NSW GOVERNMENT

Transport Access Program

# Bexley North Station Upgrade

## Review of Environmental Factors


*Artist's impression of the proposed Bexley North Station Upgrade, subject to detailed design.*

February 2019

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# Abbreviations

| Term | Meaning |
|---|---|
| AHIMS | Aboriginal Heritage Information Management System |
| ARI | Average Recurrence Interval |
| ASA | Asset Standards Authority (refer to Definitions) |
| ASS | Acid Sulfate Soils |
| BCA | Building Code of Australia |
| BC Act | Biodiversity Conservation Act 2016 (NSW) |
| CAMBA | China-Australia Migratory Bird Agreement |
| CBD | Central Business District |
| CCTV | Closed Circuit TV |
| CEMP | Construction Environmental Management Plan |
| CLM Act | Contaminated Land Management Act 1997 (NSW) |
| CNVMP | Construction Noise and Vibration Management Plan |
| CPTED | Crime Prevention Through Environmental Design |
| DBH | Diameter Breast Height |
| DBYD | Dial Before You Dig |
| DDA | Disability Discrimination Act 1992 (Cwlth) |
| DoE | Commonwealth Department of the Environment |
| DP&E | NSW Department of Planning and Environment |
| DSAPT | Disability Standards for Accessible Public Transport (2002) |
| DSS | detailed services search |
| EMS | Environmental Management System |
| EPA | Environment Protection Authority |
| EP&A Act | Environmental Planning and Assessment Act 1979 (NSW) |
| EP&A Regulation | Environmental Planning and Assessment Regulation 2000 (NSW) |
| EPBC Act | Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) |
| EPL | Environment Protection Licence |

| Term | Meaning |
|---|---|
| ESD | Ecologically Sustainable Development (refer to Definitions) |
| ETS | Electronic Ticketing System |
| EWP | Elevated Work Platform |
| FM Act | Fisheries Management Act 1994 (NSW) |
| FRL | Fire Resistance Level |
| HA | Hectares |
| Heritage Act | Heritage Act 1977 (NSW) |
| ICNG | *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000). |
| ISCA | Infrastructure Sustainability Council of Australia |
| JAMBA | Japan-Australia Migratory Bird Agreement |
| Infrastructure SEPP | State Environmental Planning Policy (Infrastructure) 2007 (NSW) |
| $L_{xxx}$ | See 'noise averaging periods' in Definitions section below |
| LEP | Local Environmental Plan |
| LGA | Local Government Area |
| MCA | Multi-Criteria Analysis |
| NCA | Noise Catchment Area |
| NES | National Environmental Significance |
| Noxious Weeds Act | Noxious Weeds Act 1993 (NSW) |
| NPfI. | Noise Policy for Industry |
| NPW Act | National Parks and Wildlife Act 1974 (NSW) |
| NSW | New South Wales |
| OEH | NSW Office of the Environment and Heritage |
| OOHW | Out of hours works |
| PA system | Public Address system |
| PDP | Public Domain Plan |
| PEA | Preliminary Environmental Assessment |
| POEO Act | Protection of the Environment Operations Act 1997 (NSW) |

| Term | Meaning |
|---|---|
| RailCorp | (former) Rail Corporation of NSW |
| RBL | Rating Background Level |
| REF | Review of Environmental Factors (this document) |
| Roads Act | Roads Act 1993 (NSW) |
| Roads and Maritime | NSW Roads and Maritime Services (formerly Roads and Traffic Authority) |
| RoKAMBA | Republic of Korea-Australia Migratory Bird Agreement |
| SEPP | State Environmental Planning Policy |
| SHR | State Heritage Register |
| SoHI | Statement of Heritage Impact |
| TCP | Traffic Control Plan |
| TfNSW | Transport for NSW |
| TGSI | Tactile Ground Surface Indicators (“tactiles”) |
| TMP | Traffic Management Plan |
| TPZ | Tree Protection Zone |
| UDP | Urban Design Plan |
| WARR Act | Waste Avoidance and Resource Recovery Act 2001 (NSW) |

# Definitions

| Term | Meaning |
|---|---|
| 'A' Frequency weighting | Frequency weightings are used to adjust sound level meters so that they are measuring and reporting noise levels that represent what humans hear.<br>The human ear is more sensitive to midrange frequencies between 500Hz and 6kHz (for example a child's scream) and less sensitive to very low or very high pitch noises. Sound level meters have inbuilt frequency weighting networks that very roughly approximate the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The 'A' weighting is the most commonly used frequency weighting for occupational and environmental noise assessments. |
| Average Recurrence Interval | The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years. |
| B-Double | A B-double is a combination of a prime mover towing two semi-trailers all connected by B-couplings |
| Concept design | The concept design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to TfNSW acceptance). |
| Decibel (dB) | The decibel (dB) is a unit used to measure the intensity of a sound by comparing it to a given value on a logarithmic scale. The logarithmic scale allows a wide range of values to be compressed into a more comprehensible range, typically 0–120 dB.<br>Noise levels in decibels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dB, and another similar machine is placed beside it, the level will increase to 53 dB (from 10 log10 (10(50/10) + 10(50/10)) and not 100 dB. The human ear has a vast sound-sensitivity range of over a thousand billion to one so the logarithmic decibel scale is useful for acoustical assessments. |
| dBA | see 'A' Frequency weighting |
| Detailed design | Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to TfNSW acceptance). |
| Disability Standards for Accessible Public Transport | The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers. |
| Ecologically Sustainable Development | As defined by clause 7(4) Schedule 2 of the EP&A Regulation.<br>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. |

| Term | Meaning |
|---|---|
| Feasible | A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements. |
| Frequency | The number of oscillations or cycles of a wave motion per unit time. 1 Hz is equivalent to one cycle per second. 1000 Hz is 1 kHz. |
| Hertz (Hz) | The unit used to measure frequency of sound expressed by cycles per second. |
| Interchange | Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange. |
| Noise averaging periods | Noise can be measured over various periods of time. The five 'averaging periods' used in this report are described below:<br>• $L_{Aeq(15\ min)}$ describes an average noise level across a period of time (either day, evening, night, or over a 15-minute period). It accounts for the full range of noise levels encountered in a given area over a given period.<br>• $L_{A90}$ describes the noise level that occurs for 90 per cent of the time and therefore describes the background noise level.<br>• $L_{A10}$ describes the noise level that occurs for 10 per cent of the time and therefore describes what the environment is like during the nosiest periods.<br>• $L_{Amax}$ describes the average maximum noise level recorded at any point in time. |
| Noise catchment area (NCA) | Areas containing noise sensitive receivers that have been categorised based on a similar noise environment. |
| Noise management level (NML) | An NML is a criteria for managing noise levels associated with an activity. They are site/project specific and are calculated based on the level of ambient noise (represented by the rating background level (RBL)) already at the site. An NML will consist of the RBL plus an allowable increase in noise emissions (e.g. RBL + 10dB). If noise emissions increase above the NML, sensitive receivers are likely to be disturbed.<br>There are usually two types of NML, 'noise affected' and 'highly noise affected.'<br>The noise affected level represents the point above which there may be some community reaction to noise. The highly noise affected level represents the point above which there may be strong community reaction to noise. |
| Noise sensitive receiver | In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches). |
| NSW Train Link | From 1 July 2013, NSW Trains (NSW Train Link) became the new rail provider of services for regional rail customers. |
| Opal card | The integrated ticketing smartcard being introduced by TfNSW. |
| Out of hours works | Defined as works *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays). |

| Term | Meaning |
|---|---|
| Proponent | A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act, in this instance, TfNSW. |
| Rail possession | Possession is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users. |
| Reasonable | Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure. |
| Sensitive receivers | Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals. |
| Sydney Trains | From 1 July 2013, Sydney Trains replaced CityRail as the provider of metropolitan train services for Sydney. |
| Tactiles | Tactile tiles or Tactile Ground Surface Indicators (TGSIs) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms. |
| The Proposal | The construction and operation of the Bexley North Station Upgrade. |
| Vegetation Offset Guide | The TfNSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act.<br>The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm. |

# Executive summary

## Overview

The NSW Government is improving accessibility at Bexley North Station. This Proposal is being delivered as part of the Transport Access Program, a NSW Government Initiative to provide a better experience for public transport customers by delivering accessible, modern secure and integrated transport infrastructure.

As part of this program, the Bexley North Station Upgrade (the Proposal) would aim to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams, and customers with luggage.

The Proposal would aim to provide:

- a lift to the station platform
- a new accessible path, ramp and stairs between the station and commuter car park on Kingsgrove Avenue
- improved amenities such as a new ambulant toilet and family accessible toilet.

Transport for NSW (TfNSW) is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Proposal.

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 Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

An overview of the Proposal is shown in Figure ES.1 below.

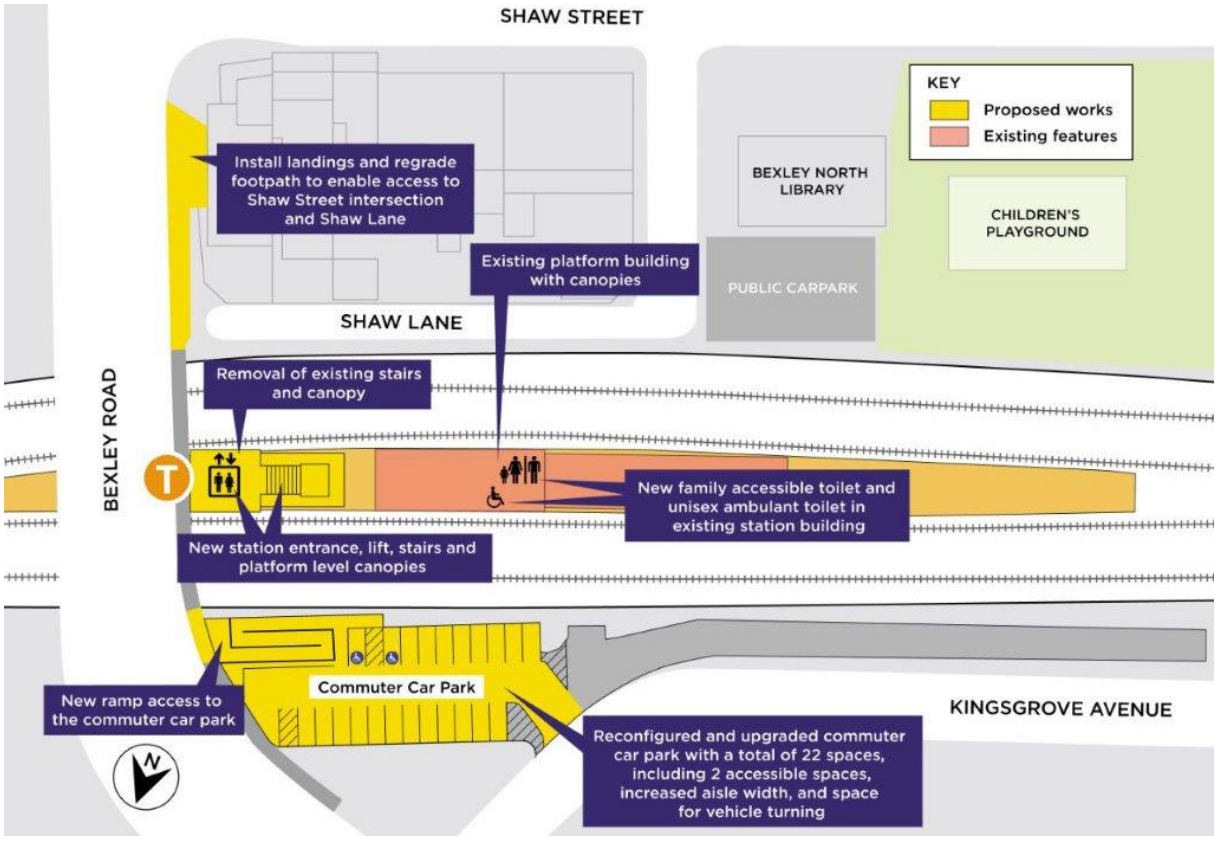



**Figure ES.1 Proposed Bexley North Station Upgrade (subject to change during detailed design)**

Subject to approval, construction is expected to commence from mid-2019 and take around 18 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF.

## Need for the Proposal

The Proposal would ensure that Bexley North Station would meet legislative requirements under the *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

The Proposal has been designed to drive a stronger customer experience outcome, to deliver improved travel to and between modes, encourage greater public transport use and better integrate interchanges with the role and function of town centres. The Proposal would also assist in responding to forecasted growth in the region and as such would support growth in commercial and residential development.

Chapter 2 of this REF further describes the need for the proposal and outlines the options considered in developing the design.

## Community and stakeholder consultation

Community consultation activities for the Proposal would be undertaken during the public display period of this REF and the public invited to submit feedback to help TfNSW understand what is important to customers and the community. The REF would be displayed for a period of two weeks. Further information about these specific activities is included in Section 4.5 of this REF.

During this period a Project Infoline (1800 684 490) and email address (projects@transport.nsw.gov.au) would be also available for members of the public to make enquiries.

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

**Feedback can be sent to:**

- **projects@transport.nsw.gov.au**
- **Transport Access Program– Bexley North**
  **Transport for NSW**
  **Locked Bag 6501**
  **St Leonards NSW 2065**

**Or submitted:**

- **In person at a project community information session**
- **Via yoursay.transport.nsw.gov.au/bexleynorth**

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure ES.2 shows the planning approval and consultation process for the Proposal.

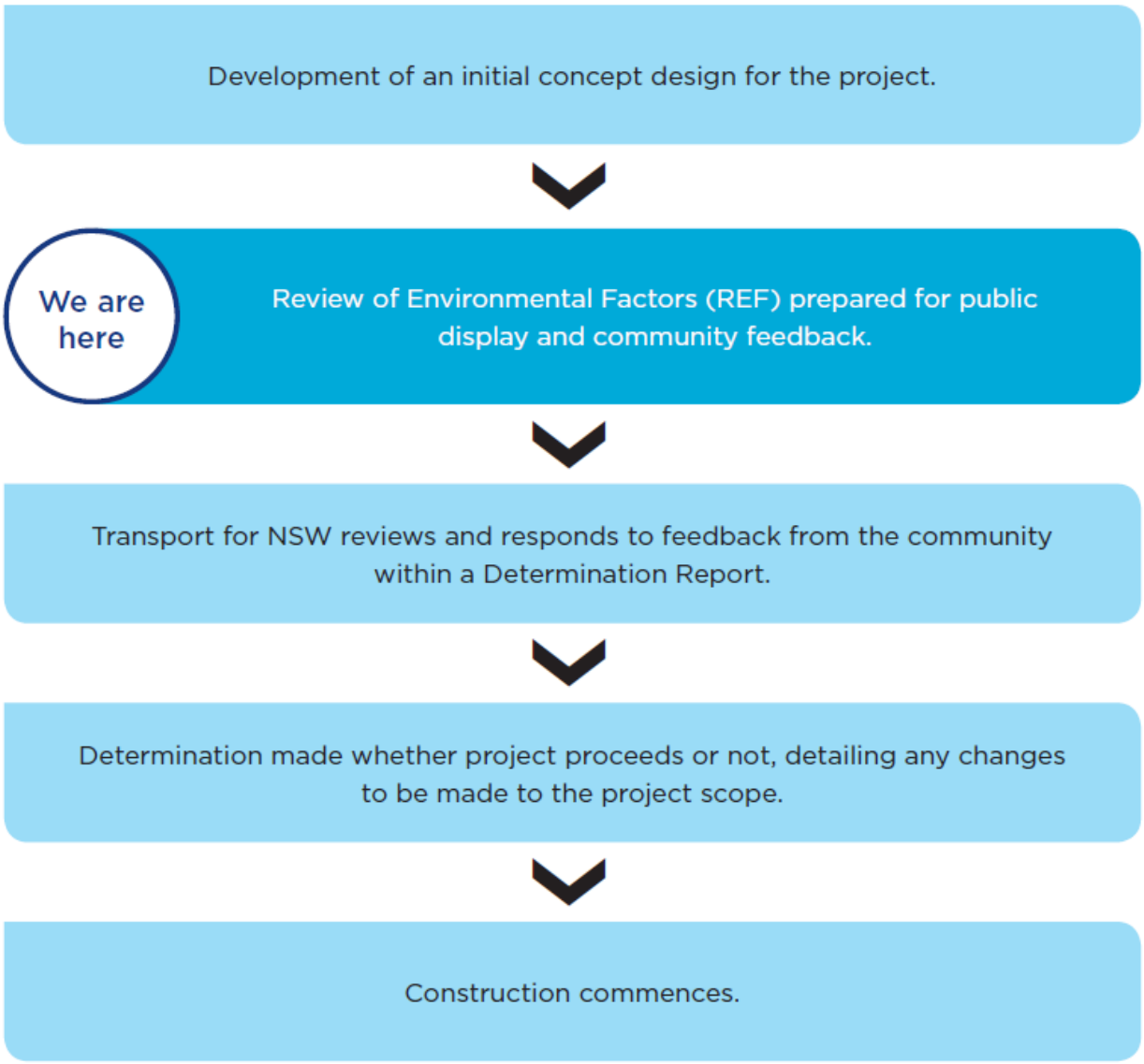



**Figure ES.2 Planning approval and consultation process for the Proposal**

## 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 Proposal would provide the following benefits:

- a station that is accessible to people with a disability, limited mobility, parents/carers with prams and customers with luggage
- upgraded buildings and facilities for all modes that meet the needs of a growing population
- improved interchange and access facilities along Kingsgrove Avenue and Bexley Road.

The following key impacts have been identified should the Proposal proceed:

- temporary impacts on local traffic flow associated with construction traffic and construction of the new station entrance from Bexley Road
- impacts to some existing parking spaces including temporary impacts to approximately 33 car parking spaces during construction, and the permanent reduction of commuter parking spaces by 11 following completion of the Proposal
- introduction of new elements to the visual environment, such as the station entry concourse, lift and associated weather canopies
- temporary noise and vibration impacts associated with construction activities
- temporary disruptions to station facilities and amenities during construction, and temporary changes to pedestrian movements, particularly during planned Sydney Trains track possessions
- removal of up to eight trees to accommodate the upgrades to the commuter car park
- potential sediment mobilisation, dust generation and erosion risk during construction.

The longer term benefits of the Proposal include improved accessibility to the station and improved station facilities. Further information regarding these impacts is provided in Chapter 6 of this REF.

## Conclusion

This REF has been prepared having regard to sections 5.5 and 5.7 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.

Should the Proposal proceed, any potential associated adverse impacts would be appropriately managed in accordance with the mitigation measures outlined in this REF, and the Conditions of Approval imposed in the Determination Report. This would ensure the Proposal is delivered to maximise benefit to the community and minimise any adverse impacts on the environment.

In considering the overall potential impacts and proposed mitigation measures outlined in this REF, the Proposal is unlikely to significantly affect the environment including critical habitat or threatened species, populations, ecological communities or their habitats.


**Figure ES.3 Photomontage of the Proposal (subject to detailed design)**

*(Indicative only, subject to detailed design)*

# 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 Bexley North Station Upgrade (the Proposal), to be delivered by the Infrastructure and Place Division.

## 1.1 Overview of the Proposal

### 1.1.1 The need for the Proposal

The NSW Government is committed to facilitating and encouraging use of public transport, such as trains, by upgrading stations to make them more accessible, and improving interchanges around stations with other modes of transport such as buses, bicycles and cars. The Transport Access Program is an initiative targeted at achieving compliance with the DSAPT Regulations across the network.

Bexley North Station has been identified for an accessibility upgrade as it currently does not meet key requirements of the DSAPT or the *Commonwealth Disability Discrimination Act 1992* (DDA). It also does not allow for equitable access to the station platforms. Bexley North Station comprises one island platform, with stairs from the Bexley Road overbridge providing the only means of access. The following accessibility issues have been identified at Bexley North Station and have been addressed in the design of the upgrade:

- access to Bexley North Station is currently via stairs only
- the existing accessible car parking space is not compliant with current DDA standards, and the existing car park layout is not compliant with Australian Standards
- the existing paths on Bexley Road facilitating access to the station are not compliant with current DDA standards
- existing platform cross falls are not DDA compliant in certain areas and there is a lack of tactile ground surface indicators (TGSIs)
- there is no family accessible toilet or ambulant toilet on the platform.

The Proposal is required to provide safe and equitable access to the station and to improve customer facilities and amenity. The improvements would in-turn assist in supporting the growth in public transport use and would provide an improved customer experience for existing and future users of the station.

### 1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- provision of new station entrance from the Bexley Road overbridge. The new station entrance would include:
    - demolition of the existing station access and the eastern platform canopy in order to accommodate the new lift and landing
    - construction of a new station entrance landing area
    - construction of a new lift between Bexley Road and the station platform
    - construction of new stairs between the proposed landing and the station platform
    - construction of a new platform level canopy which would wrap around the new stairway

- internal station building works including:
  - construction of a new family accessible toilet in the location of the existing male toilets
  - construction of a new unisex ambulant toilet at the location of the existing female toilets
  - other minor building modifications that may be required to accommodate new electrical equipment including a main switchboard, and new or upgraded station communications equipment
- upgrade of existing platform surfaces (re-grading/re-surfacing) at locations across platforms to provide compliant accessible paths and ramps to station amenities
- reconfiguration of the existing commuter car park on Kingsgrove Avenue including:
  - 22 parking spaces, including the provision of two compliant accessible parking spaces
  - an accessible ramp from the commuter car park to the Bexley Road overbridge
  - increased aisle width, space for vehicle turning and landscaping works
- upgrade of the existing footpaths to the north and south of the station entrance along the Bexley Road overbridge, including minor re-grading of footpaths and installation of landings
- ancillary works including adjustments to fencing, retaining walls, crash barriers, car park perimeter fence, lighting, electrical upgrades, relocation of rubbish bins, new and adjusted Opal card readers, improvements and modifications to station communications and security systems (including CCTV, public address system, hearing induction loops and station passenger information), wayfinding signage modifications and installation of TGSIs.

Subject to planning approval, construction is expected to commence from mid-2019 and take around 18 months to complete.

A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF).

## 1.2 Location of the Proposal

The Proposal would involve upgrade works to Bexley North Station, around 12 kilometres south west of Sydney's Central Business District (CBD). The regional context of the Proposal is shown in Figure 1.1.

The Proposal is in the suburb of Bexley North and the Bayside Local Government Area (LGA), to which the *Rockdale Local Environmental Plan 2011* (Rockdale LEP) applies. Bexley North Station is surrounded by a combination of urban land uses including various commercial buildings, mixed use development and low density housing to the south, and low density housing and public recreation to the north. The Bexley North Library is also located immediately south-west of the station.

The Proposal is generally bounded by Shaw Street to the south, Bexley Road to the east and Kingsgrove Avenue to the north. The majority of the Proposal is located within the station precinct and commuter car park, with some works also proposed along the Bexley Road footpath to the south of the existing station entrance.

Bexley North Station is serviced by the T8 Airport and South Line, with about 2,600 passenger trips (combined entry and exit) recorded at the station on an average weekday in December 2018.

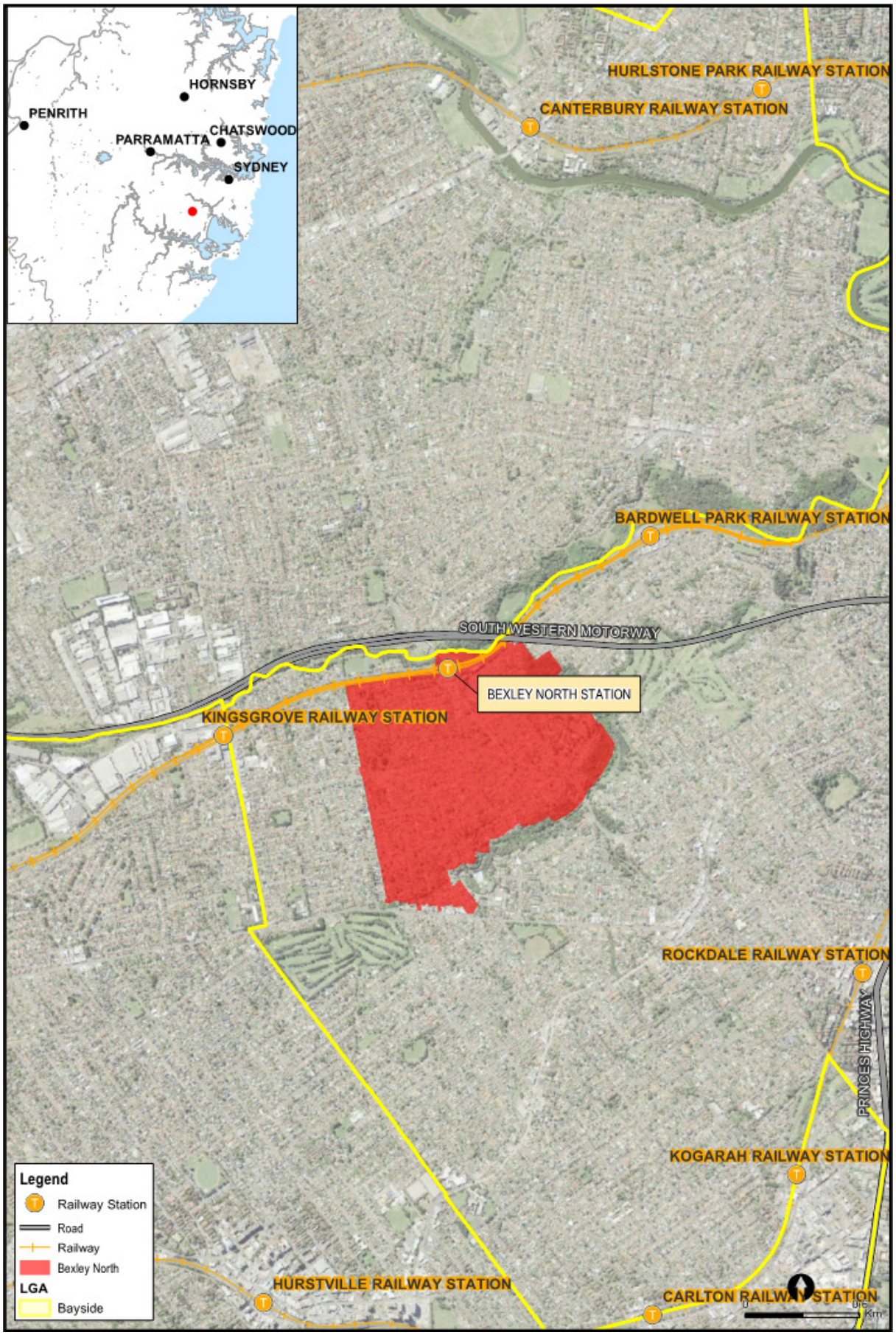



**Figure 1.1 Regional context**

## 1.3 Existing infrastructure and land uses

The Bexley North Station is comprised of one island platform (Platforms 1 and 2) with an existing station building. A site locality plan for Bexley North Station is shown in Figure 1.2.

The island platform includes a single-storey, heritage listed brick building divided into five bays containing a men's toilet, cleaners store, ladies' toilet, communications equipment room, and combined customer service room/station office. The island platform and building date from circa 1931 and are listed as being of local heritage significance (refer to section 6.5 for details).

### 1.3.1 Station access

Access to Bexley North Station is provided via a single set of stairs accessed from the Bexley Road overbridge. These stairs provide access between Bexley Road and the eastern end of the station platform.

### 1.3.2 Interchange facilities

Public transport and other interchange facilities surrounding the station include:

- existing bus stops located on the southern side of the station along Shaw Street, Bexley Road and Slade Road
- a commuter car park on Kingsgrove Avenue. The car park currently contains 33 parking spaces (including one accessible space) which are non-compliant with Standard and is accessed via a driveway off Kingsgrove Avenue. The car park provides access to the station via a footpath along Bexley Road. Around 36 additional un-restricted right-angle car parking spaces are located to the east of the car park on Kingsgrove Avenue, parallel to the rail corridor. Additionally, a substantial amount of on street, parallel parking is available along the length of Kingsgrove Avenue.

There are no current kiss-and-ride facilities or taxi ranks in the vicinity of the station.


**Figure 1.2 Site locality map**


**Figure 1.3** **Photo showing the current station entrance from the station platform, looking towards Bexley Road**

**Figure 1.4** **Photo showing the existing station building and station entrance looking north east from Shaw Lane**

**Figure 1.5 Photo looking north towards the existing car park from the station platform**


**Figure 1.6 Photo showing the existing entrance, looking north from Bexley Road**

**Figure 1.7** **Photo showing the existing commuter car park looking east from Kingsgrove Avenue**

## 1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the Bexley North Station Upgrade. For the purposes of these works, TfNSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (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 5.5 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of the Proposal. This REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (the EP&A Regulation).

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Biodiversity Conservation Act 2016* (BC 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 have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of Environment for any necessary approvals under the EPBC Act.

Refer to Chapter 4 for more information on statutory considerations.

# 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 and the specific objectives of the Proposal. This chapter also provides a summary of the options that have been considered during development of the Proposal and why the preferred option has been chosen.

## 2.1 Strategic justification

### 2.1.1 Overview

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 Bexley North Station Upgrade, the subject of this REF, forms part of the Transport Access Program. This program is an initiative targeted at achieving compliance with the DSAPT Regulations across the transport network.

In September 2015, the NSW Government announced a series of State Priorities as part of *NSW: Making It Happen* (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. *NSW: Making it Happen* focuses on 12 key 'priorities' to achieve the NSW Government's commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services.

One of the 12 priorities identified as part of *NSW: Making It Happen* relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority.

The Proposal assists in meeting the priority by improving accessibility to public transport infrastructure, thereby encouraging greater usage by the community.

TfNSW has also developed a *Future Transport Strategy 2056* (TfNSW, 2018a), an overarching strategy, supported by a suite of plans, for transport in NSW to the year 2056. Future Transport 2056 ensures that NSW is prepared for rapid changes in technology and innovation to create and maintain a world-class, safe, efficient and reliable transport system over the next 40 years.

The *Disability Inclusion Action Plan 2018-2022* (TfNSW, 2017c) was developed by TfNSW, in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Plan discusses the challenges, the achievements to date and the considerable undertaking that is required to finish the job, and offers 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.

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. Further details of the application of NSW Government policies and strategies are discussed in Section 4.5 of this REF.

### 2.1.2 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. The program aims to provide:

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

### 2.1.3 Objectives of the Proposal

The specific objectives of the Bexley North Station Upgrade are to:

- provide a station that is accessible to those with a disability, limited mobility, parents/carers with prams and customers with luggage
- improve customer experience, by providing better interchange and customer access facilities
- integrate the Proposal with the surrounding area
- improve customer safety
- improve wayfinding in and around the station precinct
- protect and enhance heritage features and trees of high amenity value
- maximise the amenity of the public domain
- improve pedestrian connectivity between the commuter car park, station, and the retail centre along Shaw Street/Bexley Road
- provide an efficient and functional solution which enhances and contributes to local amenity and prosperity.

## 2.2 Design development

The existing station layout does not meet the requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA Act) or the DSAPT. It also does not allow for equitable access to the station platform.

A Concept Design Report was finalised in 2018 (AECOM, 2018), consistent with the primary objectives of the Transport Access Program.

The development of the concept design involved identifying current deficiencies of Bexley North station and opportunities for improving accessibility and customer experience with respect to the DDA Act or DSAPT requirements (Table 2.1).

**Table 2.1 Current deficiencies of Bexley North station and opportunities identified in the concept design**

| Aspect | Key Deficiencies | Opportunities |
|---|---|---|
| Station access | • access to the station platform is limited to a staircase from the Bexley Road overbridge<br>• the existing grade of the Bexley Road footpath between Kingsgrove Avenue and the rail corridor is not compliant with AS1428<br>• the existing grade and length of the footpath along Bexley Road between Shaw Street and the rail corridor is not compliant with AS1428. | • provision of a new station entrance landing area with lift access and a new stairway from the Bexley Road overbridge to the platform<br>• minor re-grading of access footpaths within the station precinct<br>• incorporation of footpath landings along Bexley Road. |
| Station facilities and platform | • there is currently no family accessible toilet<br>• there is currently no ambulant toilet<br>• platform cross falls are steeper than 1:40 in some locations<br>• there are no tactiles on the platform. | • provision of a family accessible toilet<br>• provision of an ambulant toilet<br>• re-grade the platform to provide compliant cross falls for accessible paths between the station entry point and accessible facilities<br>• provision of tactiles to the platform surface where required. |
| Station car park | • there is no accessible path between the station access point and accessible parking bay<br>• only one accessible parking bay is provided out of 69 available parking spaces (car park and on-street parking) and it is non-compliant with grades, dimensions and layout required in AS 2890<br>• the commuter car park layout is non-compliant with AS 2890. | • provision of two new accessible parking spaces with a shared zone to replace the existing<br>• provision of an accessible path between the accessible parking spaces and the station access point<br>• reconfiguration of the car park layout to be compliant with AS 2890, including wider aisle width and space to facilitate vehicle turning |
| Security | • potential unsafe space below the access stairs (i.e. potential hiding area and low vertical clearances). | • provision of CCTV cameras<br>• provision of improved lighting<br>• opportunity to block off existing area under the stairs as part of new stair construction. |

In order to realise the potential opportunities for the site, a series of design options were identified (refer to section 2.3 below). The proposed options which have been developed would each provide compliant access to the station from the Bexley Road overbridge. The major portion of the works for each of the options would be the provision of a new station entrance landing area, providing access from the Bexley Road overbridge to the platform.

The concept design also considered the heritage value of Bexley North station and station precinct, as well as trees with high amenity value on Council land to the north of the commuter car park.

## 2.3 Alternative options considered

Options were developed for the following components discussed above to address accessibility requirements:

- Station entrance/access – three main concept options were considered regarding the proposed access location to the station for the proposed upgrade
- station car park – seven concept design options to reconfigure the car park layout and access ramp alignment.

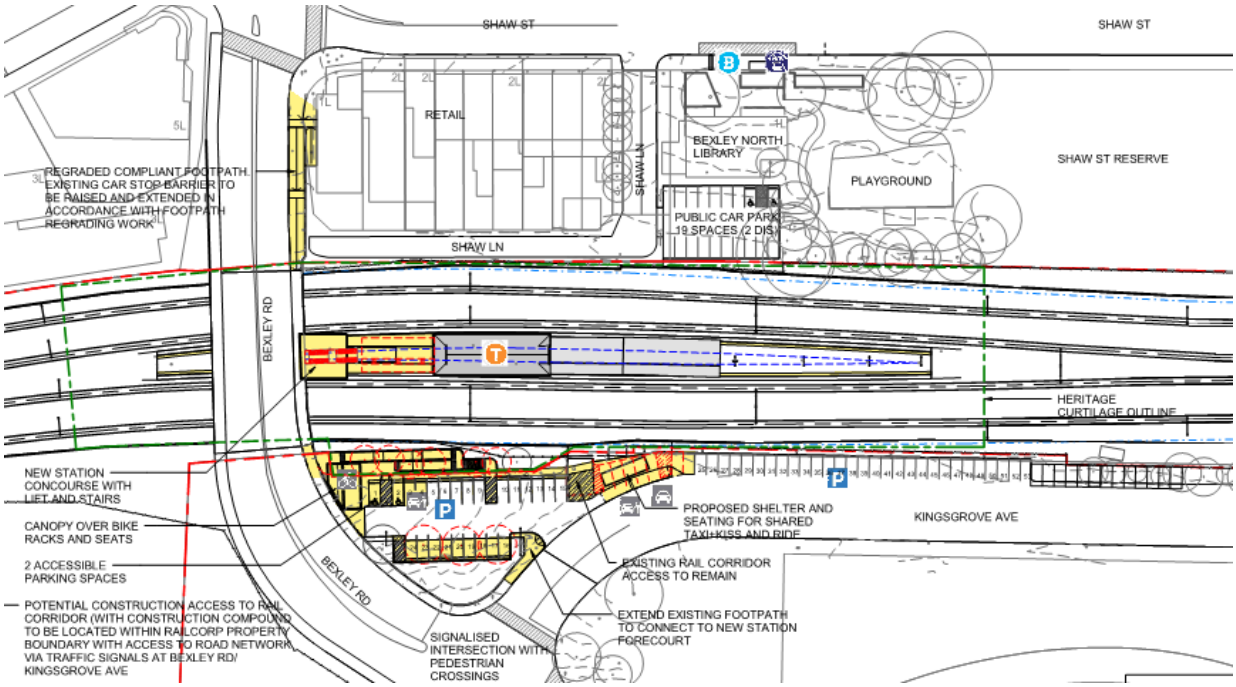
Consideration was also given to the provision for a canopy at the station concourse, lift waiting area and over the access stairs as part of the design of these works.

The key features of these options are outlined in the following sections (AECOM, 2018).

### 2.3.1 Station entrance access

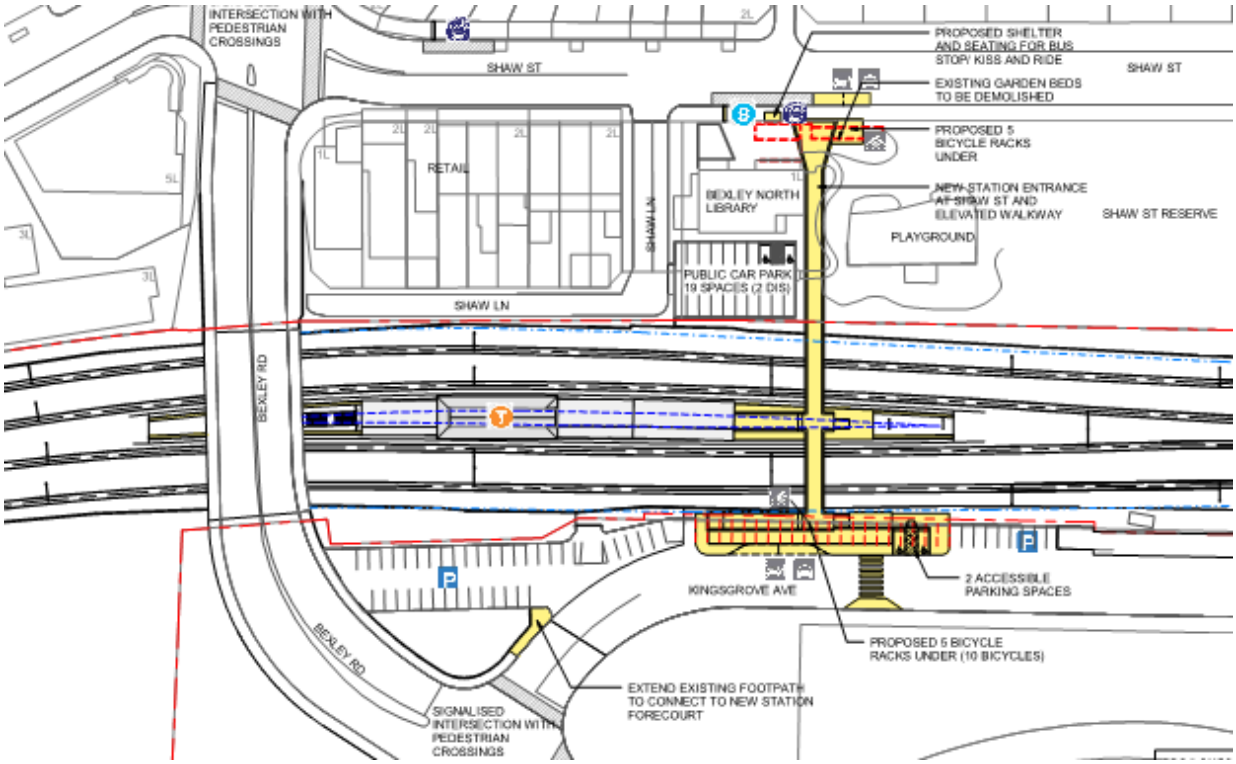
Three main concept design options were developed for the access location for the station. These options included:

- Option A, shown in Figure 2.1, involved the construction of a new station entrance from the Bexley Road Overbridge with the provision of new lift and stairs to the platform, ramp and stairs from the commuter car park and re-grading the southern footpath to improve accessibility.
- Option B shown in Figure 2.2, involves the provision of new station entrances at Kingsgrove Avenue and Shaw Street connected by a footbridge located between Bexley North Library and Shaw Street Reserve and provision of two lifts
- Option C shown in Figure 2.3, involved the provision of new station entrances at Kingsgrove Avenue and Shaw Street connected by a footbridge located between Bexley North Library and Shaw Lane and provision of three lifts.



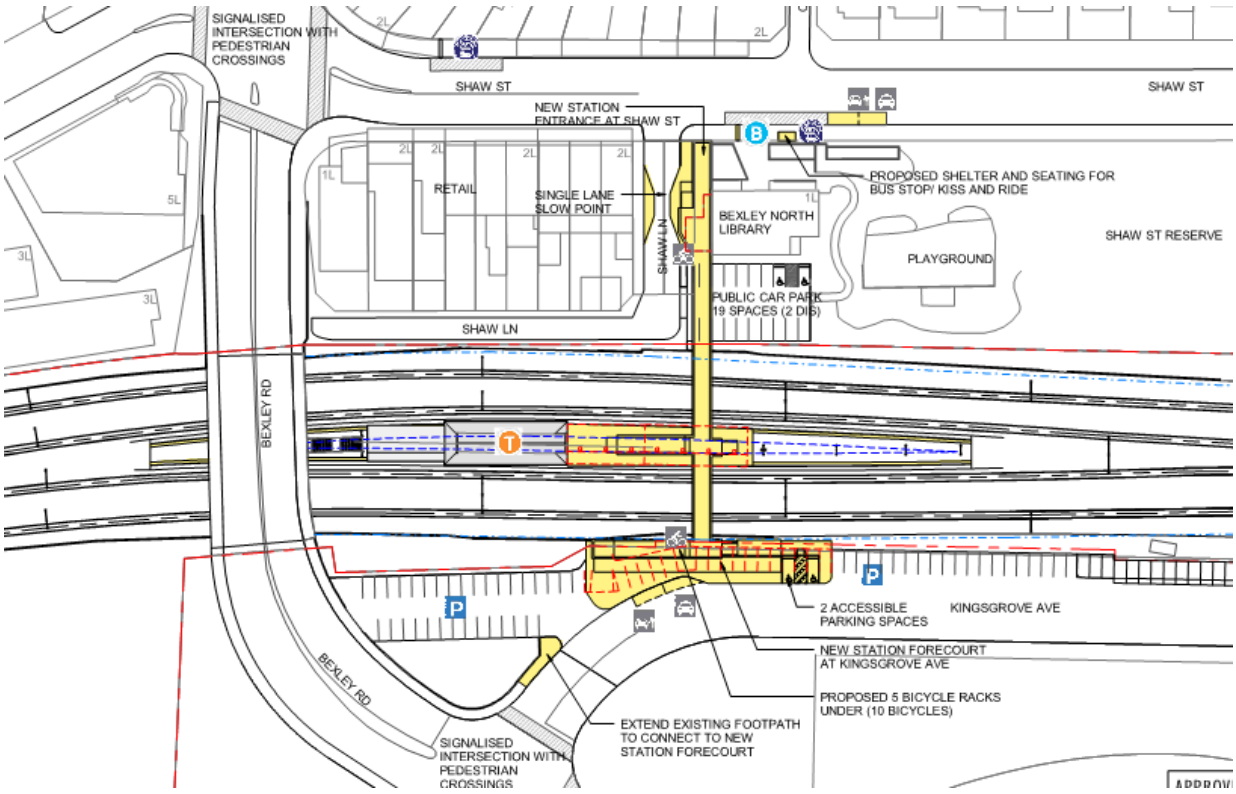

*Source: Aecom, 2015*

**Figure 2.1 Option A for station access**




*Source: Aecom, 2015*

**Figure 2.2 Option B for station access**




*Source: Aecom, 2015*

**Figure 2.3 Option C for station access**

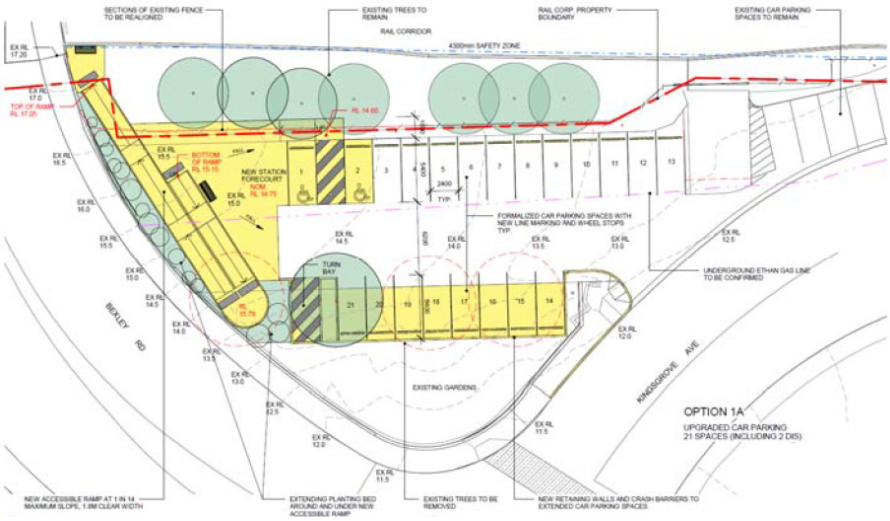
### 2.3.2 Assessment of identified options

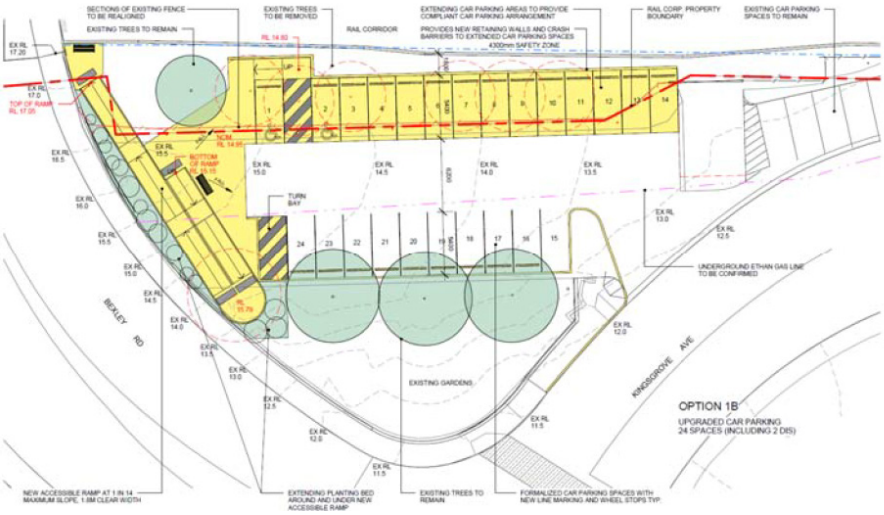
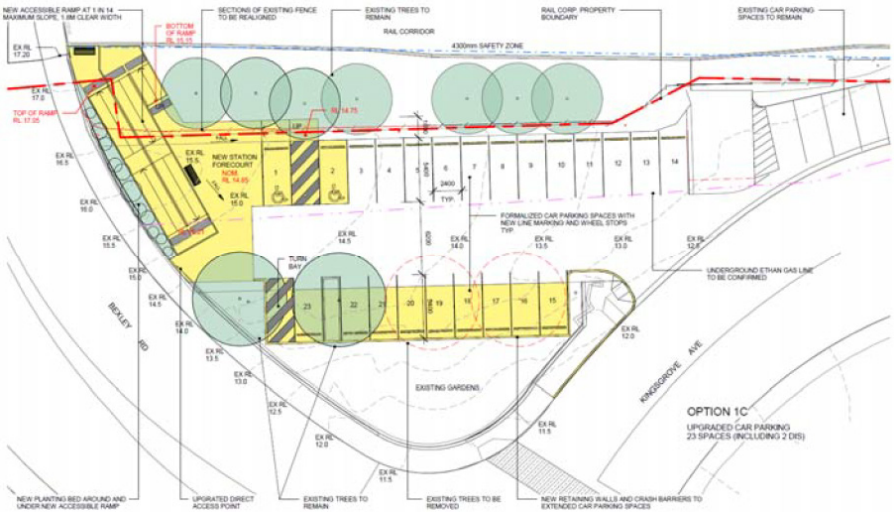
The design options for the station access were assessed in a multi criteria analysis that included consideration of factors such as customer experience, accessibility, safety, engineering constraints, modal integration and cost to select a preferred option.

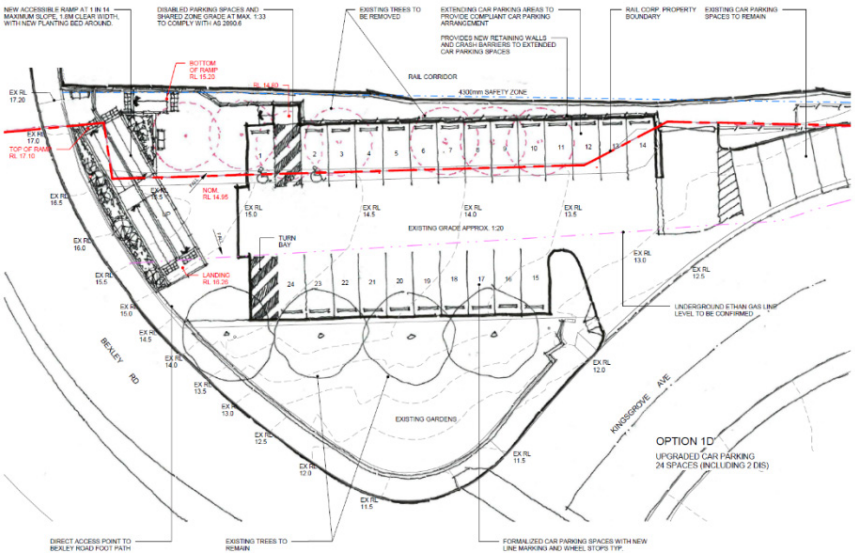
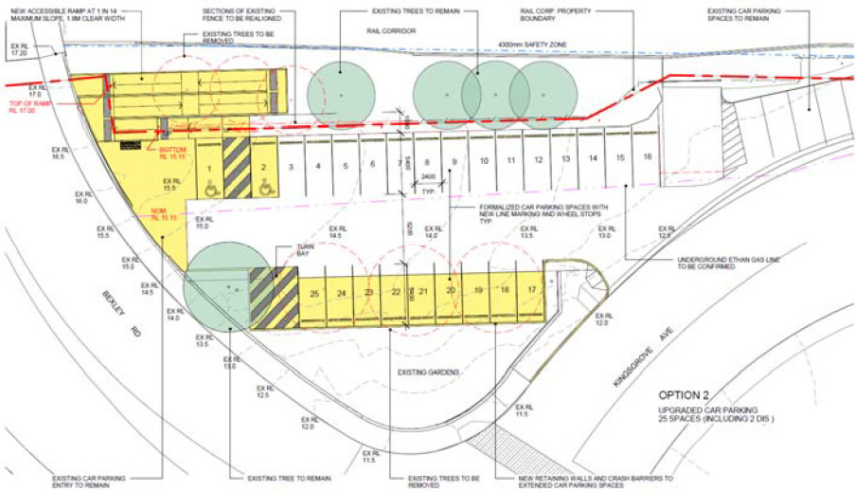
### 2.3.3 Station car park

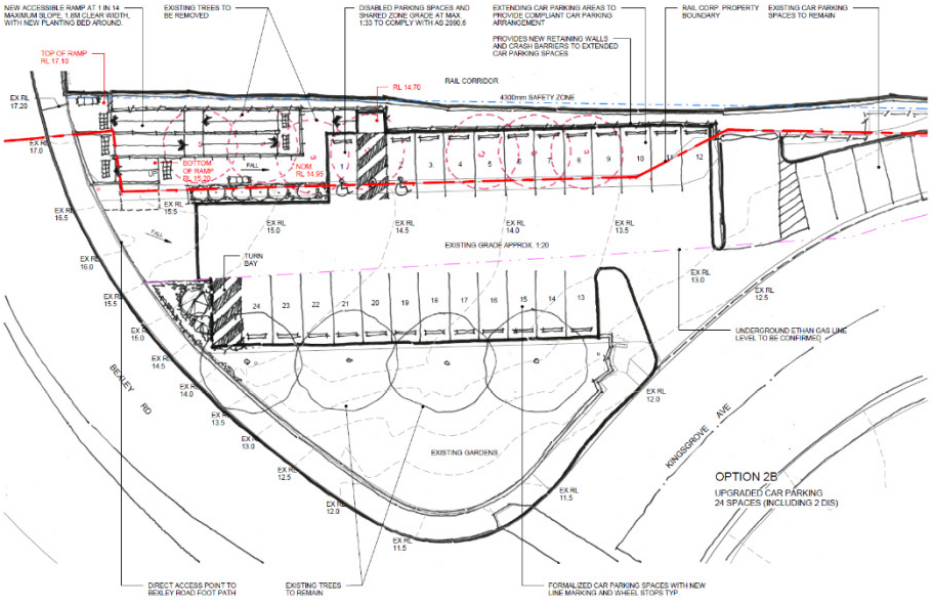
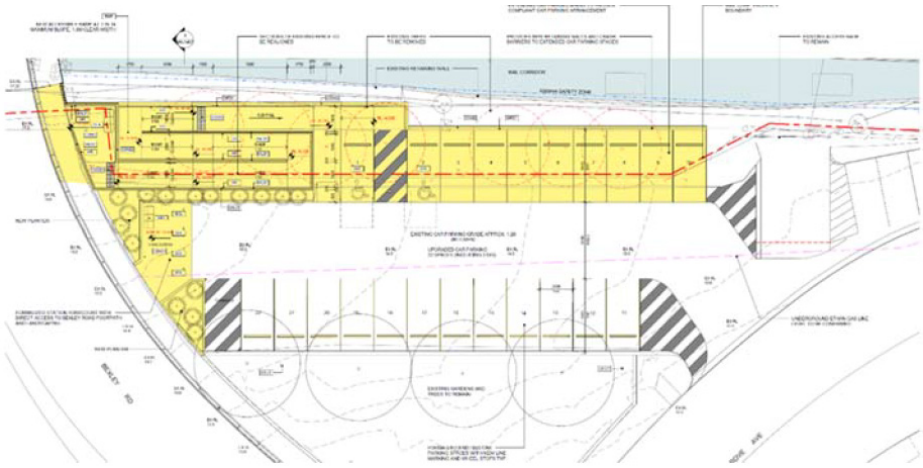
Seven car park concept design options were developed to reconfigure the car park layout and access ramp alignment. Each of the options are summarised in Table 2.2 below.

**Table 2.2 Station car park design options**

| Option | Key design feature |
|---|---|
| Option 1A – Ramp along Bexley Road and widened aisle towards Kingsgrove Avenue | • retention of existing southern kerb line of the car park as the fixed point and widening the car park north<br>• single switch-back ramp adjacent to Bexley Road, and opening onto a large paved forecourt area<br>• compliant car park with provision of 21 car parking spaces, including two accessible spaces plus a turning bay<br>• retention of existing trees inside the rail corridor, with removal of at least three council trees on the north side of the car park.<br>  |

| Option | Key design feature |
|---|---|
| Option 1B – Ramp along Bexley Road and widened aisle towards rail corridor | • retention of existing northern kerb line of the car park as the fixed point and widening the car park to the south into the rail corridor<br>• single switch-back ramp adjacent to Bexley Road, and opening onto a paved forecourt area. The proposed ramp would be located on top of an existing ethane gas pipeline<br>• compliant car park with provision of 24 car parking spaces, including two accessible spaces plus a turning bay<br>• retention of three existing trees on the north side of the car park, with removal of existing at least six trees inside the rail corridor on the southern side of the car park.<br>  |
| Option 1C – Compact ramp along Bexley Road and widened aisle towards Kingsgrove Avenue | • retention of existing southern kerb line of the car park as the fixed point and widening the car park north<br>• double switch-back ramp adjacent to Bexley Road, and opening onto a paved forecourt area. The proposed ramp would be located on top of an existing ethane gas pipeline.<br>• compliant car park with provision of 23 car parking spaces, including two accessible spaces plus a turning bay<br>• retention of existing trees inside the rail corridor, with removal of at least two council trees on the north side of the car park.<br>  |

| Option | Key design feature |
|---|---|
| Option 1D – Compact ramp along Bexley Road and widened aisle towards rail corridor | • retention of existing northern kerb line of the car park as the fixed point and widening the car park to the south into the rail corridor<br>• double switch-back ramp adjacent to Bexley Road, and opening onto a large paved forecourt area. The proposed ramp would be located on top of an existing ethane gas pipeline.<br>• direct access point from car park to station concourse<br>• compliant car park with provision of 24 car parking spaces, including two accessible spaces plus a turning bay<br>• retention of all existing trees on the north side of the car park, with removal of existing trees inside the rail corridor on the southern side of the car park.<br>  |
| Option 2A – Compact ramp along rail corridor and widened aisle towards Kingsgrove Avenue | • retention of existing southern kerb line of the car park as the fixed point and widening the car park north<br>• double switch-back ramp along rail corridor boundary, and opening onto a paved forecourt area on the car park side<br>• direct access point from car park to station concourse<br>• compliant car park with provision of 25 car parking spaces, including two accessible spaces plus a double turning bay<br>• retention of four existing trees inside the rail corridor, with removal of at least three council trees on the north side of the car park.<br>  |

| Option | Key design feature |
|---|---|
| Option 2B – Compact ramp along rail corridor and widened aisle towards rail corridor | • retention of existing northern kerb line of the car park as the fixed point and widening the car park to the south into the rail corridor<br>• double switch-back ramp along rail corridor boundary, and opening onto a paved forecourt area on the car park side<br>• direct access point from car park to station concourse<br>• compliant car park with provision of 24 car parking spaces, including two accessible spaces plus a turning bay<br>• retention of all existing trees on the north side of the car park, with removal of existing trees inside the rail corridor on the southern side of the car park.<br>  |
| Option 2C – Compact ramp along rail corridor (flipped) + widened aisle towards rail corridor | • retention of existing northern kerb line of the car park as the fixed point and widening the car park to the south into the rail corridor<br>• double switch-back ramp along rail corridor boundary, and exiting behind the ramp on the rail corridor side<br>• direct access point from car park to station concourse<br>• compliant car park with provision of 22 car parking spaces, including two accessible spaces plus a turning bay<br>• retention of all existing trees on the north side of the car park, with removal of existing trees inside the rail corridor on the southern side of the car park.<br>  |

### 2.3.4 The ‘do-nothing’ option

Under a ‘do-nothing’ option, the existing station access and car park would remain the same and there would be no changes to the way the station and interchange currently operates.

The NSW Government has identified the need for improving the accessibility of transport interchanges, train stations and commuter car parks across NSW as a priority under the Transport Access Program. The ‘do nothing’ option was therefore not considered a feasible alternative as it would be inconsistent with NSW Government objectives, would not help encourage the use of public transport and would not meet the needs of the Bexley North and surrounding community.

## 2.4 Justification for the preferred option

Following stakeholder consultation with Sydney Trains and an assessment of the advantages and disadvantages of each of the station access options identified, it was determined that the concept design would adopt the following design options for each of the elements assessed:

### 2.4.1 Station access

Option A was considered to be the preferred option based on the assessment undertaken. Option A was identified to have a range of benefits over the other options considered. These include:

- minimising new infrastructure (footbridge and lifts) while achieving accessibility objectives and requirements for the station and interchange
- providing a more cost-effective option to construct, operate and maintain
- providing a good customer outcome / experience by maintaining same station access points and wayfinding
- achieving optimal urban design outcomes and visually more appealing than the other options
- minimising impacts and resulting in the least intrusive to the surrounding environment and community facilities including the library and Shaw Street.

### 2.4.2 Preferred car park design

The car park option 2C was determined to be the preferred option as it would:

- achieve DSAPT compliance
- not encroach on the easement for the existing ethane gas main, which a number of the other options would do
- provide a ramp arrangement which reflects a more compact design than some of the other options considered
- retain the existing council trees and garden bed
- achieve the required design modifications to the station without significant negative impact
- provide improved access from the commuter car park on Kingsgrove Avenue.

# 3 Description of the Proposal

Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities. The description of the Proposal is based on the concept design and is subject to further refinement during detailed design.

## 3.1 The Proposal

As described in section 1.1, the Proposal involves an upgrade of Bexley North Station as part of the Transport Access Program which would improve accessibility and amenity for customers.

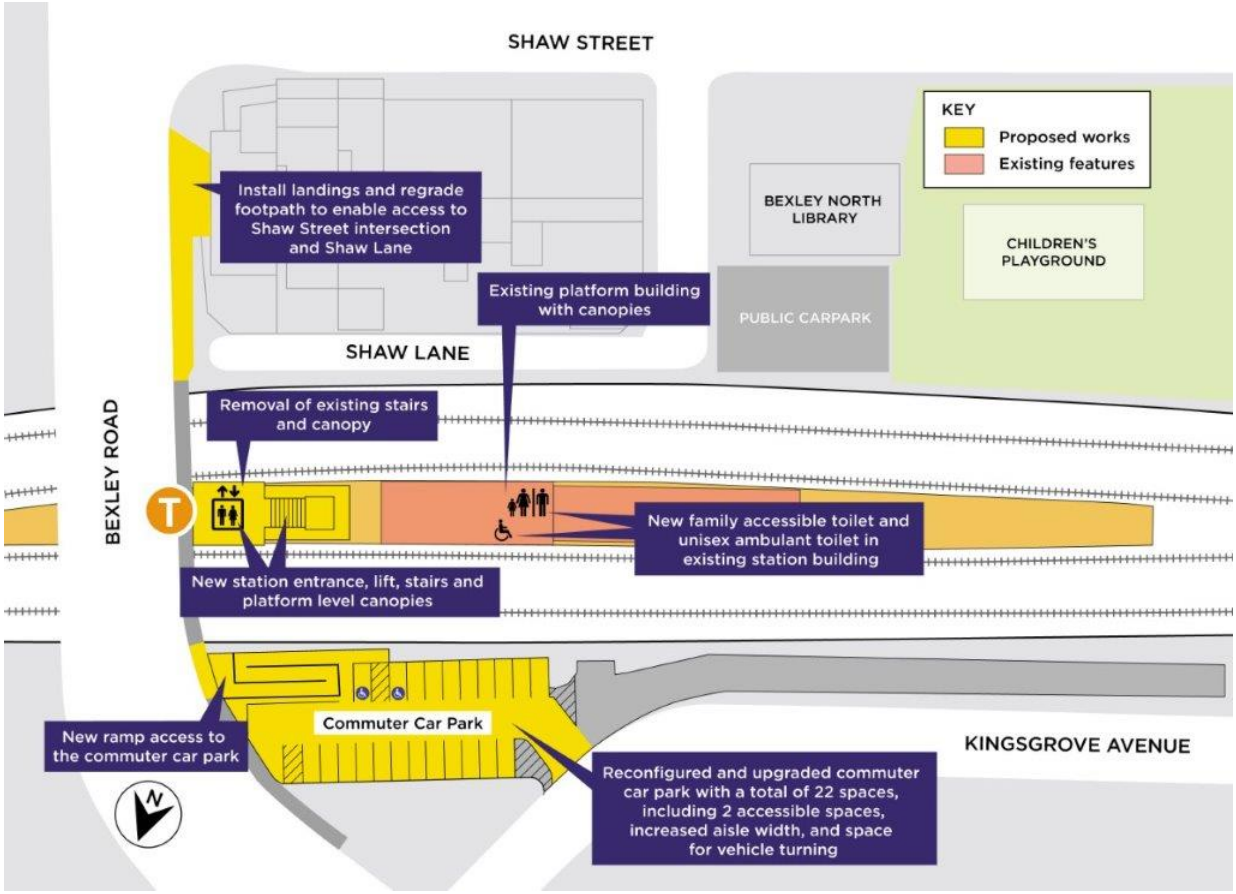
The Proposal would include the following key elements:

- provision of a new station entrance from the Bexley Road overbridge. The new station entrance would include:
  - demolition of the existing station access and the eastern platform canopy in order to accommodate the new stairs, lift and landing
  - construction of a new station entrance landing area
  - construction of a new lift between Bexley Road and the station platform
  - construction of new stairs between the proposed landing and the station platform
  - construction of a new platform level canopy which would wrap around the new stairway
- internal station building works including:
  - construction of a new family accessible toilet in the location of the existing male toilets.
  - construction of a new unisex ambulant toilet at the location of the existing female toilets.
  - other minor building modifications that may be required to accommodate new electrical equipment including a main switchboard, and new or upgraded station communications equipment
- upgrade of existing platform surfaces (re-grading/re-surfacing) at locations across platforms to provide compliant accessible paths and ramps to station amenities
- reconfiguration of the existing commuter car park on Kingsgrove Avenue including:
  - 22 parking spaces, including the provision of two compliant accessible parking spaces and an accessible path of travel from the car park. This would result in an overall reduction of 11 spaces from the current availability of 33 spaces within the car park
  - an accessible ramp from the commuter car park to the Bexley Road overbridge
  - increased aisle width, space for vehicle turning and landscaping works
- upgrade of the existing footpaths to the north and south of the station entrance along the Bexley Road overbridge, including minor re-grading of footpaths and installation of landings

- ancillary works including adjustments to fencing, retaining walls, crash barriers, car park perimeter fence, lighting, electrical upgrades, relocation of rubbish bins, new and adjusted Opal card readers, improvements and modifications to station communications and security systems (including CCTV, public address system, hearing induction loops and station passenger information), wayfinding signage modifications and installation of TGSIs.

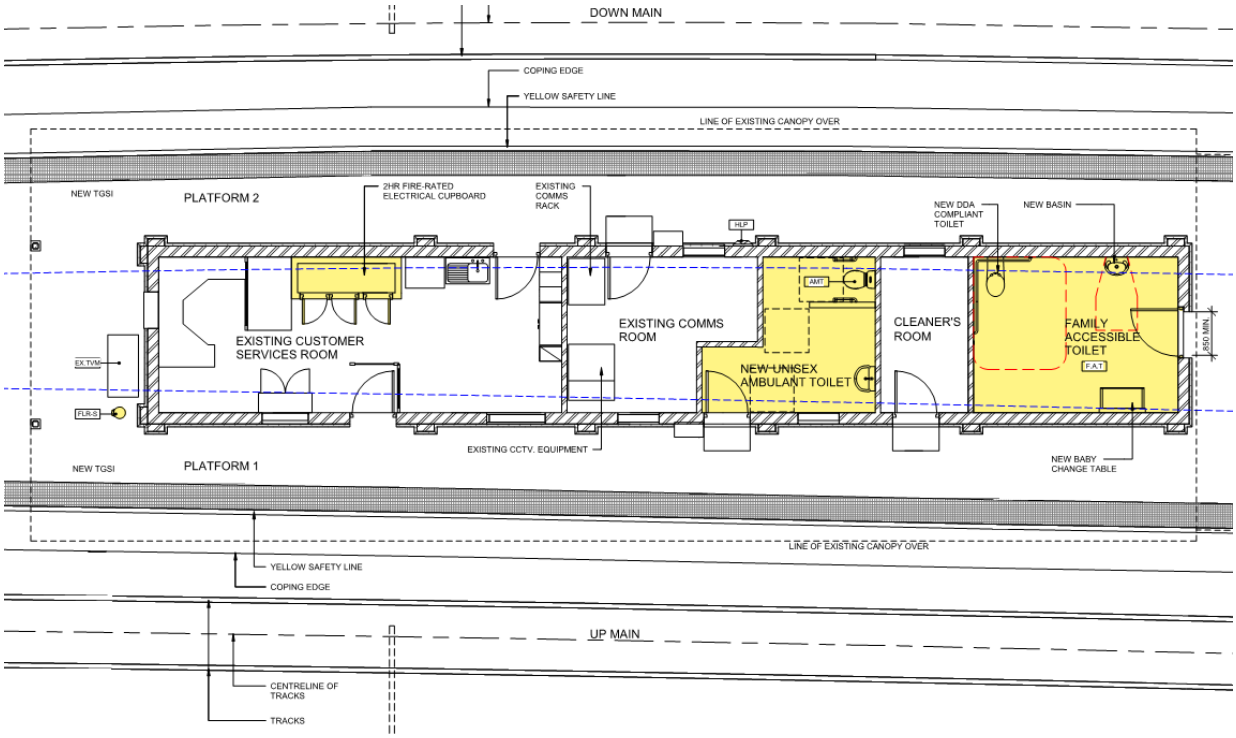
Figure 3.1 shows the general layout of key elements for the Proposal. Figure 3.2 provides an overview of the proposed station building's works. An artist impression is also provided in Figure 3.3.

Further detail regarding each of the key components of the Proposal is provided in section 3.1.1.




*(Indicative only, subject to detailed design)*

**Figure 3.1 Key features of the Proposal**




*(Indicative only, subject to detailed design)*

**Figure 3.2 Plan showing proposed internal station building works**


*(Indicative only, subject to detailed design)*

**Figure 3.3 Photomontage – view to the new station entrance from the south at Bexley Road overbridge**

### 3.1.1 Scope of works

#### New station entrance

Details of the proposed works to take place to improve accessibility and customer experience are provided below:

- upgrade works to the existing footpaths between Shaw Street and the station entrance on the Bexley Road overbridge, including provision of landings for DDA compliant accessible paths and ramps connecting to the station entrance
- demolition of the existing station access stairs and the eastern platform canopy in order to accommodate the new stairs and lift access
- construction of a new lift between Bexley Road and the station platform, including new lift and station entrance landing with canopy and protection screens
- construction of new station access stairs between the proposed new landing area and the station platform
- construction of a replacement platform level canopy which would wrap around the base of the new stairs.

In order to maintain existing pedestrian access to the station during construction of the new station entry, a temporary elevated walkway and stairs would be constructed to continue to provide access to the station platform. The design and staging of the temporary access would be determined during detailed design phase of the Proposal.

#### Station building works

The following internal station building works would be undertaken:

- construction of a new family accessible toilet in the location of the existing male toilets. This would include the demolition of existing internal partitions and fittings, installation of new fittings, fixtures, finishes, services connections, and widening of the existing brick opening to allow for a new compliant door
- construction of a new unisex ambulant toilet generally in the location of the existing female toilets. This would include the demolition of existing internal partitions and fittings and installation of new fittings, fixtures, finishes, and services connections
- other minor building modifications that may be required to accommodate new electrical equipment including a main switchboard with fire-rated enclosure, new or upgraded station communications equipment and provision of an upgraded air conditioning system to serve both the Communications Room and Station Office.

#### Upgrade of the existing commuter car park

The following upgrade works would be undertaken to the existing commuter car park and footpaths on Kingsgrove Avenue:

- provision of an accessible path of travel linking the car park and the station entrance, including a new pedestrian ramp between the commuter car park and the Bexley Road overbridge
- modification of the existing car park layout to provide 22 parking spaces, including two accessible spaces and a space to facilitate vehicle turning
- protection of the ethane gas pipeline passing through the Kingsgrove Ave commuter car park

- relocation of existing light poles within the carpark
- tree removal adjacent to the existing rail corridor boundary fencing, construction of a new retaining wall, earthworks/civil works, and pavement / resurfacing, new vehicle crash barriers and line marking to widen the carpark and to provide a compliant car park aisle width
- installation of new signage including accessible parking signage
- provision of rest seating and landscaping works.

### Ancillary works

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

- re-grading and re-surfacing of the station platforms to provide compliant paths of travel between the lift, boarding assistance zones, family accessible toilet and other facilities on the platforms
- re-surfacing of other areas of the platforms where impacted by construction activities, including services trenching work
- new stormwater drainage connections from new canopies to the existing stormwater system
- services and utilities protection, adjustments and/or relocations to accommodate the new works
- upgrade to the station power supply to cater for the new lift, including modification to the existing station 11kV padmount transformer (located on the eastern side of the Bexley Road overbridge), provision for a new submain cable and containment including an underline crossing (off the eastern end of the platform) connecting the padmount transformer to the new main switchboard in the station building
- lighting upgrades required for the new work
- improvement to station security and communication systems, including CCTV modifications, public address system upgrades, modification to station passenger information systems, new hearing induction loops within the station platforms, and new and adjusted Opal card readers
- relocation of station furniture and rubbish bins
- new/upgraded wayfinding signage and other station signage
- new TGSIs (where required, including along the length of both platform edges)
- adjustments to rail corridor boundary fencing
- temporary site compound areas for site office, crib sheds, amenities, storage of materials, plant and equipment
- provision of temporary construction and laydown areas (refer to section 3.2 for additional details).

### Materials and finishes

Materials and finishes for the Proposal would be selected based on the criteria of durability, low maintenance and cost effectiveness, to accord with heritage requirements, to minimise visual impacts, and to be aesthetically pleasing.

Availability and constructability are also important criteria to ensure that materials are readily available and the structure can be built with ease and efficiency. Materials would also be selected for their application based on their suitability for meeting design requirements.

Each of the upgraded or new station facilities for the Bexley North Station would be constructed from a range of different materials, with a different palette for each architectural element.

Subject to detailed design, the Proposal would include the following indicative key materials:

- lift shafts – concrete or brick with steel roof sheeting, aluminium louvres and woven mesh anti-throw screens and steel safety screen around the upper lift landing
- platform stairs – steel structure, concrete treads, with stainless steel/metal handrails, steel anti-climb screens and brick cladding or woven mesh on the underside stair wall
- platform and concourse canopy – steel structure with steel roof sheeting, flashings and capping
- crash barriers – concrete base with galvanised steel or powder coated anti-climb screens
- pedestrian pathways and ramps – stainless steel handrails and finished surface to match adjacent/existing surface (typically concrete/asphalt)

The design would be submitted to TfNSW's Urban Design and Sustainability teams for endorsements at various stages for comment before being accepted by TfNSW. An Urban Design Plan (UDP) and/or Public Domain Plan (PDP) would also be prepared by the Contractor, prior to finalisation of detailed design for endorsement by TfNSW.

### 3.1.2 Engineering constraints

There are a number of constraints which have influenced the design development of the Proposal. These include:

**Existing structures:** the placement and integrity of existing structures needed to be considered during the development of the design – these structures included the platforms, station buildings, overbridge, stairs, ramps and the corridor retaining structures.

**ASA / Sydney Trains requirements:** modifications for existing structures and new structures within the rail corridor must be designed and constructed with consideration of train impact loads, structure clearances to the track, and safe working provisions.

**Utilities:** Detailed Services Searches (DSS) and a Dial Before You Dig (DBYD) search has identified a number of utilities in the vicinity of the proposed works including:

- ethane gas pipeline passing through the Kingsgrove Ave commuter carpark
- underground and aerial high voltage cables and feeders, primarily located on the northern side of the rail corridor (in the vicinity of the new ramp and carpark retaining wall)
- services in the platforms including electrical and communications
- stormwater services
- water and sewer services

- rail systems including signalling infrastructure and cabling, communications optic fibre, and overhead wiring.

**Heritage**: Bexley North Station is listed on the RailCorp Section 170 Heritage and Conservation Register. The station has local historical, aesthetic, social, research and technical, rarity and representative significance. It is an intact example of an austere 1930s railway building.

The research and technical significance is related to the ability of the fabric of the Station Building to provide insights into experimental designs and modified construction techniques as a result of the economic conditions associated with the Great Depression (refer to section 6.5 for further details).

### 3.1.3 Design standards

The Proposal would be designed having regard to the following:

- Disability Standards for Accessible Public Transport 2002 (issued under the Commonwealth Disability Discrimination Act 1992)
- Building Code of Australia
- relevant Australian Standards
- Asset Standards Authority standards
- Sydney Trains standards
- Infrastructure Sustainability Rating Scheme - Version 1.2 (ISCA, 2018)
- Guidelines for the Development of Public Transport Interchange Facilities (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design (CPTED) principles
- other TfNSW policies and guidelines
- council standards, codes and guidelines (where relevant).

### 3.1.4 Sustainability in design

The proposal is also targeting a rating of 'Excellent' using the Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability (IS) Rating Scheme (v1.2). The rating scheme provides an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects. The sustainability outcomes address environmental, social, economic and governance aspects.

The IS Rating Scheme is grouped into six key themes:

- management and governance
- using resources
- emissions, pollution and waste
- ecology
- people and place
- innovation.

These sustainability themes are divided into 15 performance categories, against which the Proposal would be independently assessed and assigned a rating level. The Proposal would need to achieve at least 50 points to be certified as 'Excellent'.

## 3.2 Construction activities

### 3.2.1 Work methodology

Subject to approval, construction is expected to commence from mid-2019 and take around 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with TfNSW.

The proposed construction staging activities for the Proposal are identified in Table 3.1. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

**Table 3.1 Indicative construction staging for key activities (subject to detailed design)**

| Stage | Activities | Timing |
|---|---|---|
| Site establishment and enabling works | • site investigations and survey<br>• establishment of site compounds (i.e. erect fencing, tree protection zones, site offices, amenities and plant/material storage areas)<br>• establishment of temporary facilities as required (e.g. temporary access walkway and stairs, temporary toilets, construction lights etc.)<br>• erect temporary hoarding around the different work fronts at station<br>• relocation of minor services<br>• installation of power where required<br>• traffic control measures<br>• retaining wall works<br>• removal of eight trees (six Swamp Oak, one River Oak and one Black She-oak) inside the rail corridor<br>• power supply upgrades including modification to the existing station 11kV padmount transformer, construction of a new containment and submain cable including an underline crossing, and connection to the new main switchboard in the station building. | Standard hours and rail shutdown periods. |
| Lift, stairs and landing works | • excavate stair foundations and construct bottom flight of new stairs; demolish existing platform canopy<br>• demolish existing stairs<br>• construct temporary, footpath/walkway and stair access from Bexley Road<br>• excavate lift foundations<br>• piling, waterproofing (as required), installation of reinforcement, formwork and concrete to form the lift pit<br>• construction of lift shaft structure, new landing and upper section of new stair case<br>• lift installation and commissioning<br>• architectural fit-out around lift shaft including new canopy and anti-throw screens. | Standard hours and rail shutdown periods. |

| Stage | Activities | Timing |
|---|---|---|
| Platform | • installation of new stormwater from new lift canopy to existing stormwater<br>• platform regrading and asphalt resurfacing<br>• ancillary works including adjustment to lighting, electrical upgrades, Opal card readers, relocation of rubbish bins, improvement to station communications systems (including CCTV cameras), public address, hearing loops, wayfinding signage and installation of tactiles. | Standard hours and rail shutdown periods. |
| Kingsgrove Avenue car park | • removal of existing trees adjacent to rail corridor<br>• relocation of services (as required)<br>• demolition/excavation of existing car park surface<br>• construction of new ramp/footpath between car park and Bexley Road footpath<br>• re-asphalting of existing car park and line marking of parking spaces<br>• installation of ancillary features and landscaping within car park area. | Standard hours and possible weekend hours |
| Bexley Road footpath | • demolition/excavation of existing non-compliant footpath<br>• construction and regrading of footpath area to tie into existing. | Standard hours and possible weekend hours |
| Station building works | • reconfiguration of existing male and female toilets to provide a family accessible toilet and unisex ambulant toilet<br>• installation of a new fire-rated electrical cupboard within the current customer services room. | Standard hours and possible weekend hours |
| Demobilisation | • installation of ancillary features and landscaping<br>• removal of hoardings<br>• clearing of site. | Standard hours and possible weekend hours |

### 3.2.2 Plant and equipment

The plant and equipment likely to be used during construction includes:

- standard carpentry tools
- trucks
- jack hammer
- chainsaw
- drilling and piling rigs
- mobile cranes
- bobcat
- excavator
- dump trucks (hi-rail, rubber tyred)
- demolition/road saw
- concrete boom/line pump
- concrete mixer truck
- concrete vibrator
- mixer for screeding works
- lighting tower
- coring machine
- water cart
- suction trucks
- forklift, pallet jacks and flatbed trucks
- hi-rail plant
- asphalt paving machine
- vibrating roller/compaction plate
- road rail excavator
- hand tools
- skip trucks
- hammer drills
- torque wrenches
- impact wrenches
- grinders and bar
- benders
- elevated work platform (EWP).

### 3.2.3 Working hours

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

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

Certain works may need to occur outside standard hours and would include night works and works during pre-arranged rail possessions. These are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed and trains are not operating.

Out of hours works would be required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. It is estimated that approximately five rail possessions would be required to facilitate the following:

- demolition and removal of the existing canopy, excavation of stair foundations and installation of hoarding
- installation of full-height hoarding, demolition of existing stairs, provision of temporary access system and excavation/drilling of lift foundations
- installation of lift and structural elements of the canopies
- installation of cladding, roofing and finalisation of canopy roofing
- platform re-grading.

Out of hours works may also be scheduled outside rail possession periods. Approval from TfNSW would be required for any out of hours work and the affected community would be notified as outlined in the TfNSW Construction Noise and Vibration Strategy (TfNSW, 2018b) (refer to section 6.3 for further details).

### 3.2.4 Earthworks

Excavations and earthworks would generally be required for the following:

- the construction of the lift shaft would require an open cut excavation within the station platform
- Kingsgrove Avenue commuter car park works and ramp construction/foundation preparation
- the construction of upgraded footpath areas would require some minor excavation and regrading
- regrading/re-asphalting of platforms
- other minor civil works including footings and foundations for structures, drainage/stormwater works, and trenching activities for service adjustments and relocations.

Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements. It is estimated that around 250 cubic metres of earthworks would be required to accommodate the lift shaft, ramp construction and other ancillary works.

### 3.2.5 Source and quantity of materials

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

The Proposal would also consider life cycle impacts. The life cycle impacts of a material is calculated by looking at the environmental impacts of materials from the point of extraction, through to transportation, use, operation and end of life. This would be verified through the IS v1.2 rating.

### 3.2.6 Traffic, vehicle movements and access

Traffic and transport impacts associated with the Proposal are assessed in section 6.1 of this REF. The potential traffic and access impacts expected during the construction of the Proposal include:

- potential temporary traffic impacts along Bexley Road including temporary lane closure during certain construction activities such as lift and stair installation
- potential higher level of platform congestion arising from restricted access to some areas
- temporary minor increase in walking distance for rail customers during footpath works
- temporary changes in parking arrangements (temporary loss of access to around 33 parking spaces) to allow for reconfiguration of the commuter car park layout and compound area during construction
- higher road safety risk levels associated with construction vehicle and pedestrian interactions

- minor disruptions to pedestrian/cyclist movements in and around the station
- a minor increase in traffic on the local road network.

### 3.2.7 Ancillary facilities

Temporary construction compounds would be required to accommodate construction activities associated with the Proposal including a site office, amenities, laydown and storage area for materials, construction plant and equipment. Two areas have been identified for proposed construction compounds as shown in Figure 3.4. These are:

- the existing commuter car park located along Kingsgrove Avenue
- an area of existing grassed rail corridor land to the east of the Bexley Road overbridge, accessed from Bexley Road, opposite the intersection with Kingsgrove Avenue.

Impacts associated with utilising these areas have been considered as part of this environmental impact assessment.

### 3.2.8 Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services may require relocation, including existing electrical, water and sewer services where they are located within the vicinity of proposed works for the upgrades to the existing toilet facilities. Additional utility adjustments are also anticipated to be required to accommodate new infrastructure (such as the proposed access ramp to the commuter car park and the new lift and stairs).

In addition, the provision of new electrical connections between the existing pad-mounted substation (located within the rail corridor to the east of the station) and the station building would be required.

Such relocation is unlikely to occur outside of the footprint of the works assessed in this REF. In the event that works would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

Relocation or other works that may affect services would be undertaken in consultation with the respective utility authorities.

## 3.3 Property acquisition

TfNSW does not propose to acquire any property as part of the Proposal.

## 3.4 Operation management and maintenance

Ongoing operation of the existing station assets would remain unchanged with Sydney Trains operating and maintaining the station. Structures constructed under this Proposal would also be maintained by Sydney Trains, including the new retaining structures and the proposed car park access ramp.

The upgraded Kingsgrove Ave commuter car park area would be operated and maintained by Bayside Council. The existing garden/landscape area the north of the existing car park, and additional landscaping within the car park area would also be maintained by Bayside Council.

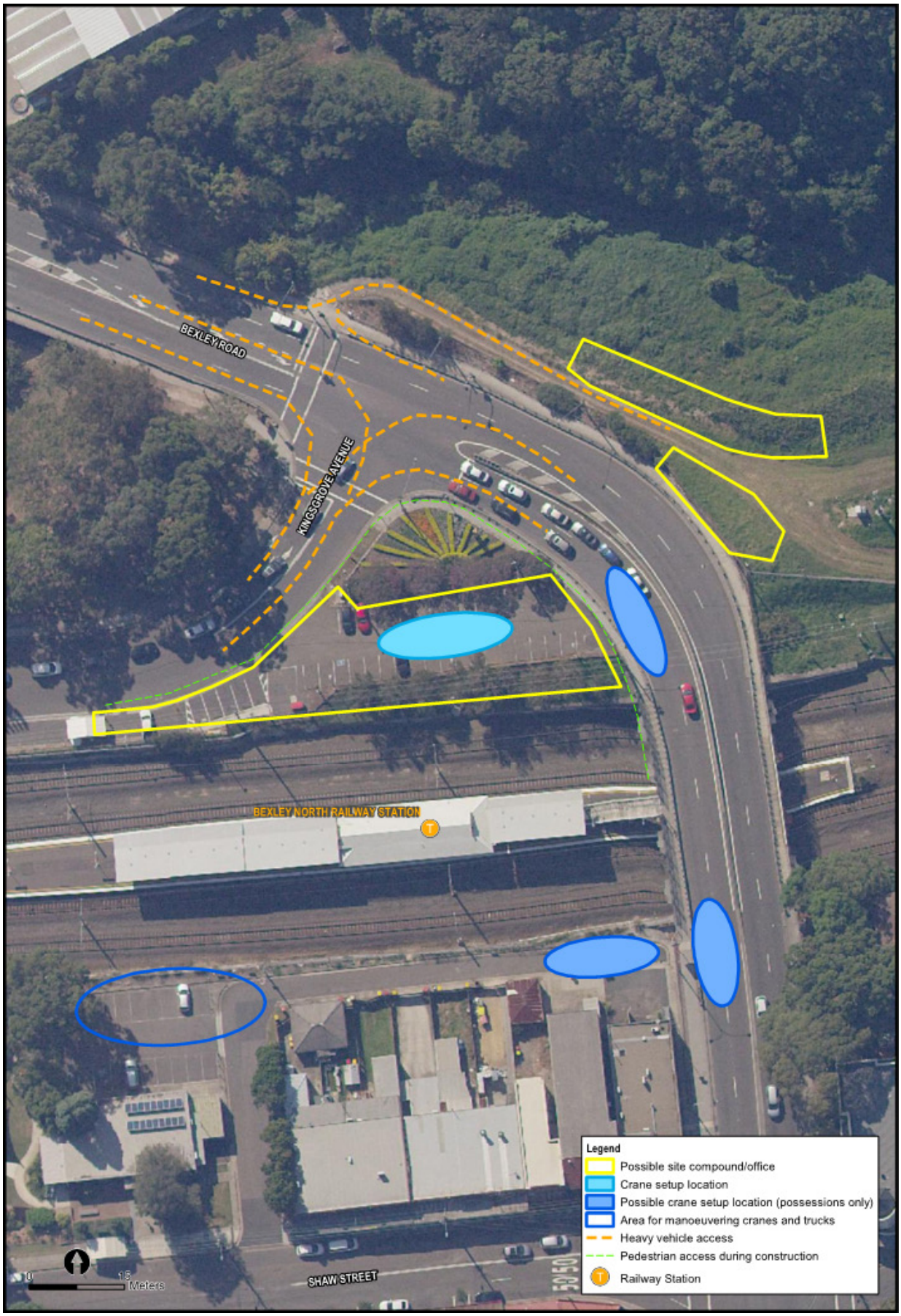



**Figure 3.4 Proposed construction arrangements**

# 4 Statutory considerations

## 4.1 Environment Protection and Biodiversity Conservation Act 1999

The (Commonwealth) EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places – defined in the EPBC Act as 'matters of National Environmental Significance (NES)'. The EPBC Act requires the assessment of whether the Proposal is likely to significantly impact on matters of NES or Commonwealth land. These matters are considered in full in Appendix A.

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 NSW 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 Division 5.1 of the EP&A Act. Division 5.1 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 5.5 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.

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 Division 5.1 of the EP&A Act has a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

### 4.2.2 Other NSW legislation and regulations

Table 4.1 provides a list of other relevant legislation applicable to the Proposal.

**Table 4.1 Other legislation applicable to the Proposal**

| Applicable legislation | Considerations |
|---|---|
| Contaminated Land Management Act 1997 (CLM Act) (NSW) | Section 60 of the CLM Act imposes a duty on landowners to notify the Office of Environment and Heritage (OEH), and potentially investigate and remediate land if contamination is above EPA guideline levels.<br>The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8). |
| Crown Lands Act 1987 (NSW) | The Proposal does not involve works on any Crown land (Department of Industry, 2018). |
| Disability Discrimination Act 1992 (DDA Act) (Cwlth) | The Proposal would be designed having regard to the requirements of this Act. The key objective of the project is to improve the accessibility of Bexley North station which is consistent with the objectives of this Act. |

| Applicable legislation | Considerations |
|---|---|
| *Heritage Act 1977* (Heritage Act) (NSW) | The Bexley North Railway Station is listed on the RailCorp Section 170 Heritage and Conservation Register (Item 4801898).<br>A heritage assessment has been undertaken for the Proposal and is summarised in Section 6.5.<br>The heritage assessment concluded that the archaeological potential within the study area is low. However, if unexpected archaeological items are discovered during the construction of the Proposal, all works would cease and appropriate advice sought, in accordance with TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2016b).<br>Formal notification is to be provided by the asset owner to the Heritage Council regarding the partial demolition of elements associated with the Bexley North Railway Station Group at least 14 days prior to the demolition of these structures in accordance with section 170A(1)(c) of the Heritage Act. The Heritage Council would need to be notified in relation to the demolition of the stairway and platform canopy from the Bexley Road overbridge.<br>No items of State heritage significance were identified near the Proposal, and therefore an approval under Section 60 of the Heritage Act is not required. |
| National Parks and Wildlife Act 1974 (NPW Act) (NSW) | Sections 86, 87 and 90 of the NPW Act require consent from OEH for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer Section 6.4).<br>However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all works would cease and appropriate advice sought.<br>Additionally, Wolli Creek Regional Park is located approximately 250 metres north-east of the Proposal. The Proposal is not anticipated to result in any adverse impacts to this park and would not involve impacts to land reserved for, or adjacent to, land reserved under the NPW Act. |
| Biosecurity Act 2015 (NSW) | No Priority Weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region were identified in the study area. Appropriate management methods would be implemented during construction (refer Section 6.7). |
| Protection of the Environment Operations Act 1997 (PoEO Act) (NSW) | The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, TfNSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor. |
| Sydney Water Act 1994 (NSW) | The Proposal would not involve discharge of wastewater to the sewer. |
| Biodiversity Conservation Act 2016 (BC Act) (NSW) | 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 Section 6.7). The Wolli Creek Regional Park (State Reserve) is located approximately 250 metres north-east of the Proposal and is not expected to be affected by the Proposal. |

| Applicable legislation | Considerations |
|---|---|
| *Roads Act 1993* (Roads Act) (NSW) | Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads.<br>The majority of roads surrounding the Proposal are local roads, managed and maintained by Bayside Council (refer to Section 6.1 for more information). The Proposal would involve limited impacts to existing roads surrounding the station, however would include works to the footpath along Bexley Road (which is a classified road).<br>The works would be undertaken in consultation with Bayside Council and Roads and Maritime Services including the need to obtain Road Occupancy Licence(s) (ROL) for temporary road closures to facilitate works (where required, such as for temporary crane operations) or impacts to classified roads. |
| Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW) | TfNSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared for the Proposal. |
| Water Management Act 2000 (NSW) | The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management works, drainage or flood works, controlled activities or aquifer interference. |

## 4.3 State Environmental Planning Policies

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

The Infrastructure SEPP is the key environmental planning instrument which determines the permissibility of the Proposal and which part of the EP&A Act an activity or development may be assessed.

Clause 79 of the Infrastructure SEPP allows for certain types of development to be carried out by or on behalf of a public authority without consent on any land (i.e. assessable under Division 5.1 of the EP&A Act). Specifically, Clause 79(1) of the Infrastructure SEPP states that

> *'Development for the purpose of a railway or rail infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land*.'

Clause 78 defines 'rail infrastructure facilities' as including elements such as:

> *'(d) railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms*
>
> *(e) public amenities for commuters*
>
> *(f) associated public transport facilities for railway stations…"*

Consequently, development consent is not required for the Proposal which is classified as a rail infrastructure facility, however the environmental impacts of the Proposal have been assessed under the provisions of Division 5.1 of the EP&A Act.

Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other agencies prior to the commencement of certain types of development.

Section 5.2 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP. It is noted that the Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (Major Development) 2005* or *State Environmental Planning Policy (Coastal Management) 2018* applies. The Proposal does not require consideration under these SEPPs and therefore do not require further consideration as part this REF.

### 4.3.2 State Environmental Planning Policy 55 – Remediation of Land

SEPP 55 provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. While consent for the Proposal is not required, the provisions of SEPP 55 have still been considered in the preparation of this REF.

Section 6.8 of this REF contains an assessment of the potential contamination impacts of the Proposal. It is not expected that any large-scale remediation (Category 1) work would be required as part of the Proposal. The proposed land use does not differ to the existing use and is, therefore, unlikely to be affected by any potential contaminants that exist within the rail corridor.

## 4.4 Local environmental planning instrument and development controls

The Proposal is located within the Bayside LGA (formerly Rockdale LGA). The provisions of the Infrastructure SEPP mean that Local Environmental Plans (LEPs), prepared by councils for an LGA, do not apply. However, during the preparation of this REF, the provisions of the *Rockdale Local Environmental Plan 2011* were considered.

### 4.4.1 Rockdale Local Environmental Plan 2011

The *Rockdale Local Environmental Plan 2011* (Rockdale LEP) is the governing plan for the Bayside LGA, including Bexley North. Table 4.2 summarises the relevant aspects of the Rockdale LEP applicable to the Proposal. Figure 4.1 shows the relevant section of the zoning map from the Rockdale LEP, with the indicative location of the Proposal.

**Table 4.2 Relevant provisions of the Rockdale LEP**

| Provision description | Relevance to the Proposal |
|---|---|
| Clause 2.3 – Zone objectives and Land Use Table | Applicable land zones<br>• Under the Bayside LEP, the Proposal is located in areas zoned as:<br>• SP2 Infrastructure (Rail) for the proposed works associated with the station platform and buildings, the new entrance on Bexley Road and footpath re-grading on Bexley Road.<br>• RE1 Public Recreation for the proposed works associated with the car park entered via a driveway off Kingsgrove Avenue.<br>Zone objectives<br>The objectives of the applicable land zones are as follows:<br>• SP2 Infrastructure (Rail) – to provide for infrastructure and related uses and to prevent development that is not compatible with or that may detract from the provision of infrastructure |

| Provision description | Relevance to the Proposal |
|---|---|
| Clause 2.3 – Zone objectives and Land Use Table (cont.) | • RE1 Public Recreation – to enable land to be used for public open space or recreational purposes, provide for a range of open space or recreational activities and to protect and enhance the natural environment for recreational purposes.<br>• The Proposal is consistent with the objectives of zone SP2 Infrastructure (Rail). The Proposal would retain the trees to the north of the car park and would not reduce the amount of open space currently provided within the RE1 Public Recreation zone. Therefore, the Proposal is considered to be consistent with the objectives of this zone.<br>Permissible development within land zones<br>Development for the purposes of a rail infrastructure facility is permissible with consent under the provisions of the SP2 Infrastructure (Rail) zone, and the car park is an existing use within the current RE1 Public Recreation zone. |
| Clause 5.10 – Heritage Conservation | Clause 5.10 of the Rockdale LEP provides for the protection of items, places and archaeological sites which have been identified in the Rockdale LEP as having heritage significance. Heritage items are listed on the Rockdale LEP in the vicinity of the Proposal including:<br>• Wolli Creek Valley (Item 237) – located around 60 metres to the north of the Proposal<br>• Stotts Reserve (Item 165) – located around 320 metres to the east of the Proposal<br>• Glendalough McIlveen Museum and Research Centre (Item 164) – located around 440 metres to the south east of the Proposal.<br>While no works are occurring at these locations, a discussion of potential impacts to local heritage and the requirements for consent is provided in section 6.5. |
| Clause 6.1 – Acid Sulfate Soils (ASS) | The Proposal site is not located on land that is mapped as having potential for ASS. |
| Clause 6.2 - Earthworks | Clause 6.2 of the Rockdale LEP aims to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.<br>By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for earthworks for the Proposal is outlined in Section 6.8. |
| Clause 6.3 – Flood planning | The areas surrounding the Proposal site are designated as flood planning areas under the Rockdale LEP. The eastern end of Bexley North station is within the flood planning area. Consideration of the potential flood risk mitigation measures to manage flood risk for the Proposal are outlined in Section 6.9. |
| Clause 6.4 – Terrestrial biodiversity | The Proposal site is not located on land that is mapped as having terrestrial biodiversity. |

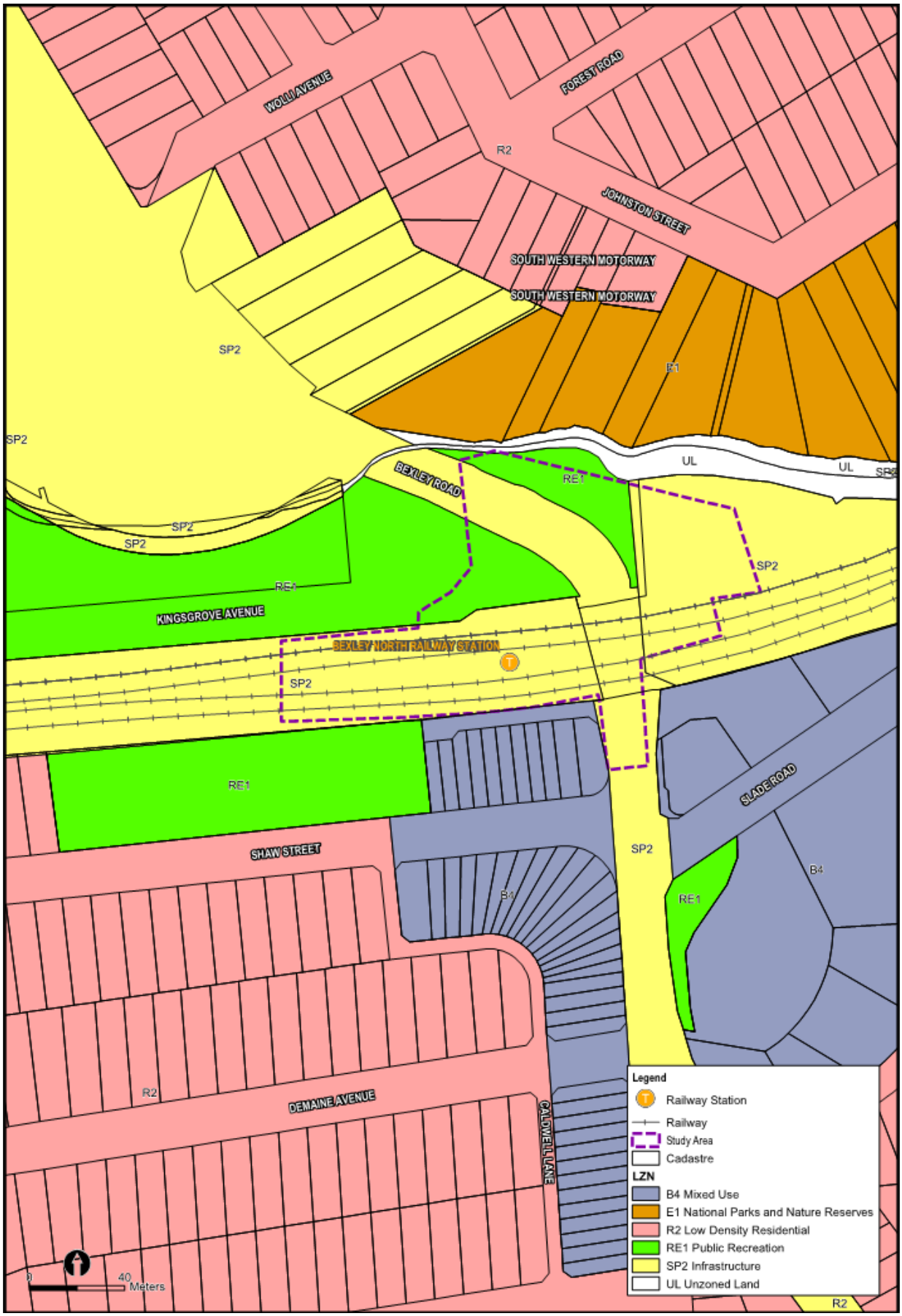



**Figure 4.1 Rockdale LEP zoning map**

## 4.5 NSW Government policies and strategies

Table 4.3 provides an overview of other NSW Government policies and strategies relevant to the Proposal.

**Table 4.3 NSW Government policies and strategies applicable to the Proposal**

| Policy/Strategy | Commitment | Comment |
|---|---|---|
| Future Transport Strategy 2056 (TfNSW, 2018) | *Future Transport 2056* is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state.<br>The strategy places the customer at the centre of works undertaken by TfNSW. It includes issue specific and place based supporting plans that seek to integrate transport modes.<br>The strategy outlines 6 state-wide outcomes<br>• customer focused<br>• successful places<br>• a strong economy<br>• safety and performance<br>• accessible services<br>• sustainability. | The Proposal supports the vision of the *Future Transport Strategy* by providing accessible services for people who find it difficult to access public transport services.<br>The new lift and accessible paths, as proposed by the Proposal, would provide a more physically accessible network allowing greater choice for people with mobility constraints to access public transport. Greater accessibility would also mean better connections to places and opportunities for employment, education, business and enjoyment. |
| Disability Action Plan 2012-2017 (TfNSW, 2012b) | The *Disability Action Plan 2012-2017* was developed by TfNSW in consultation with the Accessible Transport Advisory Committee, which is made up of up of representatives from peak disability and ageing organisations within NSW.<br>The Disability 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 with consideration of the objectives outlined in this Plan and seeks to improve and provide equitable access to public transport facilities. |
| Sydney's Walking Future - Connecting people and places (TfNSW, 2013a) | *Sydney's Walking Future* outlines the NSW government's efforts to:<br>• promote walking for transport<br>• connect people to places through safe walking networks around activity centres and public transport interchanges. | The Proposal would facilitate walking by removing physical barriers to accessible public transport (i.e. only stair access) and by providing accessible cross corridor access, hence contributing a relative reduction in local trips via private cars. |

| Policy/Strategy | Commitment | Comment |
|---|---|---|
| NSW State Infrastructure Strategy 2018-2038<br>(NSW Government, 2018) | The *NSW State Infrastructure Strategy 2018–2038* builds on the NSW Government's major long-term infrastructure plans over the last seven years.<br>The strategy sets out the government's priorities for the next 20 years, and combined with the *Future Transport Strategy 2056*, the *Greater Sydney Region Plan* and the *Regional Development Framework*, brings together infrastructure investment and land-use planning for our cities and regions.<br>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. | The Proposal supports investment in rail infrastructure, and aligns with the need to continue to provide urban public transport to support Sydney's increasing population.<br>The Proposal is also consistent with overall aims and objectives of the *Future Transport Strategy 2056* to improve transport infrastructure across NSW. |
| NSW: Making It Happen<br>(NSW Government, 2015) | In September 2015, the NSW Government announced a series of State Priorities as part of *NSW: Making It Happen* (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. *NSW: Making it Happen* focuses on 12 key 'priorities' to achieve the NSW Government's commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services.<br>One of the 12 priorities identified as part of *NSW: Making It Happen* relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority. | The Proposal would assist in meeting the priority to develop and invest in transport infrastructure by improving accessibility to, and encouraging greater usage of, public transport infrastructure. |

| Policy/Strategy | Commitment | Comment |
|---|---|---|
| A Metropolis of Three Cities – The Greater Sydney Region Plan (Greater Sydney Commission, 2018) | *A Metropolis of Three Cities* is a plan designed to complement the *Future Transport 2056* plan and *State Infrastructure Strategy* by aligning land use, transport and infrastructure planning. It aims to reshape Greater Sydney as three unique but connected cities. | The Proposal particularly supports Objective 6 of the Three Cities Plan, which is to ensure 'services and infrastructure meet communities' changing needs', as it would increase the accessibility of places and transport for all people that use Bexley North station. |
| 2017-2021 Disability Inclusion Action Plan<br>(Bayside Council, 2017) | The Disability Inclusion Action Plan identifies actions to ensure Council's services, facilities, programs and information are inclusive for all members of the community. Focus areas of the Plan are:<br>• liveable communities<br>• systems and processes<br>• access to meaningful employment<br>• attitudes and behaviours. | The Proposal would assist in achieving the objectives of the Disability Inclusion Action Plan, as it would make public transport facilities in Bayside LGA more accessible for people with a disability. |

## 4.6 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). The principles of ESD are generally defined under the provisions of clause 7(4) of Schedule 2 to the EP&A Regulation as:

- 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 Bexley North Station Upgrade. Section 3.1.4 summarises how ESD would be incorporated in the design development of the Proposal. Section 6.13 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 phase of the Proposal.

# 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 Stakeholder consultation during concept design

Key stakeholders for Bexley North Station, comprising TfNSW, Sydney Trains and Bayside Council (previously Rockdale City Council), were engaged in the development of the Concept Design Plan to provide insights into the station's deficiencies and future development and growth plans. In addition, relevant stakeholders participated in the development and assessment of the station improvement options.

Workshops and meetings undertaken during the development of the concept design included:

- options assessment workshops with relevant TfNSW and Sydney Trains representatives
- TfNSW Design and Sustainability Panel presentation
- safety meetings.

The following meetings were undertaken as part of the concept design development:

- stakeholder workshop 1 – options assessment. Attendees included representatives from a range of Transport for NSW divisions and Sydney Trains
- design and sustainability presentation to TfNSW Design and Sustainability Panel
- constructability and safety in design meeting
- stakeholder workshop 2 – preferred option development. Attendees included representatives from a range of Transport for NSW divisions and Sydney Trains.

## 5.2 Consultation requirements under the Infrastructure SEPP

Part 2, Division 1 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Clauses 13, 14, 15 and 16 of the Infrastructure SEPP require that public authorities undertake consultation with councils and other agencies, when proposing to carry out development without consent.

Table 5.1 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

**Table 5.1 Infrastructure SEPP consultation requirements**

| Clause | Clause particulars | Relevance to the Proposal |
|---|---|---|
| Clause 13 \| Consultation with Councils – development with impacts on council related infrastructure and services | Consultation is required where the Proposal would result in:<br>• substantial impact on stormwater management services<br>• generating traffic that would place a local road system under strain<br>• involve connection to or impact on a council owned sewerage system<br>• involve connection to and substantial use of council owned water supply<br>• significantly disrupt pedestrian or vehicle movement<br>• involve significant excavation to a road surface or footpath for which Council has responsibility. | The Proposal includes works that would:<br>• disrupt pedestrian and vehicle movements<br>• impact on road pavements under Council's care and control<br>• impact on Council operated footpaths<br>• impact commuter car park area (largely located on Council land).<br>Consultation with Bayside Council would therefore be undertaken as part of the planning approvals process during the public display of the REF in regard to this aspect of the Proposal. |
| Clause 14 \| Consultation with Councils – development with impacts on local heritage | Where railway station works:<br>• substantially impact on local heritage item (if not also a State heritage item)<br>• substantially impact on a heritage conservation area. | The Bexley North Railway Station is listed on the RailCorp Section 170 Heritage and Conservation Register (Item 4801898).<br>Consultation with Bayside Council would therefore be undertaken as part of the planning approvals process during the public display of the REF in regard to this aspect of the Proposal. |
| Clause 15 \| Consultation with Councils – development with impacts on flood liable land | Where railway station works:<br>• impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.* | The majority of the Proposal is not located on land that has been identified as being susceptible to flooding. One section of the Proposal (being the proposed electrical connection between an existing substation and the station building to the east of the Bexley Road overbridge) is located within the identified Flood Planning Area for Bayside Council.<br>Consultation with Bayside Council would therefore be undertaken as part of the planning approvals process during the public display of the REF in regard to this aspect of the Proposal. |
| Clause 15AA \| Consultation with State Emergency Service – development with impacts on flood liable land | • Where development works:<br>  • would be carried out on flood liable land – reference would be made to the Floodplain Development Manual: the management of flood liable land. | The eastern section of the proposal site and the surrounding area is located within a flood planning area under the Rockdale LEP.<br>Consultation would be undertaken with the State Emergency Services has been undertaken in accordance with clause 15AA. |

| Clause | Clause particulars | Relevance to the Proposal |
|---|---|---|
| Clause 16 \| Consultation with public authorities other than Councils | For specified development which includes consultation with the OEH for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974 (NPW Act)*, and other agencies specified by the Infrastructure SEPP where relevant.<br>Although not a specific Infrastructure SEPP requirement, other agencies TfNSW may consult with could include:<br>• Roads and Maritime<br>• Sydney Trains<br>• OEH. | As identified in table 4.1, Wolli Creek Regional Park is located approximately 250 metres north-east of the Proposal. The Proposal is not anticipated to result in any adverse impacts to this park and would not involve impacts to land reserved for, or adjacent to land reserved under, the NPW Act. As such, consultation with the NSW OEH is not considered to be required.<br>Consultation with other public authorities as specified in this clause is also not required. However, consultation with Sydney Trains would be ongoing through the next stage(s) of the Proposal, including the Heritage branch of Sydney Trains. |

## 5.3 Consultation strategy

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
- ensure that the directly impacted community are aware of the REF and consulted where appropriate
- 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
- build positive relations with identified community stakeholders
- ensure a comprehensive and transparent approach.

## 5.4 Public display

The REF display strategy adopts a range of consultation mechanisms, including:

- public display of the REF at various locations
- distribution of a project notification at the station, and to local community and rail customers, outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers with a link to the TfNSW website and Have Your Say page that include a summary of the Proposal and information on how to provide feedback
- consultation with Bayside Council, Sydney Trains and other key stakeholders
- installing project signage at the station informing the local community and rail customers about the project and inviting feedback on the REF
- community information sessions at/near the station where the local community and rail customers are invited to drop in and have their say.

Community consultation activities for the Proposal would be undertaken during the public display of this REF. Face to face activities such as information stalls would be conducted with the community to encourage feedback and provide the opportunity to ask questions and be informed by the project team. The community and key stakeholders would be advised about these activities via advertisements in the local paper, distribution of flyers, signage and a dedicated project page on the TfNSW website.

The display period of the REF would be advertised in the week that the public display commences. The REF would be displayed for a period of approximately two weeks.

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

- Bayside Council – 444/446 Princes Highway Rockdale
- Bexley North Library – 24 Shaw Street, Bexley North
- Transport for NSW Office – Level 5, Tower A, Zenith Centre, 821 Pacific Highway, Chatswood 2067.

The REF would also be available to download from the TfNSW website[1], Have Your Say website[2], yoursay page[2]. A Project Infoline (1800 684 490) and email inbox (projects@transport.nsw.gov.au) would be available for members of the public to make enquiries.

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

[1] http://www.transport.nsw.gov.au/bexley-north
www.yoursay.transport.nsw.gov.au/bexley-north
https://www.nsw.gov.au/improving-nsw/have-your-say/

## 5.5 Indigenous community involvement

An Aboriginal Heritage Information Management System (AHIMS) search with a buffer of 200 metres was undertaken on 5 December 2018 for the Proposal. The search identified that there are no Indigenous sites or places recorded or declared in or near the Proposal (OEH, 2018).

The extensive landscape modification that has occurred across the Proposal area suggests that intact evidence of Indigenous land use is unlikely to occur within the boundaries of the Proposal area. Similarly, the high level of disturbance would suggest that the archaeological potential of the area is low. Therefore, it was not considered necessary to undertake specific Indigenous consultation. However, as key members of the community, the Local Aboriginal Land Council has been included as a stakeholder to receive project information along with the wider community.

## 5.6 Ongoing consultation

At the conclusion of the public display period for this REF, TfNSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by TfNSW before determining whether to proceed with the Proposal (refer Figure ES.1).

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 by stakeholders and the community during the public display period, and include a summary of mitigation measures proposed to minimise the impacts of the Proposal.

Should TfNSW determine to proceed with the Proposal, 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 would be undertaken in accordance with a Community Liaison Management Plan to be developed prior to the commencement of construction.

# 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 B.

## 6.1 Traffic and transport

### 6.1.1 Existing environment

#### Site context

Bexley North Station services the T8 Airport and South Line. The existing road network around Bexley North Station comprises residential streets to the south and classified roads, Bexley Road and the M5 East, to the east and north.

Road access to the station is generally via Bexley Road and Kingsgrove Avenue (providing access to the existing car park). Pedestrian access to the station is via a pedestrian path along the Bexley Road overbridge, which spans over the rail corridor from the intersection with Kingsgrove Avenue to the intersection with Shaw Street intersection.

#### Surrounding road network

Bexley North Station is surrounded by Shaw Street to the south, Bexley Road to the east and Kingsgrove Avenue to the north. Key features of this road network include:

- Kingsgrove Avenue and Shaw Street are local collector roads which run in an east-west direction adjacent to the railway line to the north and south of the station. Both Kingsgrove Avenue and Shaw Street are two-lane, two-way with on-street parking provision. They have a posted speed limit of 50 Kilometres per hour.
- Bexley Road is a classified main road. Bexley Road overbridge passes over the rail corridor.

#### Parking

A commuter car park is located to the north of the station and is accessed via Kingsgrove Avenue. Pedestrian access is provided from the commuter car park to Bexley Road.
The existing commuter car park has 33 parking spaces including one accessible parking space. The parking layout and accessible parking space do not currently comply with the Australian Standards as there is a lack of a turning bay and insufficient aisle width.

There are additional un-timed street parking spaces available on Kingsgrove Avenue, parallel to the rail corridor.

There is an additional car park located to the south of the station with 19 parking spaces, including two spaces marked as being accessible. This car park is associated with the Bexley North Library.

### Public transport

*Rail*

Bexley North Station services the T2 Airport Line, with about 2,600 passenger trips (combined entry and exit) recorded at the station on an average weekday in December 2018.

*Bus*

The following bus stops are located in the vicinity of the Proposal:

- Shaw Street, to the south of the station, servicing routes 491, 493 and N20
- Bexley Road, to the south of the station, servicing routes 420, 420N, 491, 493 and M41
- Slade Road, to the east of the station, servicing route 446.

### Other infrastructure

*Kiss-and-ride facilities*

There are currently no kiss and ride facilities in the vicinity of Bexley North Station.

*Cyclist infrastructure*

Currently there is no active transport infrastructure, such as bike racks or bike lockers, available at Bexley North Station.

*Taxi*

Presently there is no taxi-rank within the vicinity of Bexley North Station.

## 6.1.2 Potential impacts

### a) Construction phase

The main site compound would either be located in the commuter car park, north of the station or on the eastern side of Bexley Road. Additional site office and material laydown areas would be located to the east of Bexley Road, as shown in Figure 3.4.

The road network surrounding Bexley North station is well serviced by Roads and Maritime Services, including approved B-Double route(s). The final construction haulage route would be determined by the nominated construction contractor during the detailed design of the proposal. Heavy vehicle access to the construction compound would be via Bexley Road and Kingsgrove Avenue, as shown in Figure 3.4.

### Traffic

The vehicles generated onto the road network as a result of the construction works are expected to be mostly light vehicles from construction workers with minimal heavy vehicle trips for delivery and removal of materials, plant, and equipment when required. The traffic generated as a part of the construction works is not expected to exceed 20 light vehicles and 10 heavy vehicles per day during peak construction periods. Given the minimal traffic generated during construction, including both staff light vehicle trips and construction heavy vehicle trips, the surrounding road network and intersections are anticipated to be able to accommodate vehicle trips associated with the Proposal with minimal impact to the existing network.

Construction works are predominately going to be undertaken within the Sydney Trains boundary. The construction of the new station entrance from Bexley Road would however result in some traffic impacts on the external road network, in particular Bexley Road. This would include lane and speed restrictions to undertake these works. Temporary contra-flow arrangements would be required during installation of key elements such as canopies or the lift shaft to allow for crane access on the Bexley Road overbridge. Traffic flow on Kingsgrove Avenue may also potentially be impacted by the entry and exit of heavy vehicles from the proposed construction compound.

Temporary / short term closures of Shaw Lane for lifting in weekend track possessions may also be required (subject to preparation of the detailed construction methodology by the construction contractor), with affected property owners / businesses notified in advance.

Overall, the construction of the Proposal is anticipated to be manageable with the implementation of mitigation measures (refer to section 6.13).

### Parking

As identified in section 3.2, the main site compound would either be located in the commuter car park, north of the station or on the eastern side of Bexley Road. The use of the commuter car park would result in the temporary removal of 33 parking spaces during the construction period. This would result in an impact to the overall availability of parking, however it is considered that the remaining available parking along Kingsgrove Avenue within a walking distance of approximately 400 metres is sufficient to result in minor overall impacts to existing commuters.

Light vehicle parking for construction vehicles is proposed to be within the site compound to the east of Bexley Road. Potential impacts to the un-timed street parking on Kingsgrove Avenue running parallel to the rail corridor and the secondary car park located to the south of the Proposal behind Bexley North Library are expected to be minor.

### Public transport and pedestrians

The construction of the Proposal may cause minor disruptions and restrictions to the existing bus services surrounding the station.

Existing pedestrian access to the station would be maintained throughout construction through the provision of temporary access structure from Bexley Road to the station platform.

It is expected that as a part of the works, there may be restrictions and disruptions to pedestrian manoeuvrability in close proximity to the following features of the proposal:

- Footpath upgrading to DDA compliance, on Bexley Road would impede pedestrian ingress and egress. Footpath closures are expected to be temporary with safe and suitable detours provided as a part of the construction traffic control.
- Provision of new entrance on Bexley Road. This has the potential to impact accessibility for customers, including reduced pedestrian path widths and use of the temporary access structure to access the station platform.
- Restriction of pedestrian access through the Kingsgrove Avenue commuter car park area during construction activities.

### Property access

Access to all adjoining properties would be maintained at all times and any impacts (if required) would be short-term during construction (unless agreed with the property owner(s) in advance).

Should the detailed design and construction staging of the Proposal identify impacts to residents and businesses, affected occupants would be consulted and notified in advance of the scheduled works.

### Emergency vehicle access

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

## b) Operational phase

### Pedestrians

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

### Traffic

The Proposal is not anticipated to have a direct increase in traffic generation during operation.

### Parking

The Proposal would result in an improvement in the amount of accessible parking provided at the station (providing two compliant spaces compared to no compliant spaces currently).

The Proposal would however result in an overall reduction in the amount of parking supply for the station, with the commuter car park on Kingsgrove Avenue being reconfigured from 33 parking spaces (including one accessible space), to 22 parking spaces (including the two proposed accessible spaces). The loss of parking would be due to the need to provide space for the new ramp access, vehicle turning space and shared zone for the accessible parking spaces.

While the final arrangement of the car park would result in a slightly lesser amount of parking, it is considered that the remaining available parking along Kingsgrove Avenue within a walking distance of approximately 400 metres is sufficient to compensate for the minor overall reduction in parking available for the station.

### Public transport

The Proposal does not include changes to existing bus/rail services and would not impact on the operation (service operation or timetabling) of public transport in the vicinity of Bexley North Station. The Proposal is not anticipated to have any impacts on existing bus stops surrounding the station.

### Property access

The Proposal would not result in changes to private property access during operation.

### 6.1.3 Mitigation measures

The following mitigation measures are proposed with respect to potential traffic and transport impacts:

- prior to the commencement of construction, a Construction Traffic Management Plan would be prepared as part of the Construction Environmental Management Plan and would include at a minimum:
  - maximising safety and accessibility for pedestrians and cyclists
  - ensuring adequate sight lines to allow for safe entry and exit from the site
  - ensuring access to the railway station, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made)
  - managing impacts and changes to on and off street parking and requirements for any temporary replacement provision
  - parking locations for construction workers away from stations and busy residential areas and details of how this will be monitored for compliance
  - routes to be used by heavy construction related vehicles to minimise impacts on sensitive land uses and businesses
  - measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP
- consultation with the relevant roads authorities would be undertaken prior to the preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction
- communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network
- ROL(s) for temporary road closures would be obtained, as required
- all works with the potential to impact pedestrian movements such as lifting should be carried out during scheduled track possession periods.

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.2 Urban design, landscape and visual amenity

This section provides a summary of the *Visual Impact Assessment* prepared by IRIS Visual Planning + Design (2018). The methodology used to undertake this assessment is provided in Section 6 of *Technical Paper 1 – Landscape and visual amenity assessment* (Iris, 2018). The assessment included a desktop analysis and site inspection to identify the potential visual impacts of the Proposal on views to the station from surrounding publicly accessible areas.

### 6.2.1 Existing environment

Bexley North Station, particularly the platform and platform building, is a local landmark. The visual significance of the station is reflected in its listing on the RailCorp Section 170 Heritage and Conservation Register. The platform building (c. 1931) is characterised by the distinctive single storey Inter War Art Deco style platform building, featuring a decorative red-brick façade and a gabled roof with hipped awnings at either end of the building.

The landform encompassing the station and surround generally falls from south to north. The station sits somewhat level with Kingsgrove Avenue, including the commuter car park, north of the station. North of the car park, the landform descends towards Wolli Creek valley, which meanders parallel to the rail corridor. The dense tracts of vegetation along Wolli Creek provide a sense of visual enclosure to the station and screen northerly views to residential areas of Earlwood and the M5 motorway.

The existing visual conditions of the study area are described in the following paragraphs and illustrated in Figure 6.1.


**Figure 6.1 Landscape and visual features of the site**

### Views from the east

There are views to the east from the Bexley Road overbridge, footpath and the medium density residential properties to the east of Bexley Road. In these views the roof of the station heritage platform can be seen set below the road bridge.

### View from the north

The ornamental gardens and trees on the corner of Kingsgrove Avenue and Bexley Roads are a prominent feature in views from the north. This includes views from Bexley Road and Kingsgrove Avenue.

### Views from the platform

The heritage platform building is the feature of views from the station platform.

### Views from the south

There are views along the station to the station platform building and proposed stair and lift structure on Bexley Road. There are similar views from Shaw Lane and the rear of commercial properties along Shaw Street, including a funeral chapel and reception centre.

### Views at night

At night, the study area is in an area of moderate district brightness, with the existing commercial centre, heavily trafficked roads, station and railway corridor creating a moderately well-lit at environment night.

## 6.2.2 Potential impacts

The following viewpoints were selected as representative of the range of views to the site and the Proposal:

- Viewpoint 1: View north west from eastern side of Bexley Road overbridge
- Viewpoint 2: View south from Bexley Road
- Viewpoint 3: View south east from Kingsgrove Avenue
- Viewpoint 4: View east from Station platform
- Viewpoint 5: View north east from Bexley North library car park.

The location of these viewpoints is shown on Figure 6.2 below.

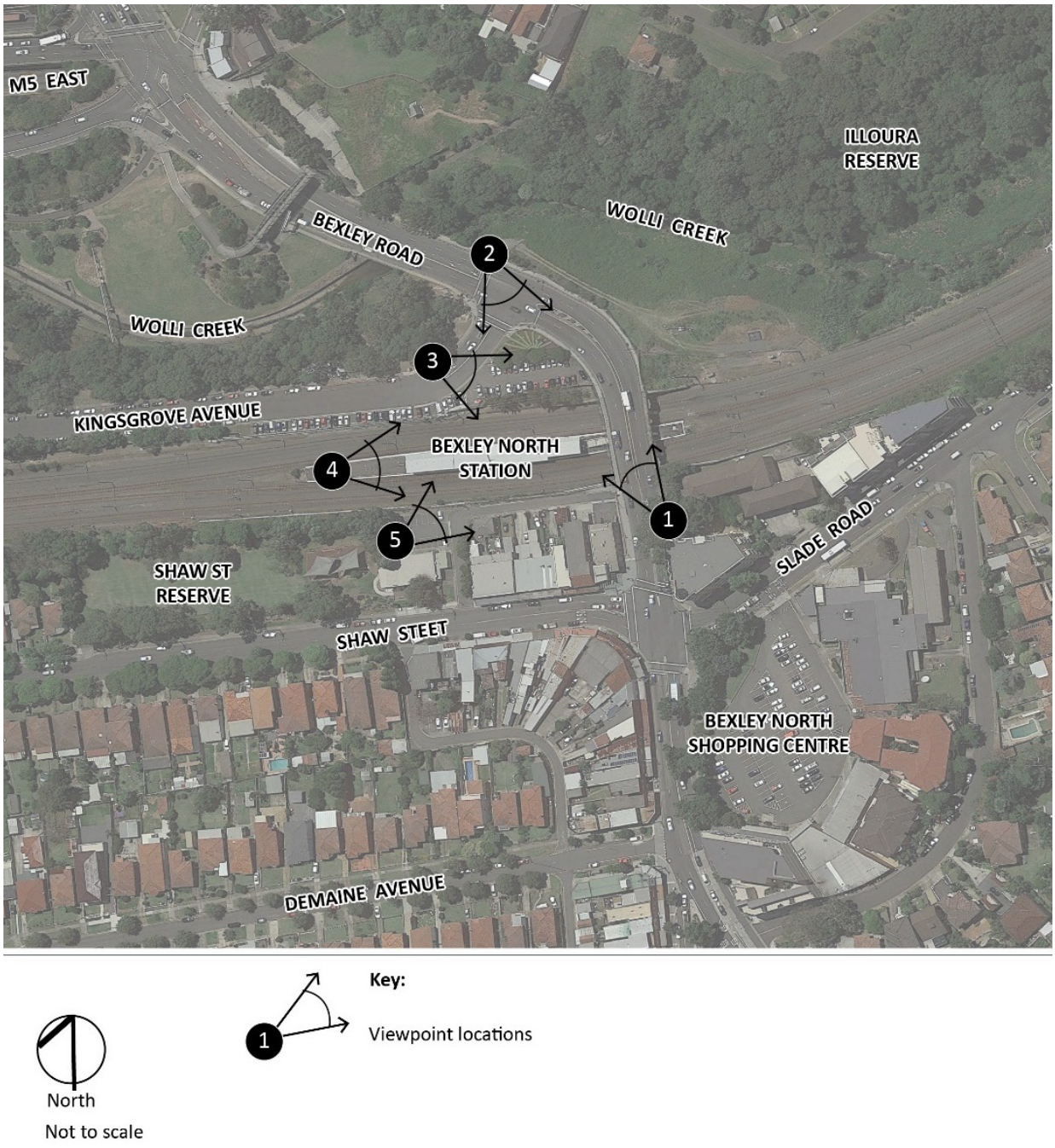



**Figure 6.2 Viewpoint location plan**

## a) Construction phase

### Viewpoint 1: View north west from eastern side of Bexley Road overbridge

Demolition of the existing station entrance would be seen in the centre of the view. Construction of the new station entrance and lifts would be visible, including installation of the lift structure, cladding, roofing, canopy and safety screens/anti-throw screens. Construction of the temporary access system between the overbridge and platform would also be seen in the centre of view.

The character of this construction activity would not contrast greatly with this busy arterial route, resulting in a minor reduction in the amenity of this view, and a minor visual impact during construction.


**Figure 6.3** **Viewpoint 1: View north west from eastern side of Bexley Road overbridge – existing view**

### Viewpoint 2: View south from Bexley Road

A construction compound may be established in the middle ground of the view, at the Kingsgrove Avenue commuter car park (unless it is located on the eastern side of Bexley Road). Trucks and construction vehicles would be seen travelling along Bexley Road, between the main construction compound and lift work area.

The ornamental gardens and trees in the middle ground of this view would be retained, and screen much of this compound.

The row of eight mature trees (six Swamp Oak, one River Oak and one Black She-oak) alongside the rail corridor would be removed, to make room for the ramp construction. The removal of these trees would also be largely screened by the retained gardens and trees on the corner.

Upgrade works to the commuter car park would be visible, to the south of the retained gardens and trees. Cranes would also be seen rising above the compound and worksite at the station.

The character of this construction activity would create a minor reduction in the visual amenity of this view, and result in a minor adverse visual impact during construction.

**Figure 6.4 Viewpoint 2: View south from Bexley Road**

### Viewpoint 3: View south east from Kingsgrove Avenue

Kingsgrove Avenue would remain open and construction traffic would be seen travelling between the compound and new station entrance worksite at the Bexley Road overbridge.

The ornamental gardens and trees would be retained. However, the row of eight mature trees between the car park and rail corridor would be removed, opening up views to the station platform works and new entrance construction, including demolition of the access stairs and installation of the new lift shaft. Platform regrading works and the station platform building upgrade would also be visible (right of view). Site fencing and hoarding would be erected along the compound and worksite boundaries, and construction equipment and machinery would be visible rising above the hoarding.

The character of this construction activity would contrast with the leafy character of the station. This would result in a minor reduction in the amenity of this view, and a minor visual impact during construction.

**Figure 6.5 Viewpoint 3: View south east from Kingsgrove Avenue**

### Viewpoint 4: View east from station platform

Construction works at the station platform would be seen in the middle ground of view, including platform resurface works and upgrade of the station platform building. Construction activity at the new station entrance would be seen in the background of this view, beyond the heritage platform building. Installation of the lift shaft would also be visible, rising above the station platform building.

The entire construction worksite and compound at Kingsgrove Avenue may be seen from this location (unless it is located on the eastern side of Bexley Road). The existing black corridor fencing and mature trees would be removed.

The character of this construction activity would contrast somewhat with the heritage and leafy character of the station, resulting in a minor reduction in the amenity of this view. This would result in a minor visual impact during construction.

**Figure 6.6 Viewpoint 4: View east from station platform**

### Viewpoint 5: View northeast from Bexley North library car park

Construction works at the station platform and Bexley Road overbridge, including the new station entrance, would be visible in the middle and background of the view. Trains would continue to be seen entering and departing the station.

Surface upgrades to the platform would be seen in the middle ground of the view, as would the upgrade of the heritage platform building. Beyond the platform building, demolition of the access stairs would be visible, along with construction of the temporary access system between the platform and overbridge. Works to construct the lift and station entrance would be visible, rising above the overbridge. Construction activity at the Kingsgrove Avenue commuter car park would be mostly screened by the platform buildings and hoarding.

The character of this construction activity would contrast somewhat with the heritage and leafy character of the station. This would result in a minor reduction in the amenity of this view, resulting in a minor visual impact during construction.

**Figure 6.7 Viewpoint 5: View northeast from Bexley North library car park**

### Views at night

During construction, the work areas and adjacent main construction compound would be lit for security. However, it is unlikely that these areas would be used on an ongoing basis for construction activity during evening hours (other than for specific activities or where works are undertaken during possession periods).

Generally, the character of the construction works at the lift work area and main construction compound at night would be visually absorbed into the surrounding brightly lit environment, particularly with the bright lights of Bexley Road along the east of the site. The works would create a minor reduction in amenity and result in negligible adverse visual impact during construction.

## b) Operational phase

### Viewpoint 1: View north west from eastern side of Bexley Road overbridge

From this location, the new station entrance would be the focus of view, including a new lift shaft and landing area, new stairs between the landing and station platform, and canopy structure. The lift shaft would rise approximately five metres above the footbridge, providing a new skyline element. While the scale of the entrance would be increased due to, the visual impact of the lift would be reduced as far as practicable by the proposed simple form (encapsulating the lift core within the entrance structure) and material palette of off-form concrete with steel roof sheeting.

The proposed anti-throw screens around the lift landing and access stairs would also be expected to provide some transparency and lightness to the structure. This simple palette of materials and finishes would create a visually consistent entrance.

The existing footpaths to the north and south of the station entrance along the Bexley Road overbridge, would be upgraded to meet DDA compliance.

Overall, the station would have an increased visual prominence in this view and be more legible to customers accessing the station. The proposed station additions would constitute a minor improvement in the amenity of this view. They would be in character with the developed nature of the station, and the dense vegetation along Wolli Creek would remain as an important visual feature in northerly views along Bexley Road. This would result in a *minor beneficial visual impact* during operation.


**Figure 6.8 Photomontage of the view north west from eastern side of Bexley Road overbridge**

### Viewpoint 2: View south from Bexley Road

During operation, the upgraded commuter car park would be visible in this view, including reconfiguration of the parking spaces, a new access ramp, lighting, signage and a waiting area with new landscaping. The ornamental gardens and mature trees would be retained, therefore maintaining the entry statement to Bexley North local centre. This garden would continue to filter views to the commuter car park and station. The new lift shaft and stairs would be largely screened by this vegetation.

Overall, the new works would comprise a small part of this view, as the gardens and trees on the corner would be retained. This would result in no perceived change in visual amenity of this view, and a negligible visual impact during operation.

### Viewpoint 3: View south east from Kingsgrove Avenue

The upgraded Kingsgrove Avenue car park would be the focus of this view. The ornamental gardens and trees would be retained, therefore maintaining the entry statement to Bexley North local centre. These gardens would be complemented by additional planting at the car park, within the forecourt and along Bexley Road. This planting would help soften and visually integrate the new ramp.

Due to the removal of vegetation along the rail corridor boundary, the new station entrance would be visible in the background of this view, with the lift shaft and canopy structure rising

above the overbridge. The station platform canopy structure and new access stairs would also be seen in this view.

The visual bulk of the lift would be reduced by its simple form. The heritage platform building, which was previously screened by vegetation, would be more visually prominent in this view.

Whilst the station works would be more visually prominent in this view, due to the scale of the changes and capacity of the character of the station setting to absorb the changes, there would be no perceived reduction in the amenity of this view. This would result in a negligible visual impact during operation.

### Viewpoint 4: View east from station platform

The upgraded Kingsgrove Avenue car park would be clearly seen from this angle. The removal of vegetation along the rail corridor would provide views to the car park and new accessible ramp, linking to the overbridge. The ramp structure would be a prominent built element alongside the rail corridor, however, new planting would assist to visually integrate and soften the car park and ramp, complementing the entry statement planting at the corner of Bexley Road and Kingsgrove Avenue.

The upgrade to the heritage platform building would be absorbed into the character of the station. The new station entrance lift shaft and access stairs would be located in the background of this view, behind the platform building, introducing a new skyline element in this view. Although the entrance roofline would rise approximately five metres above the overbridge, the simple form and palette of materials would assist in visually integrating it with the station setting. The character of these structures would be visually distinct from the highly ornate heritage architecture.

Overall, due to the scale of built form, setback from the station platform building, and ability of the station to absorb changes such as the new ramp structure, there would be a minor reduction in the amenity of the view. This would result in a minor adverse visual impact during operation.

### Viewpoint 5: View northeast from Bexley North library car park

The new station entrance and lift shaft would be visible in background of this view, introducing a new skyline element in this view. The lift structure and station entrance roofline would rise about five metres above the overbridge level. The lifts would transform this view, becoming a prominent new feature in the middle to background of this view.

The proposed anti-throw screens used on the station entrance and access stairs would create some transparency and visual lightness, reducing the visual bulk of the structures. The view to the heritage station platform building would be unobstructed by new built form, and the new lift and stair would be set back from the station platform building by approximately four metres.

Overall, the new station buildings would be visually consistent with the character of the station and be largely absorbed into this view. This would result in no perceived change in the amenity of this view, and a negligible visual impact during operation.

### Views at night

During operation, the upgraded station would continue to be brightly lit for security and safe use at night. The new platform lift and upgraded commuter car park at Kingsgrove Avenue would be seen in the context of the existing station lighting, commercial buildings and street lights along Bexley Road.

The station would be likely to create minor additional sky glow above the site due to the removal of some trees and additional built form. There is not expected to be any additional direct light spill (trespass) onto private property as all neighbouring residential properties are separated from the station by the rail corridor and roads.

Generally, the character of the proposed station upgrade at night would be visually absorbed into the surrounding brightly lit environment and the legibility of the precinct would be improved. Overall, this would result in no perceived change in the amenity of views at night, resulting in a negligible visual impact at night during operation.

### 6.2.3 Mitigation measures

The following mitigation measures are proposed with respect to potential visual impacts:

- During detailed design, TfNSW would investigate opportunities to reduce the visual bulk, lower the height of the lift shaft, and reduce the scale of the entry if achievable and reasonable.
- An Urban Design Plan (UDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to TfNSW for endorsement by the Precincts and Urban Design teams, prior to finalisation of the detailed design. The UDP, at a minimum, would address the following:
    - the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to:
        - connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown
        - integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown
        - integration with surrounding streetscape including street wall height, active frontages, awnings, street trees, entries and vehicle cross overs etc.
        - integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use
        - design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal site.
- a Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to TfNSW for endorsement by the Precincts and Urban Design teams, prior to finalisation of the detailed design. The PDP, at a minimum, would address the following:
    - materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences
    - location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment
    - landscape treatments and street tree planting to integrate with surrounding streetscape
    - opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal
    - total water management principles to be integrated into the design where considered appropriate

    - design measures included to meet the Infrastructure Sustainability Rating Scheme - Version 1.2 (ISCA, 2018)
    - identification of design and landscaping aspects that will be open for stakeholder input, as required.
- all permanent lighting would be designed and installed in accordance with the requirements of standards relevant to AS 1158 *Road Lighting* and AS 4282 *Controlling the Obtrusive Effects of Outdoor Lighting*
- the detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles
- worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations
- temporary hoardings, barriers, traffic management and signage would be removed when no longer required
- during construction, graffiti would be removed in accordance with TfNSW's Standard Requirements.

Refer to Table 7.1 for a list of proposed mitigation measures.

## 6.3 Noise and vibration

This section provides a summary of the *Noise and Vibration Impact Assessment – Bexley North* prepared by WSP (2018) (refer to Technical Paper 2). The assessment included background ambient noise monitoring and noise modelling for various stages of construction works to predict the potential impacts of Proposal on noise and vibration.

### 6.3.1 Existing environment

#### Sensitive receivers

Receivers potentially sensitive to both noise and vibration in the following categories as defined in *Noise Policy for Industry* (NPfI) (EPA, 2017) and *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) have been identified in the surrounding area:

- residential
- commercial
- library
- place of worship
- active recreation areas.

Sensitive receivers are outlined in Table 6.1 and shown in Figure 6.9.


**Figure 6.9 Sensitive receivers and noise monitoring locations**

**Table 6.1 Noise Catchment Area (NCA) and classification of representative receivers**

| NCA | Receiver Type | Address | Receiver ID |
|---|---|---|---|
| 1 | Residential | 177 Slade Road, Bexley North | R1 |
| 2 | Residential | 1 Irwin Crescent, Bexley North | R2A |
| | Residential | 236 Slade Road, Bexley North | R2B |
| | Commercial | 238 Slade Road, Bexley North | C2 |
| 3 | Residential | 29 Shaw Street, Bexley North | R3 |
| | Commercial | 6 Shaw Street, Bexley North (Olsens Funerals with Walters & Sons) | C3 |
| | Place of worship | 6 Shaw Street, Bexley North (Olsens Funerals with Walters & Sons) | P3 |
| | Library | Bexley North Library | L3 |
| | Active Recreation | Shaw Street Reserve | AR3 |
| 4 | Residential | 26 Shaw Street, Bexley North | R4 |
| 5 | Residential | 1 Kingsgrove Avenue, Kingsgrove | R5 |
| 6 | Residential | 4 Jones Avenue, Kingsgrove | R6 |
| 7 | Residential | 264 Bexley Road, Earlwood | R7 |
| 8 | Residential | 9 Johnston Street, Earlwood | R8 |

### Background noise levels

The prevailing background and ambient noise levels surrounding the site were determined through a combination of unattended and operator attended noise surveys in accordance with the *Australian Standard 1055-1997- Acoustics-Description and Measurement of Environmental Noise* (AS 1055) and the NPfI.

Due to an equipment malfunction, noise monitoring data at monitoring location NM02 has been excluded. Representative background noise levels have been supplemented by unattended noise monitoring undertaken as part of the WestConnex – The New M5 construction works by Renzo Tonin & Associates and AECOM, detailed in the publicly available report *WestConnex The New M5 Construction Noise and Vibration Management Plan, dated 28 June 2018* (WestConnex New M5 CNVMP). These supplementary unattended noise surveys were conducted within the proposal NCAs before WestConnex construction works started, and can therefore be considered representative as it considers the long-term noise environment without temporary construction works such as WestConnex.

The noise monitoring locations were used to characterise the existing noise environment at representative residential receivers on either side of the station, shown in Figure 6.9. The noise monitoring locations from the WestConnex New M5 CNVMP used to supplement the assessment are also shown.

The background characteristics for NM01 and NM02 included:

- at NM01, the background levels were characterised by consistent traffic along the M5. Ambient noise levels were controlled by vehicle pass-bys along Shaw Street, with contributions from trucks and loud vehicle pass-bys along the M5, birds and insect noise, train pass-bys and aircraft fly-overs
- at NM02 (supplemented by the addition information from WestConnex New M5 CNVMP), the background levels were characterised by consistent traffic along the M5. Ambient noise levels were controlled by trucks and loud vehicle pass-bys along the M5, birds and insect noise, train pass-bys and aircraft fly-overs.

It should be noted that sites were chosen to provide a representative characterisation the entire noise catchment area, not the noise levels at the worst case sensitive receivers.

The results of the un-attended and attended noise surveys and observations are detailed in Table 6.2 and Table 6.3.

**Table 6.2 Summary of unattended noise monitoring results**

| Location | Rating Background Level (RBL) dBA $L_{90}$ [1,2] | | | Ambient Noise Level dBA $L_{eq}$, 15 minute | | |
|---|---|---|---|---|---|---|
| | Day | Evening | Night | Day | Evening | Night |
| NM01 | 40 | 40 | 39 | 49 | 49 | 47 |
| EIS NL23 | 47 | 47 | 41 | 54 | 53 | 50 |
| DD NL03 | 49 | 48 | 36 | 59 | 55 | 52 |
| DD NL04 | 51 | 51 | 43 | 57 | 56 | 53 |

1. Rating Background Level (RBL) The overall single-figure background level representing each assessment period (daytime/evening/night-time) as defined in the NPfI.
2. Time periods defined as – Day: 7am to 6pm Monday to Saturday, 8am to 6pm Sunday; Evening: 6pm to 10pm; Night: 10pm to 7am Monday to Saturday, 10pm to 8am Sunday.

**Table 6.3 Summary of attended noise measurement results**

| Location | Time | dBA $L_{EQ(15MIN)}$ | dBA $L_{90(15MIN)}$ | Observations |
|---|---|---|---|---|
| NM01 | 11:00am – 11:15am | 50 | 46 | **Ambient**:<br>Insects: 40 to 45 dBA for around 40% of the time<br>Car pass-bys: up to 61 dBA<br>Birds: ~48 dBA for 20% of the time<br>Plane: up to 60 dBA<br>**Background**:<br>Urban hum<br>Consistent traffic from the M5 |

| Location | Time | dBA $L_{EQ(15MIN)}$ | dBA $L_{90(15MIN)}$ | Observations |
|---|---|---|---|---|
| NM02 | 12:15pm – 12:30pm | 47 | 37 | **Ambient**:<br>Insects: 40 to 45 dBA for around 60% of the time<br>Birds: ~48 dBA for 20% of the time<br>**Background**:<br>Consistent traffic from the M5 |

The results of the survey were used to set Noise Management Levels (NMLs) in accordance with the *Interim Construction Noise Guideline* (DECCW, 2009) and noise triggers for operational noise in accordance with the NPfI.

### 6.3.2 Potential impacts

### a) Construction phase

#### Predicted noise levels

The predicted noise levels for each scenario are presented in Table 6.4 outlining the noise level within each NCA for each representative receiver type. Predicted noise levels at buildings within each NCA is presented in Appendix B of the *Noise and Vibration Impact Assessment* (WSP, 2018). The maximum noise level assessment is presented in Table 6.5. The predicted noise levels have been assessed at the closest affected representative receiver within each NCA.

The calculations are conservative as they include all equipment operating simultaneously at their closest point to the receiver in a worst case 15-minute period. Actual noise levels from the construction site would be expected to be lower. Where a predicted noise level exceeds a less stringent management level, it follows that the more stringent management levels are also exceeded.

The formatting within the construction noise assessment tables indicates the following:

- the orange shaded cells show exceedances of the standard hours day period NML
- the yellow shaded cells show exceedances of the out-of-hours day period NML
- the green shaded cells show exceedances of the out-of-hours evening period NML
- the blue shaded cells show exceedances of the out-of-hours night period NML
- the **cells with red text** show exceedances of highly noise affected noise management levels.

The formatting within the sleep disturbance maximum noise level table indicates the following:

- the grey shaded cells show exceedances of the RBL + 15 screening criteria
- the blue shaded cells show exceedances of the $L_{max}$ screening criteria.

**Table 6.4 Predicted construction noise levels**

| NCA | Receiver ID | Receiver type | Noise management level | | | | Activity predicted noise level dBA $l_{eq,\ 15\ minute}$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | STANDARD HOURS | OUT-OF-HOURS DAY | OUT-OF-HOURS EVENING | OUT-OF-HOURS NIGHT | Activity 1 | Activity 2 | Activity 3 | Activity 4 | Activity 5 | Activity 6 |
| 1 | R1 | Residential | 50 | 45 | 45 | 44 | 60 (50) | 64 (57) | 65 (56) | 60 (51) | 54 | 63 (53) |
| 2 | R2A | Residential | 50 | 45 | 45 | 44 | 67 (47) | 55 (48) | 57 (48) | 71 (62) | 42 | 54 (44) |
| | R2B | Residential | 50 | 45 | 45 | 44 | ***84 (74)*** | ***84 (77)*** | ***82 (73)*** | ***88 (79)*** | 69 | ***81 (71)*** |
| | C2 | Commercial | 70 | | | | 86 (76) | 81 (74) | 79 (70) | 90 (81) | 69 | 79 (69) |
| 3 | R3 | Residential | 50 | 45 | 45 | 44 | 70 (60) | 70 (63) | 69 (60) | 70 (61) | 61 | 74 (64) |
| | C3 | Commercial | 70 | | | | > 90 | 87 (80) | 83 (74) | > 90 | 78 | 87 (77) |
| | P3 | Place of worship | 55 | | | | > 90 | 87 (80) | 83 (74) | > 90 | 78 | 87 (77) |
| | L3 | Library | 55 | | | | 81 (71) | 75 (68) | 77 (68) | 67 (58) | 70 | 85 (75) |
| | AR3 | Active Recreation | 65 | | | | 83 (73) | 74 (67) | 76 (67) | 71 (62) | 67 | 87 (77) |
| 4 | R4 | Residential | 50 | 45 | 45 | 44 | 65 (55) | 64 (57) | 67 (58) | 65 (56) | 57 | 69 (59) |
| 5 | R5 | Residential | 57 | 52 | 52 | 46 | 62 (52) | 62 (55) | 65 (56) | 63 (54) | 54 | 66 (56) |
| 6 | R6 | Residential | 59 | 54 | 53 | 41 | 56 (46) | 58 (51) | 60 (51) | 60 (51) | 50 | 59 (49) |
| 7 | R7 | Residential | 61 | 56 | 56 | 48 | 61 (51) | 60 (53) | 61 (52) | 61 (52) | 53 | 65 (55) |
| 8 | R8 | Residential | 61 | 56 | 56 | 48 | 68 (58) | 70 (63) | 73 (62) | 68 (59) | 61 | 69 (59) |

*Note 1: Activity descriptions are outlined in Technical Paper 2 – Noise and vibration assessment, and noise management level periods in Table 3.5 of Technical Paper 2. Values in brackets indicate predicted noise levels excluding plant items with special audible characteristics (concrete saw, chainsaw)*

*Note 2: Activities 1, 2 and 5 occur during Standard Hours and Out-Of-Hours Works. Activities 3, 4, and 6 only occur during Standard Hours.*

**Table 6.5 Predicted sleep disturbance assessment**

| NCA | Receiver ID | Noise management level (NML) | | Activity predicted maximum noise level $L_{max}$ dBA | | |
|---|---|---|---|---|---|---|
| | | RBL +15 screening criteria | Maximum noise level event | Activity 1 | Activity 2 | Activity 5 |
| 1 | R1 | 54 | 65 | 68 (58) | 72 (65) | 62 |
| 2 | R2A | 54 | 65 | 75 (65) | 63 (56) | 50 |
| | R2B | 54 | 65 | > 90 (82) | > 90 (85) | 77 |
| 3 | R3 | 54 | 65 | 78 (68) | 78 (64) | 69 |
| 4 | R4 | 54 | 65 | 73 (63) | 72 (58) | 65 |
| 5 | R5 | 54 | 65 | 70 (60) | 70 (63) | 62 |
| 6 | R6 | 54 | 65 | 65 (54) | 68 (52) | 59 |
| 7 | R7 | 54 | 65 | 69 (59) | 68 (54) | 61 |
| 8 | R8 | 54 | 65 | 76 (66) | 78 (64) | 69 |

*Note 1: Values in brackets indicate predicted noise levels excluding plant items with special audible characteristics (concrete saw, chainsaw)*

### Assessment of predicted noise levels

During the majority of the construction activities, the predictions indicate that construction noise levels could significantly impact the closest receivers. This is expected to occur during the worst case 15 -minute period(s) when works are carried out during standard hours or rail possessions. These impacts include exceedance of noise management levels, highly noise affected properties, and in some cases sleep disturbance. However, works are expected to take place intermittently over an 18-month period, so these exceedances will not occur continuously over the duration of the Proposal.

Out of hours works generally are also expected to only take place during rail possessions with only five rail possessions expected to occur over the duration of the Proposal. Other works may also be required to occur outside of standard hours which are not part of rail possessions.

The predictions are based on a worst case 15 -minute period. As these predictions are conservative and it is understood that the proposed works are short term in nature, actual noise levels from the construction site are expected to be lower.

Maximum noise level exceedances are predicted to occur during all out-of-hours work activities at all NCAs except for receiver R2A during Activity 5 (platform modification works). Receiver R2B is expected to experience the greatest maximum noise level exceedances, predicted to be up to 25dB above the sleep disturbance criteria.

Without plant with special audible characteristics (concrete saw, chainsaw), the predicted maximum noise levels are expected to be up to 10dB lower and receiver R6 would not exceed maximum noise level criteria for Activities 1 and 2 (site establishment and enabling works and lift, stairs and landing works), and receiver R7 would not exceed maximum noise level criteria for Activity 2 (lift, stairs and landing works).

Some non-residential receivers are predicted to exceed their NML. Receiver C2 is expected to exceed standard hours NMLs during all activities except for Activity 5 (platform modification works). Receivers C3, P3, L3, and AR3 are expected to exceed the NMLs during all activities, with the worst affected non-residential receiver, P3, predicted to exceed NMLs by greater than 35dB.

When plant with special audible characteristics were excluded, AR3 was no longer predicted to exceed the NMLs during Activity 4 (Bexley Road footpath works), and C2 is no longer expected to exceed the NMLs during Activity 3 (Kingsgrove Avenue car park works) and Activity 6 (station building works).

NMLs only apply when the premises are in use and therefore the premises would only be impacted when it is occupied.

### Construction traffic noise

The potential for noise impacts to occur due to light and heavy vehicle movements on public roads generated by the construction work has also been assessed in accordance with the *Road Noise Policy* (RNP) (EPA, 2011). Overall, the noise increase due to increased traffic is expected to be negligible along Bexley Road. It is expected that construction traffic due to the proposal would comply with RNP criteria.

### Vibration

Certain construction activities would require the use of vibration intensive equipment that may affect the nearest sensitive receivers. The vibration intensive plant nominated as part of the work is jack hammering (Activities 2, 3, 4, and 6) and bored piling (Activity 2 – lift, stairs and landing works).

Minimum working distances for vibration intensive plant have been outlined to comply with human comfort and cosmetic damage vibration limits. Commercial receiver C3 is directly adjacent to Activities 1 (site establishment) and 4 (Bexley Road footpath works), therefore vibration intensive work may occur within the minimum working distances for this receiver. All residential receivers are outside the minimum working distances.

If minimum working distances are complied with, no adverse impacts are expected for cosmetic damage or human response on nearby sensitive receivers.

#### b) Operational phase

For operational noise, the mechanical plant selections have not yet been finalised. However, it is not expected that the mechanical plant would have a significant noise impact. Any mechanical plant, equipment or other operational noise source proposed is to be designed to meet the NPfI noise triggers identified in this report. Operational noise would not be noticeably different what is currently experienced.

### 6.3.3 Mitigation measures

The following mitigation measures are proposed with respect to potential 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 *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2018b) and the *Noise and Vibration Impact Assessment* for the Proposal (WSP, 2019). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable
- the CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include:
    - regularly briefing workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise
    - avoiding any unnecessary noise when carrying out manual operations and when operating plant
    - ensuring spoil is placed and not dropped into awaiting trucks
    - avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable
    - switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded
    - avoiding deliveries at night/evenings wherever practicable
    - 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 onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors.

- the CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include:
    - maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances
    - using the most suitable equipment necessary for the construction works at any one time
    - 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-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works
    - use of quieter and less vibration emitting construction methods where feasible and reasonable.
- works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the TfNSW Environment and Planning Manager for any works outside normal hours as per the TfNSW Construction Noise Strategy
- where the $L_{Aeq}$ (15minute) construction noise levels are predicted to exceed 30 dBA above the Rating Background Level and/or 75 dBA (total including RBL) at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with the TfNSW *Construction Noise and Vibration Strategy* (TfNSW, 2018b). This would include restricting the hours that very noisy activities can occur
- to avoid structural impacts as a result of vibration or direct contact with structures, the proposed works would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (WSP, 2018) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged
- vibration resulting from construction and received at any structure outside of the project would be managed in accordance with:
    - for structural damage vibration - *German Standard DIN 4150: Part 3 – 1999 Structural Vibration in Buildings: Effects on Structures and British Standard BS 7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)*
    - for human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 7385-2:1993 *Guide to Evaluation of Human Exposure to Vibration in Buildings* (1 Hz to 80 Hz)

- property conditions surveys would be completed prior to any vibration intensive work being carried out at or within the minimum distances set out in the CNVS. Where a heritage item is determined to be structurally unsound and a reassessment of the minimum working distances would be required. Minimum working distances should be confirmed prior to carrying out any vibration intensive work on site.

Refer to Table 7.1 for a list of proposed mitigation measures.

## 6.4 Indigenous heritage

### 6.4.1 Existing environment

An assessment was undertaken for the Proposal with consideration of the requirements identified in the *Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH, 2010). As identified in section 5.5, an AHIMS search with a buffer of 200 metres was undertaken on 5 December 2018 for the Proposal. The search identified that there are no Indigenous sites or places recorded or declared in or near the Proposal (OEH, 2018).

The Proposal and surrounding area is highly modified, suggesting that the presence of Indigenous objects is unlikely. Wolli Creek is the only nearby landscape feature (e.g. nearby waterways, sand dune systems, ridge tops, ridge lines, headlands, cliff faces and rock caves/shelters) that might indicate an increase potential for Indigenous objects however is located some distance from the proposed works.

### 6.4.2 Potential impacts

#### a) Construction phase

Construction of the Proposal would involve minor excavation and ground disturbance for the following activities:

- the foundation and pit for the new lift shaft would require excavation into existing platforms, rock, soils and fill up to a depth of around three metres. Piling would result in depths up to around eight metres
- minor excavation for the construction/re-grading for compliant ramps and pavement works within the station precinct
- minor excavation within the rail corridor to allow for the new underline crossing, typically to a depth of around one to two metres.

Ground disturbing activities have the potential to impact Indigenous objects, if present. Based on the AHIMS search results and the modified landscape, the Proposal is unlikely to impact Indigenous heritage during construction.

#### b) Operational phase

There would be no risks to Indigenous heritage from the operation of the Proposal.

### 6.4.3 Mitigation measures

The following mitigation measures are proposed with respect to potential Indigenous heritage impacts:

- all construction staff would undergo an induction 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 the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites

- if unforeseen unidentified Indigenous objects are uncovered during construction, the procedures contained in the TfNSW *Unexpected Heritage Finds Guideline* (TfNSW, 2015b) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Indigenous heritage consultant, the OEH and the Local Aboriginal Land Council.
- if human remains are found, work would cease, the site secured and the NSW Police and the OEH notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.5 Non-Indigenous heritage

This section provides a summary of the *Statement of Heritage Impact* prepared by AECOM (2019) (refer to Technical Paper 3). The methodologies used to undertake this assessment are provided in section 1.3 of the *Statement of Heritage Impact* (AECOM, 2018).

### 6.5.1 Existing environment

#### Historical background

Bexley North Station was opened in 1931 and was built to the same general design and plan as other platform buildings on the East Hills Line, consisting of a booking office, Railway Station Master's office and parcels office. In 1947-48, the platform building was extended at the eastern end to add another bay. This work necessitated demolition of the original parapet at the eastern end of the building, and extension of the awning, however the work was done in matching brickwork and included recreation of a new parapet to match the original. The work undertaken was sympathetic to the original 1931 building and is virtually indiscernible. This extension allowed for the addition of a combined booking/parcels office that was excluded from the original plans.

The East Hills Line was electrified from Kingsgrove in 1939 and duplicated in 1948. In 1987, the East Hills terminus was connected to the Main Southern Line at Glenfield Junction.

Although the original terminus building at East Hills Railway Station was demolished in 1987, the remainder of the East Hills Line from Turrella to Panania is the only line in Sydney with all platform buildings extant from its original construction phase (though some have been altered).

Recent alterations have included replacement of roof cladding to the Bexley North platform building (originally corrugated asbestos) with corrugated steel, widening of the overbridge from two to four lanes with a concrete structure and concrete road deck (however retaining the original 1929 brick piers seen in Plate 3); and replacement of the platform entry stairs. In 1999 the interior fit out of the platform building was altered.

Later modifications to the Station include the removal of screening walls around the restroom and works to the doorway (including the installation of an air vent). In 1999, modifications were made to the internal fit out of the Booking Office, involving the removal and replacement of shelving, storage and desks. The original two ticket windows on the 1947 façade were bricked in and a new, wider window created. The men's toilets, cleaner's cupboards and the women's toilets have remained unchanged since their construction. The Ladies Waiting Room has been converted into a Communications Room, but the change does not seem to have resulted in any structural changes.

### Listed heritage items

The desktop search identified the Bexley North Railway Station Group as being listed on Sydney Trains Section 170 Register (SHI No.4801898). A summary of this item is provided below.

#### *Bexley North Railway Station Group*

Bexley North Railway Station Group is listed on the RailCorp (Sydney Trains) Section 170 Heritage and Conservation Register (#4801898).

The following Statement of Significance for *Bexley North Railway Station Group* has been reproduced from the RailCorp Heritage and Conservation Register, as provided in the online State Heritage Inventory database (OEH, 2018a):

> *Bexley North Railway Station - including the 1931 platform and platform building - is of local heritage significance. Bexley North Railway Station is of historical significance as a major public work completed as an unemployment relief project during the Great Depression, and as a major transport hub for the suburb of Bexley North since 1931. Bexley North Railway Station platform building is of aesthetic/technical significance as an austere 1930s railway building with simple Art Deco detailing and fine brick workmanship that is evocative of the effects of the Depression on building programs for NSW Railways. Bexley North Railway Station is representative of the cohesive collection of 10 East Hills line railway stations from Turrella to East Hills.*

Further information regarding the Bexley North Railway Station Group heritage item is provided in section 4 of the *Statement of Heritage Impact* (Technical Paper 3).

#### *Other listed heritage items within the vicinity of the Proposal*

Three additional heritage items of local significance have been identified on the Rockdale LEP as being within the vicinity of the Proposal. These are:

- Wolli Creek Valley (Item 237) – located around 60 metres to the north of the Proposal
- Stotts Reserve (Item 165) – located around 320 metres to the east of the Proposal
- Glendalough McIlveen Museum and Research Centre (Item 164) – located around 440 metres to the south east of the Proposal

No other heritage items listed on the World, Commonwealth or National Heritage Lists, the Register of the National Estate or NSW State Heritage Register have been identified within the vicinity of the Proposal.

A map of the heritage items and places surrounding the Bexley North station are shown in Figure 6.10.

#### *General*

No items of moveable heritage have been identified at the Station. The present buildings are the first known structures to have been constructed on the site. It is considered that the archaeological potential of the study area, within the rail corridor, is low.

While there are some plantings to the north of the Station, these are not of heritage significance and do not contribute to the heritage significance of the Railway Station.


**Figure 6.10 Heritage items within the vicinity of Bexley North station**

### Assessment of significance of existing heritage environment

The NSW Heritage Office publication *Assessing Heritage Significance* (2001) provides the basis for an assessment of heritage significance of an item or place. This is achieved by evaluating the place or items significance in reference to specific criteria, which can be applied at a national, state or local level.

Table 6.6 provides the significance assessment, taken from the listing (NSW Heritage Division, 2014)

**Table 6.6 Assessment of heritage significance of Bexley North Railway Station Group**

| Criteria | Application of criteria |
|---|---|
| Historical significance SHR criteria (a) | Bexley North Railway Station is of historical significance as part of the East Hills line, a major Depression period public work, and through its relationship to the development of the suburb of Bexley North and the broader East Hills region. The austere design of the platform building is reflective of the completion of the East Hills line as a Depression period unemployment relief works project. |
| Historical association significance SHR criteria (b) | No assessment provided. |
| Aesthetic significance SHR criteria (c) | Bexley North Railway Station is of aesthetic significance as an example of a small Inter-War period suburban railway building matching other East Hills line Railway Station buildings in design and style. The building is very austere in style, with Inter War Art Deco style touches (for example brick detailing to parapets) and is competently executed, exhibiting fine workmanship in its brickwork. The building is noted for its use of monochromatic brickwork, stepped parapets, irregular fenestration and engaged piers. Bexley North platform building is also of significance for its seamless 1947 addition in the same style as the original section of the building, involving recreation of a new parapet to match the original at the eastern end of the building. |
| Social significance SHR criteria (d) | The place has the potential to contribute to the local community's sense of place, and can provide a connection to the local community's past. |
| Technical/Research significance SHR criteria (e) | Bexley North Railway Station is of research significance for its ability to demonstrate design and construction techniques of the Inter-War period. The building provides insights into NSW Railways experimentation with styles of architecture and adaptation to depression period economic conditions. |
| Rarity SHR criteria (f) | The Bexley North Railway Station is not rare, as it is part of a cohesive group of 10 similar to identical Inter-War suburban Railway Stations completed in 1931 between Turrella and East Hills. |
| Representativeness SHR criteria (g) | Bexley North Railway Station is a good representative example of the cohesive collection of East Hills line Railway Stations built from Turrella to East Hills, with the platform and platform building generally intact (except for sympathetic extension to the platform building in 1948), and demonstrates the effects of the economic Depression of 1929-1930s on Railway Station construction. |
| Integrity/intactness | Bexley North Railway Station has not had access lifts installed, as at some other Railway Stations on the East Hills line, and the Railway Station itself is therefore intact. The platform building has retained a high degree of integrity externally and a moderate degree of integrity internally. |

### 6.5.2 Potential impacts

#### a) Construction phase

Table 6.7 identifies the key components of the Proposal and considers the potential impacts of the proposed works upon the heritage significance of Bexley North Railway Station.

**Table 6.7 Potential impacts to heritage associated with the Proposal**

| Component | Description of works | Assessment |
|---|---|---|
| Provision of new station entrance from the Bexley Road overbridge | This project element would comprise:<br>• demolition of the existing stairs and the eastern platform canopy in order to accommodate the new lift and landing<br>• construction of a new landing area<br>• construction of a new lift between Bexley Road and the station platform<br>• construction of new stairs between the proposed landing and the station platform<br>• construction of a replacement platform canopy. | The location of the lift shaft adjacent to the Bexley Road overbridge locates the height of the shaft as far from the station building as possible, thereby limiting the overshadow within the space available.<br>However, the lift would still be substantially higher than the station building, largely as a function of the necessity of moderating the change in level between the overbridge and the platform.<br>The demolition of the existing weather canopy would result in a positive heritage outcome.<br>The replacement canopy associated with the lift and stairs would be withdrawn around two metres from the station building, subject to DSAPT compliance. This may have the effect of opening up views towards the station building that would increase customers' ability to view and appreciate the aesthetic significance of the building. |
| Upgrade of the existing commuter car park on Kingsgrove Avenue | This project element would comprise provision of:<br>• 22 parking spaces, including two accessible parking spaces<br>• an accessible ramp from the commuter car park to the Bexley Road overbridge. | When viewed from the station car park and Kingsgrove Avenue, the ramp would partially obscure views of the station building. The visual impact has been reduced through the selection of transparent screens, rather than steel, which would act as a visual barrier. |
| Internal station building works | This project element would comprise:<br>• reconfiguration of the existing male toilet to a family accessible toilet. This would include the demolition of existing internal partitions and fittings, and widening of the existing brick opening to allow for a new compliant door<br>• reconfiguration of the existing female toilet to a unisex ambulant toilet. This would include the demolition of existing internal partitions and fittings | The alterations to the Station Office (historically known as a Booking Office) would have minimal impact on fabric of heritage significance, being limited to the bricking in of two windows on the northern elevation associated with the proposed electrical cupboard.<br>If the electrical cupboard is to remain the proposed location, the windows be retained and supplied with frosted/fire rated glass or boarded with fire rated fibre cement sheeting from the inside so as to maintain the façade.<br>The bricking in of two windows on the southern elevation, which would be obscured by the proposed electrical cupboard, would have an impact on the aesthetic significance of the station. |

| Component | Description of works | Assessment |
|---|---|---|
| Internal station building works (cont.) | • installation of new electrical cupboard within the platform building<br>• provision of air conditioning to Communications Room and Station Office within the platform building which would involve installing a condenser unit under stairs with a service conduit below platform level.<br>• other minor building works. | The proposed works to the interior of the station building (associated with the new toilets) would have limited impact on the overall heritage significance of the Station. These works would remove internal partitions, toilet cisterns and hand basins that are not original fabric and non-significant.<br>The proposal also includes the widening of the door in the western elevation or modification to the timber frame. The brickwork of the building has been identified as contributing to the aesthetic significance of the station. However, this elevation has undergone modification in the past as it appears to have lost the screen walls which have been unsympathetically patched, making the doorway an eyesore. |

The proposed indicative area for the construction site office, amenities / crib room, light vehicle parking and equipment and materials storage is immediately adjacent the Wolli Creek Valley, listed as a local heritage item (237) in the Rockdale LEP (Figure 6.10). Alternatively, the construction site compound may be located in the commuter car park (subject to final construction methodology).

There is no other heritage fabric within the vicinity of the Proposal that would be substantially impacted by the construction activities.

#### b) Operational phase

The Proposal would result in some impacts to significant fabric and views. Impacts would be mitigated through the measures described below.

### 6.5.3 Mitigation measures

The following mitigation measures are proposed with respect to potential non-Indigenous heritage impacts:

- a heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction
- in the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in the TfNSW *Unexpected Heritage Finds Guideline* (TfNSW, 2015a) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and the TfNSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and OEH. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location
- during construction, suitable measures would be put in place to ensure the retained heritage elements are protected from damage. Measures may include hoardings, use of spotters during the movement of equipment and other measures as necessary. Any accidental damage to a heritage item is to be treated as an incident, with appropriate recording and notification

- on completion of works, an update would be prepared for the Section 170 Heritage and Conservation Register, with required details
- a heritage conservation architect would be engaged during the detailed design process to inform the detailed design and assess the following design recommendations:
    - retention of the coffered ceilings and air vents in the Communications Room and the toilets
    - use of transparent screens on the ramp between the station carpark and the Overbridge
    - evaluate opportunities for the in situ retention of the two windows within the Station Office that may be either removed (and 'bricked in') or covered by fibrous cement sheeting in the internal side of the building
    - in the design of the lift shaft base, utilise materials that are complementary to the existing materials palate, such as red brick in English stretcher bond to clad the lift shaft base.
- the proposed impacts to significant fabric associated with the bricking in of two windows on the southern elevation can be mitigated by:
    - investigating options to relocate the electrical cupboard elsewhere during detailed design
    - if the electrical cupboard is to remain the proposed location, the windows should be retained and supplied with frosted/fire rated glass or boarded with fire rated fibre cement sheeting from the inside so as to maintain the façade
    - relocating the air conditioning unit.

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

## 6.6 Socio-economic impacts

### 6.6.1 Existing environment

The Bexley North Station services the T2 Airport Line, with about 2,600 passenger trips (combined entry and exit) recorded at the station on an average weekday in December2018).

The proposed works associated with the Station Platform and buildings, the new entrance on Bexley Road and footpath re-grading on Bexley Road are in an area zoned as SP2 Infrastructure (Rail). Works associated with the commuter car park on Kingsgrove Avenue are in an area zoned as RE1 Public Recreation (Figure 4.1).

Potential sensitive receivers that have the potential to be influenced by the Proposal include:

- local residents, particularly those located within streets adjacent to the rail corridor (Shaw Street and the residential apartments on Bexley Road), as well as residents located within streets that provide access to the construction sites for construction vehicles. Also, residents on those streets where parking is permitted as the number of cars parking on the street may increase with the temporary closure of the commuter car park
- local businesses surrounding Bexley North station, particularly those located on Bexley Road and Shaw Street
- community facilities, namely the library located on Shaw Street
- commuters including train passengers and motorists using Bexley North station and its surrounding streets (i.e. rail passengers who travel through the area).

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for Bexley North. The suburb of Bexley North has a population of 4,000 people with a median age of 40 years. Of this population, around 1,700 were employed and train was identified as the second most common method of travel to work (around 21 percent of employed people aged over 15 years) (ABS, 2016).

### 6.6.2 Potential impacts

#### a) Construction phase

The construction of the Proposal has the potential to temporarily impact commuters, pedestrians, residents, motorists, businesses, community facilities and other receivers due to:

- temporary impacts to local traffic movements due to increase in truck movements in the area, delivering site materials, plant and equipment
- temporary changes to existing pedestrian access on the Bexley Road overbridge
- temporary restricted pedestrian movements along the station platform
- temporary disruption to existing station facilities and amenities (e.g. street furniture, commuter car park and platform toilets)
- temporary reduction of parking in the area resulting from construction workforce vehicles and the closure of the commuter car park to accommodate a construction compound and proposed works (temporary restriction of access to 33 parking spaces during this period). Further discussion of this impact is provided in section 6.1.2 of this REF.
- temporary closures of Bexley North station to accommodate construction works (during scheduled rail possession periods)
- temporary / short term closure of Shaw Lane for lifting in weekend track possessions
- construction noise, dust and visual impacts.

Access for emergency services would be maintained at all times and it is not anticipated that access to residential or commercial properties would be affected during construction of the Proposal.

Construction works would be undertaken to ensure pedestrian and cyclist access to and through the precinct would be maintained. Where works are carried out that may potentially disrupt the existing pedestrian facilities, appropriate signs or traffic controllers would be positioned to notify pedestrians of the temporary arrangements.

During the construction of the new lift and stairs work zones would also need to be created which may restrict some pedestrian movements within the station precinct and along section(s) of the central platform.

Refer to sections 6.1, 6.2 and 6.3 for discussion on the potential traffic, access, visual and noise impacts arising from construction of the Proposal and the proposed management strategies.

### b) Operational phase

Overall, the Proposal would provide positive socio-economic benefits to Bexley North and the Bayside LGA, including:

- improved accessibility for customers at Bexley North station providing accessible pedestrian route to the station platforms through the provision of upgraded footpaths, new lift, stairs and canopy, compliant with key DDA and DSAPT requirements
- improved station facilities and amenities including provision of an ambulant toilet and family accessible toilet, wayfinding, new tactiles and accessible parking spaces
- potential increased use of public transport to and from Bexley North Station
- additional lighting and CCTV would provide positive CPTED outcomes for the area.

### 6.6.3 Mitigation measures

The following mitigation measures are proposed with respect to potential socio-economic impacts:

- a Community Liaison Management Plan would be prepared prior to construction to 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 practicable
- contact details for a 24-hour construction response line (1800 775 465), Project Infoline (1800 684 490) and email address (projects@transport.nsw.gov.au) would be provided for ongoing stakeholder contact throughout the construction phase
- the community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Management Plan to be developed prior to construction.

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.7 Biodiversity

This section provides a summary of the *Ecological Impact Assessment* (Technical Paper 4) prepared by WSP (2018) and the *Arboricultural Impact Assessment* (Technical Paper 5) prepared by Earthscape Horticultural Services (2018). The methodologies used to undertake these assessments are provided in Technical Paper 4 and Technical Paper 5 respectively.

The assessment below included an ecological field survey undertaken on 12 November 2018 and an arborist inspection undertaken on 22 November 2018.

### 6.7.1 Existing environment

#### Vegetation communities

All vegetation observed within the vicinity of the Proposal comprised of ornamental planted exotic and native garden specimens along with a small area of exotic perennial grasses that do not form part of any recognised native NSW Plant Community Type. No threatened ecological communities were identified within the vicinity of the Proposal.

### Planted trees

Dominant semi-mature to mature trees observed fringing the Kingsgrove Avenue car park include; *Casuarina glauca* (Swamp Oak), *Casuarina cunninghamiana* (River Oak), *Allocasuarina littoralis* (Black She-oak), which occur on the southern side of the car park and are currently pruned due to overhead powerlines and *Tibouchina macrantha* (Lasiandra) (Figure 6.11).

Planted ornamental garden specimens occurring on the corner of Bexley Road and Kingsgrove Avenue include *Abelia* × *grandiflora* 'Kaleidoscope' (Glossy Abelia), *Lomandra* sp. (Mat Rush), *Lophostemon confertus* (Brush Box) and *Petunia* sp., (Petunia) (Figure 6.12 and Figure 6.13).

**Figure 6.11** **Planted *Casuarina glauca* (Swamp Oak), *Casuarina cunninghamiana* (River Oak) and *Allocasuarina littoralis* (Black She-oak) underneath powerlines**

**Figure 6.12** ***Lophostemon confertus* along fence line**

**Figure 6.13** **Planted ornamental garden on the corner of Bexley Road and Kingsgrove Avenue**

**Figure 6.14** **Exotic perennial grasses to the east of Bexley Road and north of the rail line (proposed construction compound area)**

### Flora

No threatened flora species were identified during the site inspections. Background investigations identified 45 threatened flora species listed under the BC Act and/or EPBC Act that were considered to have the potential to occur within the locality of the study area. Following field surveys, it is considered that the Proposal site is unlikely to provide habitat to threatened flora species and no threatened flora is likely to be affected by the Proposal.

### Weeds

No Priority Weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region were identified in the study area.

### Fauna

The fauna habitat within the Proposal site is limited, with majority of vegetation in the form of planted ornamental native and exotic trees and shrubs. A majority of the original vegetation has been cleared for urban development and what remains is landscape gardens and plantings. The habitat and vegetation within the Proposal site provides limited resources and lacks important features such as hollow bearing trees, rocky outcrops, dense litter layer or fallen woody debris.

The Proposal site does not provide any significant habitat for fauna and species likely to utilise resources are those that are well adapted to urban environments or those species that are highly mobile (such as birds and bats). The surrounding trees (both native and introduced) provide some foraging habitat (such as fruits and blossom) for mobile species (such as birds and bats). It is unlikely that these resources are heavily utilise or relied upon by majority of fauna but instead are intermittently used whilst foraging within the greater locality.

No threatened fauna species were identified during site inspections. Background investigations identified 77 threatened fauna species listed under the BC Act and/or EPBC Act that have been previously recorded or have the potential to occur within the locality (refer to Appendix A and Appendix B of Technical Paper 4). The likelihood of these species occurring within the Proposal site was determined based on field investigations and fauna habitat available. It is considered unlikely that any threatened fauna would occur or utilise the habitat within the Proposal site.

### Migratory species

Migratory species are protected under international agreements, to which Australia is a signatory, including Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA), Republic of Korea-Australia Migratory Bird Agreement (RoKAMBA) and the Bonn Convention on the Conservation of Migratory Species of Wild Animals. Migratory species are considered Matters of NES and are protected under the EPBC Act. A total of 40 species listed as migratory under the EPBC Act were identified during background investigations that have been previously recorded or have the potential to occur within the locality. Of these, no species are considered likely to utilise the habitat present within the Proposal site.

The habitats within the Proposal site are unlikely to constitute important habitat for any of the listed species. The habitat present is unlikely to support significant proportions of the population of any migratory species, nor are the habitats critical to any life stage of these species. Due to their mobile nature, the mentioned species are likely to utilise higher quality habitat within the greater locality and where more extensive tracts of native vegetation occur.

### 6.7.2 Potential impacts

#### a) Construction phase

##### Direct impacts

Direct impacts to biodiversity as a result of the Proposal are considered negligible due to the existing disturbed nature of the available habitat and the nature of the construction works to be undertaken.

Vegetation clearing would include the removal of eight planted semi- mature She-oaks in the form of six *Casuarina glauca* (Swamp Oak), one *Casuarina cunninghamiana* (River Oak) and one *Allocasuarina littoralis* (Black She-oak) trees. No impacts to remnant native vegetation or high quality fauna habitat are predicted as a result of the Proposal.

Direct mortality or trauma to fauna is also expected to be minimal as habitat to be removed is of low quality (i.e. planted native trees and landscape gardens).

##### Impacts to threatened fauna

No threatened fauna are likely to be significantly impacted by the Proposal. It is unlikely that any threatened fauna identified within the locality would have a moderate to high likelihood to utilise the habitat within the study area, nor are any threatened fauna likely to be reliant on the habitat to be removed or impacted.

##### Removal of vegetation

The removal/disturbance of eight planted semi- mature She-oaks in the form of six *Casuarina glauca* (Swamp Oak), one *Casuarina cunninghamiana* (River Oak) and one *Allocasuarina littoralis* (Black She-oak) trees in the form of a planted native vegetation and some associated landscape garden would be undertaken as part of the Proposal. These trees are located within the existing rail corridor, were planted as part of station car park landscaping and are not naturally occurring vegetation. The impact of this vegetation is unlikely to constitute important biodiversity value.

The vegetation identified within the study area does not contain important habitat features (i.e. hollows for breeding) for any potential threatened species known or predicted to occur within the locality. Given this, the Proposal is considered unlikely to significantly affect threatened species or ecological communities, or their habitats.

##### Potential environmental impact of noise, light and vibrations on wildlife

It is likely that noise from the existing rail corridor and arterial roads would already impact background levels of noise in the study area. However, construction and operation phases of the Proposal (along with its ancillary activities) may cause disturbance to animals. The impacts from noise emissions are likely to be localised close to the project and are not likely to have a significant long-term impact on wildlife populations, given that populations are already exposed to noise associated with the existing rail corridor. Furthermore, it is likely that most animal species would habituate to periodic noise disturbance from regular maintenance activities (Forman et al. 2000).

##### Weeds

The Proposal is unlikely to impact any Priority Weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region such that they would pose a risk to any areas of native vegetation. Outside the study area, thickets of *Lantana camara* (Lantana) were observed fringing Wolli Creek although the Proposal is unlikely to further exacerbate this infestation.

### b) Operational phase

The operation of the Proposal is not anticipated to result in any further impacts to biodiversity.

### 6.7.3 Mitigation measures

The following mitigation measures are proposed with respect to potential biodiversity impacts:

- construction of the Proposal would be undertaken in accordance with the TfNSW *Vegetation Management (Protection and Removal) Guideline* and the TfNSW *Fauna Management Guideline* and the TfNSW *Biodiversity Offsets Calculator*
- all workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity
- disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. The tree nominated to be removed in the *Arboricultural Impact Assessment Report* (Earthscape Horticultural Services, 2018) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal
- tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the *Arboricultural Impact Assessment Report* (Earthscape Horticultural Services, 2018). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs
- where the loss of trees is unable to be mitigated, Transport for NSW would replace the tree removed as a result of the project in accordance with the TfNSW *Vegetation Offset Guide* (2016). In accordance with Section 5 of the guideline, 32 trees would be required to meet this offset requirement
- in the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible
- should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Construction Contractor would be required to complete the TfNSW Removal or Trimming Application form and submit it to TfNSW for approval
- for new landscaping works, mulching and watering would be undertaken until plants are established
- weed control measures, consistent with the TfNSW *Weed Management and Disposal Guideline,* would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the Proposal. This would include the management and disposal of weeds in accordance with the *Noxious Weeds Act 1993.*

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.8 Contamination, landform, geology and soils

A desktop geology and contaminated land assessment of Bexley North Station was undertaken for the *Preliminary Environmental Assessment* for the Proposal (RPS Group, 2018). An updated desktop assessment was also undertaken as part of this REF. The findings of these studies are summarised below.

### 6.8.1 Existing environment

#### Landform, geology and soils

The topography of the Bexley North Station and the rail corridor generally falls from south to north. To the south of the station, as the landform rises, the railway line is in cutting, with a retaining wall located along the southern boundary of the corridor. Minor fill may have been required to achieve the current grades at the station.

Existing ground modification within the station precinct include excavations, earth filling, construction of retaining walls, railway tracks and platforms and building of structures.

*Acid sulphate soils*

Bexley North Station is located in Class 5 Acid Sulphate Soil (ASS) area which is the lowest of the classes and used to denote areas where ASS are not typically found (RPS Group, 2018).

*Salinity*

Based on the Australian Groundwater Explorer site (Australian Bureau of Meteorology. 2018), the likelihood of the occurrence of saline soil conditions is considered to be low.

#### Contamination

Given the historical use of the station as a rail corridor, there is potential for contaminants to be present within the soils underlying the station. Historic activities associated with rail corridors that have the potential to result in contamination include the introduction of fill materials including ash, fuel or oil spills and accidental leaks or spills from maintenance and operational activities. Given the age of the building, there is also potential for asbestos materials and lead paint to be encountered.

A search of the public register of notices issued by the NSW EPA under *Contaminated Land Management Act 1997* was undertaken on 5 December 2018. No notices have been issued within Bexley North.

### 6.8.2 Potential impacts

#### a) Construction phase

The Proposal would require excavation work for the installation of foundations and footings for new lift shaft, lift and stairs. Other trenching or excavation may be required for footpath and road works, relocation of services, drainage works and tree removal.

#### Soil disturbance

Excavation and other earthworks such as trenching and stockpiling activities, if not adequately managed, could result in the following impacts:

- erosion of exposed soil and stockpiled materials
- dust generation from excavation and vehicle movements over exposed soil
- increase in sediment loads entering the stormwater system and/or local runoff.

Such impacts can be a nuisance to community members, and lead to an adverse environmental impact on biodiversity, for example through the introduction of sediment into waterways. These impacts are expected to be minor due to the limited level of ground disturbance required for the Proposal and the stability of the Proposal site.

Erosion risks can be adequately managed through the implementation of standard measures as outlined in *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) (the Blue Book).

#### Contamination

Excavation also has the potential to expose contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. The exposure of contaminants could also pose an environmental risk if they were to enter nearby waterways through the stormwater infrastructure.

The Proposal has the potential to disturb contaminated material. As there is potential for onsite contamination, chemical testing and visual characterisation would be undertaken to confirm the composition and nature of excavated material. Where spoil is classified as unsuitable for reuse it would be transferred to an appropriately licensed offsite facility.

There is also potential for activities to result in the contamination of soil through accidental fuel or chemical spills from construction plant and equipment.

### b) Operational phase

There would be no ongoing operational risks to geology and soils as a result of the Proposal.

### 6.8.3 Mitigation measures

The following mitigation measures are proposed with respect to potential soil and contamination impacts:

- prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction
- erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the works are complete and areas are stabilised
- vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area
- all fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and the TfNSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2015g)
- in the event of a pollution incident, works would cease in the immediate vicinity and the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager. The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act

- 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 Response Guidelines (TfNSW, 2015g) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill
- the CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum:
    - identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities
    - detail other onsite management practices such as keeping areas free of rubbish
    - specify controls and containment procedures for hazardous waste and asbestos waste
    - outline the reporting regime for collating construction waste data.
- an appropriate unexpected contamination finds protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with SafeWork NSW requirements
- all spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility
- all spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying Waste* (EPA, 2014) prior to disposal
- any concrete washout would be established and maintained in accordance with the TfNSW *Concrete Washout Guideline* – draft (TfNSW, 2015i) with details included in the CEMP and location marked on the ECM.

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.9 Hydrology and water quality

### 6.9.1 Existing environment

The Proposal site is located within the Cooks River Catchment Estuary. The nearest watercourse is Wolli Creek, located about 100 metres to the north of the station. The creek is a major tributary of the Cooks River.

A search of NSW OEH data in December 2018 found no groundwater bores within 500 metres of the station. The Bureau of Meteorology Australian Groundwater Explorer was searched for bores in the broader region however water level records from these bores were returned as false (BoM, 2018).

The eastern section of the proposal site and the surrounding area is located within a flood planning area under the Rockdale LEP. A preliminary flood assessment undertaken between Bexley North Station and Bardwell Park in 2016 indicated an estimated flood immunity of less than ten years Average Reoccurrence Interval (AECOM, 2016) (refer to Figure 6.15).


**Figure 6.15 Flood zone**

### 6.9.2 Potential impacts

#### a) Construction phase

Without appropriate safeguards, pollutants (fuels, chemicals or wastewater from accidental spills, and sediment from excavations and stockpiles) could potentially enter stormwater drains and flow into nearby waterways.

Activities that would disturb soil during construction work would have the potential to impact on local waterways as a result of erosion and sedimentation.

Additionally, while groundwater levels were not determined as part of this assessment, areas of excavation may need to be locally dewatered as a result of groundwater seepage or rainfall runoff (such as within the vicinity of the excavations for the western lift). Incorrect dewatering may pose risks to nearby waterways where run-off travels from the site to these areas.

Construction activities have the potential to be impacted by flood events, including delays due to site inundation or rain and potential damage to machinery and equipment. Excavation works and the addition of hardstand areas (e.g. the construction site office) may also increase the risk of flooding in the area.

#### b) Operational phase

The Proposal is unlikely to have a major impact on the hydrology of the Proposal site or the surrounding area.

Minor tree removal, ramp installation and regrading of access footpaths and the installation of a new canopy would result in minor alterations to the existing surface water flow regime within the station precinct and surrounding streets due to minor increases in hardstand areas. The overall area of impervious surfaces will not significantly increase, therefore the operation of the Proposal is not expected to increase flood risk.

Alterations to the surface water flows would likely be within the capacity of the stormwater network and as such, impacts would be minor.

The current design has considered the potential impacts of flooding on the operation of the Proposal. Further investigations will be undertaken during the detailed design stage to ensure the design meets potential flood risk requirements for operational activities and equipment.

### 6.9.3 Mitigation measures

As noted in Section 6.8.3, a site-specific Erosion and Sediment Control Plan would be prepared and implemented for the Proposal to manage risks to water quality. Additional mitigation measures that would be required for construction include would include:

- prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction
- erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the works are complete and areas are stabilised

- vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area
- all fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and the TfNSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2015g)
- 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 Tf*NSW Chemical Storage and Spill Response Guidelines* (TfNSW, 2015g) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill
- in the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager. The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act
- the existing drainage systems would remain operational throughout the construction phase
- should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the Waste Classification Guidelines (EPA, 2014) and the TfNSW *Water Discharge and Reuse Guideline* (TfNSW, 2015b).

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.10 Air quality

### 6.10.1 Existing environment

#### Regional air quality

The broader Sydney East monitoring region provides the most representative air quality monitoring results for Bexley North. The Sydney East region includes air quality monitoring sites at Macquarie Park, Chullora, Rozelle, Lindfield, Randwick and Earlwood.

The closest monitoring site to the Proposal is Earlwood however this site is noted as non-conforming to the requirements of the Australian Standard AS/NZS 3580.

#### Air pollutant sources

Based on the land uses surrounding Bexley North Station, the existing air quality is likely to be characteristic of an urban environment.

A search of the National Pollutant Inventory undertaken identified no registered facilities within the Rockdale LGA (now Bayside LGA). The search identified 72 air polluting substances from 21 sources in the Rockdale LGA (now Bayside LGA).

### Sensitive receivers

Sensitive receivers near the Proposal include:

- local residents, particularly those located within streets adjacent to the rail corridor (Shaw Street and the residential apartments on Bexley Road)
- local businesses surrounding Bexley North Station, particularly those located on Bexley Road
- community facilities, namely the library located on Shaw Street
- commuters including train passengers and motorists using Bexley North station and its surrounding streets (i.e. rail passengers who travel through the area)
- staff at Bexley North Station.

## 6.10.2 Potential impacts

### a) Construction phase

Potential air quality impacts during construction would be temporary and associated with dust particles and emissions of carbon monoxide, sulphur dioxide, particulate matter ($PM_{10}$), nitrous oxides, volatile organic compounds, and polycyclic aromatic hydrocarbons from the combustion of diesel fuel and petrol from construction plant and equipment.

Anticipated sources of dust and dust-generating activities include:

- excavation for the new lift and stairs to access the station platform
- other trenching or excavation for footpath and road works
- upgrade of the commuter car park
- stockpiling activities
- dust generated from the loading and transfer of material from trucks
- other general construction works.

The Proposal would be likely to have minimal impact on air quality as it would not involve extensive excavation or other land disturbance with the potential to generate significant quantities of dust. The operation of plant, machinery and trucks, as well as construction traffic, may also lead to increases in exhaust emissions in the local area however these impacts would be minor and short-term.

### b) Operational phase

Overall impacts on air quality during the operation of the Proposal would be negligible as the Proposal would not result in a change in land use.

Additionally, as the Proposal would increase access to public transport, the use of public transport would be expected to increase and lead to a relative reduction in the amount of private vehicle related emissions in the long-term.

### 6.10.3 Mitigation measures

The following mitigation measures are proposed with respect to potential air quality impacts:

- air quality management and monitoring for the Proposal would be undertaken in accordance with the TfNSW *Air Quality Management Guideline* (TfNSW, 2015h). This is likely to be dependent on weather conditions and dust generating activities
- methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks
- plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling
- vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable
- to minimise the generation of dust from construction activities, the following measures would be implemented:
    - apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)
    - cover stockpiles when not in use
    - appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading
    - prevent mud and dirt being tracked onto sealed road surfaces.

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.11 Other impacts

### 6.11.1 Services/utilities

The Proposal has the potential to impact services such as from direct impact from excavation activities or from operation of other equipment, if services are not appropriately identified and protected or relocated. A number of utilities have been identified in the vicinity of the proposed works including:

- existing conduit and transmission lines/electrical services
- high pressure ethane gas main
- telecommunication services
- stormwater services
- water and sewer services
- rail utilities, including signalling cabling and overhead wiring and associated equipment.

A high-pressure ethane gas main is located to the north of the railway line in the commuter car park. To minimise risk surrounding the ethane gas main, approval of the detailed design, construction methodology and safety plan would be sought from the asset owner prior to the commencement of works.

The detailed design of the Proposal would be undertaken to avoid services where feasible including undertaking a detailed Dial Before You Dig search. Relocation or other works that may affect services would be undertaken in consultation with the respective utility authorities.

### 6.11.2 Waste

#### Construction

The construction of the Proposal would generate a range of waste streams including:

- asphalt and concrete
- surplus building materials
- excavated spoil
- building material wastes (including metals, timbers, plastics, packaging, fencing etc.)
- electrical wiring and conduit waste (from electrical connections)
- hazardous chemical wastes (e.g. fuels)
- green waste (including weeds)
- demolition waste from the stairs, canopy, footpath works, footbridge modifications, platform pavement, preparations to upgrade the existing toilet facilities and non-compliant tactiles
- general waste, including food scraps generated by construction workers.

Appropriate planning of construction activities would ensure that the volume of surplus materials is minimised. Waste management would be undertaken in accordance with the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). A Waste Management Plan would be prepared that would identify all potential waste streams associated with the works and outline methods of disposal, reuse and recycling as well as other onsite waste management practices.

The handling, storage, transport and disposal of asbestos and hazardous waste (including lead waste) would be in accordance with the requirements of relevant EPA and Safe Work NSW guidelines.

Waste management targets in consideration of the Infrastructure Sustainability Rating Scheme – Version 1.2 (ISCA, 2018) would be developed for the Proposal and would include reuse and recycling.

#### Operation

The Proposal would not result in changes to operational waste management arrangements.

#### Mitigation measures

The following mitigation measures are proposed with respect to potential waste impacts:

- the CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum:
  - identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities
  - detail other onsite management practices such as keeping areas free of rubbish
  - specify controls and containment procedures for hazardous waste and asbestos waste
  - outline the reporting regime for collating construction waste data.

Refer to Table 7.1 in Section 7.2 for a list of proposed mitigation measures.

## 6.12 Cumulative impacts

### 6.12.1 Existing or potential projects

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. Multiple projects undertaken at a similar time/similar location may also lead to construction fatigue, particularly around noise, traffic and air quality impacts, if not appropriately managed.

A search of the Department of Planning and Environment's Major Projects Register, Sydney East Joint Regional Planning Panel Development and Planning Register, and Bayside Council Development Application Register on 12 December 2018 identified a number of proposals and projects within the Bayside LGA.

The following current and proposed projects have been identified as the most likely to contribute to cumulative impacts from the Proposal, due to their scale and/or proximity to the Proposal site:

- WestConnex M5
- small-scale projects in the area surrounding the Proposal site.

WestConnex M5 is a project to duplicate the M5 East from Beverley Hills to St Peters. The project includes twin underground tunnels, nine kilometres long from Kingsgrove to a new interchange at St Peters. Construction of the project commenced in July 2016 and is expected to be completed in early 2020. The WestConnex M5 tunnels pass under the T2 Airport Line approximately 750 metres west of Bexley North Station.

No other major development proposals have been identified in the immediate vicinity of the Proposal. Other developments likely to occur within the locality would be small scale projects such as residential dwellings in adjacent residential areas.

### 6.12.2 Potential impacts

#### Construction

Potential cumulative impacts arising from the Proposal being undertaken simultaneously with the above projects would include:

- increased construction noise and vibration
- reduced visual amenity
- additional parking restrictions
- potential additional restriction for pedestrian and cyclist movements.

#### Operation

Operational traffic and transport impacts are likely to be positive, as traffic congestion may be slightly improved due to increased public transport use as a result of both the Proposal.

### 6.12.3 Mitigation measures

During construction, the works would be coordinated with WestConnex construction activities. Consultation and liaison would occur with Bayside Council, RailCorp/Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise.

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.

Traffic associated with the construction work is not anticipated to have a significant impact on the surrounding road network. Operational traffic and transport impacts would have a 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 Chapter 7 are implemented.

## 6.13 Climate change and sustainability

### 6.13.1 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.

Projects are required to establish a baseline footprint using the *Carbon Estimate and Reporting Tool* (CERT) and demonstrate a reduction of construction related GHG emissions of at least five percent from the established project baseline (note: The project baseline is automatically generated within the CERT tool, refer to CERT user manual for details).

Due to the small scale of the Proposal and the short term temporary nature of the individual 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 7.1.

It is anticipated that, once operational, the Proposal may result in an increase in use of public transport and a relative decrease in use of private motor vehicles by commuters to travel to and from Bexley North. A modal shift in transport usage may reduce the amount of fuel consumed by private motor vehicles with a corresponding relative reduction in associated greenhouse gas emissions in the local area.

### 6.13.2 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation. The effects of climate 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 excepted 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 with respect to issues such as increased flooding (for more information on flooding refer to Section 6.9).

Climate change could lead to an increase in frequency and severity in bushfires. The Proposal is not situated on land mapped as bush fire prone, but would be designed with appropriate fire protection measures.

A high-level Climate Risk Assessment was undertaken as part of the Preliminary Environmental Assessment and identified the following key risks and opportunities (RPS, 2018):

- there is potential and likelihood of an increase of localised flood events and the extremity of flooding due to an increase in precipitation
- an increase in the number of hot days and daily mean temperature could lead to heat stress and solar exposure for both staff and rail customers
- increase in incidents of storms could impact ICT networks affecting communication and emergency response management
- power outages as a result of weather may increase the risk of lift breakdown, lighting loss and other technological issues.

### 6.13.3 Sustainability

The design of the Proposal would be based on the principles of sustainability, including the consideration of the *Infrastructure Sustainability Rating Scheme - Version 1.2* (ISCA, 2018) and the TfNSW *Environmental Management System* (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.1.4 for more information regarding the application of these guidelines.

Further positive impacts in relation to climate change and sustainability associated with the Proposal include encouraging a reduction in private vehicle use and increase the accessibility of public transport services.

# 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 CEMP for the construction phase of the Proposal would be prepared in accordance with the requirements of the TfNSW Environmental Management System (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 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 7.1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

**Table 7.1 Proposed mitigation measures**

| No. | Mitigation measure |
|---|---|
| | General |
| 1. | A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of *Guideline for Preparation of Environmental Management Plans,* Department of Infrastructure, Planning and Natural Resources, 2004) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction. |
| 2. | A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP. |
| 3. | An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with the TfNSW *Guide to Environmental Controls Map* (TfNSW, 2015c) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction. |
| 4. | Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval. |
| 5. | Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals. |
| 6. | Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction. |

| No. | Mitigation measure |
|---|---|
| 7. | Any modifications to the Proposal, if approved, would be subject to further assessment and approval by TfNSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised. |
| | Traffic and site access |
| 8. | Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum:<br>• maximising safety and accessibility for pedestrians and cyclists<br>• ensuring adequate sight lines to allow for safe entry and exit from the site<br>• ensuring access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made)<br>• managing impacts and changes to on and off street parking and requirements for any temporary replacement provision<br>• parking locations for construction workers away from stations and busy residential areas and details of how this would be monitored for compliance<br>• routes to be used by heavy construction related vehicles to minimise impacts on sensitive land uses and businesses<br>• measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP.<br>Consultation with the relevant roads authorities would be undertaken prior to the preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction. |
| 9. | Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site works. |
| 10. | ROL(s) for temporary road closures would be obtained, where required. |
| 11. | All works with the potential to impact pedestrian movements such as lifting should be carried out during scheduled track possession periods |
| | Urban design, landscape and visual amenity |
| 12. | During detailed design, TfNSW would investigate opportunities to reduce the visual bulk, lower the height of the lift shaft, and reduce the scale of the entry if achievable and reasonable. |

| No. | Mitigation measure |
|---|---|
| 13. | An Urban Design Plan (UDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The UDP, at a minimum, would address the following:<br>• the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to:<br>  ○ connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown<br>  ○ integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown<br>  ○ integration with surrounding streetscape including street wall height, active frontages, awnings, street trees, entries and vehicle cross overs etc.<br>  ○ integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use<br>• design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal site. |
| 14. | A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The PDP, at a minimum, would address the following:<br>• materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences<br>• location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment<br>• landscape treatments and street tree planting to integrate with surrounding streetscape<br>• opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal<br>• total water management principles to be integrated into the design where considered appropriate<br>• design measures included to meet the Infrastructure Sustainability Rating Scheme - Version 1.2 (ISCA, 2018) and the TfNSW Environmental Management System (EMS)<br>• identification of design and landscaping aspects that will be open for stakeholder input, as required. |
| 15. | All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting* and *AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting.* |
| 16. | The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles. |
| 17. | Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations. |
| 18. | Temporary hoardings, barriers, traffic management and signage would be removed when no longer required. |

| No. | Mitigation measure |
|---|---|
| 19. | During construction, graffiti would be removed in accordance with TfNSW's Standard Requirements. |
| | Noise and vibration |
| 20. | 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 *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2018b) and the Noise and Vibration Impact Assessment for the Proposal (WSP, 2018). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable. |
| 21. | The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include:<br>• regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise<br>• avoiding any unnecessary noise when carrying out manual operations and when operating plant<br>• ensuring spoil is placed and not dropped into awaiting trucks<br>• avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable<br>• switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded<br>• avoiding deliveries at night/evenings wherever practicable<br>• no idling of delivery trucks<br>• keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site<br>• minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors. |
| 22. | The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include:<br>• maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances<br>• using the most suitable equipment necessary for the construction works at any one time<br>• directing noise-emitting plant away from sensitive receivers<br>• regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc.<br>• using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works<br>• use of quieter and less vibration emitting construction methods where feasible and reasonable. |

| No. | Mitigation measure |
|---|---|
| 23. | Works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the TfNSW Environment and Planning Manager for any works outside normal hours. |
| 24. | Where the $L_{Aeq\ (15minute)}$ construction noise levels are predicted to exceed 75 dBA and/or 30 dBA above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with TfNSW's *Construction Noise and Vibration Strategy* (TfNSW, 2018b). This would include restricting the hours that very noisy activities can occur. |
| 25. | To avoid structural impacts as a result of vibration or direct contact with structures, the proposed works would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (WSP, 2018) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged. |
| 26. | Vibration resulting from construction and received at any structure outside of the project would be managed in accordance with:<br>• for structural damage vibration - German Standard DIN 4150: Part 3 – 1999 Structural Vibration in Buildings: Effects on Structures and British Standard BS 7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)<br>• for human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS *7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).* |
| 27. | Property conditions surveys would be completed prior to any vibration intensive work being carried out at or within the minimum distances set out in the CNVS. Where a heritage item is determined to be structurally unsound and a reassessment of the minimum working distances would be required. Minimum working distances should be confirmed prior to carrying out any vibration intensive work on site. |
| | Indigenous heritage |
| 28. | All construction staff would undergo an induction 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 the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites. |
| 29. | If unforeseen Indigenous objects are uncovered during construction, the procedures contained in the TfNSW *Unexpected Heritage Finds Guideline* (TfNSW, 2015a) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the OEH and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and the OEH notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location. |

| No. | Mitigation measure |
|---|---|
| | Non-Indigenous heritage |
| 30. | A heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction. |
| 31. | In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in the TfNSW *Unexpected Heritage Finds Guideline* (TfNSW, 2015a) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and the TfNSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and OEH. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location. |
| 32. | During construction, suitable measures would be put in place to ensure the retained heritage elements are protected from damage. Measures may include hoardings, use of spotters during the movement of equipment and other measures as necessary. Any accidental damage to a heritage item is to be treated as an incident, with appropriate recording and notification. |
| 33. | On completion of works, an update would be prepared for the Section 170 Heritage and Conservation Register, with required details. |
| 34. | A heritage conservation architect should be engaged during the detailed design process to inform the detailed design and assess the following design recommendations:<br>• retention of the coffered ceilings and air vents in the Communications Room and the toilets<br>• use of transparent screens on the ramp between the station carpark and the Overbridge<br>• in the design of the lift shaft base, utilise materials that are complementary to the existing materials palate, such as red brick in English stretcher bond to clad the lift shaft base. |
| 35. | The proposed impacts to significant fabric associated with the bricking in of two windows on the southern elevation can be mitigated by:<br>• investigating options to relocate the electrical cupboard elsewhere during detailed design<br>• if the electrical cupboard is to remain the proposed location, the windows should be retained and supplied with frosted/fire rated glass or boarded with fire rated fibre cement sheeting from the inside so as to maintain the façade, and<br>• relocating the air conditioning unit and reinstate the existing window detail. |
| | Socio-economic |
| 36. | A Community Liaison Plan would be prepared prior to construction to identify all potential stakeholders and 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 practicable. |
| 37. | 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. |

| No. | Mitigation measure |
|---|---|
| 38. | The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction. |
| | Biodiversity |
| 39. | Construction of the Proposal must be undertaken in accordance with the TfNSW *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2015d) and the TfNSW *Fauna Management Guideline* (TfNSW, 2015e). |
| 40. | All workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity. |
| 41. | Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the *Ecological Impact/Arborist Assessment* (WSP, 2018 and Earthscape Horticultural Services 2018) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures discussed below. |
| 42. | Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Ecological Impact/Arborist Assessment (WSP, 2018 and Earthscape Horticultural Services 2018). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs. |
| 43. | Where the loss of trees is unable to be mitigated, Transport for NSW would replace the tree removed as a result of the project in accordance with the TfNSW *Vegetation Offset Guide* (2016). In accordance with Section 5 of the guideline, four trees would be required to meet this offset requirement. |
| 44. | In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible. |
| 45. | Should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete the TfNSW Tree Removal or Trimming Application form and submit it to TfNSW for approval. |
| 46. | For new landscaping works, mulching and watering would be undertaken until plants are established. |
| 47. | Weed control measures, consistent with the TfNSW *Weed Management and Disposal Guideline* (TfNSW, 2015f), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Noxious Weeds Act 1993.* |
| | Soils and water |
| 48. | Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction. |

| No. | Mitigation measure |
|---|---|
| 49. | Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the works are complete and areas are stabilised. |
| 50. | Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area. |
| 51. | All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and the TfNSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2015g). |
| 52. | 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 Response Guidelines* (TfNSW, 2015g) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill. |
| 53. | In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager. The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act. |
| 54. | The existing drainage systems would remain operational throughout the construction phase. |
| 55. | Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and the TfNSW *Water Discharge and Reuse Guideline* (TfNSW, 2015b). |
| | Air quality |
| 56. | Air quality management and monitoring for the Proposal would be undertaken in accordance with the TfNSW *Air Quality Management Guideline* (TfNSW, 2015h). |
| 57. | Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks. |
| 58. | Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling. |
| 59. | Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable. |

| No. | Mitigation measure |
|---|---|
| **60.** | To minimise the generation of dust from construction activities, the following measures would be implemented:<br>• apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)<br>• cover stockpiles when not in use<br>• appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading<br>• prevent mud and dirt being tracked onto sealed road surfaces. |
| | Waste and contamination |
| **61.** | The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum:<br>• identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities<br>• detail other onsite management practices such as keeping areas free of rubbish<br>• specify controls and containment procedures for hazardous waste and asbestos waste<br>• outline the reporting regime for collating construction waste data. |
| **62.** | An appropriate unexpected contamination finds protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with SafeWork NSW requirements. |
| **63.** | All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility. |
| **64.** | All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal. |
| **65.** | Any concrete washout would be established and maintained in accordance with the TfNSW *Concrete Washout Guideline* – draft (TfNSW, 2015i) with details included in the CEMP and location marked on the ECM. |
| | Climate change and sustainability |
| **66.** | Detailed design of the Proposal would be undertaken in accordance with the *Infrastructure Sustainability Rating Scheme - Version 1.2* (ISCA, 2018) and the TfNSW *Environmental Management System* (EMS). |
| | Cumulative impacts |
| **67.** | 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 in the CEMP, and implemented as appropriate. |

# 8 Conclusion

This REF has been prepared in accordance with the provisions of section 5.5 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:

- a station that is accessible to people with a disability, limited mobility, parents with prams and people with luggage
- upgraded buildings and facilities for all modes that meet the needs of a growing population
- improved interchange and access facilities along Kingsgrove Avenue and Bexley Road

The likely key impacts of the Proposal are as follows:

- temporary impacts on local traffic flow associated with construction traffic and construction of the new station entrance from Bexley Road
- impacts to some existing parking spaces including temporary impacts to approximately 33 car parking spaces during construction, and the reduction of available parking spaces by 11 following completion of the Proposal
- introduction of new elements, such as the station entrance, lift and associated weather canopies, to the visual environment
- temporary noise and vibration impacts associated with construction activities
- temporary disruptions to station facilities and amenities during construction, including temporary closures of the Bexley North Station (during planned track possessions) and restricted pedestrian movements
- removal of eight trees to accommodate the upgrades to the commuter car park
- potential sediment mobilisation, dust generation and erosion risk during construction.

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 6, Appendix A and Appendix B). Based on the assessment contained in this REF, it is considered that the Proposal is not likely to have a significant impact upon the environment or any threatened species, populations or communities. Accordingly, an EIS is not required, nor is the approval of the Minister for Planning.

The Proposal would also take into account the principles of ESD (refer to Section 3.1.4 and Section 4.6). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

# References


ABS, 2016, *2016 Census QuickStats,* Australian Bureau of Statistics, Bexley North

AECOM, 2015, *Bexley North Station Precinct Accessibility Upgrade Concept Plan Project,* Sydney

AGIC, 2011, *Guidelines for Climate Change Adaptation,* Australian Green Infrastructure Council (now Infrastructure Sustainability Council of Australia), Sydney

Australian Standard, *AS1428 Design for Access and Mobility*

Australian Standard, *AS 2890 – Parking Facilities*

Bureau of Meteorology 2018, Australian Groundwater Explorer

Bayside Council, 2017, *Disability Inclusion Action Plan 2017-2021, Sydney*

Department of Environment and Climate Change, 2009*, Interim Construction Noise Guideline*, Sydney

Department of Environment and Conservation, 2006, *Assessing Vibration: A Technical Guideline*, Sydney

Department of Environment, Climate Change and Water, 2011*, NSW Road Noise Policy*, Sydney

Department of Environment and Energy, 2018, *EPBC Act Protected Matters Report generated 14/11/18*

Department of the Environment and Heritage, 2006, *Climate Change Impacts and Risk Management; A Guide for Business and Government,* Australian Greenhouse Office, Canberra

Department of Industry, 2018, *Crown Land Manager Reserves Portal,* Sydney

Department of Infrastructure, Planning and Natural Resources, 2004, *Guideline for Preparation of Environmental Management Plans*, Sydney

Department of Planning and Environment, 2014, *A Plan for Growing Sydney*, Sydney

EPA, 2000, *NSW Industrial Noise Policy,* Sydney

EPA, 2014, *Waste Classification Guidelines*, Sydney

Infrastructure Sustainability Council of Australia, 2018, *Infrastructure Sustainability Rating Scheme (v1.2)*

Landcom, 2004, *Managing Urban Stormwater: Soils and Construction, Volume - 4th Edition*, Sydney

Ministry of Transport, 2008, *Guidelines for the Development of Public Transport Interchange Facilities*, Sydney

NSW Government, 2014, *Rebuilding NSW - State Infrastructure Strategy 2014*, Sydney

NSW Government, 2015, *NSW: Making It Happen, Sydney*

NSW Heritage Office & Department of Urban Affairs and Planning, 1995, *NSW Heritage Manual*, Sydney

NSW Heritage Office, 1998, *How to Prepare Archival Records of Heritage Item*, Sydney

NSW Heritage Office, 2001, Assessing heritage significance, Parramatta

NSW Heritage Office, 2002, *Conservation Management Documents – Guidelines on Conservation Management Plans and Other Management Documents*, Sydney

NSW Heritage Office, 2005, *Interpreting Heritage Places and Items Guidelines*, Sydney

NSW Government, 2015, *State Priorities – NSW: Making It Happen*, Sydney

OEH, 2011, *Guidelines for Consultants Reporting on Contaminated Sites*, Sydney

OEH, 2018, *AHIMS Web Services Search Result,* Sydney

OEH, 2018a, *Bexley North Railway Station Group,* Sydney

RPS Group, 2018, *Bexley North Station Upgrade Preliminary Environmental Assessment Transport Access Program 3,* Sydney

TfNSW, 2012a, *NSW Long Term Transport Master Plan*, Sydney

TfNSW, 2012b, *Disability Action Plan 2012-17*, Sydney

TfNSW, 2013a, *Sydney's Walking Future - Connecting people and places*, Sydney

TfNSW, 2013b, *Greenhouse Gas Inventory Guide for Construction Projects*, Sydney

TfNSW, 2015a, *Unexpected Heritage Finds Guideline,* Sydney

TfNSW, 2015b, *Water Discharge and Reuse Guideline*, Sydney

TfNSW, 2015c, *Guide to Environmental Controls Map*, Sydney

TfNSW, 2015d, *Vegetation Management (Protection and Removal) Guideline*, Sydney

TfNSW, 2015e, *Fauna Management Guideline*, Sydney

TfNSW, 2015f, *Weed Management and Disposal Guide*, Sydney

TfNSW, 2015g, *Chemical Storage and Spill Response Guidelines*, Sydney

TfNSW, 2015h, *Air Quality Management Guideline,* Sydney

TfNSW, 2015i, *Concrete Washout Guideline - draft*, Sydney

TfNSW, 2016, *Vegetation Offset Guide*, Sydney

TfNSW, 2017a, *Open data Opal Tap On and Tap Off Location – 8th to 14th August 2016,* Sydney

TfNSW, 2017b, *NSW Sustainable Design Guidelines - Version 4.0*, Sydney

TfNSW, 2017c, *Disability Inclusion Action Plan 2018-2022*, Sydney

TfNSW, 2018a, *Future Transport Strategy 2056,* Sydney

TfNSW, 2018b, *Construction Noise and Vibration Strategy*, Sydney

# Appendix A 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 Commonwealth Department of the Environment.

| Matters of NES | Impacts |
|---|---|
| Any impact on a World Heritage property?<br>There are no World Heritage properties within a ten-kilometre radius of the site. | Nil |
| Any impact on a National Heritage place?<br>There are no National Heritage places within a ten-kilometre radius of the site. | Nil |
| Any impact on a wetland of international importance?<br>No wetlands of international importance are located within a ten-kilometre radius of the site. The Towra point nature reserve is located approximately twelve kilometres south east of the Proposal. | Nil |
| Any impact on a listed threatened species or communities?<br>Based on available habitat and the potential impacts of the Proposal, it is unlikely that any threatened species or community will be impacted. | Nil |
| Any impacts on listed migratory species?<br>No listed migratory species are likely to utilise the habitat within the study area. | Nil |
| Does the Proposal involve a nuclear action (including uranium mining)?<br>The Proposal does not involve a nuclear action. | Nil |
| Any impact on a Commonwealth marine area?<br>The Proposal would not impact on a Commonwealth marine area. | Nil |
| Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources?<br>The Proposal is not related to coal seam gas or mining, | Nil |
| Additionally, any impact (direct or indirect) on Commonwealth land?<br>The Proposal would not impact on Commonwealth land. | Nil |

# Appendix B Consideration of clause 228

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 |
|---|---|
| (a) Any environmental impact on a community?<br>There are potential impacts to the community associated with the construction phase of the Proposal. Mitigation measures in Table 7.1 would minimise the potential adverse impacts of the Proposal.<br>There would be positive long-term impacts associated with the operational phase of the Proposal. | Minor |
| (b) Any transformation of a locality?<br>Seven trees would be removed as a result of the Proposal. The Station would have an increased visual prominence resulting from the installation of the new station entrance, lift and canopy. The new elements would be consistent with the Station.<br>The Proposal would have a positive contribution to the locality through improving accessibility to the Station. | Minor |
| (c) Any environmental impact on the ecosystem of the locality?<br>There are potential impacts to the ecosystem surrounding the station associated with the construction phase of the Proposal, including the removal of seven trees. Mitigation measures in Table 7.1 would minimise the potential adverse impacts of the Proposal.<br>There are no long-term impacts associated with the operational phase of the Proposal. | Minor |
| (d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?<br>There are potential short-term reductions to environmental qualities and values associated with the construction of the Proposal. Mitigation measures in Table 7.1 would minimise the potential adverse impacts of the Proposal.<br>The Proposal would improve the value of the locality through improving accessibility to the Station. | Minor |
| (e) 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?<br>Bexley North Station is listed on the RailCorp Section 170 Heritage and Conservation Register. The heritage listing applies to the station platform and building. The Proposal would seek to retain existing heritage values, where possible (refer to section 6.5). | Minor |
| (f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)?<br>Based on available habitat and the potential impacts of the Proposal, it is considered unlikely that any threatened fauna would be impacted. | Nil |

| Factor | Impacts |
|---|---|
| (g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?<br>The Proposal would not have any impact on endangering any species. | Nil |
| (h) Any long-term effects on the environment?<br>There are no long-term effects on the environment resulting from the Proposal. | Nil |
| (i) Any degradation of the quality of the environment?<br>There is no anticipated degradation of the quality of the environment resulting from the Proposal. | Nil |
| (j) Any risk to the safety of the environment?<br>Mitigation measures in Table 7.1 would minimise the potential adverse impacts of the Proposal, including risks to environmental safety. | Nil |
| (k) Any reduction in the range of beneficial uses of the environment?<br>The Proposal would not reduce the range of beneficial uses of the environment. | Nil |
| (l) Any pollution of the environment?<br>Mitigation measures in Table 7.1 would minimise the potential adverse impacts of the Proposal, including pollution. | Nil |
| (m) Any environmental problems associated with the disposal of waste?<br>Mitigation measures in Table 7.1 would minimise the potential adverse impacts of the Proposal, including waste management. | Nil |
| (n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?<br>The Proposal would not place increased demand on resources that are, or are likely to become, in short supply. The Proposal may result in lower car dependence, reducing use of fossil fuels associated with car transport. | Nil |
| (o) Any cumulative environmental effect with other existing or likely future activities?<br>Works would be coordinated with any other construction activities in the area, through consultation and liaison with Bayside Council, RailCorp/Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise. | Nil |
| (p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?<br>The Proposal would not impact on coastal processes and is not subject to coastal hazards, including those projected under climate change conditions. | Nil |