facilities which have reported pollution are all located within the Girraween Industrial Precinct:

- DuPont Girraween – Total volatile organic compounds, ethanol, methanol
- Industrial Galvanizers Girraween – Zinc compounds, PAHs, sulphur dioxide, total VOCs, Carbon monoxide
- Redox Pty Ltd – Total VOCs, acetic acid, nitric acid, sulfuric acid.

Other sources of localised air pollution within proximity of Wentworthville Station would be vehicle exhaust fumes.

Potentially affected receptors within the vicinity of the site include the following:

- users of the adjacent commercial and recreational areas
- local residents
- pedestrians and commuters within the Wentworthville Station precinct.

### 6.10.2 Potential impacts

#### Construction phase

During construction, air quality impacts would be associated with the generation of dust and emissions from stationary and moving on-site machinery and associated vehicular traffic. Anticipated sources of dust and dust generating activities include:

- dust generated from the loading and transfer of material from trucks
- dust generated from vehicle movements within the construction compound area for the west of the station
- minor excavation and preparation of the footings and foundations
- bridge repairs and repainting
- general construction works
- emissions associated with the combustion of diesel fuel and petrol from construction plant and equipment.

Dust produced from excavation works would be minor as excavation would generally only be required for the lift pits, services relocation, stormwater diversion, placement of footings and structure foundations.

The operation of plant, machinery and trucks may also lead to increases in exhaust emissions in the study area; however these impacts would be minor and short term. The minor, short-term air quality impacts would be minimised with the implementation of the mitigation measures identified below.

#### Operation phase

Overall impacts of air quality during the operation of the Proposal are considered minimal as the Proposal would not result in a change in land use.

The Proposal aims to improve amenity and access at Wentworthville Station which would support an increase of patronage of the rail system which could result in a relative reduction of commuter vehicle movements on local roads. The Proposal, therefore, would have the potential to reduce vehicle emissions in the long term which would have some beneficial effect on local and regional air quality.

### 6.10.3 Mitigation measures

The following mitigation measures are proposed to manage impacts on air quality:

- Methods for reduction in air emissions would be incorporated into project inductions, training and pre-start talks.
- Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
- Stockpiles would be covered when not in use.

- Dust would be visually monitored and where necessary the following measures implemented:
- apply water (or alternate measures) to exposed surfaces that are causing dust generation. Surfaces may include unpaved roads, stockpiles, hardstand areas and other exposed surfaces
- appropriately cover loads on trucks transporting material to and from the construction site. Securely fix tailgates of road transport trucks prior to loading and immediately after unloading.
- Plant and machinery would be regularly checked and maintained in a proper and efficient condition.

## 6.11 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in close proximity to one another. The impacts may be caused by both construction and operational activities and can result in a greater impact to the surrounding area than would be expected if each project was undertaken in isolation.

A review of the major project register, maintained by NSW Department of Planning and Environment in November 2014 has identified that there are no other major developments located within the vicinity of the Proposal and/or would be under concurrent construction.

Transport for NSW is proposing to upgrade station facilities at Pendle Hill Station, location about 1.5 kilometres to the west of Wentworthville Station. The Proposal would at times coincide with works being undertaken at Pendle Hill Station and would both share the same construction compound located in an existing lay down area within the rail corridor adjacent to the west of the Proposal. However, there is unlikely to be any direct impact to the Proposal site as a result of these works.

During construction the works would be coordinated with any other construction activities in the area with Council, Sydney Trains and any other developers identified to minimise cumulative construction impacts such as traffic and noise.

Traffic associated with the construction works is not anticipated to have a significant impact on the surrounding road network. Operational traffic and transport impacts would have minimal impact on the performance of the surrounding road network.

Based on this assessment it is anticipated that the cumulative impacts would be minor provided that consultation with relevant stakeholders and mitigation measures in Section 7 are implemented.

The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would take into consideration any planned or existing developments that could result in cumulative impacts to the surrounding receivers. Consultation with the relevant stakeholders would be ongoing and would address any potential cumulative impacts.

## **6.12 Climate change and sustainability**

### **6.12.1 Greenhouse gas emissions**

An increase in greenhouse gas emissions, primarily carbon dioxide, would be expected during construction of the Proposal due to exhaust emissions from construction machinery and vehicles transporting materials and personnel to and from site.

Due to the small scale of the Proposal and the short term temporary nature of the construction works, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 19 included in Chapter 7.

It is anticipated that, once operational, the Proposal would result in an increase in use of public transport and a decrease in use of private motor vehicles by commuters to travel to and from Wentworthville town centre. This shift in transport usage would reduce the amount of fuel consumed by private motor vehicles and would result in a relative reduction in associated greenhouse gas emissions in the local area.

### **6.12.2 Climate change**

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to changes in the climate and understand the limitations of adaptation. The effects of climate change on the Sydney region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire. Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a 100-year average recurrence interval flood event would occur more frequently. Such changes in weather in the region are unlikely to impact on the operation of the Proposal.

### **6.12.3 Sustainability**

The design of the Proposal would be based on the principles of sustainability. The detailed design would adopt sustainability initiatives in accordance with the Sustainable Design Guidelines for Rail (Version 3.0) (TfNSW, 2014) and the TfNSW EMS.

# 7 Environmental management

This chapter of the REF identifies how the environmental impacts of the Proposal would be managed through environmental management plans and mitigation measures. Section 7.2 lists the proposed mitigation measures for the Proposal to minimise the impacts of the Proposal identified in Chapter 6.

## 7.1 Environmental management plans

A construction environmental management plan (CEMP) for the construction phase of the Proposal would be prepared in accordance with the requirements of the TfNSW Projects Division's EMS. The CEMP would provide a centralised mechanism through which all potential environmental impacts relevant to the Proposal would be managed, and outline a framework of procedures and controls for managing environmental impacts during construction.

The CEMP would include but not be limited to the following management plans:

- Construction Traffic Management Plan (CTMP)
- Construction Noise and Vibration Management Plan (CNVMP)
- Erosion and Sediment Control Plan (ESCP).

The CEMP would incorporate as a minimum all environmental mitigation measures identified below in Section 7.2, any conditions from licences or approvals required by legislation, and a process for demonstrating compliance with such mitigation measures and conditions.

## 7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 19 below. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6, should the Proposal proceed.

Table 19: Proposed mitigation measures

No. Mitigation measures	
<b>General</b>	
1	An Environmental Design Constraints Map will be developed during detailed design and implemented during construction.
2	An Environmental Controls Map (ECM) will be developed prior to commencement of construction in accordance with TfNSW's draft guide to preparing ECMs. The ECM will be implemented for the duration of construction.
3	An appropriately qualified and experienced site based environment manager will be appointed prior to the commencement of construction.
4	A project risk assessment including environmental aspects and impacts will be undertaken prior to the commencement of construction.
5	Weekly inspections to monitor environmental compliance and performance will be undertaken during construction.

## No. Mitigation measures

- 6 Prior to the commencement of construction, all contractors will be inducted on the key project environmental risks, mitigation measures and conditions of approval.

### Traffic and site access

- 7 Prior to the commencement of works, a construction traffic management plan (CTMP) would be prepared and provided to Council for information. Specifically the TMP would discuss:
- traffic management
  - locations of access to and from the local road network
  - pedestrian management - including wayfinding signage, traffic controllers and fencing
  - routes and turning movements of heavy vehicles
  - loading/delivery zones including queuing
  - parking (construction worker and commuter)
  - an Emergency Response Plan.
- 8 A Road Safety Audit would be undertaken during detailed design and design amendments made as required.
- 9 Heavy vehicles would be restricted to specified routes, with the aim of minimising impacts on local roads.
- 10 The impacts of construction traffic on the local road network and the impacts on intersection operation would be minimised by undertaking construction vehicle traffic movements outside of peak road traffic periods and outside of school peak periods where practicable.
- 11 The queuing and idling of construction vehicles in residential streets would be minimised through staging of deliveries where practicable.
- 12 Where required, communication would be provided to the community and local residents to inform them of impacts to vehicle movements and anticipated effects on the local road network relating to site works.
- 13 Access to all private properties and businesses adjacent to the works would be maintained during construction, unless otherwise agreed by relevant property owners.
- 14 Signage would be erected to warn vehicles of construction activities and heavy vehicle movements.
- 15 Should road closures be required, signage would clearly delineate alternative access, and that nearby businesses would operate as normal.
- 16 Pedestrian access to and from the station and across the station footbridge would be maintained at all times during construction during non-possession periods.
- 17 During possession periods, where the station footbridge is restricted, temporary diversions would be established to direct pedestrian traffic to an alternate crossing.

## No. Mitigation measures

- 18 Road occupancy licences for temporary closure of roads would be obtained, where required.

### Urban design, landscape and visual amenity

- 19 Minimise light spill from the rail corridor into adjacent visually sensitive properties by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
- 20 Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
- 21 Work/site compounds would be screened, with shade cloth (or similar material where necessary) to minimise visual impacts from identified sensitive visual receivers.
- 22 All lighting would be designed and installed in accordance with the requirements of AS4282 Control of the Obtrusive Effects of Outdoor Lighting
- 23 Unnecessary loss or damage to vegetation partially affected or unaffected by the Proposal would be avoided by protecting trees prior to construction and/or trimming vegetation where possible to avoid total removal.
- 24 Rehabilitation planting would be undertaken as early as possible to replace vegetation that provided screening to adjacent residential properties and sensitive visual receivers.
- 25 Specifically designed lighting equipment would be used to minimise the upward spread of light near to and above the horizontal. Care would be taken when selecting luminaires to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum.
- 26 Graffiti would be removed in accordance with TfNSW's standard requirements.
- 27 A landscape plan would be prepared for the proposed new elements. It would aim to provide some integration between the new structure and the existing vegetation. It would consider the long term replacement of tree planting within the station precinct to maintain visual filtering and screening of external views.

### Noise and vibration

- 28 Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Construction Noise Strategy (TfNSW, 2012a) and the Noise and Vibration Impact Assessment for the Wentworthville Station Accessibility Upgrade (ERM, 2014). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
- 29 Works would be carried out during normal work hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Works outside these hours may be undertaken if approved by TfNSW. An Out of Hours Work approval would need to be obtained from TfNSW for any works outside normal work hours.
- 30 Works would be carried out in accordance with the requirements of the Construction Noise Strategy (TfNSW, 2012a), ICNG and the Noise and Vibration Impact Assessment for the Wentworthville Station Accessibility Upgrade (ERM, 2014).

## No. Mitigation measures

- 31 To reduce the construction noise impact from human activities, reasonable and feasible noise mitigation options should be considered, including:
- regularly training workers and contractors (such as at toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise
  - using only the equipment necessary for the upgrade works at any one time
  - avoiding any unnecessary noise when carrying out manual operations and when operating plant
  - ensuring spoil is placed and not dropped into awaiting trucks
  - switching off any equipment not in use for extended periods e.g. heavy vehicles engines should be switched off whilst being unloaded
  - avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where possible
  - avoiding deliveries at night/evenings wherever possible
  - no idling of delivery trucks
  - keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site
  - minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios on site. No dropping of materials from height where practicable, throwing of metal items and slamming of doors.
- 
- 32 To reduce the construction noise and vibration impacts from mechanical activities, reasonable and feasible noise mitigation options should be considered, including:
- maximising the offset distance between noisy plant and adjacent sensitive receivers
  - directing noise-emitting plant away from sensitive receivers
  - regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc.
  - using non-“beeper” reversing/movement alarms such as broadband (nontonal) alarms or ambient noise-sensing alarms for all plant and vehicles regularly used on site (greater than one day)
  - fitting mufflers/silencers to pneumatic tools (e.g. breakers) and use residential grade mufflers on plant
  - use of quieter and less vibration emitting construction methods where feasible and reasonable.
- 
- 33 Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding should take into consideration the location of residential receivers to ensure that ‘line of sight’ is broken, where feasible.
- 
- 34 Where the LAeq (15minute) construction noise levels are predicted to exceed 75 dBA, respite periods would be considered in accordance with the ICNG.
- 
- 35 Noise and vibration emissions shall be qualitatively assessed throughout works and additional measures shall be implemented to prevent jeopardising the intelligibility of the station public address (PA) system and the safety of commuters and staff as a result.
-

## No. Mitigation measures

### Indigenous heritage

- 36 all construction staff would receive basic training in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to both the Indigenous and non-Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites
- 37 in the event Aboriginal objects are located during works, all works must stop in the vicinity of the find, and the NSW Office of Environment and Heritage, LALC and an archaeologist would be notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained before works recommence.

### Non-Indigenous heritage

- 38 Following the development of detailed designs, and prior to the commencement of construction works, Sydney Trains and Holroyd City Council would be notified of the Proposal. A copy of the SoHI prepared by MWH and Cosmos Archaeology would be provided.
- 39 A suitably qualified and experienced heritage architect/consultant will be engaged to provide input to, and review of the detailed design of the Proposal
- 40 The detailed design of the Proposal would aim to be as sympathetic as possible to the existing character of the study area in order to minimise visual impacts. Wentworthville is designed in the Inter-War Period Stripped Functionalist style, and additional items should echo these architectural philosophies by incorporating minimalist designs, curved corner details and horizontal lines, and respond to the existing colour schemes and material palette to those associated with the precinct today. The use of unobtrusive, modern, light materials, such as glass panelling and slim frame elements would reduce the bulk of the Proposal, reducing the visual impact of the additional items
- 41 Consideration should be given to create visual gaps between the awnings and canopies. At a minimum, a short visual gap should be retained between old and new fabric.
- 42 Detailed design will include identification of existing heritage features within the existing platform buildings for conservation, and internal alterations are to be guided by the advice of the heritage architect/consultant
- 43 Archival recording of the bridge in its current condition and relationship to the surrounding station precinct would be undertaken in accordance with Heritage Division Guidelines prior to the proposed works commencing to mitigate impacts to the heritage significance of the study area
- 44 An archival recording of the Wentworthville Memorial Fountain, in accordance with the NSW Heritage Division guidelines for Archival Recordings, would be undertaken prior to its dismantling and reconstruction. This recording would be placed in Holroyd City Council Library so that a complete record of the Memorial Fountain is available for public access.
- 45 The proposed methodology for the relocation of the fountain will be developed in consultation with a suitably qualified and experienced heritage professional for approval by TfNSW prior to the commencement of the relocation works. The methodology is to consider any feedback from Holroyd City Council referred to in Section 5.6

## No. Mitigation measures

- 46 The existing railway commemorative plaque, erected in 1985, and memorial garden, would be relocated by an experienced craftsman so that it remains with the Wentworthville Memorial Fountain and is associated with the Wentworthville Station.
- 47 In the event that any unanticipated archaeological deposits are identified within the project site during construction, work likely to impact on the deposit would cease immediately and a suitably qualified heritage consultant would be contacted and directed by TfNSW. Where it is required further, archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.
- 48 During detailed design, a heritage interpretation strategy would be developed which provides information on the heritage of the area. This would include heritage interpretive signage in relation to the removed ramps. Interpretive signage would be positioned in an area regularly used by Wentworthville Station commuters and placed in a logical context associated with the location of the ramps and the station precinct. For example, signage could be located near the existing station buildings, facing the footbridge, or within the portion of the footbridge proposed to be retained.
- 49 A heritage induction would be provided to workers before construction begins, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction.
- 50 Non-Indigenous heritage items would be identified on the construction contractor's Environmental Control Maps.

## Socio-economic

- 51 The proposed sustainability criteria for the project would encourage the contractor to purchase goods and services locally.
- 52 The community liaison plan would be prepared by the contractor (refer to Section 5) and would identify all potential stakeholders and the best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project.
- 53 Feedback through the submissions process would be encouraged and facilitate opportunities for the community and stakeholders to have input into the project.
- 54 The community would be kept informed of construction progress.
- 55 Contact details for a 24-hour construction response line.

## Biodiversity

- 56 Disturbance of vegetation would be limited to the minimum amount necessary for the Proposal.
- 57 Trees to be removed would be clearly demarcated on site prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through exclusion fencing or Tree Protection Zones (TPZs) in accordance with Australian Standard AS4970-2009.

## No. Mitigation measures

- 58 There would be no pedestrian or vehicular access to TPZs. No building activities should take place within the TPZ, including storage or stockpiling. Runoff from the site would not be allowed to enter the tree protection zones. Toolbox talks would inform workers of these zones and the restrictions applied.
- 59 In the event of any tree to be retained becoming damaged during construction, an arborist would be informed immediately to inspect and provide advice on remedial action where possible.
- 60 Impacts to the Grey Gum located at the northern staircase are to be avoided where possible. If pruning or removal is required, a qualified ecologist should be present during tree removal to salvage any roosting microbats that may be present beneath the exfoliating bark of the tree.
- 61 To minimise impacts to resident fauna, if Lantana thickets are planned for removal, these should be inspected for nesting birds prior to clearing. If nesting birds are present, consideration should be given to allow these birds to move on at their own pace.
- 62 Landscaping designs should aim to maintain and improve the current biodiversity values present by enhancing fauna habitat through establishment of dense native shrubs and grasses to provide resources for small native birds as well as the planting of winter flowering trees suitable to the location.
- 63 Offsets and/ or landscaping would be undertaken in accordance with TfNSW Vegetation Offset Guidelines. Detailed design would see the landscape plan include provision of as much native vegetation within the Proposal as is feasible. Remaining vegetation to be offset would be undertaken in consultation with the relevant council.
- 64 Strategies to manage the light pollution including appropriate selection of luminaries to manage light spill through strategic positioning will be adopted during detailed design.
- 65 Weed control measures would be developed and implemented in the CEMP to manage the dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal in accordance with the Noxious Weeds Act 1993.
- 66 Vehicles and other equipment to be used on site would be cleaned to minimise seeds and plant material entering the site to prevent the introduction of further exotic plant species.
- 67 All workers would be provided with an environmental induction prior to commencing work on-site. This induction would include information on the protection measures to be implemented to protect vegetation and penalties for breaches.
- 68 Should onsite works determine the removal or trimming of any additional trees, TfNSW Tree Removal Application Form would need to be completed and submitted to TfNSW for approval.

## Contamination, Landform , Geology and Soils

- 69 Prior to commencement of works, erosion and sediment control plans would be prepared in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom/ Department of Housing) (The Blue Book). The erosion and sediment control plans would be established prior to the commencement of construction and be updated and managed throughout as relevant to the activities during the construction phase.

## No. Mitigation measures

- 70 In the event of an incident, works would cease in the immediate vicinity and the EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act.
- 71 An appropriate Unexpected Finds Protocol, incorporating asbestos and other potential contaminants, would be included in the Construction Environment Management Plan. This would include procedures for handling asbestos contaminated materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal would be undertaken in accordance with WorkCover requirements.
- 72 All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards and EPA Guidelines.
- 73 The existing Sydney Trains and Council drainage systems would remain operational throughout the construction of the project.
- 74 Emergency spill kits would be kept on-site at all times. All staff would be made aware of the location of the spill kit and be trained in its use.

## Hydrology and water quality

- 75 All stormwater drainage systems south of the corridor for public roads surface drainage will be designed in accordance with Holroyd Council Stormwater Drainage Requirements. This will be for an average recurrence interval (ARI) of 1 in 20 years. Provision will be made to safely convey overland flows for the 100 year ARI.
- 76 All stormwater drainage systems north of the corridor for public roads surface drainage will be designed in accordance with Parramatta Council Stormwater Drainage Requirements. This will be for an Average Recurrence Interval (ARI) of 1 in 20 years. Provision will be made to safely convey overland flows for the 100 year ARI.
- 77 Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW Chemical Storage and Spill Management guidelines during the construction phase. All staff would be made aware of the location of the spill kit and be trained in its use.
- 78 Temporary scour protection and energy dissipation measures would be designed and implemented to protect receiving environments from erosion.
- 79 Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the Waste Classification Guidelines (DECCW 2009) and Water Discharge and Reuse Guideline (TfNSW, 2011).

## Air quality

- 80 Methods for reduction in air emissions would be incorporated into project inductions, training and pre-start talks.
- 81 Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
- 82 Stockpiles would be covered when not in use.

## No. Mitigation measures

- 83 Dust would be visually monitored and where necessary the following measures implemented:
- apply water (or alternate measures) to exposed surfaces that are causing dust generation. Surfaces may include unpaved roads, stockpiles, hardstand areas and other exposed surfaces
  - appropriately cover loads on trucks transporting material to and from the construction site. Securely fix tailgates of road transport trucks prior to loading and immediately after unloading.
- 
- 84 Plant and machinery would be regularly checked and maintained in a proper and efficient condition.

## Cumulative impacts

- 85 The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed and implemented as appropriate.

## Sustainability

- 86 The detailed design would adopt sustainability initiatives in accordance with the Sustainable Design Guidelines for Rail (Version 2.0) (TfNSW, 2012c) and the TfNSW EMS.

## 8 Conclusion

---

This REF has been prepared in accordance with the provisions of section 111 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The proposal would provide the following benefits:

- DDA compliant access to the station and the platforms
- improved customer experience through the widened concourse space, which allows for a concession/ kiosk, real-time information provision and ticket machines
- improved legibility, wayfinding and station entrance from both northern and southern approaches
- consolidated lift and stair access from both street entrances
- improved waiting environment for bus passengers, kiss and ride, and taxi passengers
- additional cycle storage provided at both street entrances.

The key likely impacts of the Proposal are as follows:

- heritage impacts to Wentworthville Station and the Wentworthville Memorial Fountain
- temporary noise and vibration impacts
- minor temporary delays on the adjacent road network
- temporary changes to access arrangements including pedestrian diversions
- tree removal and visual impacts.

This REF has considered and assessed these impacts in accordance with clause 228 of the EP&A Regulation and the requirements of the EPBC Act (refer to Chapter 7, and Appendices 1 and 2). Should the project proceed, these impacts will be effectively managed in accordance with the proposed Wentworthville Station Easy Access Upgrade CEMP, mitigation measures (refer to Chapter 8) and the conditions of approval. As a result, the Proposal is not likely to have a significant impact on the environment, threatened species, populations, EECs or their habitats. Accordingly an EIS is not required, nor is the approval of the Minister for Planning and Infrastructure.

The Proposal would also take into account the principles of ESD (refer to Section 5.6). These would be considered further during the detailed design, construction and operational phases of the proposal. This will ensure the proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

# References

- Australian Bureau of Statistics (2011) Census of Population and Housing.
- Biosis. 2014. Wentworthville Station Precinct Accessibility Upgrade: Flora and Fauna Assessment
- Cardno. 2014. Wentworthville Station Precinct Accessibility Upgrade – Concept Design Report
- Chapman, G.A & Murphy, C.L. . 1989. *Soil Landscapes of the Sydney 1:100 000 Sheet* (Map and Report), Sydney.
- Department of Environment and Climate Change (DECC). 2009. *Interim Construction Noise Guideline*
- Department of Environment and Conservation (DEC). 2006. *Assessing Vibration: A Technical Guideline*
- Department of Premier and Cabinet. 2011. *NSW 2021 – A Plan to Make NSW Number One*
- Department of Planning. 2005. *Metropolitan Strategy—City of Cities: A Plan for Sydney's*
- Department of Planning. 2007. *Inner North Subregion - Draft Subregional Strategy*.
- Department of Planning. 2010. *Metropolitan Plan for Sydney 2036*.
- Environment Protection Authority (2000) *Industrial Noise Policy*
- Environmental Investigation Services. 2014. Report to Cardno (NSW/ACT) Pty Ltd on preliminary environmental site assessment and management plan for proposed access upgrades at Wentworthville Station, Wentworthville NSW
- ERM. 2014. *Wentworthville Station Precinct Accessibility Upgrade: Noise and Vibration Impact Assessment*.
- Green Bean Design. 2014. *Wentworthville station upgrade, Transport Access Program: Visual impact assessment*
- GTA Consultants. 2014. *Wentworthville railway station easy access upgrade traffic, transport and access impact assessment*.
- JK Geotechnics. 2014. Report to Cardno (NSW/ACT) Pty Ltd on geotechnical investigation for proposed access upgrade at Wentworthville Station, Wentworthville NSW.
- Landcom. 2004. *Managing Urban Stormwater: Soils and Construction, Sydney*
- MWH and Cosmos Archaeology. 2014. *Wentworthville railway station – Statement of heritage impact*.
- Office of Environment and Heritage (OEH). 2013a *Aboriginal Heritage Information Management Systems (AHIMS)*. Accessed October 2014: <http://www.environment.nsw.gov.au/awssapp/login.aspx>
- Office of Environment and Heritage. 2013b. *Air Quality Index Values*. Accessed October 2014 from <http://www.environment.nsw.gov.au/aqms/aqi.htm>
- Transport for NSW. 2012a. *Construction Noise Strategy*
- Transport for NSW. 2012b. *NSW Long Term Transport Master Plan*

Transport for NSW. 2013. *NSW Sustainable Design Guidelines – For Rail, Version 3.0*

Transport for NSW. 2012d. *Sydney's Rail Future*

Transport for NSW. 2012e. *Vegetation Offset Guide*

Transport for NSW. 2012f *2012-2017 Disability Action Plan*

# Appendix 1 – Consideration of Clause 228 factors

The table below demonstrates TfNSW’s consideration of the specific factors of clause 228 of the EP&A Regulation in determining whether the Proposal would have a significant impact on the environment.

Factor	Impacts
<p><b>Any environmental impact on a community?</b></p> <p>Some short-term impacts during construction would be anticipated, particularly in relation to noise, traffic and access and visual amenity.</p> <p>Mitigation measures outlined in Section 7 would be implemented to manage and minimise any adverse impacts.</p>	minor
<p><b>Any transformation of a locality?</b></p> <p>The Proposal is unlikely to have any transformation of the locality surrounding the Station.</p>	nil
<p><b>Any environmental impact on the ecosystem of the locality?</b></p> <p>The Proposal is unlikely to impact the local ecosystem as discussed in Section 6.</p>	nil
<p><b>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</b></p> <p>Some short-term impacts during construction would be anticipated, particularly in relation to noise, traffic and access and visual amenity.</p> <p>During operation the Proposal would have positive impacts to the community through providing improved access to Wentworthville Station.</p>	minor
<p><b>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</b></p> <p>The Proposal would change the views and vistas of the heritage listed Wentworthville Station however, given the visual clutter of street signage in these areas, these changes would not have a detrimental effect on the heritage significance of Wentworthville Station. Subject to archival recording, the relocation of the memorial fountain is considered to be an acceptable impact.</p>	minor
<p><b>Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</b></p> <p>The Proposal is unlikely to have any impact on the habitat of protected fauna.</p>	nil
<p><b>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</b></p> <p>The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	nil
<p><b>Any long-term effects on the environment?</b></p> <p>The Proposal is unlikely to have any long-term effects on the environment.</p>	nil

Factor	Impacts
<p><b>Any degradation of the quality of the environment?</b></p> <p>The Proposal is unlikely to have any degradation on the quality of the environment.</p>	nil
<p><b>Any risk to the safety of the environment?</b></p> <p>Construction of the Proposal would be managed in accordance with a CEMP to reduce any risks to the environment.</p>	nil
<p><b>Any reduction in the range of beneficial uses of the environment?</b></p> <p>The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.</p>	nil
<p><b>Any pollution of the environment?</b></p> <p>The Proposal is unlikely to cause any pollution to the environment.</p>	nil
<p><b>Any environmental problems associated with the disposal of waste?</b></p> <p>The Proposal is unlikely to cause any environmental problems associated with the disposal of waste.</p> <p>All waste would be managed and disposed of in accordance with the EPA Waste Classification Guidelines (April, 2008). Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.</p>	nil
<p><b>Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</b></p> <p>The Proposal is unlikely to have increased demands on limited resources.</p>	nil
<p><b>Any cumulative environmental effect with other existing or likely future activities?</b></p> <p>Cumulative effects of the Proposal are described in Section 6. Where feasible, environmental management measures would be coordinated to reduce cumulative construction impacts. The Proposal is unlikely to have any significant long term impacts.</p>	nil

## Appendix 2 – Consideration of matters of national environmental significance

The table below demonstrates TfNSW’s consideration of the matters of NES under the EPBC Act to be considered in order to determine whether the Proposal should be referred to The DoE.

Factor	Impacts
<p><b>Any impact on a World Heritage property?</b></p> <p>There are no World Heritage properties in the vicinity of the Proposal.</p>	nil
<p><b>Any impact on a National Heritage place?</b></p> <p>There are no National Heritage places in the vicinity of the Proposal.</p>	nil
<p><b>Any impact on a wetland of international importance?</b></p> <p>There are no wetlands of international significance in the vicinity of the Proposal.</p>	nil
<p><b>Any impact on a listed threatened species or communities?</b></p> <p>It is unlikely that the development of the Proposal would significantly affect any listed species or ecological communities.</p>	nil
<p><b>Any impacts on listed migratory species?</b></p> <p>It is unlikely that the development of the Proposal would significantly affect any listed migratory species.</p>	nil
<p><b>Any impact on a Commonwealth marine area?</b></p> <p>The works are not in the vicinity of a Commonwealth marine area.</p>	nil
<p><b>Does the Proposal involve a nuclear action (including uranium mining)?</b></p> <p>The Proposal does not involve a nuclear action.</p>	nil
<p><b>Additionally, any impact (direct or indirect) on Commonwealth land?</b></p> <p>The Proposal would not be undertaken on or near to any Commonwealth land.</p>	nil

# Appendix 3 – Results of noise modelling

Construction noise predictions – standard construction hours (ERM, 2014)

Construction scenario	Receiver type	Noise level – LAeq, 15 minute (dBA)		
		Daytime noise affected management level	Worst case predicted	Exceedance
Establish construction compound	Residential	50	72	22
	Community / medical centre	65	70	5
	Commercial	70	70	0
Demolish and remove stairs and canopies	Residential	50	81	31
	Community / medical centre	65	80	15
	Commercial	70	80	10
Demolish concession outlet on footbridge	Residential	50	64	14
	Community / medical centre	65	65	-
	Commercial	70	65	-
Demolish brick walls and fencing	Residential	50	83	33
	Community / medical centre	65	83	18
	Commercial	70	83	13
Construct garbage bay on Wentworth Avenue	Residential	50	71	21
	Community / medical centre	65	68	3
	Commercial	70	68	-
Construct temporary booking office	Residential	50	63	13
	Community / medical centre	65	57	-
	Commercial	70	57	-
Construct temporary toilets	Residential	50	62	12
	Community / medical centre	65	58	-
	Commercial	70	58	-

Construction scenario	Receiver type	Noise level - LAeq, 15 minute (dBA)		
		Daytime noise affected management level	Worst case predicted	Exceedance
Construct temporary alternative pedestrian crossing	Residential	50	77	27
	Community / medical centre	65	83	18
	Commercial	70	83	13
Construct lift, stair and canopy access to The Kingsway	Residential	50	81	31
	Community / medical centre	65	80	15
	Commercial	70	80	10
Construct lift, stair and canopy access to Wentworth Avenue	Residential	50	77	27
	Community / medical centre	65	80	15
	Commercial	70	80	10
Construct new extended canopies to match existing	Residential	50	70	20
	Community / medical centre	65	69	4
	Commercial	70	69	-
Construct lift and stair access to island platforms	Residential	50	77	27
	Community / medical centre	65	76	11
	Commercial	70	76	6
Construct collision protection	Residential	50	71	21
	Community / medical centre	65	70	5
	Commercial	70	70	-
Construct widened concourse	Residential	50	70	20
	Community / medical centre	65	70	5
	Commercial	70	70	-
Construct anti-throw screens on footbridge	Residential	50	72	22
	Community / medical centre	65	71	6
	Commercial	70	71	1

Construction scenario	Receiver type	Noise level - LAeq, 15 minute (dBA)		
		Daytime noise affected management level	Worst case predicted	Exceedance
Construct passenger information systems and ticketing facilities	Residential	50	70	20
	Community / medical centre	65	69	4
	Commercial	70	69	-
Platform 1/2 building modifications	Residential	50	48	-
	Community / medical centre	65	47	-
	Commercial	70	47	-
Platform 3/4 building modifications	Residential	50	71	21
	Community / medical centre	65	70	5
	Commercial	70	70	-
Stormwater drainage adjustments	Residential	50	91	41
	Community / medical centre	65	93	28
	Commercial	70	93	23
Services diversion	Residential	50	77	27
	Community / medical centre	65	76	11
	Commercial	70	76	6
Relocate Sydney Trains 11kV aerial feeder	Residential	50	77	27
	Community / medical centre	65	77	12
	Commercial	70	77	7
Relocate Endeavour Energy high voltage aerial feeder on Wentworth Avenue	Residential	50	74	24
	Community / medical centre	65	70	5
	Commercial	70	70	-
Station power supply upgrade	Residential	50	77	27
	Community / medical centre	65	77	12
	Commercial	70	77	7

Construction scenario	Receiver type	Noise level - LAeq, 15 minute (dBA)		
		Daytime noise affected management level	Worst case predicted	Exceedance
Lighting adjustments	Residential	50	70	20
	Community / medical centre	65	63	-
	Commercial	70	63	-
Relocation of station communication systems	Residential	50	70	20
	Community / medical centre	65	70	5
	Commercial	70	70	0
Wentworth Avenue/Railway Street intersection treatment	Residential	50	83	33
	Community / medical centre	65	75	10
	Commercial	70	75	5
Provide accessible car parking on Wentworth Avenue	Residential	50	81	31
	Community / medical centre	65	76	11
	Commercial	70	76	6
Provide kiss and ride on Wentworth Avenue	Residential	50	76	26
	Community / medical centre	65	78	13
	Commercial	70	78	8
Construct bicycle storage on Wentworth Avenue	Residential	50	66	16
	Community / medical centre	65	71	6
	Commercial	70	71	1
Upgrade bus stop on Wentworth Avenue	Residential	50	69	19
	Community / medical centre	65	70	5
	Commercial	70	70	-
The Kingsway/ Station Street intersection treatment	Residential	50	82	32
	Community / medical centre	65	82	17
	Commercial	70	82	12

Construction scenario	Receiver type	Noise level - LAeq, 15 minute (dBA)		
		Daytime noise affected management level	Worst case predicted	Exceedance
Replace footpath on The Kingsway	Residential	50	72	22
	Community / medical centre	65	71	6
	Commercial	70	71	1
Provide kiss and ride on The Kingsway	Residential	50	81	31
	Community / medical centre	65	81	16
	Commercial	70	81	11
Provide taxi rank on The Kingsway	Residential	50	80	30
	Community / medical centre	65	80	15
	Commercial	70	80	10
Provide new bicycle storage on The Kingsway	Residential	50	69	19
	Community / medical centre	65	68	3
	Commercial	70	68	-
Upgrade waiting area on The Kingsway	Residential	50	75	25
	Community / medical centre	65	74	9
	Commercial	70	74	4
Relocate Memorial Fountain and plaque	Residential	50	85	35
	Community / medical centre	65	85	20
	Commercial	70	85	15
Upgrade wayfinding signage	Residential	50	82	32
	Community / medical centre	65	85	20
	Commercial	70	85	15

Note:  Shaded cells on predicted noise level indicates noise levels above the highly noise affected level of 75 dB(A)