METRO **city&southwest**

CHATSWOOD TO SYDENHAM SUBBISSIONS AND PREFERRED INFRASTRUCTURE REPORT

OCTOBER 2016







EXECUTIVE SUMMARY

Executive summary

Sydney Metro is Australia's biggest public transport project. A new standalone railway, this 21st century network would deliver 31 metro stations and more than 65 kilometres of new metro rail for Australia's biggest city – revolutionising the way Sydney travels.

The first stage of Sydney Metro – Sydney Metro Northwest – is currently being built between Rouse Hill and Chatswood.

The NSW Government is now proposing to build the second stage – Sydney Metro City & Southwest. The first component of this stage is the Chatswood to Sydenham project (the project), which would extend the metro rail line under Sydney Harbour, through new Sydney CBD stations and south to Sydenham.

The project is due to open in 2024 with the capacity to run a metro train every two minutes each way through the centre of Sydney – a level of service never before seen in Sydney. Sydney's new metro railway would have a target capacity of about 40,000 customers per hour, similar to other metro systems worldwide. This is a major increase on Sydney's current suburban system, which can reliably carry 24,000 people an hour per line.

Sydney Metro is part of a plan identified in *Sydney's Rail Future* to transform and modernise Sydney's rail network so it can grow with the city's population and meet the future needs of customers. The project is fully integrated with transport and planning strategies, being specifically addressed in the NSW Governments *State Infrastructure Strategy* and *Long Term Transport Master Plan*.

Sydney Metro, together with signalling and infrastructure upgrades across the existing Sydney rail network, would increase the capacity of train services entering the Sydney CBD – from about 120 an hour today to up to 200 services beyond 2024. This is an increase of up to 60 per cent capacity across the network.

The key components of the project would include about 15.5 kilometres of rail track within tunnels located between Chatswood and Sydenham. New metro stations would be built at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street and Waterloo, as well as new underground platforms at Central Station. The project would also include realignment of the T1 North Shore Line surface tracks, traction power substations and a number of ancillary components.

Project benefits

Sydney Metro City & Southwest and the project would deliver the following significant benefits:

- The Sydney Metro network would substantially increase rail network capacity by introducing new high-capacity rail connections between the Sydney CBD and other key economic centres in Sydney. It would cater for expected increased demand for rail services and accommodate an extra 100,000 customers per hour across the Sydney CBD rail lines
- Sydney Metro City & Southwest would relieve platform crowding at existing Sydney CBD stations, and reduce the amount of time customers spend on heavily crowded platforms. The new stations and platforms at Martin Place, Pitt Street, Central and Barangaroo would spread customers across more stations, thereby reducing crowding at Town Hall and Wynyard stations
- The project would substantially improve travel times for customers. The largest travel time savings would be experienced by customers travelling from new stations (such as Crows Nest), or where the project provides a more direct route of travel (such as Victoria Cross to Martin Place)
- The project would substantially increase accessibility to the broader transport network by extending the metro network under Sydney Harbour through the Sydney CBD and by increasing the number of Sydney CBD rail stations; and providing extra connectivity and interchange capacity at existing stations
- Sydney Metro City & Southwest would substantially increase transit amenity throughout Sydney, which would facilitate increased economic productivity and land use efficiency. This would provide the opportunity for development adjacent to metro stations within existing centres, activating precincts and providing new communities around metro station locations.

Consultation on the Environmental Impact Statement

In May 2016, the Environmental Impact Statement was placed on public exhibition for a period of 48 days (six weeks). During this time, consultation activities were carried out to engage key stakeholders and the community on information in the Environmental Impact Statement, encourage participation in exhibition activities and provide guidance on the submissions process. Submissions on the project were received by the NSW Department of Planning and Environment during the exhibition period.

Key stakeholders, such as local and State government departments and peak bodies, were briefed via emails, meetings, presentations and phone calls, to ensure they were adequately informed of the project.

Place Managers engaged residents, tenants and businesses throughout the exhibition period to ensure they were aware of the Environmental Impact Statement. Place Managers build relationships and act as a feedback mechanism to help ensure community and stakeholder aspirations are consistently considered in the planning process.

The project team hosted six information sessions where information about the project was displayed and explained. All members of the community were invited to attend these sessions and meet expert members of the project team and have questions answered. In addition, representatives from the Department of Planning and Environment attended all sessions.

Purpose of this report

This Submissions and Preferred Infrastructure Report documents and considers the issues raised in community and stakeholder submissions received during the public exhibition of the Environmental Impact Statement. Transport for NSW has carefully considered the content of the submissions and has prepared clarifications and responses to the issues raised in the submissions. This report also details project changes and additional investigations carried out since the exhibition of the Environmental Environmental Impact Statement.

In preparing this report and responding to some of the submissions, Transport for NSW has updated a number of the key management strategy documents for the delivery of the project, as appended to this report. In addition, archaeological heritage has been assessed further. Guidance on the management of heritage during construction is provided in the appended reports.

Overview of submissions

The Department of Planning and Environment received 318 submissions during the Environmental Impact Statement exhibition period. Of these submissions, 17 were from government agencies and local councils. These groups raised a range of issues relevant to their respective areas of interest and responsibility. Further information on key issues raised by each groups is provided in Chapter 5 (Submissions received).

A total of 301 submissions were received from the community and businesses. Key issues of most concern to the community and businesses included:

- Pedestrian and motorist safety around construction sites and haul routes
- O Noise and vibration impacts during construction and operation, including during out of hours work
- Construction traffic impacts
- Impacts on the performance of the local road network during construction and operation
- Suggestions for alternative tunnel alignments and additional station locations
- Future development opportunities around stations
- Impacts on property values and the need for property condition surveys
- Access and amenity related impacts to businesses during construction
- O Direct and indirect impacts on heritage items, including areas of potential archaeological value
- Visual impacts during construction and operation.

Chapter 6, Chapter 7 and Chapter 8 of this report present the issues raised in submissions and corresponding responses.

Changes to the project made since exhibition

Since exhibition of the Environmental Impact Statement, some changes have been made to the project design or construction methodology to minimise the environmental impact of the project and / or to address issues raised in submissions and during the assessment.

Among these are changes to the northern surface track works at Chatswood, changes to the proposed solution at the Pacific Highway / Mowbray Road intersection, changes to the design at Central Station, and the removal of rock breaking for cut-and-cover stations and station shafts (except for Central Station) outside of standard construction hours to reduce noise impacts. These changes are summarised below and further details are provided in Chapter 9 (Preferred Infrastructure Report).

Northern surface track works

Ongoing construction planning has identified the need to change the construction methodology for the proposed retaining wall beside the track. Frank Channon Walk, between Albert Avenue and Nelson Street, Chatswood, would be reconstructed in stages and would need to be closed for a longer period of time. To improve the safety of access to the western side of the rail corridor, there is a need to introduce a new temporary construction access point from Gordon Avenue.

Pacific Highway / Mowbray Road intersection

Consultation with stakeholders (including Roads and Maritime Services) on a solution for the Pacific Highway and Mowbray Road intersection has identified that it would be preferable to take into account broader road network requirements, and that it would be more desirable for upgrades of this intersection to be carried out at the one time to avoid multiple traffic disruptions. As a result, Transport for NSW would need to identify an intersection arrangement that improves on the solution described in the Environmental Impact Statement.

Design changes at Central Station

Several changes have been made to the design and construction methods at Central Station:

- The submission from the Heritage Council of NSW raised concerns regarding the impacts to heritage canopies from the proposed temporary pedestrian bridge. The project has now been revised and this bridge is no longer proposed. This would reduce impacts to heritage fabric at Central Station. Pedestrian movements would be mostly managed through underground subway connections
- Further construction planning has identified the need for an additional construction site to support the construction of the Sydney Yard Access Bridge. This is within the Sydney Yard area, just beyond the Regent Street access point
- Ongoing design development has identified the need for changes to the northern concourse to improve pedestrian circulation. This has resulted in the need to lengthen platforms 9 to 14
- It is now proposed to relocate the northern services building from the Eddy Avenue forecourt to the southern side of the Central Electric Building. This would consolidate the operational metro infrastructure.

Rock breaking

A number of submissions, including those from the Environmental Protection Authority and the community, raised concerns about the potential noise impacts outside standard daytime construction hours from rock breaking to excavate cut-and-cover stations and station shafts.

Ongoing construction planning has identified that it is no longer essential to carry out rock breaking for cut-and-cover stations and station shafts (with the exception of Central Station) outside of standard construction hours.

The removal of this previously proposed activity would substantially reduce the potential impacts associated with airborne and ground-borne noise in periods outside standard daytime construction hours.

Further investigations and clarifications

Since exhibition of the Environmental Impact Statement, additional investigations have been carried out into the following aspects of the project:

- Barangaroo track cross-over a track cross-over north of Barangaroo Station (identified as the optimal location for the cross-over) has been described and assessed
- Barangaroo Station barging the potential barging arrangements (in the event this solution is adopted) have been described and assessed
- O'Connell Street future underground pedestrian link the construction of the proposed underground pedestrian link between Martin Place Station and O'Connell Street has been described and assessed
- Waterloo Station revised footprint a larger station excavation at Waterloo to accommodate the structure required to tank the station (which is designed to inhibit the inflow of groundwater) has been described and assessed
- Additional heritage investigations the results of the Historical Archaeological Research Design and the Aboriginal Cultural Heritage Assessment Report to fulfil the requirements of mitigation measures NAH2 and AH2 from the Environmental Impact Statement have been documented.

Details regarding these additional investigations are provided in Chapter 3 (Clarifications – with additional investigations).

In response to design development, refinements to the project definition have also been made which provide further explanation and clarification. These are:

- Chatswood dive structure design refinement of the operational maintenance access
- Blues Point temporary site description of the potential barging of the tunnel boring machine components, if this is determined to be a feasible solution
- Over station development additional information regarding the provision for over station development and the relationship with the project
- Design principles for Sydney Yard Access Bridge updated design principles in recognition of the sensitive visual and heritage setting in which the bridge would be placed
- Clarification of noise receiver types revised noise and vibration assessment where further information on the specific use within some buildings has been obtained.

Details regarding these clarifications are provided in Chapter 2 (Clarifications).

Consultation on the Submissions and Preferred Infrastructure Report

During the preparation of this Submissions and Preferred Infrastructure Report, further engagement was carried out with stakeholders and community members who would be directly impacted by the following revised project scope items:

- Northern surface track works changes in construction methodology
- O'Connell Street future underground pedestrian link
- Waterloo Station revised footprint.

Stakeholder and community engagement activities included phone calls, letterbox drops, doorknocks, information via email and website, briefings and a community information session held in Chatswood. Feedback received through this engagement is addressed in this Submissions and Preferred Infrastructure Report.

Next steps

The Department of Planning and Environment will, on behalf of the NSW Minister for Planning, review the Environmental Impact Statement and this Submissions and Preferred Infrastructure Report. Once the Department of Planning and Environment has completed its assessment, a draft assessment report will be prepared for the Secretary of the Department of Planning and Environment, which may include recommended conditions of approval.

The assessment report will then be provided to the NSW Minister for Planning for consideration. The Minister for Planning may then approve the project, with any conditions considered appropriate.

The NSW Minister for Planning's determination, including any conditions of approval and the Secretary's report, will be published on the Department of Planning and Environment's website immediately after determination, together with a copy of this Submissions and Preferred Infrastructure Report.



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INTRODUCTION

CHAPTER ONE

1 Introduction

1.1 Overview

The New South Wales (NSW) Government is implementing *Sydney's Rail Future* (Transport for NSW, 2012a), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

Sydney Metro is a new standalone rail network identified in *Sydney's Rail Future*. The Sydney Metro network consists of Sydney Metro Northwest (previously known as the North West Rail Link) and Sydney Metro City & Southwest.

The proposed Sydney Metro City & Southwest comprises two core components:

- The Chatswood to Sydenham project (the project), which is the subject of this Submissions and Preferred Infrastructure Report. The project would involve construction and operation of an underground rail line, about 15.5 kilometres long, and new stations between Chatswood and Sydenham
- The second core component would involve upgrading the 13.5 kilometre rail line and existing stations from Sydenham to Bankstown which will be subject to a separate environmental assessment process.

A State significant infrastructure application report for Sydenham to Bankstown is anticipated to be lodged with the Department of Planning and Environment in late 2016. Chapter 6 of the Environmental Impact Statement also provides information regarding an interim operational arrangement in the event that the Chatswood to Sydenham component is opened in advance of the Sydenham to Bankstown component. An assessment of the relevant cumulative impacts between the Chatswood to Sydenham project and the Sydenham to Bankstown project is provided in Chapter 26 of the Environmental Impact Statement.

The project is subject to assessment by the Department of Planning and Environment and approval by the Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Sydney Metro Delivery Office has been established as part of Transport for NSW to manage the planning, procurement and delivery of the Sydney Metro network.

1.2 The project

The project involves the construction and operation of a metro rail line, around 16.5 kilometres in length, between Chatswood Station and just north of Sydenham Station. The proposed alignment, stations and operational ancillary infrastructure are shown in Figure 1-1.

The key operational components include:

- About 15.5 kilometres of twin rail tunnels (that is, two tunnels located side-by-side) between Mowbray Road, Chatswood and Bedwin Road, Marrickville. The tunnel corridor would extend about 30 metres either side of each tunnel centre line and around all stations
- About 250 metres of aboveground metro tracks between Chatswood Station and the northern dive structure
- A northern dive structure (about 400 metres in length) and tunnel portal south of Chatswood Station and north of Mowbray Road, Chatswood
- A southern dive structure (about 400 metres in length) and tunnel portal north of Sydenham Station and south of Bedwin Road, Marrickville
- New metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street and Waterloo, as well as new underground platforms at Central Station
- Underground pedestrian links and connections to other modes of transport (such as the existing suburban rail network) and surrounding land uses
- Realignment of T1 North Shore Line surface track within the existing rail corridor between Chatswood Station and Brand Street, Artarmon, including a new rail bridge for a section of the 'down' (northbound) track to pass over the proposed northern dive structure
- Permanent closure and demolition of the road bridge on Nelson Street, Chatswood
- Signalisation of the Mowbray Road / Hampden Road intersection at Chatswood
- Modification (including protection) of the road bridge on Mowbray Road, Chatswood to accommodate the reconfigured T1 North Shore Line track arrangement
- Services within each of the stations, including mechanical and fresh air ventilation equipment and electrical power substations
- A permanent power supply from Pyrmont or Surry Hills to Pitt Street Station
- Alterations to pedestrian and traffic arrangements and public transport infrastructure around the new stations and surrounding Central Station
- Signalisation of the Edinburgh Road / Edgeware Road / Bedwin Road intersection at Marrickville
- A substation (for traction power supply) at Artarmon
- A services facility (for traction power supply and an operational water treatment plant) adjacent to the southern dive structure
- Installation and modification of existing Sydney Trains rail systems including overhead wiring, signalling, access tracks / paths, rail corridor fencing and noise walls, within surface sections at the northern end of the project at Chatswood
- Removal of the existing Sydney Trains maintenance access point from Hopetoun Avenue, Chatswood and modifications to the existing access point from Drake Street, Artarmon
- Provision of a maintenance access point from Brand Street, Artarmon on the 'down' (western) side of the T1 North Shore Line
- Provision of maintenance access stairs from Albert Avenue, Chatswood.

The project would also include temporary ancillary facilities to support the construction of the project.



1.3 Purpose of this report

During public exhibition of the Environmental Impact Statement, 318 submissions were received by the Department of Planning and Environment. The Secretary of Department of Planning and Environment provided copies of the submissions to Transport for NSW.

In accordance with section 115Z of the EP&A Act, the Secretary required Transport for NSW to respond to the issues raised in these submissions in a submissions report. The Secretary also advised that if there were any proposed changes to the project to minimise its environmental impact or to address issues raised in submissions, a preferred infrastructure report would be required. This Submissions and Preferred Infrastructure Report has been prepared to fulfil both these requirements.

The structure and content of this report are outlined in Table 1-1.

Chapter	Description
Chapter 1	Introduction Provides an overview of the project and outlines the purpose and content of this report.
Chapter 2	Clarifications Provides clarifications to the information presented in the Environmental Impact Statement.
Chapter 3	Clarifications – with additional investigations The Environmental Impact Statement identified some elements of the project as requiring further investigations in the Submissions and Preferred Infrastructure Report. This chapter provides those investigations.
Chapter 4	Community and stakeholder involvement Provides details of the consultation, and community and stakeholder involvement activities carried out during the development of the Environmental Impact Statement, during exhibition of the Environmental Impact Statement and future consultation should the project be approved.
Chapter 5	Submissions received Provides a summary of the submissions received during the public exhibition of the Environmental Impact Statement.
Chapter 6	Government submissions Identifies the issues raised by government agencies and local councils and provides responses to those submissions.
Chapter 7	Businesses and educational institutions Identifies the issues raised by businesses and educational institutions directly impacted by the project and provides responses to those submissions.
Chapter 8	Community and other submissions Identifies the issues raised by the community and others, and provides responses to those submissions.
Chapter 9	Preferred infrastructure report Provides a description and assessment of changes made to the project as presented in the Environmental Impact Statement.
Chapter 10	Preferred infrastructure engagement Provides details of the consultation and community and stakeholder involvement activities carried out regarding changes to the project as described in Chapter 9 of this report
Chapter 11	Revised environmental mitigation measures and environmental performance outcomes Provides the revised consolidated environmental mitigation measures and environmental performance outcomes, resulting from the submissions received and the preferred infrastructure report.

Table 1-1 Structure and content of this report
1.4 Next steps

The Department of Planning and Environment will, on behalf of the NSW Minister for Planning, review the Environmental Impact Statement and this Submissions and Preferred Infrastructure Report. Once the Department of Planning and Environment has completed its assessment, a draft assessment report will be prepared for the Secretary of the Department of Planning and Environment, which may include recommended conditions of approval.

The assessment report will then be provided to the NSW Minister for Planning for consideration. The Minister for Planning may then approve the project (with any conditions considered appropriate) or refuse to give approval.

The NSW Minister for Planning's determination including any conditions of approval and the Secretary's report will be published on the Department of Planning and Environment's website immediately after determination, together with a copy of the Submissions and Preferred Infrastructure Report.

Chapter 1 - Introduction

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ENVIRONMENTAL IMPACT STATEMENT CLARIFICATIONS



2 Environmental Impact Statement clarifications

This chapter clarifies information included in the Environmental Impact Statement. The following clarifications are discussed:

- Chatswood dive structure access for maintenance
- Blues Point temporary site use of barges to transport tunnel boring machine components
- Design resolution for the project
- Over station development
- Design principles for the Sydney Yard Access Bridge
- Clarification of noise receiver types.

2.1 Chatswood dive structure – maintenance access arrangements

Chapter 6 (Project description – operation) of the Environmental Impact Statement identifies the maintenance access to the Chatswood dive structure extending as a decline ramp along Nelson Street, Chatswood with access for maintenance vehicles from Nelson Street. The Environmental Impact Statement further identifies that the Frank Channon Walk would be extended from Nelson Street to Mowbray Road on the western side of the railway line to provide an enhanced facility for pedestrians and cyclists as it would provide continuous access between Chatswood Station and residential areas to the south.

Ongoing design refinement has resulted in the access for maintenance vehicles being moved closer and aligned along the dive structure; it is now proposed that this access / egress would be via the Mowbray Road / Hampden Road intersection. Traffic signals would be installed at this intersection as part of the project. The Frank Channon Walk extension would run alongside the access road; however, there may be a requirement for a shared zone to provide vehicular access to the intersection while avoiding any additional direct impacts on Mowbray House (which is a local heritage item).

This arrangement would also enhance opportunities for the residual land at the Chatswood dive site (northern) and provide for the extension of the Frank Channon Walk.

The revised access for maintenance vehicles and extension of the Frank Channon Walk are shown (indicatively) in Figure 2-1. All activities would be contained within the construction site boundary as identified in Chapter 7 (Project description – construction) of the Environmental Impact Statement.

The final arrangement of the Frank Channon Walk extension to Mowbray Road, including any potential shared zone, would be determined during detailed design and would consider design approaches to manage any potential conflicts between pedestrians, cyclists and maintenance vehicles while avoiding additional impacts on Mowbray House. The design of the interface between the Frank Channon Walk extension and the intersection at Mowbray Road / Hampden Road (including any shared zone proposal) would be developed in consultation with Roads and Maritime Services and Willoughby Council. An additional mitigation measure is provided in Chapter 11 of this report (Revised environmental mitigation measures and environmental performance outcomes) to reflect this requirement.

Due to the low anticipated number of vehicles and the infrequent use of the access (refer to Chapter 9 of the Environmental Impact Statement), maintenance access is not expected to result in any impacts on the surrounding road network, or any noticeable increase in road traffic noise. Impacts on receivers along Nelson Street (including visual receivers) are not expected to differ from those presented in the Environmental Impact Statement. The impacts may reduce, given access would no longer be via Nelson Street.



Figure 2-1 Chatswood dive structure - access for maintenance vehicles, and extension of Frank Channon Walk

2.2 Blues Point temporary site – use of barges to transport tunnel boring machine components

Chapter 7 (Project description – construction) of the Environmental Impact Statement identifies that the opportunity to transport tunnel boring machine components from Blues Point by barge (as an alternative to truck transport), would be further investigated. This section provides a description of the potential barging arrangements if this is determined to be a feasible solution.

Figure 2-2 shows the potential barging arrangements at Blues Point. Indicatively, a barge would be moored at or close to the existing wharf at the end of Blues Point Road. The water is around four metres deep at this location, which provides sufficient depth without the need for any dredging. A crane would be established at the end of Blues Point Road (within the expanded site area) to lift the tunnel boring machine components onto the barge. Alternatively, a crane mounted on a barge could be used.

No further assessment of this activity is considered necessary as:

- A maximum of four barge trips would occur within the harbour as a result of this activity (if adopted), which would not result in any additional impacts on marine traffic in the harbour
- The extraction and lifting of the tunnel boring machine components is included in the construction noise assessment presented in the Environmental Impact Statement
- The visual assessment in the Environmental Impact Statement identifies the potential for cranes to be present at the site, and the short term occupation of the expanded site area during the extraction of the tunnel boring machine. It concludes that the impact of construction activity at this temporary site would have a high visual landscape impact, and a high adverse visual impact in areas around Blues Point and McMahons Point. The temporary addition of barges would be consistent with the visible construction elements assessed in the Environmental Impact Statement and would have negligible additional impact
- There would be no additional impact on Aboriginal or non-Aboriginal heritage items to that described and assessed in the Environmental Impact Statement. In particular, the work would be undertaken in a manner that would not have an impact on the waterfront wall, which forms part of the Blues Point Waterfront Group, a local heritage item under *North Sydney Local Environmental Plan 2013*
- The barging activities would not result in any change to the social and community infrastructure impacts as described and assessed in the Environmental Impact Statement.

Overall, it is expected that using a barge to transport tunnel boring machine components would result in negligible changes in impacts when compared with those assessed in the Environmental Impact Statement.



Figure 2-2 Potential barging arrangements at the Blues Point temporary site

2.3 Design resolution

Chapter 6 (Project description – operation) and Chapter 7 (Project description – construction) describes the key elements of the project including the construction and operation of the project, including the associated stations. Section 6.6 of the Environmental Impact Statement shows an indicative layout and section for each station.

The project defined in the Environmental Impact Statement is based on a concept design with each station subject to further design resolution. The design presents a general arrangement of each station based on current information. Following the determination of the planning approval, the detailed design for each station would be undertaken to ensure that the functional and operational requirements of Sydney Metro are accommodated in the built form to be constructed.

The final built form for each station would be the outcome of the detailed design process that would include consideration of the Chatswood to Sydenham Design Guidelines (refer to Appendix A) and an iterative process and review by Sydney Metro's Design Review Panel. In some cases, the detailed design of the infrastructure may vary from the concept design assessed within the planning approval. For example, the actual size, space and specific use of particular station spaces may change as part of the detailed design. However, the nature of such variations would be generally consistent with the concept design.

2.4 Over station development

Chapter 6 of the Environmental Impact Statement identifies that the metro stations would be designed and constructed to take into account, and make physical provision for, any design or other requirements associated with possible future over station development. This could include elements such as:

- Structural elements, building grids, column loadings and building infrastructure and services to enable the construction of future over station development
- Space for future lift cores, access, parking, retail and building services for the future over station development.

This design approach would potentially enable over station development to be more efficiently built and appropriately integrated into the metro station structure. Drawings that show this design interface as it is currently developed are provided in Appendix D of this report. These drawings reflect further design development since the Environmental Impact Statement was exhibited and are indicative only and not to scale. The integration of the over station development elements and the metro station elements would be subject to the design resolution process outlined in Section 2.3 of this report. It is also intended that the Design Review Panel process, to be established for this project, would be extended following the separate assessment process to apply to the over station developments, including the interface with the metro station elements and (subject to approval) the future built form of the over station development elements.

Provision of space for these elements has been made within the building footprints presented and assessed as part of the Environmental Impact Statement. The proposed location of these elements is to be finalised as part of the detailed design and may result in changes or clarifications to the section diagrams contained in this report and the Environmental Impact Statement.

The Environmental Impact Statement further indicates that over station development above the transfer slab would be subject to a separate assessment process. For clarity, the specific use and fit-out of the spaces below the transfer slab (above ground level, at ground level and below ground level – refer Figure 2-3) does not form part of the project and would be subject to a separate assessment process.

The project also includes a subdivision of the station sites to create separate lots for each of the stations. This will separate the land and air space required for the stations from the space required for future over station development. The subdivision for each station will be registered once the space requirements for the station have been finalised.

The construction of the project is not dependent on over station development proceeding. Should over station development not proceed at any site, it would not affect the project construction elements as identified in the Environmental Impact Statement. In the event that over station development does not proceed at any site, Transport for NSW would consult with key stakeholders (such as the Department of Planning and Environment and local councils) to determine the most appropriate use of the spaces created for potential over station development spaces as well as appropriate planning for the air space above the transfer slab, if necessary. The use of this space would be subject to a separate planning approvals process.

Transport for NSW will manage any vacant over station development spaces and may transfer them to third parties for redevelopment in the longer term. Make safe works and treatments for the transfer slab and other over station development spaces would be undertaken as part of the project as an interim measure. This may include appropriate temporary hoarding and security of the over station development site. Where residual development may not occur in conjunction with operation of the project, Transport for NSW will provide interim uses with the aim of activating street frontages. Interim activities undertaken as part of the project, including retail or commercial uses, will be implemented in consultation with the relevant local council.



Figure 2-3 Typical over station development interface (not to scale)

2.5 Design principles for Sydney Yard Access Bridge

Section 6.9.2 of the Environmental Impact Statement provides preliminary principles to guide the detailed design of the Sydney Yard Access Bridge. In recognition of the sensitive visual and heritage setting in which the bridge would be placed, additional architectural analysis was carried out (with input from heritage specialists), which resulted in a more detailed set of design principles for the bridge. These principles replace the principles listed in the Environmental Impact Statement, and have also been incorporated into an updated version of the Chatswood to Sydenham Design Guidelines (Appendix A). The design objective of the Sydney Yard Access Bridge is as follows:

The bridge will be of a high architectural and urban design quality, utilising structures, forms and materials that respond to and respect the industrial rail context and aesthetic of the Sydney Yard and setting of Mortuary Station.

The refined design principles (developed in consultation with the Department of Planning and Environment, Sydney Trains and the Heritage Council of NSW) are:

- The design shall be visually unobtrusive and minimise adverse impacts on existing views of significant heritage and provide wide and clear spans over the tracks.
- The bridge shall minimise impacts on the heritage values of Sydney Terminal and Central Railway Stations Group, the Chippendale Heritage Conservation Area (HCA), the Mortuary Station or the former Co-Masonic Temple.
- The bridge shall demonstrate best practice in integrated bridge engineering, architectural and urban design and construction.
- The bridge shall have a predominantly continuous compound curvature, with no sharp transitions or deviations, to create a simple elegant form with a gentle sinuous curvature in plan and elevation.
- The bridge shall have a low profile form with shallow deck and low super-structure; with low profile parapet, edge beams, and traffic barriers.
- The bridge approach to Regent Street shall be designed to integrate with the surrounding context and minimise the visual intrusion onto the streetscape.
- The entry driveway and access site off Regent Street is to ensure pedestrian safety and good sightlines across the vehicular driveway; allowing for a pedestrian pavement that continues across the driveway without a kerb or step.
- Landscape screening of dense hedge planting and / or climbing plants shall be provided to adjacent buildings and vertical surfaces to deter graffiti.
- Low maintenance native landscaping together with medium-sized native trees shall be provided to the residual spaces between the approach ramp and the site boundaries to soften the appearance of the site from Regent Street.
- The abutments shall be sympathetic to the existing surrounding viaducts, with bridge piers incorporated within the envelope of the bridge, and shall be of concrete construction with precast concrete panels.
- All screens, balustrades and fences shall be light weight and transparent, and be visually consistent in their aesthetic appearance.
- The bridge shall have no signage or advertising.
- Lighting of the bridge shall be inconspicuous and avoid spill lighting into the adjacent public domain or Mortuary Station and must also not distract train drivers.

2.6 Clarification of noise receiver types

Since the exhibition of the Environmental Impact Statement, further information has been obtained on specific noise receiver types. This information has been reviewed with respect to the noise and vibration assessment. It is noted that the predicted noise and vibration levels as a result of the project have not changed, rather the degree of impact considering the change in receiver type (ie commercial receivers and residential receivers have different noise management levels). The relevant sites are:

- Northern surface track works
- Crows Nest Station (the clarification of receiver types is included as part of the assessment associated with the removal of rock breaking outside standard construction hours – refer Section 9.6)
- Victoria Cross Station (the clarification of receiver types is included as part of the assessment associated with the removal of rock breaking outside standard construction hours – refer Section 9.6)
- Blues Point temporary site
- Barangaroo Station (the clarification of receiver types is included as part of the assessment associated with the barging option at Barangaroo refer Section 3.2)
- Martin Place Station (the clarification of receiver types is included as part of the further assessment of the O'Connell Street future underground pedestrian link entry – refer Section 3.3)
- Pitt Street Station (the clarification of receiver types is included as part of the assessment associated with the removal of rock breaking outside standard construction hours – refer Section 9.6)
- Central Station (the clarification of receiver types is included as part of the assessment associated with the changes at Central Station refer Section 9.4).

Consistent with the approach taken for the noise impact assessment, the noise and vibration modelling considers a worst case scenario for each phase of construction where the concurrent use of relevant plant and equipment is assumed to be working at the boundary of the construction site that is closest to the receiver. This is consistent with the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009a).

The actual noise and vibration levels associated with construction activities are likely to be lower than the predictions given that construction equipment would be moving around the construction site and would not always be closest to a particular receiver for the full duration of that construction phase.

2.6.1 Northern surface track works

In the vicinity of the northern surface track works, one receiver located to the west on Ellis Street (Area C) was correctly identified and assessed as education. It was also identified as being the closest receiver type of that category in Area C. However, the results were not presented in the summary table in the Environmental Impact Statement.

This receiver location is shown in Figure 2-4, and the predicted airborne noise level exceedances for this receiver are shown in Table 2-1.





Note 1: The results presented in the Environmental Impact Statement are shown in brackets () Note 2: DOOH = Daytime out of hours (i.e Saturdays 1pm to 6pm and Sundays 7am to 6pm) Note 3: Additional or clarified receiver types are shown in italics.

Table 2-1 indicates that there would be exceedances of the noise management levels of more than 20 dB during enabling works, track works and earthworks. The exceedance during earthworks accounts for the change in construction methodology as outlined in Section 9.1 of this report.

As presented in the Environmental Impact Statement, the vibration at this receiver would be below the screening criteria of 7.5 mm/s. As the receiver is not located near the dive structure, ground-borne noise and vibration impacts from tunnelling activities would not occur.

There would be no change to the predicted operational airborne noise levels for this receiver.



Figure 2-4 Sensitive noise receiver types near northern surface track works

2.6.2 Blues Point temporary site

East of the Blues Point temporary site, and south of Henry Lawson Avenue (Area D), one receiver was identified in the Environmental Impact Statement as a commercial receiver. However, this has since been identified as a residential receiver. This receiver location is shown in Figure 2-5.

The noise criteria (and therefore noise management levels) for residential receivers are more stringent than for commercial receivers. Therefore, although the predicted noise and vibration levels have not changed since the exhibition of the Environmental Impact Statement, the level of potential exceedances at this location has increased.



Figure 2-5 Revised classification of noise receiver at the Blues Point temporary site

Construction airborne noise

The predicted airborne noise level exceedances of the noise management levels for this reclassified receiver at the Blues Point temporary site are presented in Table 2-2. The following exceedances are predicted:

- Enabling works (one month) exceedances of more than 20 dB are predicted
- Earthworks and shaft excavation (one month) exceedances of between 10 dB and 20 dB are predicted
- Site reinstatement (12 months) exceedances of between 10 dB and 20 dB are predicted.

Table 2-2 Predicted airborne noise level exceedances for reclassified receiver at the Blues Point temporary site



Note 1: DOOH = Daytime out of hours (i.e Saturdays 1pm to 6pm and Sundays 7am to 6pm)

Construction ground-borne noise and human comfort vibration

Potential ground-borne noise impacts due to vibration-intensive construction activities (namely, rock breaking) have been considered based on the updated receiver type. It was found that daytime ground-borne noise levels would be up to 10 dBA higher than the noise management level for this receiver. Construction activities would only occur during the day at this location.

Operational ground-borne noise

The ground-borne noise levels would comply with the relevant criterion at the receiver during operation of the project.

CLARIFICATIONS -WITH ADDITIONAL INVESTIGATIONS

CHAPTER THREE

3 Clarifications – with additional investigations

The Environmental Impact Statement identifies that the scope of the following items would be further clarified through additional investigations:

- Barangaroo track cross-over
- Barangaroo Station use of barges for deliveries and to remove spoil
- O'Connell Street future underground pedestrian link to Martin Place Station
- Waterloo Station revised footprint.

Additional heritage investigations have also been carried out since the Environmental Impact Statement.

These clarifications and additional heritage investigations are discussed in this chapter.

3.1 Barangaroo track cross-over

Chapter 6 of the Environmental Impact Statement identifies that a track cross-over may be provided to improve operational efficiency and flexibility in the event of an incident. Further investigations have identified that the optimal location of a track cross-over would be north of the proposed Barangaroo Station.

3.1.1 Description

The Barangaroo track cross-over cavern would be located to the north of Barangaroo Station and would be around 190 metres long, 12 metres high and 20 metres wide. The location of the track cross-over is shown on Figure 3-1, with a long section shown on Figure 3-2.

Construction of the cross-over would be carried out from the Barangaroo Station construction site. This would involve:

- Excavation of the cavern using road headers
- Lining of the cavern to form a tanked structure
- Fit-out of the cavern with track, mechanical and electrical equipment.

The addition of the cross-over cavern would generate about 55,000 cubic metres of spoil at Barangaroo Station, taking the total spoil generation at Barangaroo Station to around 290,000 cubic metres. This would result in additional daily truck movements at the construction site, which would change the impacts assessed in the Environmental Impact Statement. These revised impacts are assessed in the following sections.



Figure 3-1 Barangaroo track cross-over (plan view)

BARANGAROO CROSSOVER LONG SECTION



Figure 3-2 Barangaroo track cross-over (long section)

3.1.2 Environmental screening assessment

To understand the potential change in environmental impacts compared to that assessed in the Environmental Impact Statement, a screening assessment was conducted and is presented in Table 3-1. This assessment considers potential environmental aspects that may require further assessment to understand likely environmental impacts, and identify any relevant mitigation measures that may be required. An assessment of those aspects determined to have a potential change in impacts from the Environmental Impact Statement is provided below.

Aspect	Potential change in impacts	Description
Construction traffic and transport	Yes	The addition of the cross-over cavern would increase the Metro construction vehicle numbers. A further assessment is provided in Section 3.1.3.
Operational traffic and transport	No	The cross-over cavern would not result in any changes to the function of Barangaroo Station, or require additional maintenance access. No further assessment is considered necessary.
Construction noise and vibration	Yes	The excavation of the cross-over cavern would result in the extended use of road headers, with excavation work closer to receivers above the tunnels. A further assessment is provided in Section 3.1.4.
Operational noise and vibration	Yes	The presence of a track cross-over may alter the operational noise profile of train operating on this section of track. A further assessment is provided in Section 3.1.5.
Land use and property	No	No additional land would be required to construct or operate the cross-over. No further assessment is considered necessary.

Table 3-1 Barangaroo cross-over - environmental screening assessment

Aspect	Potential change in impacts	Description	
Business impacts	No	The cross-over would not result in any additional impacts to businesses.	
		No further assessment is considered necessary.	
Non-Aboriginal heritage	No	The excavation of the cross-over would not result in any impacts on know non-Aboriginal heritage items and there would be no additional impacts in terms of vibration beyond those predicted in the Environmental Impact Statement. Further, the excavation would be entirely within rock and, as such, there would be no impact to potential archaeology. No further assessment is considered necessary.	
Aboriginal heritage	No	The excavation of the cross-over would not result in any impacts to known Aboriginal heritage items. Further, the excavation works would be entirely within rock and, as such, there would be no impact to potential archaeology. No further assessment is considered necessary.	
Landscape character and visual amenity	No	The cross-over would be located underground and would not require any additional land to facilitate construction.	
		No further assessment is considered necessary.	
Groundwater and geology	No	The excavation of the cross-over would result in additional tunnelling. However, the cavern would be tanked, which would prevent the long term inflow of groundwater. No further assessment is considered necessary.	
Soils, contamination and water quality	No	The cross-over would not change the potential soils, contamination or water quality impacts. No further assessment is considered necessary.	
Social impacts and community infrastructure	No	The cross-over would not result in additional impacts to community infrastructure or additional social impacts. No further assessment is considered necessary.	
Biodiversity	No	The cross-over would not result in any additional biodiversity impacts. No further assessment is considered necessary.	
Flooding and hydrology	No	The cross-over would be located entirely underground. No further assessment is considered necessary.	
Air quality	No	The cross-over would not result in any additional air quality impacts. No further assessment is considered necessary.	
Hazard and risk	No	The cross-over would not include the storage and use of any additional hazardous substances and dangerous goods, or be located within a bushfire prone area. No further assessment is considered necessary.	
Waste management	No	The cross-over would result in a minor increase in the volume of spoil generated. However, it would not result in the generation of any different waste materials or a change in the management approach. No further assessment is considered necessary.	

Aspect	Potential change in impacts	Description
Sustainability	No	The cross-over would not change the climate risk profile of the project, and would not result in a substantial change to the generation of greenhouse gases or the use of resources. No further assessment is considered necessary.
Cumulative impacts	No	The cross-over would not result in any additional cumulative impacts. No further assessment is considered necessary.

3.1.3 Construction traffic and transport

The excavation and fit-out of the cross-over would generate more construction vehicle movements on the surrounding road network than estimated in the Environmental Impact Statement. The total number of construction vehicles generated at the construction site is presented in Figure 3-3, and the change in heavy and light construction vehicle movements is presented in Table 3-2. There would be no change in construction vehicles associated with tunnel excavation, or to the construction routes presented in the Environmental Impact Statement.

As detailed in the Environmental Impact Statement, construction vehicles would enter and leave the site 24 hours a day, with the peak construction period occurring between 10am and 4pm. The arrival and departure pattern of construction vehicles would aim to minimise the impact of construction activity during the network peak periods, and keep heavy vehicle movements to a minimum at night-time.

	Change in heavy vehicles per hour			Change in light vehicles per hour		
Construction	AM / PM	Outside AN	1 / PM peak	AM / PM	Outside AN	1 / PM peak
activity	peak ¹	Maximum ²	Average ³	peak ¹	Maximum ²	Average ³
Excavation	+4	0	+10	+8	+6	+2
Fit-out	+4	0	+10	+4	+6	+2

Table 5 Z Increase in construction venicles as a result of the barangaroo track cross over (arrival only	Table 3-2	Increase in construction vehicles as a result of the Barangaroo track cross-over (arrival only)
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Note 1: The AM / PM peak is taken to be 7am to 10am, and 4pm to 7pm.

Note 2: The maximum period would occur between 10am to 4pm

Note 3: The average period would occur between 7pm and 7am

As detailed in Table 3-3 and shown in Figure 3-4, the additional vehicle movements generated by the cross-over would result in minimal change to the level of service at all intersections or the degree of saturation compared to that predicted in the Environmental Impact Statement. Additional intersection performance metrics, including average delay, are provided in Appendix F.

To manage the potential impacts on traffic and transport in the area, the mitigation measures presented in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) would be implemented. In particular, there would be ongoing consultation with the CBD Coordination Office, Roads and Maritime Services, City of Sydney Council, and Barangaroo Delivery Authority (BDA) to minimise traffic and transport impacts during construction (mitigation measure T1). No additional mitigation measures beyond those identified in the Environmental Impact Statement are considered necessary.









	Existing (base)		With project as presented in the EIS Assessment		With project including Barangaroo cross-over	
Peak period	Level of service	Degree of saturation	Level of service	Degree of saturation	Level of service	Degree of saturation
Shelley Street /	Sussex Street					
AM peak	А	0.61	А	0.63	А	0.66
PM peak	А	0.35	А	0.37	А	0.40
Sussex Street / N	Napoleon Street					
AM peak	В	0.70	В	0.68	В	0.68
PM peak	В	0.55	В	0.55	В	0.59
Kent Street / Na	poleon Street / M	argaret Street				
AM peak	В	0.52	В	0.52	В	0.52
PM peak	В	0.37	В	0.37	В	0.37
Kent Street / Cla	arence Street / Ha	rbour Bridge on-r	amp			
AM peak	E	1.00	E	1.00	E	1.00
PM peak	D	0.93	D	0.93	D	0.93
Sussex Street / E	Erskine Street					
AM peak	С	0.80	С	0.77	С	0.76
PM peak	В	0.59	В	0.59	В	0.59
Sussex Street / King Street						
AM peak	С	0.90	С	0.92	С	0.93
PM peak	В	0.72	В	0.73	В	0.76
Sussex Street / Market Street						
AM peak	В	0.82	В	0.83	В	0.84
PM peak	В	0.76	В	0.77	В	0.79

Table 3-3 Intersection performance – Barangaroo Station construction

Note: Level of Service reported for signalised intersections is for the overall intersection. Base and 'with project' results are based on 2016 traffic counts. Note: Outputs from LinSig Version 3.2

Note: Refer to Figure 8-31 of the Environmental Impact Statement for construction haulage routes



Figure 3-4 Barangaroo Station construction site - level of service with and without the Barangaroo cross-over

3.1.4 Construction noise and vibration

The construction of the cross-over would have the potential to generate additional ground-borne noise and vibration impacts on nearby sensitive receivers. To assess the potential impacts, it has been assumed that the road header would progress around four metres per day, and take around three months to complete.

The noise and vibration assessment is presented in Appendix E has found that:

- There would be no change in impacts during the daytime period for ground-borne noise when compared to the assessment presented in the Environmental Impact Statement
- There would be minor exceedances of the noise management level for ground-borne noise of up to 10 dB for nine residential buildings, located on Dalgety Road. Where ground-borne noise exceedances are identified, human comfort vibration exceedances would also be present
- O There would be no additional buildings with vibration levels above the screening criteria.

To manage the additional potential exceedances at the nine residential buildings, the mitigation measures presented in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) would be implemented, as well as the Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report). No additional mitigation measures are considered necessary.

3.1.5 Operational noise and vibration

The proposed cross-over would change the potential impacts on ground-borne noise and vibration during operation. The closest receivers to the cross-over cavern would be commercial and residential receivers. The noise model for the project was updated to include the cross-over located north of the station to identify any potential changes in impacts at sensitive receivers.

The assessment is provided in Appendix E, with the results presented in Figure 3-5 to Figure 3-7. It was found that the inclusion of the cross-over would marginally increase the operational noise levels at residential receivers located above the cross-over. Specifically, the six residential buildings at the northern end of Dalgety Road would experience an increase in noise levels from between 26 and 30 dB(A) (as assessed in the Environmental Impact Statement) to between 30 and 35 dB(A) during the night-time period (10pm to 7am). However, these levels would remain at or below the 35 dB(A) L_{Amax(slow)} night-time noise trigger levels identified in the *Rail Infrastructure Noise Guideline* (NSW Environment Protection Authority, 2013). Ground-borne noise for the closest commercial building would remain below the applicable noise trigger levels for that use.

As such, the inclusion of the proposed cross-over would not require additional mitigation measures.

Ground-borne noise trigger levels almost always require lower vibration levels than would otherwise be required by the vibration objectives for rail projects. Compliance with the ground-borne noise trigger levels would ensure that the vibration design objectives would be achieved. There are no known highly sensitive facilities near the cross-over that with particular sensitivity to vibration.





Figure 3-7 Predicted ground-borne vibration levels with the cross-over

3.2 Barangaroo Station – use of barges

Chapter 7 and Chapter 9 of the Environmental Impact Statement identify that it may be feasible to transport some of the spoil generated at the Barangaroo Station construction site by barge. Further investigations have been carried out to identify a feasible solution for barging in the event this is adopted as a transport method. Further investigations also identified that barges could be used to deliver materials to the Barangaroo Station construction site.

This section provides a description of the work required to enable barging to and from Barangaroo Station, and an assessment of the potential impacts of this activity.

3.2.1 Description

If barging is adopted as a transport method, barging facilities would likely be established to the south of the Nawi Cove. This would include around 200 metres of wharf frontage, with one section used to load spoil barges and another used as a berth for deliveries. A materials storage area would be be provided adjacent to the delivery berth. A maximum of seven barge trips per day (one-way) would be generated for spoil removal and deliveries.

A conveyor system would transport spoil from the main construction site to the wharf and a haul road would be established adjacent to the conveyor to transport material deliveries from the wharf to the construction site. The location and layout of the barging infrastructure is shown on Figure 3-8. A photo of the area of foreshore that would be impacted is provided in Figure 3-9.

It is expected that the barging area would operate after hours. This would require lighting on the barges to facilitate a safe working platform while berthed, and lighting within the adjacent construction sites.



Figure 3-8 Barangaroo Station – location and layout of barging infrastructure



Figure 3-9 Existing view south from Wulugul Walk at Nawi Cove to the possible barge facility site

3.2.2 Environmental screening assessment

To understand the potential change in environmental impacts compared to those assessed in the Environmental Impact Statement, a screening assessment was conducted and is presented in Table 3-4. This assessment considers potential environmental aspects that may require further impact assessment to understand likely environmental impacts, and identify any relevant mitigation measures that may be required.

Aspect	Potential change in impacts	Description
Construction traffic and transport	Yes	Barging would result in additional marine movements and would impact on pedestrian and cyclist movements. If the option were implemented, it would have major benefits in the reduction of construction vehicle movements on the surrounding road network. A further assessment is provided in Section 3.2.3.
Operational traffic and transport	No	Barging would occur during the construction phase only and would not alter the operational transport arrangements at Barangaroo Station. No further assessment is considered necessary.
Construction noise and vibration	Yes	The barging facilities would introduce new infrastructure and new noise sources during the construction phase at Barangaroo Station. A further assessment is provided in Section 3.2.4.

Table 7 4	Parangaraa barging anvironmental sereening assessment
Idule 3-4	Dd(d())d())Dd()())d() = e()(())(())(())()()()())()()()()())()()()

Aspect	Potential change in impacts	Description
Operational noise and vibration	No	Barging would occur during the construction phase only and would not alter any operational arrangements at Barangaroo Station.
		No further assessment is considered necessary.
Land use and property	Yes	Additional land would be required for the barging facilities, mainly within the Barangaroo Delivery Authority area.
		A further assessment is provided in Section 3.2.5.
Business impacts	No	Barging would not result in any additional impacts to businesses.
		No further assessment is considered necessary.
Non-Aboriginal heritage	No	Barging would not result in any impacts to known non-Aboriginal heritage items. There may be views of barging activities from heritage items or the heritage conservation area. However, these would not be significantly different from the views of the current construction activity at Barangaroo. Further, there would be no impact to potential archaeology as excavation is not proposed.
		With the restriction of rock breaking to only standard construction hours, there would be no change to vibration levels from those predicted in the Environmental Impact Statement for heritage items.
		No further assessment is considered necessary.
Aboriginal heritage	No	Barging would not result in any impacts to known Aboriginal heritage items. Further, there would be no impact to potential archaeology as excavation is not proposed.
		No further assessment is considered necessary.
Landscape character and visual amenity	Yes	The barging facilities would introduce temporary infrastructure adjacent to the wharf near Barangaroo Station.
visual amenity		A further assessment is provided in Section 3.2.6.
Groundwater and geology	No	Barging would not result in any additional groundwater and geology impacts as excavation is not proposed.
		No further assessment is considered necessary.
Soils, contamination and water quality	No	Barging would not result in any change to the potential soils, contamination or water quality impacts.
		No further assessment is considered necessary.
Social impacts and community infrastructure	No	Barging would not result in additional impacts to community infrastructure or additional social impacts.
minastructure		No further assessment is considered necessary.

Armost	Potential change	Description
Aspect	in impacts	Description
Biodiversity	No	Barging would not require the clearing of any vegetation, or the removal or any potential habitat. The fixed barge would be fixed to the adjoining land, and would not involve work to the harbour bed at this location. There is the potential for overshadowing impacts, but any impact on fauna (if present) would not be permanent.
		There is potential for the spread of marine pests (particularly the marine alga (<i>Caulerpa taxifolia</i>) from the transport of materials and spoil in the harbour (eg barges). However, C.taxifolia is not known to occur in the Barangaroo area. Mitigation measure B4 would be in place to avoid transportation of marine pests from other locations. Therefore, no impact is expected. No further assessment is considered necessary.
Flooding and	No	Barging would not result in any changes to flooding and would not alter
hydrology		existing stormwater systems.
		No further assessment is considered necessary.
Air quality	No	Without the implementation of adequate mitigation measures, barging would pose additional risks to local air quality. However, these risks would be readily managed through standard mitigation measures. No further assessment is considered necessary.
Hazard and risk	No	Barging would not include the storage and use of any additional hazardous substances and dangerous goods, or be located within a bushfire prone area. No further assessment is considered necessary.
Waste management	No	Barging would not result in the generation of any different and increased volumes of waste materials.
Sustainability	No	Paraing would not change the climate rick profile of the project and would
Sustainability	INO	not result in a substantial change to the generation of greenhouse gases or the use of resources.
		no further assessment is considered necessary.
Cumulative	No	Barging would not result in any additional cumulative impacts.
inpuets		No further assessment is considered necessary.

3.2.3 Construction traffic and transport

Road network performance

If barging to and from Barangaroo is adopted, there would be a benefit to the surrounding road network due to a reduction in construction vehicles transporting spoil or materials to the site. This would result in a reduction in potential impact and therefore no further quantification of the change in network performance was carried out.

As the internal haulage route would be restricted to construction vehicles only, this would have no impact on the surrounding network.

Maritime traffic impacts

Given the anticipated low volume of barge movements (around 14 movements per day), there would be minimal impacts to maritime services, including services to and from the planned ferry hub at Barangaroo, and the water taxi wharf at Rowntrees Wharf in Nawi Cove.

To minimise potential navigational safety impacts, warning signals and demarcation would be provided for the fixed supporting barge and for the barges moored at the designated loading / unloading areas.

The Port Authority of NSW (Harbour Master), Roads and Maritime Services and Sydney Ferries would be consulted in relation to all barge movements within Sydney Harbour to avoid impacts on the safety of other harbour users.

Active transport impacts

Wulugul Walk, which will eventually provide foreshore access for pedestrians and cyclists to King Street Wharf and Darling Harbour, is presently closed as part of the construction of Central Barangaroo. It is anticipated that the walk will be re-opened as construction activities for Barangaroo progress. At present, it terminates around 300 metres south of Nawi Cove, and provides no through access.

To allow for the infrastructure associated with the barge activities, Wulugul Walk would need to be closed for safety requirements at the point where the conveyor belt passes over the shared paths.

As the walk presently does not provide access to the south, any temporary closure would not have a significant impact on pedestrians or cyclists, with pedestrians and cyclists having to use Hickson Road to travel to / from areas further south of Barangaroo Point Reserve.

The completion of the Central Barangaroo precinct is expected to occur in 2024. If the remaining sections of Wulugul Walk within Central Barangaroo are completed while construction of the project is underway, alternative paths would be available for north-south movements (such as Hickson Road).

Any changes to Wulugul Walk would be subject to mitigation measures as proposed in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes), such as directional signage (mitigation measure T3) and advanced community notifications (mitigation measure T5).

3.2.4 Construction noise and vibration

The establishment and operation of the barges at Barangaroo, including the movement of barges to and from the shoreline to the harbour, would generate additional noise impacts on nearby sensitive receivers. To assess these potential impacts, the construction noise assessment for Barangaroo Station, as provided in the Environmental Impact Statement, has been expanded to include the additional activities. The assessment incorporates revisions to:

- The classification of sensitive receiver types near Barangaroo Station (refer to Section 2.6). The sensitive receiver type changes relate to a receiver to the north on Hickson Road. This receiver was identified as commercial, However, it has since been identified that there is a theatre located on the upper floors of this building and the building is now re-classified as a theatre receiver
- A receiver to the east on High Street, which was identified and assessed as a childcare centre in the Environmental Impact Statement. However, this receiver was not identified in the summary table for airborne noise as the nearest receiver of that type. For completeness, this has now been included in the summary table
- The removal of rock breaking at night, as rock breaking would now only occur during standard construction hours (refer to Section 9.6).
Airborne noise

A number of scenarios were developed for the daytime, evening and night-time periods to be representative of activities that would potentially have the greatest noise impact on surrounding receivers. These scenarios have been developed as a subset of those discussed in Section 3 of the *Technical Working Paper 2 Noise and Vibration*, and are:

- Enabling work, including mobilisation and demolition
- Earthworks, which consists of initial excavation (noting that rock breaking during excavation would now only occur during standard construction hours)
- Construction of an acoustic shed to shield the excavation work
- Excavation and tunnelling with an acoustic shed, including the barge support activities of spoil and materials handling
- Barge movements from the barge berth south of the Nawi Cove to a point in the harbour north of Barangaroo Reserve and west of the Harbor Bridge
- Construction and fit-out of the station.

A summary of the predicted noise level exceedances at the nearest sensitive receivers is provided in Table 3-5 for each construction scenario. Noise level exceedances are shown in brackets where they have changed from those presented in the Environmental Impact Statement.

The findings of the construction noise impact assessment indicate that:

- The restriction of rock breaking activities to standard construction hours during excavation has removed predicted exceedances of noise management levels at residential receivers in Areas A and B. In Area C and D, it has resulted in minor predicted exceedances of up to 10 dB at residential receivers during excavation with an acoustic shed, during the daytime (outside standard construction hours), evening and night-time periods. Sleep disturbance noise management levels would now not be exceeded at any receiver type
- The addition of the barging activities would not increase exceedances of noise management levels as presented in the Environmental Impact Statement. While barging within Barangaroo would introduce a new source of airborne noise, it would not be to a level that would cause an increase in the category of exceedance. This is in part due to the restriction of rock breaking activities to standard construction hours, which has lowered the predicted noise contribution from excavation activities
- Barge movements would be within the noise management levels for all receiver areas.
- For the theatre in Area B, exceedances greater than 20 dB above the noise management levels are predicted during enabling work, earthworks, excavation and construction. Moderate exceedance of the noise management levels of between 10 dB and 20 dB are predicted during construction of the acoustic shed, and minor exceedances of up to 10 dB during excavation (daytime out of hours).
- For the childcare centre in area C, exceedances greater than 20 dB above the noise management levels are predicted during enabling work and earthworks. Moderate exceedance of the noise management levels of between 10 dB and 20 dB are predicted during construction of the acoustic shed and excavation, and minor exceedances of up to 10 dB during excavation (daytime out of hours).

Table 3-5 Predicted airborne noise level exceedances at Barangaroo Station

Noise modelling scenario

Noise modelling scenar	Site establishment	Earthworks	Acoustic shed construction	Excavation with shed		Building construction			Barge travel through harbour					
Receiver area	Day	Day	Day	Day	DOOH	Evening	Night	Sleep	Day	Day	НООО	Evening	Night	Sleep
A Commercial receiver to the east (to be constructed)	•	•	•	•	•	•	•	•	•	•	٠	٠	•	•
A Residential receivers to the west and south (to be constructed)	•		•	•		•			•	•	•	•	•	•
B Residential receivers to the north on Bettington Street	•	•	•		•	•	•	•	•	•	•	•		•
B Passive recreation area receivers to the north in Barangaroo reserve	•		•	•	•	•	•	•			•	•	•	•
C Residential receivers to the east on High Street	•	•	•	•	•	•	•	•	•	•	٠	٠	•	•
D Residential receivers to the south on High Street	•	•	•		•		•		•	•	•	•	•	•
D Commercial receivers to the south on Hickson Road	•	•	•	•	•	•	•	•	•	•		•	•	•
E Residential receivers to the west in Balmain East	•	•	٠	•	•	•	•	•	•		٠	•	•	
Legend NML compliance NML ex less that	kceedanc an 10 dB	ce of		N I 10	ML exc dB ar	ceedai nd 20 (nce be dB	etweer	n (NM mo	IL exce re tha	eedan n 20 c	ce of IB	

Note 1: The results presented in the EnvironmentI Impact Statement are shown in brackets () Note 2: DOOH = Daytime out of hours (i.e Saturdays 1pm to 6pm and Sundays 7am to 6pm) As identified in the Environmental Impact Statement, feasible and reasonable noise mitigation measures would be implemented in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (refer to Appendix C of this report) to minimise airborne construction noise where exceedances are predicted. Standard mitigation measures that could be implemented, where feasible and reasonable, include avoiding the coincidence of noisy plant operating simultaneously close together, use of dampened rock hammers, scheduling of noisy activities during less sensitive periods, and considering opportunities in site layouts to shield receivers from noise.

On-site night-time LAmax truck noise

As shown in Table 3-5, the L_{Amax} noise levels associated with barge support activities would exceed the sleep disturbance screening level by up to 10 dB at residential receivers in area A during excavation with an acoustic shed. This is consistent with the impact predicted in the Environmental Impact Statement.

Vibration

During excavation of the shafts, vibration levels are anticipated to remain below the vibration screening levels associated with minor cosmetic building damage at all buildings except for one building – the heritage listed Dalgety Bond Store – adjacent to the north of the site on Hickson Road, and one proposed building to the south. The predicted exceedance at Dalgety Bond Store would be consistent with the predicted exceedance identified in the Environmental Impact Statement.

A more detailed assessment of these structures and attended vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for these structures.

The construction of the conveyor between the construction site and the wharf may require bored piles. If these were required, vibration levels from the piling activity would remain below the relevant cosmetic damage screening criteria at the nearest sensitive receivers.

Construction ground-borne noise

The ground-borne noise analysis indicates that:

- For the receivers along High Street (including the childcare centre), there would be ground-borne noise level exceedances of up to 10 dBA during the daytime period. However, as rock breaking would be restricted to standard construction hours, exceedances during the night-time would no longer occur
- The theatre located on Hickson Road is predicted to have ground-borne noise level exceedances of the noise management levels greater than 25 dBA during the daytime period. The restriction of rock breaking to standard construction hours would reduce the level of ground-borne noise experience at this receiver during the night-time period; however, exceedances of up to 10 dB would remain.

As identified in the Environmental Impact Statement, feasible and reasonable noise mitigation measures would be implemented to minimise ground-borne noise where exceedances are predicted. Mitigation measures would be implemented in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (refer to Appendix C of this report).

Blasting

Consistent with the approach taken in the Environmental Impact Statement, blasting has been considered due to the level and duration of ground-borne noise exceedances associated with rock breaking. As rock breaking would now only be undertaken during standard construction hours, only the daytime period has been further considered.

Table 3-6 shows the number of daytime periods when the noise management levels would be exceeded while excavation is underway. As shown, the adoption of blasting as an excavation technique would reduce impacts on receivers during the daytime period (there would be a reduction in impact of up to 50 per cent for residential receivers).

	Number of daytime periods above noise management levels						
	Residential		Commercial				
Scenario	Blasting plusNo blastingrock breaker		No blasting	Blasting plus large rock breaker			
Barangaroo	153	73	4	3			

Table 3-6 Barangaroo Station - blasting scenarios

Further detailed construction planning, through the development of Construction Noise Impact Statements (as required by the Sydney Metro Construction Noise and Vibration Strategy in Appendix C of this report) would determine detailed construction activities with the aim of reducing ground-borne noise impacts on receivers. This could involve the consideration of different sized rock breakers at different periods, and the positioning of rock breakers within the site during different periods.

With careful planning and positioning of the rock breakers it may be possible to avoid consecutive periods of noise management levels exceedance at any one receiver, effectively providing respite periods. For any residual exceedances of the noise management levels, additional mitigation measures would be implemented in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (refer to Appendix C of this report).

3.2.5 Land use and property

Chapter 12 (Land use and property) of the Environmental Impact Statement provides an assessment of potential impacts to land use and property as a result of the project.

Subject to detailed construction sequencing, the barging option and associated infrastructure would be partially located within the foreshore areas of Barangaroo Reserve, referred to as Wulugul Walk, and partially within the construction footprint of Central Barangaroo precinct.

Central Barangaroo is currently under development and is scheduled to be completed in stages by 2024. It is currently a construction site that supports the construction of Barangaroo South and will continue to be a construction site as the Central Barangaroo precinct is developed.

Central Barangaroo covers 5.2 hectares. It will effectively become the cultural heart of Barangaroo, and will include a combination of civic and cultural attractions along with recreational, residential, retail and commercial uses. The proposed restaurants and cafes to be located at Wulugul Walk at Central Barangaroo have not yet commenced construction.

The barging option would require the temporary occupation of foreshore areas and parts of the Central Barangaroo precinct (subject to more detailed construction sequencing of both projects) for a storage area, internal haulage route and elevated conveyor system. The majority of this infrastructure would be within the Central Barangaroo precinct. The use of the land would be secured by way of lease or a Memorandum of Understanding with Barangaroo Delivery Authority.

The temporary occupation of open space areas would have a minor land use impact associated with the removal of foreshore access. This would impact on a limited section of the Wulugul Walk, which currently terminates around 100 metres south of the barging area footprint.

The temporary occupation of construction areas of Central Barangaroo could have impacts on the staging of that development. To manage these impacts, the final configuration of construction activities within Central Barangaroo would be determined in consultation with the Barangaroo Delivery Authority with the objective of minimising disruption to construction staging for the precinct.

3.2.6 Landscape character and visual assessment

The barging option and associated infrastructure would be partially located within the foreshore areas of Wulugul Walk, and partially within the construction footprint of Central Barangaroo precinct.

Wulugul Walk includes a timber wharf along the harbour edge, locally quarried sandstone retaining walls, broad decomposed granite and asphalt footpaths with a triple avenue of trees, bicycle racks and lighting. Seats are provided at intervals along the path. This location provides views across the harbour to the Balmain peninsular. The foreshore park also provides access to the foreshore unfettered by boat mooring or other development.

An assessment of the landscape character and visual impacts has been completed in accordance with the methodology and rating systems as identified in Chapter 16 (Landscape character and visual amenity) of the Environmental Impact Statement.

Landscape impacts

Landscape impacts anticipated during construction and operation are summarised in Table 3-7 and Table 3-8.

During construction, there would be:

- A high adverse landscape impact on Wulugul Walk due to the restriction of access to the foreshore and proximity of construction activities to remaining accessible foreshore areas. This would reduce the attractiveness of this space
- A moderate adverse landscape impact on Sydney Harbour and foreshore areas. The presence of the barges and supporting infrastructure would result in a noticeable reduction in the landscape quality of this area.

Following the completion of construction, all infrastructure associated the barging would be removed. The path and landscaping would be reinstated consistent with existing landscaping, and with plantings of a similar maturity to the surrounding area.

		Construction in	npact	Operation impact			
Location	Sensitivity rating	Modification rating	Impact rating	Modification rating	Impact rating		
Sydney Harbour and foreshore areas	Regional	Noticeable reduction	Moderate adverse	N/A	N/A		
Wulugul Walk	Regional	Considerable reduction	High adverse	No perceived change	Negligible		

Table 3-7	Barangaroo	Station -	landscape	impacts	with	barging	option
	24.4.94.00						• p • • • • •

Daytime visual amenity impacts

The anticipated daytime visual impacts on representative viewpoints during construction and operation are summarised in Table 3-8. Viewpoints 10 to 12 are presented as additional viewpoints to those assessed within the Environmental Impact Statement, and are shown on Figure 3-10.

As noted in Table 3-8, during construction, there would be additional adverse visual impacts due to the construction activity and infrastructure, and the changes to open space areas along the foreshore. While the work would be adjacent to construction activities associated with the Central Barangaroo site, the impacts would still be moderate to high due to the sensitivity of the views. The exception would be for views north from Wulugul Walk at Barangaroo South, where impacts are predicted to be negligible due to the distance and partial obstruction of views by the existing wharf and Central Barangaroo.

Following the completion of construction, all infrastructure associated with barging would be removed and the Wulugul Walk reinstated with landscaping. As such, there would be a negligible permanent and long term landscape impacts on all viewpoints.

No additional mitigation measures have been identified as the mitigation measures presented in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) would address the potential impacts where there is an interface with public space areas.



Indicative only, subject to design development



Figure 3-10 Barangaroo Station construction site - viewpoints

		Construction in	npact	Operation impact			
Location	Sensitivity rating	Modification rating	Impact rating	Modification rating	Impact rating		
Viewpoint 2: View east to Barangaroo from Darling Harbour	Regional	Noticeable reduction (no perceived change) ¹	Moderate impact (negligible) ¹	No perceived change	Negligible		
Viewpoint 10: View south from Wulugul Walk at North Cove	Regional	Considerable reduction	High adverse	No perceived change	Negligible		
Viewpoint 11: View southwest from Barangaroo Reserve	Regional	Noticeable reduction	Moderate impact	No perceived change	Negligible		
Viewpoint 12: View north from Wulugul Walk at Barangaroo South	Regional	No perceived change	Negligible	No perceived change	Negligible		

Table 3-8 Barangaroo Station - daytime visual impacts with barging option

Note 1: The modification rating and impact rating in brackets denote the originally assessed impacts as stated in the Environmental Impact Statement.

Night-time visual impacts

Barging would involve night-time work, which would create an additional source of lighting at storage areas along the foreshore and barge infrastructure.

As indicated in the Environmental Impact Statement, the project would have negligible night-time visual impacts during construction due to its brightly lit Sydney CBD location, and the relatively few visual receivers that are currently immediately adjacent to the site in the Central Barangaroo precinct. This level of impact would not change as a result of barging, and the area of the Wulugul Walk directly impacted does not presently attract a large number of night-time users.

As Central Barangaroo develops, the number of night-time users would increase, including additional residential receivers. Should this occur while construction of the project continues, mitigation measures around minimising light spill would be implemented (mitigation measure LV3).

3.3 O'Connell Street – future underground pedestrian link

Chapter 6 of the Environmental Impact Statement identifies that further investigations were being carried out for a proposed underground pedestrian connection and station entry for Martin Place metro station at 33 Bligh Street (now referred to as the O'Connell Street site). The Environmental Impact Statement identifies the construction activities that may be expected to occur at this site but does not provide a detailed impact assessment. The results of the further investigations and potential impacts are presented below, which are subject to ongoing negotiations with Ausgrid regarding the use of this site.

3.3.1 Need and justification

Chapter 9 (Operational traffic and transport) of the Environmental Impact Statement identifies that additional pedestrian crossing capacity may be needed at the intersection of Hunter and Castlereagh streets as a result of the proposed Martin Place metro station. As a result, an underground pedestrian connection between the metro station and O'Connell Street and / or Bligh Street was identified as one possible response, with a potential entry / exit at 33 Bligh Street. The site for the entry / exit point was identified on the basis of the opportunity provided by the current development work being carried out by Ausgrid (which is the landowner). The major benefits of an underground pedestrian link at this location would include:

- Reduced pedestrian queuing and congestion at the intersection of Hunter and Castlereagh streets and adjoining footpaths (particularly Hunter Street)
- Improved safety, with a reduction in informal crossings in the general vicinity of this intersection
- Improved operational performance of the metro station by:
 - simplifying pedestrian movements at platform level at the northern station entry
 - splitting pedestrian demand and reducing congestion on the escalators at the northern station entry.

Transport for NSW has continued its investigation into this option in consultation with Ausgrid. However, at this stage, it has determined that it would be necessary for any design and fit-out associated with an additional station entry / exit at this location to be incorporated into the future architectural design and construction of the new building at 33 Bligh Street. This building currently has a Concept and Project approval under Part 3A of the *Environmental Planning & Assessment Act 1979*.

As part of the construction of Martin Place metro station, it is now proposed to excavate the tunnel for the underground pedestrian link (refer to Section 3.3.2). This construction work would be in addition to work assessed in the Environmental Impact Statement. However the provision and fit out of the station entry / exit would be subject to a separate assessment and approval process given the need for it to be integrated into the proposed building development at this site.

This is a similar approach to future over station developments, in that the future underground connections would be designed and constructed to account and provide for the physical provision for potential elements associated with the station entry and pedestrian link.

Transport for NSW is continuing to negotiate with Ausgrid regarding the use of this site and to ensure appropriate planning and legal mechanisms are in place to maintain the opportunity for this site as a future entry / exit for Martin Place Station.

3.3.2 Construction activities

As identified in Chapter 7 of the Environmental Impact Statement, the key activities that would be carried at the O'Connell Street site to construct Martin Place Station would include:

- Excavation of a shaft to provide a future station entry / exit and vertical transport
- Excavation of underground pedestrian connections from the shaft using a mined technique
- Excavation of the Martin Place Station caverns using two road headers.

Excavation for the pedestrian link is expected to generate 54,000 cubic metres of spoil. This would be in addition to the 175,000 cubic metres identified in the Environmental Impact Statement. Construction access would be left-in from O'Connell Street and left-out to Bligh Street.

Construction works would occur for about 12 months, and would take place at the same time as Martin Place Station is being constructed. This is expected to occur from the fourth quarter of 2017 until the third quarter of 2019.

Construction would be carried out 24 hours per day, seven days a week consistent with Table 7-20 of the Environmental Impact Statement.

The location and indicative layout of the O'Connell Street construction site (being the 33 Bligh Street property), including vehicle access and egress, is shown in Figure 3-11.

Drainage infrastructure and surfacing of the tunnel would be designed to cater for the construction period and until such time that the pedestrian link is fitted out.

At the completion of construction, the site would be returned to Ausgrid (as landowner).



Figure 3-11 O'Connell Street - indicative construction site layout

3.3.3 Environmental screening assessment

To understand the potential change in environmental impacts compared to those assessed in the Environmental Impact Statement, a screening assessment was conducted and is presented in Table 3-9. The assessment considers potential environmental aspects that may require further impact assessment to understand likely environmental impacts, and identify any relevant mitigation measures that may be required. The screening assessment is presented in Table 3-9.

Aspect	Potential change in impacts	Description
Construction traffic and transport	Yes	The proposed works would result in additional haul routes and additional construction traffic movements. A further assessment is provided in Section 3.3.4.
Operational traffic and transport	Yes	The proposed works would result in an additional station entry and integration with the surrounding road and transport network. This would provide benefits to pedestrians within the station, and along the pedestrian network, at surface. A further assessment is provided in Section 3.3.4.
Construction noise and vibration	Yes	The proposed works would result in an additional construction site. A further assessment is provided in Section 3.3.5.
Operational noise and vibration	Yes	As approval is not being sought for the operation of the underground pedestrian link (including the entry / exit), there would be no additional operational noise and vibration associated with the proposed works. There may be additional sources as part of the future fitout of the station entry / exit. A further assessment is provided in Section 3.3.11.
Land use and property	Yes	The proposed works would require additional property. A further assessment is provided in Section 3.3.6.
Business impacts	Yes	The proposed works may result in impact to additional businesses. A further assessment is provided in Section 3.3.7.
Non-Aboriginal heritage	Yes	The proposed works are located in close proximity to known non-Aboriginal heritage items. Additionally, the work would involve excavation in additional areas with archaeological potential. A further assessment is provided in Section 3.3.8.
Aboriginal heritage	Yes	The proposed works would involve excavation in additional areas with Aboriginal archaeological potential. As such, an assessment is provided in Section 3.3.9.
Landscape character and visual amenity	Yes	The proposed works would require an additional construction site, and further assessment is provided in Section 3.3.10. At the completion of construction, there would be no visible feature.
		The future entry / exit at Bligh Street (subject to separate assessment and approval) would result in additional permanent built structures that have the potential for visual impacts. This is discussed further in Section 3.3.11.

Table 3-9 O'Connell Street future underground pedestrian link - environmental screening assessment

Aspect	Potential change in impacts	Description
Groundwater and geology	No	The extent of additional underground elements that could lead to an increase in groundwater impacts would be minor within the context of the project impacts at this location. As such, the proposed works would not change the potential impacts on groundwater, as presented in the Environmental Impact Statement. Further, the total predicted annual inflow provided in Section 17.4.3 of the Environmental Impact Statement would not increase given that assessment assumed all project elements would be drained. The target levels for groundwater levels established in mitigation measure GWG1, would also apply to the underground link. The target levels generally aim to keep the project related changes to within natural variation of groundwater levels encountered in the past. No further assessment is considered necessary.
Soils, contamination and water quality	No	The proposed works would not change the likely potential soil, contamination or water quality impacts. Mitigation measures as provided in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) of this report would be implemented to manage potential impacts. No further assessment is considered necessary.
Social impacts and community infrastructure	No	The proposed works would not result in additional impacts to community infrastructure. The potential impacts to amenity during construction would be consistent to that assessed in the Environmental Impact Statement. Mitigation measure SO2 would manage any potential impacts on sensitive community facilities in the area. No further assessment is considered necessary.
Biodiversity	No	The proposed works would not result in additional biodiversity impacts as the site is highly disturbed with no vegetation. No further assessment is considered necessary.
Flooding and hydrology	No	The proposed works are not located in flood prone land and would not alter existing stormwater systems. No further assessment is considered necessary.
Air quality	No	The proposed works would not result in any additional air quality impacts, with the site currently an existing construction site. Mitigation measures, as detailed in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes), would manage any sources for air quality impacts at the site. No further assessment is considered necessary.

Aspect	Potential change in impacts	Description
Hazard and risk	No	The proposed works would not include the storage and use of any additional hazardous substances and dangerous goods. No further assessment is considered necessary.
Waste management	No	The proposed works would result in a minor increase in the volume of spoil generated, however it would not result in the generation of any different waste materials or a change in the management approach. The increase in spoil would generate additional construction vehicle movements, which has been considered in Section 3.3.4. No further assessment is considered necessary.
Sustainability	No	The proposed works would not change the climate risk profile of the project, and would not result in a substantial change to the generation of greenhouse gases or the use of resources. No further assessment is considered necessary.
Cumulative impacts	No	The proposed works would not result in any additional cumulative impacts. Construction works associated with 33 Bligh Street are not expected to occur concurrently. Mitigation measure CU1 would also provide mitigation to any potential cumulative impacts should this occur.
		There would be a potential for longer duration of impacts (ie due to delay to the construction of 33 Bligh Street). Reasonable and feasible mitigation measures would be in place to reduce impacts to an acceptable level.
		No further assessment is considered necessary.

3.3.4 Construction traffic and transport

As shown in Figure 3-11, construction vehicles would enter the site from O'Connell Street, and exit onto Bligh Street. The haulage routes to and from the site are shown in Figure 3-12. These routes would be in addition to the haulage routes assessed in the Environmental Impact Statement.

This section provides a revised assessment of the combined use of all three Martin Place Station construction sites. A profile of the hourly construction vehicle movements at the O'Connell Street site is provided in Figure 3-13.



Figure 3-12 O'Connell Street construction site - haul routes

Heavy vehicles



Figure 3-13 O'Connell Street construction site - hourly traffic profile of construction vehicles (inbound only)

Impact on road network performance

Traffic data collected in 2016 indicates that during the morning peak hour, Bridge Street carries up to 990 vehicles per hour westbound and up to 640 vehicles per hour eastbound. During the evening peak hour, up to 640 vehicles per hour travel westbound and 850 vehicles per hour travel eastbound. Low traffic volumes during both peak hours are experienced on Loftus Street and O'Connell Street, with 160 vehicles per hour and 220 vehicles per hour, respectively. On Hunter Street, there are higher traffic volumes in the westbound direction during both peak hours. Bligh Street is one-way southbound and carries about 200 and 290 vehicles per hour in the AM and PM peaks, respectively.

Table 3-10 and Figure 3-14 shows a comparison of the predicted traffic impacts with that assessed in the Environmental Impact Statement. The assessment assumes that eight vehicles enter and depart the site in the AM and PM peak period per hour (totalling 16 movements), as per the profile provided in Figure 3-13, in addition to vehicle movements associated with the other Martin Place construction sites. The assessment shows there would be no change to the predicted level of service (compared with the assessment in the Environmental Impact Statement) at all key intersections during construction as a result of the additional construction vehicles.

	Base		EIS assessment		With O'Conne	I Street site		
Peak period	Level of service	Degree of saturation	Level of service	Degree of saturation	Level of service	Degree of saturation		
Macquarie Street / Bent Street / Eastern Distributor ramps								
AM peak	F	1.25	F	1.27	F	1.25		
PM peak	F	1.20	F	1.29	F	1.31		
Bent Street / Phi	illip Street							
AM peak	В	0.61	В	0.74	В	0.68		
PM peak	В	0.79	В	0.71	В	0.79		
Bent Street / Blig	gh Street							
AM peak	А	0.33	N/A	N/A	А	0.34		
PM peak	А	0.32	N/A	N/A	А	0.33		
Loftus Street / B	ent Street / O'Co	nnell Street (prior	ity controlled)					
AM peak	А	0.40	N/A	N/A	А	0.40		
PM peak	А	0.36	N/A	N/A	А	0.36		
Castlereagh Stre	et / Hunter Stree	t / Bligh Street						
AM peak	В	0.48	В	0.45	В	0.58		
PM peak	В	0.54	В	0.50	В	0.48		
Elizabeth Street	/ Phillip Street / H	lunter Street						
AM peak	В	0.77	В	0.83	В	0.75		
PM peak	В	0.73	В	0.81	В	0.74		

Table 3-10	Intersection	nerformance -	Martin Dlaco	with the	O'Connell	Stroot sito
	Intersection	periornance -	r martin Place	with the	O Connen	Street Site

Note: Level of Service reported for signalised intersections is for the overall intersection.

Note: Outputs from LinSig Version 3.2



Figure 3-14 Martin Place Station construction sites plus the O'Connell Street site

3.3.5 Construction noise and vibration

This section provides a revised assessment of construction noise and vibration at the Martin Place Station site with the addition of the O'Connell Street construction site. It also incorporates revisions to the classification of sensitive receiver types near the Martin Place Station and O'Connell Street construction sites (refer to Section 2.6), and the results of the removal of rock breaking at night (refer to Section 9.6).

The following revisions have been made to the sensitive receiver types assessed in the Environmental Impact Statement:

- The Commercial Travellers Association Hotel has been re-classified as a residential receiver given that this receiver provides accommodation
- The ELS Universal English College, located on O'Connell Street, has been re-classified as an educational establishment.

The Channel Seven studio at Martin Place and the Theatre Royal on King Street, were correctly identified and assessed as theatres in the *Technical Working Paper 2: Noise and Vibration*. However, the results were not presented in the summary table as the nearest receivers of this type.

A receiver to the west on Castlereagh Street, which was identified and assessed as a residential receiver in the Environmental Impact Statement, has been clarified as being a commercial receiver with residential at the rear of this property. As the noise criteria (and therefore noise management levels) for commercial receivers are less stringent than what applies to residential receivers, this receiver has not been re-assessed.

The nearest sensitive receivers to the proposed construction sites are shown in Figure 3-15. The construction scenarios assessed are consistent with those assessed in the Environmental Impact Statement.

Construction airborne noise

A summary of the predicted noise level exceedances at the nearest sensitive receivers is provided in Table 3-11 for each construction scenario. Where predicted noise level exceedances have changed, the results presented in the Environmental Impact Statement are shown in brackets. The construction noise impact assessment indicates that:

- The restriction of rock breaking to standard construction hours during the excavation has removed predicted exceedances of noise management levels at residential receivers in areas A, B and E
- At the Commercial Travellers Association (Area A) there would be a moderate exceedance of the noise management levels of between 10 dB and 20 dB during enabling and earthworks
- For the Theatre Royal in Area A, there would be a moderate exceedance of the noise management levels of between 10 dB and 20 dB during enabling and earthworks. At this location during construction of the acoustic shed, there is predicted to be a minor exceedance of up to 10 dB during the daytime
- There would be a change in impacts at the nearest commercial receivers in Area C:
 - During enabling and earthworks, high exceedances of the noise management levels of more than 20 dB are predicted (compared to a moderate exceedance predicted in the Environmental Impact Statement)
 - During construction of the acoustic shed, there is predicted to be a moderate exceedance of the noise management levels of between 10 dB and 20 dB (compared to a finding of compliance with the noise management levels in the Environmental Impact Statement)
 - During excavation with an acoustic shed there is predicted to be minor exceedances of the noise management levels of less than 10 dB during the daytime period (compared to a finding of compliance with the noise management levels in the Environmental Impact Statement)
- For the educational receiver in Area C, there would be a moderate exceedance of the noise management levels during enabling and earthworks. Minor exceedances of the noise management levels of less than 10 dB are predicted during construction of the acoustic shed
- For the Channel 7 studio in Area D, there would be high exceedances of noise management levels of more than 20 dB for enabling work, earthworks and construction. Exceedances of between 10 dB and 20 dB are predicted at this receiver during the construction of the acoustic shed, and up to 10 dB during excavation (with an acoustic shed).



Figure 3-15 Location of sensitive receivers near Martin Place Station and O'Connell Street sites

Table 3-11 Predicted noise level exceedances at Martin Place and O'Connell Street sites

Noise modelling scenario		Enabling Works Earthworks Acoustic shed construction Excavation with shed						Construction	
Receiver area	Day	Day	Day	Day	DOOH ²	Evening	Night	Sleep	Day
A Commercial Travellers Association (Hotel), west of Castlereagh Street	•	•	•	•	•		•		•
A Commercial receivers to the west, west of Castlereagh Street and south of Martin Place	•	•	•			٠			
A Theatre Royal to the west, west of Castlereagh Street and south of Martin Place	•	•	•						•
B Residential receivers to the west, west of Castlereagh Street and north of Martin Place	•		•			•			
B Commercial receivers to the west, west of Castlereagh Street and north of Martin Place	•	•			•				
${\bf C}$ Residential receivers to the north, north of Hunter Street									
C Commercial receivers to the north, north of Hunter Street									
C Educational ELS Universal English College to the north, north of O'Connell Street	•	•	•	•					
D Residential receivers to the east, between Hunter Street and Martin Place									
D Commercial receivers to the east, between Hunter Street and Martin Place	•	•	•		•				
D Channel 7 Studio			•						
E Residential receivers between the two construction sites	•	•							•
E Commercial receivers between the two construction sites		•							•
F Residential receivers to the south on Elizabeth Street									
F Commercial receivers to the east, between King Street and Martin Place			•		•	٠			
G Educational to the east, between King Street and Martin Place	•	•							
G Educational receivers to the south, between Castlereagh Street and Elizabeth Street	•	•	•	•					
G Commercial receivers to the south, between Castlereagh Street and Elizabeth Street			•						
Legend									
NML compliance NML exceedance of less than 10 dB	ML exc dB an	eedan d 20 d	ice betv IB	veen	۱ 🔴 r	NML ex more th	ceedar Ian 20	nce of dB	

Note 1: The results presented in the Environmental Impact Statement are shown in brackets () Note 2: DOOH = Daytime out of hours (i.e Saturdays 1pm to 6pm and Sundays 7am to 6pm) Note 3: Additional or clarified receiver types are shown in italics. A recent meeting with 31 Bligh Street identified that specific uses in this building include events, conferences and filming. These particular uses would be considered as part of the Construction Noise Impact Statement process (described in the Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report)). As part of this process, consultation would be carried out with 31 Bligh Street (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to 31 Bligh Street.

As identified in the Environmental Impact Statement, noise mitigation measures would be implemented, where feasible and reasonable, in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (refer to Appendix C of this report) to minimise airborne construction noise where exceedances are predicted. Standard mitigation measures that could be implemented include avoiding the coincidence of noisy plant operating simultaneously close together, use of dampened rock hammers, scheduling of noisy activities during less sensitive periods, and considering opportunities in site layouts to provide shielding from noise for receivers.

Construction ground-borne noise

The ground-borne noise analysis of the O'Connell Street site indicates that:

- For the Commercial Travellers Association there would be ground-borne noise levels potentially higher than 55 dBA on one or more floors during the daytime
- There would be a change in impacts for some receivers:
 - One commercial receiver adjacent to the north on Bligh Street is predicted to have ground-borne noise levels potentially higher than 75 dBA for several floors, which correlates to very high noise management level exceedances of greater than 25 dB
 - One commercial receiver adjacent to the south on Hunter Street is predicted to have ground-borne noise level exceedances of the noise management levels of 10 dB to 20 dB
 - One commercial receiver adjacent to the north on O'Connell Street is predicted to have ground-borne noise level exceedances of the noise management levels of up to 10 dB
- The Channel Seven studio is predicted to have ground-borne noise level exceedances of 10 to 15 dB during excavation during the daytime period.

As identified in the Environmental Impact Statement, feasible and reasonable noise mitigation measures would be implemented to minimise ground-borne noise where exceedances are predicted, in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (refer to Appendix C of this report).

Blasting

Consistent with the approach taken in the Environmental Impact Statement, blasting has been considered due to the level and duration of ground-borne noise exceedances associated with rock breaking. As rock breaking would only be undertaken during standard construction hours, only the daytime period has been further considered.

Table 3-12 shows the anticipated reduction in the number of times when the noise management levels would be exceeded during the daytime periods while excavation is underway. As shown, the adoption of blasting as an excavation technique would reduce impacts to commercial receivers during the daytime period at all sites. For the Martin Place Station construction site, it would also reduce impacts to residential receivers during the daytime periods.

Table 3-12	O'Connell	Street	blasting	scenarios

	Number of daytime periods above noise management levels					
	Residential		Commercial			
Scenario	No blasting	Blasting plus large rock breaker	No blasting	Blasting plus large rock breaker		
Martin Place south	9	3	21	12		
Martin Place north	1	0	134	25		
O'Connell Street site	0	0	12	8		

Further detailed construction planning, through the development of Construction Noise Impact Statements (as required by the Sydney Metro Construction Noise and Vibration Strategy in Appendix C of this report) would determine the exact construction activities with the aim of reducing ground-borne noise impacts to receivers. For example, this could involve the consideration of different sized rock breakers at different periods, and the positioning of rock breakers within the site during different periods.

With careful planning and positioning of the rock breakers it may be possible to avoid consecutive periods of noise management levels exceedances at any one receiver, effectively providing respite periods. For any residual exceedances of the noise management levels, additional mitigation measures would be implemented in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (refer to Appendix C of this report).

Construction ground-borne vibration

During construction of the shafts, vibration levels are anticipated to remain well below the vibration screening levels associated with minor cosmetic building damage for all the surrounding buildings except at one commercial building located immediately to the south of the southern shaft (at Martin Place Station construction site), a residential building immediately south of the northern shaft (at the Martin Place Station construction site), and the adjacent building to the north of the shaft at the O'Connell Street site.

A more detailed assessment of the structure and attended vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for this structure.

Construction traffic noise

Table 3-13 shows the predicted road traffic noise level on the haul route to and from the O'Connell Street site. This haul route would be in addition to the haul routes to the other Martin Place Station construction site as presented in the Environmental Impact Statement.

On Bent Street (between Macquarie and O'Connell streets) and Bligh Street (between the site exit and Hunter Street) the base noise criterion is predicted to be exceeded. However, the increase would comply with the 2 dB allowance. On O'Connell Street (between Bent Street and the site entry) the base criterion is also predicted to be exceeded and the increase would be above the 2 dB allowance during the night-time period. Therefore, sensitive receivers along this section of O'Connell Street are likely to notice an increase in traffic noise during construction.

While there would likely be an exceedance of the sleep disturbance screening criterion (of up to 9 dB) and the external sleep disturbance noise management level of 65 dBA (by up to 11 dB), the L_{Amax} levels would be similar to that currently experienced with heavy vehicles using O'Connell Street.

Road	Base criteria (dB) day / night (L _{Aeq(15hr/9hr})	Predicted road traffic noise (dB) day / night	Predicted road traffic noise increase (dB) day / night	RBL + 15 dB screening criterion (dBA)	External L _{Amax} NML Level (dBA)	Predicted L _{Amax} Noise Level (dBA)
Bent Street	60 / 55	65 / 59	0.2 / 0.4	67	65	68
O'Connell Street	60 / 55	62 / 56	1.0 / 3.8	67	65	76
Bligh Street	60 / 55	67 / 62	0.02/0.04	67	65	61

Table 3-13	O'Connell	Street	site -	road	traffic	noise

3.3.6 Construction land use and property

The O'Connell Street site (known as 33 Bligh Street) is owned by Ausgrid, and has an approval for the construction of a substation and new commercial building. The former building at the site has been demolished under that approval. Transport for NSW is currently in discussions with Ausgrid concerning the temporary lease of the property for construction. This would delay the construction of the approved commercial building until the site has been released by Transport for NSW.

It would also be necessary to acquire stratum below the surface of properties for the construction of the underground tunnel. Under the *Transport Administration Act 1988*, compensation is not payable where stratum is required for the development of underground infrastructure. The introduction of the subsurface stratum, and the tunnel itself, has the potential to limit development above the alignment. However, the majority of the tunnel structure, beyond the footprint of the O'Connell Street site, would be directly below Hunter and Bligh streets. Where it is below existing private property, the tunnel would have a minor impact as it would limit future aboveground development.

3.3.7 Construction business impacts

The O'Connell Street site would not substantially alter the impacts on businesses as presented in the Environmental Impact Statement. Additional activities at the site and below ground would potentially increase impacts on surrounding businesses, primarily due to changes in amenity (as construction activities would be closer to new receivers) and increased traffic on the road network. The main impacts would relate to:

- Servicing and delivery access: Potential impacts in this precinct relate to servicing and delivery constraints for businesses as a consequence of increased traffic and the cumulative impacts of construction work from other projects such as the CBD and South East Light Rail where they temporally and geographically overlap. Delays associated with the addition of construction traffic associated with the proposed site are expected to be negligible within this local business precinct
- Customer access and passing trade: The O'Connell Street site is currently an active construction site. While there would be an increase in vehicles accessing or departing the site, and associated additional construction activity, there would be no changes to pedestrian access or visibility of surrounding businesses as a result of this activity

- Noise, vibration and dust: Activities at the proposed site could disturb businesses and the work environment. These impacts would be most noticeable at buildings beside or above the construction activities, and at amenity-sensitive businesses such as outdoor cafes and bars. The impacts would be exacerbated by construction work on other projects nearby. As concluded in the Environmental Impact Statement, the impacts have the potential to have a moderate negative impact on businesses. The impacts would be generally consistent with those assessed in the Environmental Impact Statement
- Property acquisition: The site would be temporarily leased from Ausgrid for the duration of construction of Martin Place Station. As the former building has been demolished, there would be no additional impacts on businesses due to acquisition.

3.3.8 Non-Aboriginal heritage

The former building on the O'Connell Street site has been demolished under an existing approval, and would be excavated to basement level two at the time of transfer to Transport for NSW for construction purposes. Potential impacts on heritage as result of the O'Connell Street site (and underground tunnel) would be associated with indirect impacts (changes to views and vistas) and direct impacts due to vibration. However, impacts on views and vistas of heritage items during construction would not significantly differ from what has occurred.

As the station entry / exit on O'Connell Street would be subject to further design, and delivered by other entities, this assessment has not considered any permanent impacts to views and vistas of nearby heritage items.

Heritage items

The O'Connell Street site and the construction of the underground pedestrian link would impact, directly or indirectly, on a number of listed heritage items as identified in Table 3-14 and Figure 3-16. Table 3-14 also provides an indication of the potential change in impact from that presented in the Environmental Impact Statement. Further detail on these assessments in provided in Appendix G.

No additional mitigation measures over and above those included in the Environmental Impact Statement for Martin Place Station would be required. In particular, impacts due to vibration would be managed through mitigation measure NAH4 and through the Sydney Metro Construction Noise and Vibration Strategy (refer to Appendix C of this report).

Ref	Description	Listing ¹	Heritage significance	Change in impact, as assessed in theHeritage impact and magnitude of the O'Connell Street siteEnvironmental Impact Statement
MP3	Richard Johnson Square including monument and plinth	LEP	Local	 Indirect impact: Minor (views and vistas). There may be some minor visual impacts as a result of construction within the O'Connell Street site. These would be temporary. Potential direct impact: Neutral (vibration). The closest façade of this item would not experience vibration above the 7.5 mm/s screening level for cosmetic damage. No. However, there would be a minor indirect impact on the permanent structures of Martin Place Station (views and vistas), which would not change as a result of the O'Connell Street construction site.
MP13	AFT House	LEP	Local	 Indirect impact: Negligible (views and vistas). Potential direct impact: Neutral (vibration). The closest façade of this item would not experience vibration above the 7.5 mm/s screening level for cosmetic damage. Not assessed in the Environmental Impact Statement as it was located outside the study area.
MP12	Former NSW Club	SHR, LEP	State	 Indirect impact: Negligible (views and vistas). Potential direct impact: Minor (vibration). This item would experience vibration above the 7.5 mm/s screening level for cosmetic damage. Not assessed in the Environmental Impact Statement as it was located outside the study area.
MP16	Radisson Plaza Hotel	SHR, LEP	State	 Indirect impact: Negligible (views and vistas). Not assessed in the Environmental Impact Statement as it was located outside the study area.
MP15	Public Trust Office	SHR, LEP	State	 Indirect impact: Negligible (views and vistas). Not assessed in the Environmental Impact Statement as it was located outside the study area.
MP14	Manufacturers Mutual Building	LEP	Local	 Indirect impact: Neutral (views and vistas). There is no direct view line between the O'Connell Street site and the item. There would be no visual impact. Not assessed in the Environmental Impact Statement as it was located outside the study area.

Table 3-14 O'Connell Street site and underground pedestrian link – potential construction impacts on heritage items

Ref	Description	Listing ¹	Heritage significance	Heritage impact and magnitude of the O'Connell Street site	Change in impact, as assessed in the Environmental Impact Statement
MP2	Former Qantas House	SHR, LEP	State	 Indirect impact: Neutral (views and vistas). There is no direct view line between the O'Connell Street site and the item. There would be no visual impact. 	No. However, there would be a minor indirect impact on the permanent structures of Martin Place Station (views and vistas), which would not change as a result of the O'Connell Street construction site.
MP1	Former City Mutual Life Assurance building, including interior	SHR, LEP	State	 Indirect impact: Negligible (views and vistas). Potential direct impact: Neutral (vibration). The closest façade of this item would not experience vibration above the 7.5 mm/s screening level for cosmetic damage. 	No. However, there would be a minor indirect impact on the permanent structures of Martin Place Station (views and vistas), which would not change as a result of the O'Connell Street construction site.
MP6	Bennelong Stormwater Channel	Sydney Water S170	Local	• Potential direct impact: Neutral (vibration). The item would not experience vibration above the 7.5 mm/s screening level for cosmetic damage if construction work is not within 1 metre of the item.	There would be no change to the impacts assessed in the Environmental Impact Statement, but construction of the Martin Place Station would have a minor direct impact on the stormwater channel. The location of the
					item relative to the underground tunnel would be confirmed during detailed design. Should construction occur within one metre of the item, and / or present a risk to the item, the potential impacts would be managed in accordance with the existing mitigation measures and the Construction Noise and Vibration Strategy

1 SHR: State Heritage Register; s.170: Listing under section 170 (of the Heritage Act 1977); LEP: local environment plan





Proposed operational area at surface

Archaeological heritage

The excavation of the shaft and use of the O'Connell Street site for construction is highly unlikely to impact on non-Aboriginal archaeology. Past activities at the site would have removed any archaeological remains apart from possibly bases of deep wells (Casey and Lowe, 2012a). As the basements have been cut down to around nine metres along Bligh Street at the location of the proposed shaft excavation, it is unlikely that even the remains of deep wells would be preserved.

The underground tunnel would be excavated at depth through bedrock. As there would be no surface impacts outside the footprint of the O'Connell Street site, any archaeological remains associated with Richard Johnson Square, including potential buried remains of a 1793 church, or nineteenth century structures, would not be directly impacted.

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3.3.9 Aboriginal heritage

A search of the OEH AHIMS site register was conducted on 2 October 2015 during preparation of the Environmental Impact Statement (AHIMS Client ID 193689). No recorded Aboriginal sites are located within the proposed O'Connell Street site or within a 25-metre buffer of the site. The closest previously recorded Aboriginal heritage site (comprising a subsurface archaeological deposit) is about 75 metres north of the proposed Martin Place Station. A site inspection of the proposed construction site indicates that the site is located across a built environment on a gentle – moderate slope down to the west. No areas of surface visibility or intact ground surface were observed.

Construction of the project would not directly impact on any previously recorded Aboriginal heritage sites. In addition, no previously unrecorded Aboriginal heritage sites were identified during the site inspection of the study area.

Previous assessments of the O'Connell Street site also indicate that previous construction on the site included excavation into underlying bedrock. This has therefore removed any archaeological potential at the site and the site is likely to demonstrate low archaeological significance. Further, the underground tunnel would be constructed through bedrock and therefore would not have any potential for Aboriginal heritage sites.

In conclusion, no identified Aboriginal sites or areas of archaeological potential would be impacted by the proposed construction at the O'Connell Street site.

3.3.10 Construction landscape character and visual impacts

The O'Connell Street site is an existing construction site. The site extends across part of Richard Johnson Square. The proposed works associated with this project would require additional activities at the site, with additional temporary structures (such as an acoustic shed).

An assessment of the landscape character and visual impacts has been completed in accordance with the methodology and rating systems presented in the Environmental Impact Statement.

Landscape impacts

Landscape impacts anticipated during construction and operation are summarised in Table 3-15.

During construction, there would be:

- A minor adverse landscape impact on Richard Johnson Square due to the additional construction activity. This has increased the impact rating from a negligible impact (as assessed in the Environmental Impact Statement), due to the direct impacts associated with the egress point for the construction site
- A minor adverse landscape impact on O'Connell and Bligh streets due to the continued construction activity at the site, which has already commenced under existing approvals.

		Construction impact ¹		Operation impact	
Location	Sensitivity rating	Modification rating	Impact rating	Modification rating	Impact rating
Richard Johnson Square	Local	Noticeable reduction (no perceived change)	Minor adverse (negligible)	No perceived change	Negligible
O'Connell and Bligh Streets	Local	Noticeable reduction	Minor adverse	N/A	N/A

Table 3-15	O'Connell	Street site	 landscape 	impacts

Note I: The modification rating and impact rating in brackets denote the originally assessed impacts as stated in the Environmental Impact Statement.

Daytime visual amenity impacts

The anticipated daytime visual impacts for representative viewpoints during construction and operation are summarised in Table 3-16. Viewpoints 8 to 11 are in addition to those assessed in the Environmental Impact Statement. The additional viewpoints, along with those as presented in the Environmental Impact Statement are provided in Figure 3-17.

During construction, there would be additional visual impacts due to the additional construction activity and infrastructure. However, as work would be a continuation of construction activity at the site and views of construction would be restricted by the surrounding built form, it is not likely to create a perceived change in the amenity of the views assessed. As such, the O'Connell Street site would have a negligible impact on daytime visual amenity for all assessed viewpoints.

No additional mitigation measures have been identified as the mitigation measures as presented in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) would address the potential impacts where there is an interface with public space areas.

Night-time visual impacts

The O'Connell Street site would involve night-time construction and, as such, would create an additional source of lighting at the site and at access / egress points, which would be more brightly lit. However, as indicated in the Environmental Impact Statement, construction would have negligible visual impacts at night-time as this location is already brightly lit.

		Construction impact		Operation impact	
Location	Sensitivity rating	Modification rating	Impact rating	Modification rating	Impact rating
Viewpoint 8: View northeast from the intersection of Hunter, Pitt and O'Connell Streets	Local	No perceived change	Negligible	N/A	N/A
Viewpoint 9: View southwest along O'Connell Street	Local	No perceived change	Negligible	N/A	N/A
Viewpoint 10: View southwest along Bligh Street	Local	No perceived change	Negligible	N/A	N/A
Viewpoint 11: View northwest to Richard Johnson Square	Local	No perceived change	Negligible	N/A	N/A

Table 3-16 O'Connell Street site – daytime visual impacts





Figure 3-17 O'Connell Street future pedestrian link - representative viewpoints

3.3.11 Operational impacts

The operational impacts associated with the underground link (but not including any longer term pedestrian link) would be essentially the same as assessed in the Environmental Impact Statement.

Impacts associated with the future design and fit-out of the pedestrian underground link would be incorporated into the future architectural design and construction of the new building at 33 Bligh Street, by the developer of that site and would be assessed at that stage.

For completeness and to consider cumulative impacts, Table 3-17 provides an overview of potential impacts during operation of the O'Connell Street future underground pedestrian link.

Table 3-17 O'Connell Street future underground pedestrian link - potential operational impacts

Aspect	Consideration
Pedestrians	As indicated in Section 3.3.1, the provision of an underground pedestrian link would reduce pedestrian queuing and congestion at the intersection of Castlereagh Street, Hunter Street and Bligh Street and adjoining footpaths (particularly Hunter Street), and could improve safety with a reduction in informal crossings near this intersection.
	However, the link would not remove the need to implement mitigation measures identified in the Environmental Impact Statement (such as increasing the green-time per cycle for pedestrians, or widening the pedestrian crossing).
	The provision of an underground pedestrian link would also improve the operational performance of the station by:
	• Simplifying pedestrian movements at platform level at the northern station entry
	• Splitting pedestrian demand and reducing congestion at the escalators at the northern station entry.
Noise and vibration	An additional station entry, and the plant required to operate the pedestrian link, would introduce additional noise sources. It is expected that the future assessment, based on the design of the entry, would provide an assessment of potential noise impacts on nearby sensitive receivers, which include the nearby Radisson Hotel. However, it is expected that the applicable criteria under the <i>Industrial Noise Policy</i> (EPA, 2000) would be achieved through the use of appropriate noise attenuation measures such as equipment selection, position of plant and ventilation discharges, in-duct attenuators and acoustic enclosures.
Property and land use / business impacts	An additional station entry would have implications for the existing project approval for 33 Bligh Street. As indicated above, Transport for NSW is liaising with Ausgrid to ensure appropriate planning and legal mechanisms are in place to facilitate the future provision of this entry. Importantly, the future provision of a station entry at this location would have direct benefits for the future commercial building and surrounding land uses, including hotels, due to the opportunities afforded by the more direct station connection.
Non-Aboriginal heritage	As noted in Section 3.3.8, there are a number of built heritage items near the future station entry / exit on O'Connell Street. The urban design of the station entry, within the context of the approved project approval at the site, would need to consider potential impacts on views and vistas to the adjoining and nearby items. However, the site has an existing approval for a new development, and the provision of a station entry within the built form of the site is unlikely to significantly alter the predicted heritage impacts on nearby items.
Landscape character and visual impacts	An additional station entry / exit on O'Connell Street would introduce a new element within the streetscape. The design of the additional station would be subject to further design work and would consider integration with the future development of the site, as well as the potential landscape character and visual impacts of the station entry.

3.4 Waterloo Station – revised footprint

3.4.1 Description

Ongoing design work has identified the need for a larger excavation at Waterloo Station to accommodate the structure required to tank the station (tanking is required to inhibit the inflow of groundwater). This has resulted in the need for additional land to the east and the west, including:

- Demolition of the toilet block and the permanent acquisition of a small portion of land at the back of the Waterloo Congregational Church. Temporary toilets would be provided for church patrons for the duration of construction, and permanent toilets would be reinstated following construction. The permanent toilets would be built to at least the equivalent standard as the current toilets and in consultation with the owner. Any temporary or permanent reinstatement of fabric at the rear of the item would be sympathetic to the heritage values and architectural form of the building.
- Incorporation of the footpath and parking lane on the western side of Cope Street into the Waterloo Station construction site, for the duration of construction.

This change would also provide the opportunity for an additional access and egress point for construction vehicles, directly from Cope Street.

Construction associated with the tanking of the station box would also require rock anchors to be placed directly under the church.

The revised indicative construction layout for Waterloo Station is provided in Figure 3-18.

Rock breaking associated with station excavation would also no longer be carried out during standard construction hours. The assessment of that change is presented in Section 9.6.



Figure 3-18 Revised Waterloo Station construction site - indicative location and layout

3.4.2 Environmental screening assessment

To understand the potential change in environmental impacts compared to those assessed in the Environmental Impact Statement, a screening assessment was conducted and is presented in Table 3-18. This assessment considers potential environmental aspects that may require further impact assessment to understand likely environmental impacts, and identify any relevant mitigation measures that may be required.

Aspect	Potential change in impacts	Description
Construction traffic and transport	Yes	The revised footprint of Waterloo Station would result in the temporary closure of the footpath and western carriageway (parking lane) on the western side of Cope Street.
		A further assessment is provided in Section 3.4.3.
Operational traffic and transport	No	The revised footprint of Waterloo Station would not change the station layout. No further assessment is considered necessary.
Construction noise and vibration	Yes	The addition of an access and egress point for construction vehicles on Cope Street may alter the construction traffic noise impacts. Construction work associated with the tanking of the station box would also require rock anchors to be placed directly under the church, which have the potential for ground-borne noise and vibration impacts.
		A further assessment is provided in Section 3.4.4.
Operational noise and vibration	No	The revised footprint of Waterloo Station would not change the station layout or the transport integration arrangements. No further assessment is considered necessary.
Land use and property	No	Although some additional land would be required to construct Waterloo Station, including the permanent acquisition of a strip of land from the Congressional Church and temporary occupation of road space, there would be no significant changes to land use. No further assessment is considered necessary.
Business impacts	No	The revised footprint of Waterloo Station would not lead to impacts on additional businesses. No further assessment is considered necessary.
Non-Aboriginal heritage	Yes	The revised footprint of Waterloo Station would result in additional impacts on the Congressional Church on Botany Road. A further assessment is provided in Section 3.4.5.
Aboriginal heritage	No	The revised footprint of Waterloo Station would not impact any additional Aboriginal heritage items and would not change the archaeological potential or significance identified in the Environmental Impact Statement. No further assessment is considered necessary.

Table 7-19	Watarloo Station	rovised feetprint	- onvironmontal	scrooning assassment
Table 3-18	waterioo Station	revised tootprint	- environmental	screening assessment
Aspect	Potential change in impacts	Description		
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Landscape character and visual amenity	Yes	The revised footprint of Waterloo Station would result in the construction site shifting towards the east and encompassing the footpath and parking lane of Cope Street.		
		A further assessment is provided in Section 3.4.6.		
Groundwater and geology	No	The revised footprint of Waterloo Station would not change the ongoing inflow of groundwater.		
		No further assessment is considered necessary.		
Soils, contamination and water quality	No	The revised footprint of Waterloo Station would not change the potential soils, contamination or water quality impacts.		
		No further assessment is considered necessary.		
Social impacts and community infrastructure	Yes	The demolition of the Congressional Church toilets may result in additional temporary social and community infrastructure impacts.		
		A further assessment is provided in Section 3.4.7.		
Biodiversity	No	The revised footprint of Waterloo Station would not result in any additional biodiversity impacts.		
		No further assessment is considered necessary.		
Flooding and hydrology	No	The revised footprint of Waterloo Station would not be located on flood-prone land and would not alter existing stormwater systems.		
		No further assessment is considered necessary.		
Air quality	No	The revised footprint of Waterloo Station would not result in any additional air quality impacts.		
		No further assessment is considered necessary.		
Hazard and risk	No	The revised footprint of Waterloo Station would not change the storage and use of any additional hazardous substances and dangerous goods, or be located within a bushfire prone area.		
		No further assessment is considered necessary.		
Waste management	No	The revised footprint of Waterloo Station would result in a minor increase in the volume of spoil generated, but it would not result in the generation of any different waste materials or a change in the management approach.		
		No further assessment is considered necessary.		
Sustainability	No	The revised footprint of Waterloo Station would not change the climate risk profile of the project, and would not result in a substantial change to the generation of greenhouse gases or the use of resources.		
		No further assessment is considered necessary.		
Cumulative impacts	No	The revised footprint of Waterloo Station would not result in any additional cumulative impacts.		
		No further assessment is considered necessary.		

3.4.3 Construction traffic and transport

The revised footprint at Waterloo Station would result in the temporary closure of the footpath on the western side of Cope Street between Raglan Street and Wellington Street and the temporary occupation of the western carriageway of Cope Street.

Active transport network

The closure of the footpath on the western side of Cope Street would require pedestrians to use alternative facilities. Depending on their origin and destination, pedestrians would be able to use the existing footpath on the eastern side of Cope Street or the footpaths on Botany Road. Given the existing low pedestrian volumes, the impact of increased pedestrian activity on these alternative footpaths is expected to be minimal. Consistent with mitigation measure T3 (refer to Chapter 11 Revised environmental mitigation measures and environmental performance outcomes) directional signage would be used to direct and guide pedestrians past the construction site and to the alternative facilities available.

On-street parking

On-street parking on the western side of Cope Street consists of around 18 unrestricted long term spaces. It is likely demand for these spaces is generated mainly by the adjoining businesses in Cope Street, with some demand from nearby residential and commercial land uses. The removal of these on-street parking spaces is expected to have a minimal impact as:

- It is proposed to demolish the existing buildings (and hence the businesses would be removed) within the block bounded by Raglan Street, Cope Street, Wellington Street and Botany Road
- There is alternative long term residential on-street parking on adjacent streets including Raglan Street (east of Cope Street), Wellington Street (east of Cope Street) and Cooper Street.

Road network performance

The revised footprint would not change the proposed haul routes or the construction vehicle numbers associated with construction of Waterloo Station. Cope Street is designated as a proposed primary inbound haulage route in the Environmental Impact Statement. The proposed site access in Cope Street means that construction vehicles would use Cope Street for outbound trips as well as inbound trips. As such, there would be no potential change to the intersection performance assessed in the Environmental Impact Statement.

3.4.4 Construction noise and vibration

This section provides an assessment of construction noise and vibration associated with the revision to the Waterloo Station footprint. The assessment of the removal of rock breaking at night is provided in Section 9.6.

While the revised footprint would reduce the setback to residential properties along Cope Street, it would unlikely result in a change in impact at these receivers given the marginal revision of the footprint.

Construction noise

The installation of tanking and rock anchors would result in additional ground-borne noise and vibration impacts on the Waterloo Congregational Church. Vibration is predicted to exceed the screening level of 7.5 mm/s at the rear of the church. A more detailed assessment of this structure and attended vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for these structures.

Internal ground-borne noise levels from piling and the installation of rock anchors are predicted to be up to 50 dB within the church. These levels exceed the noise management level by up to 10 dB. Exceedances of the ground-borne noise management levels of between 10 dB to 20 dB at the church are predicted in the Environmental Impact Statement due to other construction activity at the Waterloo Station construction site. Feasible and reasonable measures would be implemented in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy to minimise ground-borne noise where exceedances are predicted.

Traffic noise

Cope Street and Wellington Street were identified as haulage routes and the provision of an access / egress point directly on Cope Street would not change the distribution of construction vehicles using this road. The predicted LAeq increase and sleep disturbance noise levels for Cope Street and Wellington Streets are presented in Table 3-19.

The predicted noise levels would comply with the base criteria on Cope Street. On Wellington Street, the base criterion would be exceeded and there would be an exceedance of the 2 dB allowance. Therefore, receivers on Wellington Street and potentially Cope Street are likely to notice an increase in traffic noise.

There would be an exceedance of the sleep disturbance screening criterion (by up to 22 dB) and external sleep disturbance noise management levels of 65 dBA (by up to 11 dB). Wellington and Cope streets are both local roads with limited night-time traffic movements, so there would be a risk of sleep disturbance from construction traffic.

Unless compliance with the relevant traffic noise criteria can be achieved night-time heavy vehicle movements would be restricted to the use of Botany Road and Reglan Street. This is reflected in an updated mitigation measure – NV2 presented in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes).

Road	Base criteria (dB) day / night (L _{Aeq(15hr/9hr)})	Predicted road traffic noise (dB) day / night	Predicted road traffic noise increase (dB) day / night	RBL + 15 dB Screening criterion (dB)	External L _{Amax} NML level (dBA)	Predicted L _{Amax} noise level (dBA)
Wellington Street	55 / 50	57 / 52	2.9 / 7.9	54	65	76
Cope Street	55 / 50	53 / 50	N / A ¹	54	65	74

Table 3-19	Waterloo Station	- road traffic noise on Co	ne Street and Wellington	Street
	valence station		pe sueel and wennigton.	JUEEL

1 Existing traffic flows are not available for Cope Street

3.4.5 Non-Aboriginal heritage

Waterloo Congregational Church is listed as a local heritage item on Sydney Local Environmental Plan 2012. Heritage information on the Office of Environment and Heritage register identifies the significance of the building as follows:

The Gothic church of rendered brick construction was constructed in 1883 to replace the congregation chapel built in 1865. The symmetrical design of the façade demonstrates high quality architectural traits of the building. It is one of the earliest worship venues in Waterloo.

The recommended management measures for the item are:

The building should be retained and conserved. A Heritage Assessment and Heritage Impact Statement, or a Conservation Management Plan, should be prepared for the building prior to any major works being undertaken. There shall be no vertical additions to the building and no alterations to the façade of the building other than to reinstate original features. The principal room layout and planning configuration as well as significant internal original features including ceilings, cornices, joinery, flooring and fireplaces should be retained and conserved. Any additions and alterations should be confined to the rear in areas of less significance, should not be visibly prominent and shall be in accordance with the relevant planning control

The impacts of the revised station footprint on this heritage item are outlined below. The updated heritage impact assessment for the church is presented in Appendix G.

Direct impact - partial demolition

There would be a direct impact on Waterloo Congregational Church due to the demolition of the toilet block.

The toilet block appears (from construction material and design) to be a more recent addition to the church. It is located at the rear of the church building, and is accessed via two separate doors from the annex. It is not visible from the street. The toilets are not original or significant elements, unlike the front façade and internal original features of the main church building. Demolition of the toilet block would have some physical impact on the rear façade of the annex, where the block is directly connected to the annex.

Prior to the removal of the toilet block, temporary facilities would be provided for the church community on a portion of the adjacent construction site. These facilities would not result in any direct impacts on the item.

Impacts on the fabric of the rear of the item are expected to be moderate in localised areas where brickwork, render or other structural features would be removed to facilitate demolition of the toilet block and relocation of services. The level of physical impact would depend on the structural and utility connections between the toilet block and the annex wall, which would require further investigation prior to the demolition of the structure. However, as the toilet block is not a significant or contributory feature of the heritage item, its removal would have a minor to moderate heritage impact, depending on the extent of impact on the fabric of the annex wall.

Impacts on the fabric of the annex wall would be minimised during demolition of the toilet block.

Once construction is completed, permanent toilets would be reinstated. Details of the location and design of these toilets would be discussed with the owner, but they would be reinstated to at least the equivalent standard as the current toilets. Any temporary or permanent reinstatement of fabric at the rear of the item would be sympathetic to the heritage values and architectural form of the building. A heritage impact statement would also be prepared prior to the permanent reinstatement of toilets.

An archival recording of the item would be completed in accordance with mitigation measure NAH1 prior to the demolition of the toilet block. The mitigation measure has been amended to include this item within the list of locations as provided in NAH1.

Direct impact - acquisition of heritage curtilage

There would be a direct impact on Waterloo Congregational Church due to the acquisition of a small portion of the property at the rear to enable the station box to be tanked.

This would have a permanent impact on the heritage curtilage of the item, which aligns with the property boundary. This impact on curtilage would be minor and would not impact the aesthetic or representative values of the item as a whole.

Potential direct impact - vibration

There would be a potential direct impact on Waterloo Congregational Church due to vibration during construction associated with the tanking of the station box, which would also involve piling activities closer to the church, and the installation of rock anchors directly under the church. Vibration from this activity would be above the screening criterion and mitigation measures would be implemented as provided in the Environmental Impact Statement.

3.4.6 Landscape character and visual amenity

The revised footprint at Waterloo Station would result in the following changes to visible elements at the construction site:

- The footprint of the 15-metre-high section of the acoustic shed would be enlarged to the east by around four metres, to include the western footpath and on-street parking on Cope Street
- The footprint of the 6.5-metre-high sections of the acoustic shed would be enlarged to the east by around 0.5 metres
- There would be an additional construction vehicle access and egress point on Cope Street
- The western footpath would be temporarily closed and on-street car parking on the western side of Cope Street would be removed.

An assessment of the landscape character and visual impacts has been completed in accordance with the methodology and rating systems as identified in Chapter 16 (Landscape character and visual amenity) of the Environmental Impact Statement.

Landscape impacts

Landscape character impacts anticipated during construction are summarised in Table 3-20.

During construction there would be a minor adverse impact on Cope Street due to the addition of a construction access and egress point and the loss of the footpath. This impact has increased from a negligible impact, as assessed in the Environmental Impact Statement.

Table 3-20 Waterloo Station - landscape impacts

		Construction impact		
Location	Sensitivity rating	Modification rating	Impact rating	
Cope and Wellington streets	Neighbourhood	Considerable reduction (noticeable reduction) ¹	Minor adverse (Negligible) ¹	

Note I: The modification rating and impact rating in brackets denote the originally assessed impacts as stated in the Environmental Impact Statement.

Daytime visual amenity impacts

The anticipated daytime visual impacts for representative viewpoints during construction and operation are summarised in Table 3-21. Viewpoints 4 and 5 have the potential to be altered by the revised footprint.

Overall, the project would result in a negligible visual impact during construction. This assessment remains unchanged from the Environmental Impact Statement as the character and extent of work seen in this view would be generally consistent with that previously assessed. During construction, the following impacts are expected:

- The acoustic shed would be prominent in much of the middle ground of viewpoint 4 and would be closer to receivers; the acoustic shed would also be prominent in the view at viewpoint 5
- The character of construction work would reinforce the visual contrast with the adjacent, leafy residential area. The work would include a larger footprint, bring the construction activity closer to the viewer, and construction vehicles would be introduced into Cope Street. This would result in a considerable reduction in the amenity of this view, which is of neighbourhood visual sensitivity, resulting in a minor adverse visual impact during construction. This would represent a minor increase in the impact assessment presented in the Environmental Impact Statement.

Table 3-21 Waterloo Station - daytime visual impacts

		Construction impact	
Location	Sensitivity rating	Modification rating	Impact rating
Viewpoint 4: View southwest from the corner of Cope and Raglan Street	Neighbourhood	Noticeable reduction (noticeable reduction) ¹	Negligible (negligible) ¹
Viewpoint 5: View south from Cope Street	Neighbourhood	Considerable reduction (noticeable reduction) ¹	Minor adverse (negligible) ¹

Note 1: The modification rating and impact rating in brackets denote the originally assessed impacts as stated in the Environmental Impact Statement.

Night-time visual impacts

The Waterloo Station construction site would involve night-time work, which would create an additional source of lighting. However, lighting impacts would be no greater than those provided in the Environmental Impact Statement.

3.4.7 Social impacts and community infrastructure

The toilet block at the Waterloo Congregational Church provides amenities for the church community. They are accessed through the annex at the rear of the main church building. Temporary toilets would be installed prior to the demolition of the church toilets, and would be accessed via an existing door in the annex. The provision of temporary toilets would minimise the impacts on the church community, but may still cause an inconvenience. The church pastor would be consulted concerning the provision of temporary toilets, as well as the reinstatement of amenities following the completion of construction. Any reinstatement would ensure that the functionality of the building is not impacted.

The loss of parking and a footpath on the western side of Cope Street would cause disruption to the surrounding community. As discussed in Section 3.4.3, pedestrians would be able to use the footpath on the eastern side of Cope Street or the footpaths on Botany Road, and changes to car parking availability for the community are likely to be minimal. Mitigation measures provided in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) would be implemented to manage any disruption to pedestrian connectivity.

3.5 Additional heritage investigations

Since exhibition of the Environmental Impact Statement, the following additional investigations have been carried out:

- Historical Archaeological Research Design (ARD), which is included as Appendix H
- Aboriginal Cultural Heritage Assessment Report (ACHAR), which is included as Appendix I.

These investigations effectively bring forward commitments made in the Environmental Impact Statement. The Archaeological Research Design fulfils the requirement of Environmental Impact Statement mitigation measure NAH2. The Aboriginal Cultural Heritage Assessment Report fulfils the requirement of Environmental Impact Statement mitigation measures AH1 and AH2. Chapter 3 - Clarifications - with additional investigations

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COMMUNITY AND STAKEHOLDER INVOLVEMENT

CHAPTER FOUR

4 Community and stakeholder involvement

4.1 Consultation overview

The Environmental Impact Statement was exhibited for 48 days from 11 May to 27 June 2016. During this time, consultation activities were carried out to engage key stakeholders and the community on information in the Environmental Impact Statement, encourage participation in exhibition activities and provide guidance on the submissions process.

Submissions on the project were received by the NSW Department of Planning and Environment during the exhibition period. The issues raised, and responses to them, are presented in Chapters 6, 7 and 8.

4.2 Communication objectives

Transport for NSW has been and continues to be interested in community and stakeholder feedback on the project. The Sydney Metro communication objectives include to:

- Communicate the rationale for the project and the broader network benefits it would deliver, including how it fits into the NSW Government's plans to increase Sydney's rail capacity
- Communicate the Sydney Metro concept and timing
- Build community and key stakeholder relationships and maintain goodwill
- Provide information about the planning approvals process and encourage community participation
- Clearly communicate the corridor protection and property acquisition process.

The project team has developed a comprehensive community and stakeholder engagement program to proactively engage with local communities, key stakeholders and government agencies.

4.3 Consultation activities prior to Environmental Impact Statement exhibition

Engagement with the community and stakeholders began in June 2014 and has continued throughout the preparation of the Environmental Impact Statement.

Consultation activities carried out prior to the public exhibition of the Environmental Impact Statement are outlined in Section 5.7.2 and Appendix C of the Environmental Impact Statement and included:

- Stakeholder consultation following the announcement of Sydney Rapid Transit in June 2014
- Consultation and engagement on the project scope following the announcement of Sydney Metro City & Southwest in June 2015
- Consultation with industry in June and December 2015
- Engagement following the project update announcement in November 2015
- Engagement following the announcement of the Waterloo Station location in February 2016
- O Engagement regarding the Blues Point temporary site in February 2016
- Engagement regarding the Marrickville dive site (southern) pre-cast facility in April 2016.

Contact statistics from the various activities prior to exhibition of the Environmental Impact Statement are provided in Chapter 5 of the Environmental Impact Statement.

4.4 Environmental Impact Statement exhibition consultation

The Environmental Impact Statement and its accompanying documents were made available to view on the Department of Planning and Environment's website: www.majorprojects.planning.nsw.gov.au and the project website: www.sydneymetro.info.

Hard copies of the document were also available at Community Information Sessions and Information Stalls and at the following locations:

- NSW Department of Planning and Environment Information Centre: 23–33 Bridge Street, Sydney
- Transport for NSW Community Information Centre: 388 George Street, Sydney
- Sydney Metro Northwest Community Information Centre: Shop 490, Castle Towers Shopping Centre, Castle Hill
- Crows Nest Centre: 2 Ernest Place, Crows Nest
- State Library: Macquarie Street, Sydney
- Nature Conservation Council: Level 2, 5 Wilson Street, Newtown
- Willoughby Council
 - Customer Service Centre: Level 4, 31 Victor Street, Chatswood
 - Chatswood Library on The Concourse: 409 Victoria Avenue, Chatswood
 - Artarmon Library: 139 Artarmon Road, Artarmon
- North Sydney Council
 - Customer Service Centre: 200 Miller Street, North Sydney
 - Stanton Library: 234 Miller Street, North Sydney
- Lane Cove Council
 - Customer Service Centre: 48 Longueville Road, Lane Cove
- City of Sydney Council
 - Customer Service Centre: Town Hall House Level 2, 456 Kent Street, Sydney
 - Haymarket Library: 744 George Street, Sydney
 - Waterloo Town Hall Library: 770 Elizabeth Street, Waterloo
- Inner West Council
 - Customer Service Centre: 2-14 Fisher Street, Petersham
 - Marrickville Town Hall Library: Corner Marrickville and Petersham Roads, Marrickville
 - St Peters Town Hall Library: Unwins Bridge Road, Sydenham.

The Sydney Metro project team supported the public exhibition of the Environmental Impact Statement through a variety of engagement methods and communication materials, as outlined below.

Engagement methods

- Community contact and information points
- Community Information Sessions
- Community Information Stalls
- Stakeholder engagement
- Place Managers.

Engagement materials

- O Media releases
- Newspaper advertisements
- Email alerts to the project mailing list
- Project website
- Environmental Impact Statement Summary document
- Project newsletter.

4.4.1 Community contact and information points

Table 4-1 outlines community contact and information points in use on the project.

Activity	Detail
Community information line (toll free)	1800 171 386
Community email address	sydneymetro@transport.nsw.gov.au
Website	www.sydneymetro.info
Postal address	Sydney Metro City & Southwest: PO Box K659, Haymarket, NSW 1240
Transport for NSW community information centre	388 George Street, Sydney
Sydney Metro Northwest community information centre	Shop 490, Castle Towers Shopping Centre: Old Castle Hill Road, Castle Hill

Table 4-1 Community contact and information points

4.4.2 Community information sessions

The project team hosted a series of community information sessions where displays and information about the Environmental Impact Statement were available.

All members of the community were invited to attend these sessions and meet expert members of the project team and have any questions answered. There was no need to make a booking; visitors could drop in anytime within the advertised times.

In addition, representatives from the Department of Planning and Environment attended all sessions and representatives from UrbanGrowth NSW attended the Redfern session.

There were also 322 visitors at the six community information sessions along the project alignment. Table 4-2 outlines the date, time and location of community information sessions.

Table 4-2 Community information sessions

Date and time	Location	Attendees
Saturday 21 May, 10am-2pm	Dougherty Community Centre: 7 Victor Street, Chatswood	86
Wednesday 25 May, 4pm-8pm	Masonic Centre: 66 Goulburn Street, Sydney	35
Saturday 28 May, 10am-2pm	McMahons Point Community Centre: 165 Blues Point Road, McMahons Point	88
Wednesday 1 June, 4pm-8pm	Northside Conference Centre: Oxley Street and Pole Lane, St Leonards	50
Saturday 4 June, 10am-2pm	Redfern Oval: 51 Redfern Street, Redfern	25
Thursday 16 June, 4pm-8pm	Concordia Club: 1 Richardson Crescent, Tempe	38

Invitations

Invitations to attend the sessions were included in:

- The project newsletter
- The Environment Impact Statement Summary document
- The Sydney Metro City & Southwest website
- Advertisements in local newspapers.

Display materials

At the display locations, copies of the Environmental Impact Statement were available for visitors to view. A PDF of the report was also provided on a USB stick for those wanting an electronic copy to take away, as were copies of the Environmental Impact Statement Summary, project newsletter, contact cards and fridge magnets. The display also featured a video outlining the project (including animations played on repeat) and information boards presented around the room on the following themes:

- What's in the Environmental Impact Statement
- How to make a submission
- Sydney Metro is Australia's biggest public transport project
- Map of Sydney Metro including the Northwest and City & Southwest components
- Sydney's new metro trains
- Project benefits
- Building Chatswood to Sydenham
- Tunnel boring machines
- Building the dive structures
- Work at Chatswood
- Surface trackwork at Chatswood
- Artarmon substation

- Work in Sydney Harbour
- Work at Blues Point
- Work at Marrickville
- Building the stations
- Crows Nest Station
- Victoria Cross Station
- Barangaroo Station
- Martin Place Station
- Pitt Street Station
- Central Station metro platforms
- Waterloo Station.



An example of the information boards presented at the display locations

4.4.3 Community information stalls

The project team hosted two community information stalls at community markets, as outlined in Table 4 3. These were attended by 175 visitors.

Table 4-3 Information stalls

Date and time	Location	Attendees
Saturday 28 May, 8am-2pm	Kirribilli Market: Kirribilli Bowling Green, Kirribilli	63
Saturday 18 June, 9am-1pm	Crows Nest Market: Ernest Place, Crows Nest	112

Display materials

Copies of the Environmental Impact Statement were available for visitors to view; a PDF of the report was also provided on a USB stick for those wanting an electronic copy to take away, as were copies of the Environmental Impact Statement Summary, project newsletter, contact cards and fridge magnets.

4.4.4 Stakeholder engagement

Key stakeholders (including local government, NSW and Australian Government departments, peak bodies and industry associations) were briefed via emails, meetings, presentations and / or phone calls. The briefings were designed to ensure stakeholders were adequately informed of the project (including the Environmental Impact Statement) and to encourage them to make a submission. Table 4-4 outlines stakeholders who were contacted about the project between 1 May and 27 June 2016.

Stakeholder engagement	
Federal Government	
Australian Rail Track Corporation	Infrastructure Australia
State Government	NSW Trains
Barangaroo Delivery Authority	NSW Treasury
CBD Coordination Office	Office of Environment and Heritage
Department of Planning and Environment	Port Authority of NSW
Environment Protection Authority	Roads and Maritime Services
Greater Sydney Commission	State Emergency Service
Harbour Trust	State Transit Authority
Heritage Council of NSW	Sydney Harbour Foreshore Authority
Housing NSW	Sydney Light Rail
Infrastructure NSW	Sydney Motorway Corporation (Westconnex)
NSW Fire and Rescue	Sydney Trains
NSW Health	Transport Management Centre
NSW Health - Sydney Local Health District	UrbanGrowth NSW
NSW Police	
Local Government	
City of Canterbury Bankstown	Inner West Council (formerly Marrickville Council)
City of Sydney	North Sydney Council
Lane Cove Council	Willoughby City Council

Table 4-4 Contacted stakeholders

Stakeholder engagement	
Regional Organisation of Councils	
Northern Sydney Regional Organisation of Councils	Western Sydney Regional Organisation of Councils
Federal Members of Parliament	
Member for Barton	Member for North Sydney
Member for Blaxland	Member for Sydney
Member for Bradfield	Member for Watson
Member for Grayndler	
State Members of Parliament	
Member for Bankstown	Member for Lakemba
Member for Baulkham Hills	Member for Lane Cove
Member for Canterbury	Member for Newtown
Member for Castle Hill	Member for North Shore
Member for East Hills	Member for Riverstone
Member for Epping	Member for Ryde
Member for Heffron	Member for Summer Hill
Member for Holsworthy	Member for Sydney
Member for Hornsby	Member for Willoughby
Member for Ku-ring-gai	
Peak bodies	
10,000 Friends of Greater Sydney	International Association of Public Transport
Action for Public Transport	NRMA Motoring & Services
Australian Constructors Association	NSW Business Chamber
Australian Hotels Association	NSW Commuter Council
Australian Institute of Architects	NSW Permanent Way Institution
Australasian Railway Association	NSW Rail Transport Museum
Australian Railway Historical Society	NSW Taxi Council
Bicycle Network	Office of the National Safety Regulator
Bicycle NSW	Pedestrian Council of Australia
BusNSW	Planning Institute of Australia
Cement, Concrete and Aggregates Australia	Property Council
Civil Contractors Federation	Roads Australia
Comfort Delgro Cabcharge Pty Ltd (Hills Bus)	Sydney Business Chamber
Committee for Economic Development of Australia	Sydney Hills Business Chamber
Committee for Sydney	The Australian Taxi Drivers Association
Connect Macquarie Park	Tourism and Transport Forum
Consult Australia	Urban Development Institute of Australia
Engineers Australia	Urban Taskforce
Housing Industry Association	Warren Centre for Advanced Engineering
Infrastructure Partnerships Australia	

Educational institutions Monte Sant' Angelo Mercy College The Tom Bass Sculpture Studio School Transport specialists Contra for Mestern Scales and Mestern Scales and Incompile	
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Centre for western Sydney, Western Sydney UniversityInstitute of Transport and Logistics StudiesFaculty of Engineering and Information Sciences, University of WollongongSMART Infrastructure Facility, University of Wollong Sydney University Public Transport ChairInstitute for Sustainable Futures, University of Technology SydneySigney University	ong
Community and interest groups	
Alexandria Residents Action GroupNorth Shore Historical SocietyArtarmon Bushcare GroupNorth Sydney Sunrise Rotary ClubArtarmon Progress AssociationRedWatchArtarmon Village Chamber of CommerceStanton Precinct CommitteeBarangaroo Community Working PartyWilloughby District Historical SocietyChatswood Chamber of CommerceWollstonecraft Precinct CommitteeChatswood East Side Progress AssociationMillers Point Community Working PartyChatswood West Ward Progress AssociationMillers Point, The Rocks and Walsh Bay ResidentCrows Nest Main StreetAction GroupCrows Nest RotaryMillers Point, Dawes Point and The Rocks Public Housing TenantsHoltermann Precinct CommitteeWaverton Precinct Committee (Berry's Bay)Lavender Bay Precinct CommitteeWestConnex Action Group	
Naremburn Progress Association	
Channel 7 Fairfax and Roberts Macquarie Bank Sydney Airport Waterloo Congregational Church	
Industry	
Deutsche Bahn Engineering and Consulting	
Utilities	
AARNetQuenosAusgridSydney WaterJemenaTelstraMacquarie TelecomTPG (AAPT / Powertel / PipeNetworks)	
NBN Co TransGrid Nextgen / Visionstream Verizon / Worldcom Optus / Uecomm Vocus (M2 / Dodo / iPrimus / Engine / Commanded)	er)

Note: All applicable stakeholders were approached and offered project information and project briefings, where appropriate. Not all stakeholders accepted the opportunity to be briefed by the project team.

4.4.5 Place Managers

Place Managers build relationships and act as a feedback mechanism to help ensure community and stakeholder aspirations are consistently considered in the planning process. Their role is to be a direct point of contact between affected members of the community and the project team.

Place Managers will continue to play a vital role in maintaining close and ongoing contact with local communities and stakeholders during the design and delivery of Sydney Metro.

Place Managers have engaged impacted residents, tenants and businesses throughout the exhibition period (by phone, email, newsletter or doorknock) to ensure they were aware of the Environmental Impact Statement, invite them to community information sessions and stalls and ensure they had the information they needed to make a submission on the project.

For large buildings and apartment blocks, Place Managers contacted building / facilities / strata managers to assist with distributing information to tenants and owners. Contact was made with stakeholders and properties in the immediate vicinity of each proposed construction site and based on proposed construction activities and potential impacts. These groups were offered project information and briefings by the project team, where appropriate. Not all property owners and occupiers accepted the opportunity to be briefed.

Place Managers can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

4.4.6 Media releases

Table 4-5 outlines the media releases issued since the Environmental Impact Statement was finalised.

Date	Detail
11 May 2016	'New congestion-busting CBD metro stations and harbour rail tunnel another step closer' Issued by Premier of NSW, Mike Baird
20 June 2016	'NSW Budget - \$12 billion in Budget for metro rail revolution' Issued by Premier of NSW, Mike Baird
21 June 2016	'Budget delivers \$10.5 billion for public transport' Issued by Minister for Transport and Infrastructure, Andrew Constance

Table 4-5	Media releases
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4.4.7 Newspaper advertisements

Table 4-6 outlines the newspaper advertisements placed since the Environmental Impact Statement was finalised.

Table 4-6 Newspaper advertising

Advertisement date	Publication
Thursday 12 May 2016	Mosman Daily
Friday 13 May 2016	North Shore Times
Saturday 14 May 2016	The Australian Chinese Daily
Saturday 14 May 2016	The Sydney Morning Herald
Tuesday 24 May 2016	Inner West Courier
Thursday 26 May 2016	Mosman Daily
Friday 27 May 2016	North Shore Times
Saturday 28 May 2016	The Sydney Morning Herald
Tuesday 7 June 2016	Inner West Courier
Tuesday 14 June 2016	Inner West Courier

METRO City& southwest



Australia's largest public transport project

Sydney Metro is Australia's largest public transport project. It will transform Sydney, delivering more trains and faster services for customers across the network.

Sydney Metro City & Southwest will extend metro rail between Chatswood and Bankstown, including a new crossing beneath Sydney Harbour, new railway stations in the lower North Shore and CBD, and the upgrade and conversion of the current line between Sydenham and Bankstown. The Environmental Impact Statement for the Chatswood to Sydenham component is now on exhibition. Your submission must reach the NSW Department of Planning and Environment by **Monday 27 June 2016**.

INFORMATION SESSIONS

Community information sessions are now being held. We encourage people to come along to one of the sessions below to meet expert members of the project team who will be happy to answer any questions. There is no need to make a booking.

COMMUNITY INFORMATION SESSIONS			
Saturday 21 May	Dougherty Community Centre:		
10 am-2 pm	7 Victor Street, Chatswood		
Wednesday 25 May	Masonic Centre:		
4-8 pm	66 Goulburn Street, Sydney		
Saturday 28 May	McMahons Point Community Centre:		
10 am-2 pm	165 Blues Point Road, McMahons Point		
Wednesday 1 June	Northside Conference Centre:		
4-8 pm	Oxley Street & Pole Lane, St Leonards		
Saturday 4 June	Redfern Oval:		
10 am-2 pm	51 Redfern Street, Redfern		
Thursday 16 June	Concordia Club:		
4-8 pm	1 Richardson Crescent, Tempe		
For more information or to register for email updates contact the project team on: Website sydneymetro.info Email sydneymetro@transport.nsw.gov.au			
Call 1800 171 386			
	Transport for NSW		

Example of advertisement placed in local newspapers

4.4.8 Email alerts to the project mailing list

An email alert was sent to 2,500 community members registered in the Sydney Metro City & Southwest project database. The email encouraged recipients to visit the Sydney Metro website for more information and advised of the exhibition dates.

4.4.9 Facebook

Sydney Metro posted invitations and reminders regarding the Community information sessions and information stalls on its Facebook feed which has over 13,500 followers.

4.4.10 Website

Table 4-7 outlines the website statistics between 11 June 2014 and the close of the exhibition period on 27 June 2016.

Table 4-7Website statistics, 11 June 2014 - 27 June 2016

Activity	Number of contacts		
Sydney Metro Northwest			
Registrations for project updates	3,192		
Unique visitors	417,158		
Total hits	1,929,151		
Document views	31,862		
Sydney Metro City & Southwest			
Registrations for project updates	2,894		
Unique visitors	181,230		
Total hits	250,818		
Document views	57,958		

Information on the website includes:

- Animations and videos
- A document library that includes newsletters (in English and other languages), overview documents, the State Significant Infrastructure Application Report, and the Environmental Impact Statement
- Route maps
- Information on how to make a submission on the Environmental Impact Statement.

How to make a submission

The 'How to make a submission' page on the Sydney Metro website included a direct link to the online submissions form on the Department of Planning and Environment's website, as well as information on how to make a postal submission.

Document library

The document library provided access to the Environmental Impact Statement document in full along with the Summary document and a copy of the newsletter that was delivered to homes along the alignment.

All project documents issued since June 2015, including the State Significant Infrastructure Application Report, are also available to download.

Translated materials

Copies of the newsletter were also translated into six languages, reflecting the diverse audience of the communities along the Sydney Metro alignment.

4.4.11 Environmental Impact Statement Summary document

An Environmental Impact Statement Summary document was prepared and made available electronically on the project website and also in hard copy. Hard copies were available at the community information centres, community information sessions and stalls, via place managers and other team members during meetings, briefings, doorknocks, and by request.

This Summary document provided an overview of the Chatswood to Sydenham component of Sydney Metro City & Southwest. Readers were also encouraged to review the Environmental Impact Statement and supporting documents on the Sydney Metro website. The Summary document included:

- An overview of Sydney Metro
- Key features, objectives and benefits of Sydney Metro
- An overview of the Chatswood to Sydenham project
- A map showing station, construction and tunnelling sites and the project alignment
- O An overview of the Environmental Impact Statement and what it contains
- Infographics explaining how the stations and dive sites would be built, how tunnel boring machines operate, and how work would be carried out at Blues Point
- An overview of each station, construction and tunnelling site and a brief overview of the key impacts anticipated during construction and the features available during operation
- Information on where to view the Environmental Impact Statement
- An invitation to the community information sessions and information stalls
- Information on how to make a submission
- Disclosure and privacy information
- Contact details for Sydney Metro
- Information on how to access translation services.

4.4.12 Project newsletter

A copy of the project newsletter Chatswood to Sydenham – Environmental Impact Statement was delivered to 155,000 properties within one kilometre of the project alignment between 12 May and 28 May 2016.

The newsletter included:

- An overview of Sydney Metro
- Key features of Sydney Metro
- An overview of the Chatswood to Sydenham project
- A map showing station, construction and tunnelling sites
- An overview of the Environmental Impact Statement and what it contains
- Information on where to view the Environmental Impact Statement
- An invitation to the Community Information Sessions and Information Stalls
- Information on how to make a submission
- Disclosure and privacy information
- Contact details for Sydney Metro
- Information on how to access translation services.

Translation services

The newsletter was translated into six languages – Arabic, Chinese, Greek, Hindi, Korean and Vietnamese – to cater for the main non-English language groups among the communities along the Sydney Metro alignment. Translated versions of the newsletter were provided on the project website.

4.5 Ongoing consultation and engagement

Transport for NSW will continue to work with stakeholders and the community to ensure they are informed about the project and have opportunities to provide feedback to the project team. A list of activities and their timing is provided in Table 4-8.

Awareness and marketing campaign Ongoing to engage future customers Community events Ongoing Community information centres Ongoing Community information sessions As required **Community Communications Strategy** Prior to construction Construction complaints management system Prior to construction Construction notifications Seven days prior to construction starting Doorknocks As required Email updates **Relevant milestones** Enquiries and complaints hotline Ongoing Fact sheets As required Engagement with stakeholders including As required; relevant milestones government, peak bodies and local businesses Media releases **Relevant milestones** Newsletter **Relevant milestones Relevant milestones** Newspaper advertising Operation communications plan Prior to operation **Place managers** Ongoing Project briefings and presentations **Relevant milestones** Project overview document **Relevant milestones** Site signage Prior to construction Social media updates As required; relevant milestones Website, animations and online forums Ongoing

Table 4-8 Ongoing consultation and engagement activities

4.5.1 Industry engagement

An industry briefing was held on 1 September 2016 at the Sofitel Hotel in Sydney. Invitations to attend the briefing were included in:

- Sydney Metro website
- Advertisements in Australian
- O Direct invitations.

The briefing provided industry with information on:

- Progress with the development of the Sydney Metro City & Southwest project
- Details of the updated project delivery strategy
- Timing of next steps, including upcoming procurement processes.

The session was attended by just over 500 industry representatives from Australian and international firms. Attendees received a copy of the booklet - *Sydney Metro, City & Southwest Industry Briefing.*

Transport for NSW will continue to engage industry in the development of the project.

4.5.2 Heritage working group

A Sydney Metro City & Southwest Heritage Working Group was established after the exhibition of the Environmental Impact Statement to provide key government stakeholders with:

- An understanding of the work carried out to date to develop the scope of the project
- A forum to discuss and review heritage issues raised and to agree on governance.

The objectives of the heritage working group are to:

- Provide clarification to heritage agencies and other stakeholders regarding project development, design and assessment carried out to date
- Provide clarification on design development processes
- Gain input from heritage agencies and other stakeholders into ongoing project design and assessment
- Assist in identifying heritage mitigation and management measures for the project
- Assist in identifying heritage governance and processes to guide the next stages of project development.

The heritage working group includes representatives of Department of Planning and Environment, Transport for New South Wales (including heritage specialists), heritage specialists from Sydney Trains Environment Division, representatives from Heritage Division of Office of Environment and Heritage, City of Sydney and Barangaroo Delivery Authority. During the preparation of this Submissions and Preferred Infrastructure Report, heritage working group sessions were held during which Transport for New South Wales provided information on:

- The process for considering heritage as part of multi criteria assessments for station design decisions
- Explanation of constraints and opportunities that have influenced the final station locations
- A greater level of detail around the design of the stations
- Design responses to heritage issues
- The ongoing design development process.

4.5.3 Aboriginal community consultation

Aboriginal community consultation has been guided by Office of Environment and Heritage *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (Department of Environment and Conservation, 2005), using the Office of Environment and Heritage *Aboriginal cultural heritage consultation requirements for proponents* (Department of Environment, Climate Change and Water, 2010b) as best practice. Consultation has been conducted for the entirety of the Sydney Metro City & Southwest route between Chatswood and Bankstown, encompassing both the Chatswood to Sydenham and the Sydenham to Bankstown upgrade projects.

In accordance with the Office of Environment and Heritage consultation requirements, Transport for NSW corresponded with the following organisations by letter as part of the preparation of the Cultural Heritage Assessment Report (refer to Appendix H of this report) requesting the details of Aboriginal people who may hold cultural knowledge relevant to determining the Aboriginal significance of Aboriginal objects and / or places within and adjacent to the project area:

- Regional Operations Group, Metropolitan Region, Office of Environment and Heritage
- Metropolitan Local Aboriginal Land Council (MLALC)
- Gadangarra Local Aboriginal Land Council (GLALC)
- The Registrar, Aboriginal Land Rights Act 1983
- National Native Title Tribunal
- Native Title Services Corporation Limited (NTSCORP)
- City of Canterbury Council
- City of Sydney Council
- North Sydney Council
- Greater Sydney Catchment Management Authority.

An advertisement was placed in the Sydney Morning Herald and Koori Mail in May 2016 in accordance with the Office of Environment and Heritage consultation requirements. The advertisement invited all Aboriginal persons and organisations who hold cultural knowledge relevant to determining the significance of Aboriginal objects and places in the project area to register their interest by May 2016. Letters were also sent to all 37 Aboriginal persons or organisations identified through responses from agencies contacted. The letters provided details about the location and nature of the project, as well as an invitation to register as an Aboriginal stakeholder for the project by June 2016.

Following the completion of steps outlined above, twenty Aboriginal stakeholders registered as persons or organisations that may hold cultural knowledge relevant to determining the Aboriginal cultural values of the study area. The registered Aboriginal stakeholders are listed in the Cultural Heritage Assessment Report (refer to Appendix I of this report).

Registered Aboriginal Parties were consulted regarding the Cultural Heritage Assessment Report methodology and were invited to attend an Aboriginal Focus Group in July 2016. The Aboriginal Focus Group provided an opportunity for Transport for NSW to present the key project details, and overview of the Aboriginal heritage assessment and proposed excavation methodology. Following the Aboriginal Focus Group, all Registered Aboriginal Parties were sent a copy of the draft Cultural Heritage Assessment Report and excavation methodology with an invitation to provide comments on the document.

4.5.4 Consultation and engagement during construction

An overview of stakeholder and community involvement during construction of the project is provided in the Construction Environmental Management Framework (Appendix B of this report).

During construction, Sydney Metro and the Principal Contractors will work closely with stakeholders and the community to ensure they are well informed regarding the construction works.

Stakeholders and the community will be informed of significant events or changes that affect or may affect individual properties, residences and businesses. These will include:

- Significant milestones
- Design changes
- Changes to traffic conditions and access arrangements for road users and the affected public
- Construction operations which will have a direct impact on stakeholders and the community including noisy works, interruptions to utility services or construction work outside of normal work hours.

Community Communication Strategy

A Community Communication Strategy will be developed by each Sydney Metro Principal Contractor.

Key elements of the Community Communication Strategy will be implemented at appropriate times in the construction process, and will include:

- Notification (including targeted letterbox drops and email) of any works that may disturb local residents and businesses (such as noisy activities and night works) at least seven days prior to those works commencing
- Notification (including targeted letterbox drops and email) of works that may affect transport (such as road closures, changes to pedestrian routes and changes to bus stops)
- Traffic alerts (via email) to all key traffic and transport stakeholders advising of any changes to access and local traffic arrangements (at least seven days prior to significant events)
- Print and radio advertisements regarding major traffic changes
- 24-hour toll-free community project information phone line
- Complaints management process
- Community information sessions, as required

- Regular updates to the Sydney Metro website (sydneymetro.info), including uploading of all relevant documents, and contact details for the stakeholder and community relations team
- Provision of information to the Sydney Metro Community Information Centre including community newsletters, information brochures and fact sheets and interactive web-based activities
- Clear signage at the construction sites
- Regular newspaper advertisements in local and metropolitan papers
- Regular inter-agency group meetings
- Community, business and stakeholder satisfaction surveys and feedback forms
- Translator and interpreter services.

Complaint handling

Community liaison and complaints handling will be undertaken in accordance with the Construction Complaints Management System and will include:

- Principal Contractors will deal with complaints in a responsive manner so that stakeholders' concerns are managed effectively and promptly
- A verbal response will be provided to the complainant as soon as possible and within a maximum of two hours from the time of the complaint (unless the complainant requests otherwise). A detailed written response will then be provided, if required, to the complainant within one week.

Chapter 4 - Community and stakeholder involvement

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SUBMISSIONS RECEIVED

CHAPTER FIVE

5 Submissions received

5.1 Respondents

The Department of Planning and Environment received 318 submissions in response to the Environmental Impact Statement during the public exhibition period (a period of 48 days between 11 May 2016 and 27 June 2016). Submissions were accepted by:

- Electronic submission (online) www.majorprojects.planning.nsw.gov.au/page/on-exhibition
- Post Department of Planning and Environment, GPO Box 39, Sydney, NSW 2001.

The number of submissions received by respondent type is presented in Table 5-1.

Table 5-1 Submissions received by respondent type

Respondent type	Number of submissions
Government agency	12
Local council	5
Community, business and other	301
Total	318

Six different form letters were received from a total of 67 individuals. Responses to the issues raised in these form letters are provided as part of the responses to community submissions in Chapter 8.

5.2 Overview of issues raised

Each submission has been individually examined to understand the issues being raised. The issues raised in each submission have been extracted and collated by category and sub-category, and corresponding responses to the issues have been provided. Where similar issues have been raised in different submissions, these have been amalgamated and only one response has been provided. Care has been taken in this process to preserve the specific details of each issue raised.

Submission authors have not been identified in this report (excluding submissions by government agencies, councils and elected representatives). Submission authors have been assigned a unique identification number which is referred to in this report as a 'stakeholder identification number'. Stakeholder identification numbers appear above the issue responses throughout the report, to enable individuals to locate the response to their submissions. Letters have been sent to each submission author (where contact details have been provided) to advise the author of their unique stakeholder identification number and the availability of this report.

The issues raised most frequently in submissions relate to:

- Project description
- Project development and alternatives
- Strategic need and justification
- Construction and operational noise and vibration
- Construction and operational traffic and transport
- Land use and property
- O Business impacts
- Stakeholder and community engagement.

5.2.1 Government agencies

Eleven government agencies made submissions, raising a range of issues relevant to their respective areas of interest and responsibility. Some recommendations for suggested conditions of approval for the project were also made. A summary of each agency's issues is provided below. Detailed responses are provided in Chapter 6.

UrbanGrowth NSW and Land & Housing Corporation

UrbanGrowth NSW and the Department of Family and Community Services (Land and Housing Corporation) provided a joint submission which raised issues relating to:

- The need for an iterative and integrated approach to future over station development
- Planning and design around Waterloo Station, with particular focus on social housing tenants
- Construction impacts on social housing tenants around Waterloo Station, including noise and vibration, and traffic impacts
- Cumulative impacts of the project with development activities at Waterloo Housing Estate.

Office of Environment and Heritage

The Office of Environment and Heritage raised issues relating to:

- Floodplain risk management around the Marrickville dive site
- Biodiversity, including further consideration of mitigation measures
- Support for the Aboriginal heritage mitigation measures included in the Environmental Impact Statement.

Heritage Council of NSW

The Heritage Council of NSW raised issues relating to:

- Potential impacts on heritage listed properties
- Potential impacts on archaeological items.

Ausgrid

Ausgrid indicated its commitment to maintaining a close working relationship with Transport for NSW on the project and providing safe operation of the Ausgrid electrical network.

Fire and Rescue NSW

Fire and Rescue NSW raised issues relating to:

- The need for provision of emergency support services on the Sydney Metro network
- The design of Sydney Metro rolling stock and tunnels to facilitate safe and efficient evacuations
- Compliance of stations and ancillary buildings with the National Construction Code.

Geological Survey of NSW

The Geological Survey of NSW has no concerns with the proposal as it would not impact on mineral extractive or energy resources.

Sydney Harbour Foreshore Authority

The Sydney Harbour Foreshore Authority noted the need for ongoing consultation with stakeholders during construction, especially in relation to the establishment of temporary construction zones around the Sydney CBD, but raised no particular concerns as the proposal would not directly impact on The Rocks or Darling Harbour precincts.

Sydney Water

Sydney Water raised issues relating to:

- The ongoing application of environmental protection legislation to the project
- The need to protect and monitor Sydney Water assets during construction and operation.

Port Authority of NSW

The Port Authority of NSW raised issues relating to:

- Impacts of barge use on shipping channels in Sydney Harbour during construction
- Construction traffic impacts at Barangaroo on access routes to the Overseas Passenger Terminal
- Noise and vibration impacts on Port Authority property near Barangaroo.

Environment Protection Authority

The Environment Protection Authority requested additional information regarding groundwater, noise and vibration impacts. They also raised issues relating to construction noise and vibration impacts, including suggested conditions for approval, and suggested operational noise limits.

Barangaroo Delivery Authority

The Barangaroo Delivery Authority noted its support for the project and indicated that it is working with Transport for NSW to finalise specific project interface agreements.

Department of Primary Industries

The Department of Primary Industries raised issues relating to water quality, groundwater bores, and groundwater inflow and take.

5.2.2 Local councils

Willoughby Council, Lane Cove Council, North Sydney Council, City of Sydney Council and Inner West Council each made a submission. The main issues raised related to:

- The need for ongoing consultation with local councils and the community
- Construction traffic, especially haulage routes, and the use and adjustment of the local road network
- O Construction noise and vibration including impacts from work outside of standard construction hours
- Operational noise from fixed infrastructure, including the adjusted T1 North Shore Line
- Pedestrian safety, amenity and access during construction and operation of the stations
- Construction air quality impacts due to dust and exhaust fumes
- Visual impacts, including future landscape treatments and the urban design of fixed infrastructure
- O Non-Aboriginal heritage impacts and potential impacts to locally listed non-Aboriginal heritage items.
- O Potential Aboriginal heritage impacts at Blues Point temporary site
- Biodiversity impacts and the possibility of improvements to local urban biodiversity
- Plooding impacts around Victoria Cross Station and Marrickville dive site
- The integration of station development with existing council planning documents, and adjacent land uses and the public domain
- Cumulative impacts with other large infrastructure and urban development projects.

Detailed responses to the issues raised by local councils are provided in Chapter 6.

5.2.3 Community, business and other submissions

Submissions from community groups, businesses, schools, places of worship, property management groups, elected representatives and individuals raised the following main issues:

- Transport integration
- Development and transport planning
- Environment and community impacts.
- Pedestrian and motorist safety around construction sites and haul routes
- Noise and vibration impacts during construction and operation, including during out of hours work
- Construction traffic impacts
- Impacts on the local road network performance during construction and operation
- Suggestions for alternative tunnel alignments and additional station locations
- Future development opportunities around stations
- Impacts on property values and the need for property condition surveys
- Access and amenity related impacts to businesses during construction
- Direct and indirect impacts on heritage items, including areas of potential archaeological value
- Visual impacts during construction and operation.

Responses to community, business and other submissions are provided in Chapter 7 and 8.
GOVERNMENT SUBMISSIONS



6 Government submissions

This chapter provides responses to issues raised by government agencies and local councils.

6.1 UrbanGrowth NSW and Land & Housing Corporation

UrbanGrowth NSW and the Department of Family and Community Services (Land and Housing Corporation Directorate) provided a joint submission.

The submission is supportive of the project on the basis that the proposed metro station at Waterloo would provide a unique opportunity to transform the Waterloo area and make it a better place to live for future and existing residents.

The submission focuses on the renewal of the Waterloo social housing estate as part of the NSW Government's *Communities Plus Program* – a key initiative to grow the social housing portfolio. This program is expected to deliver up to 23,000 new and replacement social housing dwellings, 500 affordable housing dwellings and up to 40,000 private dwellings over the next 15 to 20 years.

The submission also raises a number of planning, design, construction and operational issues.

6.1.1 Planning and design

Issue raised

Continued collaboration with Land and Housing Corporation and UrbanGrowth NSW throughout the whole renewal process for the area will be essential to achieve world class outcomes that exemplify best practice in the integration of design and land use with public transport transformation in Sydney.

Response

Consultation would continue with Land and Housing Corporation and UrbanGrowth NSW regarding the integration of Waterloo Station with surrounding land uses.

Issue raised

The Waterloo Station strategy, location of the station entry / lobby and services, and retention of the Congregational Church building as shown in Chapter 6 of the Environmental Impact Statement are generally supported. We understand the station layout and key features displayed in the map are indicative only. Further resolution of the location of pedestrian crossings, cycle routes and bus stops should be informed by a detailed transport study to be carried out as part of the broader planning of the area, which will also determine the future character and role of Botany Road and Cope Street. A potential additional green / cycle link through Wellington Street is being considered as part of the strategic directions for the Central to Eveleigh Urban Transformation and Transport Program (C2E) and the City of Sydney Council.

Response

The Waterloo Station layout and transport integration arrangements are subject to detailed design. Consultation would continue with Land and Housing Corporation, UrbanGrowth NSW and other relevant stakeholders to ensure the station arrangements consider the broader strategic planning for the area and other relevant projects.

Issue raised

Future planning for development above the station and within the station block should be supported by a coherent vision for the renewal of the broader area to be developed in partnership with the Department of Planning and Environment, City of Sydney, Land and Housing Corporation, UrbanGrowth NSW, other agencies and the community. Alignment with the strategic framework for the Central to Eveleigh Urban Transformation and Transport Program should be sought and maintained as the planning processes evolve.

Response

Development above the station and on the residual land within the station block will be subject to a separate planning and assessment process. As identified in Section 12.5.10 of the Environmental Impact Statement, strategies and opportunities for this development would be developed in consultation with the Department of Planning and Environment, UrbanGrowth NSW, Land and Housing Corporation, Greater Sydney Commission, City of Sydney Council and other relevant agencies.

Issue raised

Given that the renewal of the social housing estate will take 15 to 20 years to complete, planning concerns more specific to social housing tenants should be considered, including lower car ownership rates and increased reliance on public transport.

Response

As identified in Section 12.5.10 of the Environmental Impact Statement Waterloo Station would provide the opportunity for positive land use change and transport integration. Providing opportunities to increase residential densities within walking distance of the station would reduce private vehicle use. In addition creating strong public transport links to the Sydney CBD and other centres throughout the Global Economic Corridor would reduce the reliance on public transport.

Notwithstanding, it is recognised that the renewal of the social housing estate will be progressed over a number of years. Waterloo Station would also provide a benefit to social housing tenants by improving public transport and reducing reliance on car ownership.

Issue raised

The station design should continue to be developed as practical through an iterative and integrated approach to ensure future over station development and the renewal of the adjoining social housing estate can achieve design excellence, optimal connectivity and amenity outcomes for residents and public spaces.

Response

As identified in Section 6.5.3 of the Environmental Impact Statement, the design of the Waterloo Station would make provision for future over station development. In general this includes structural elements to enable the construction of future over station developments and providing space for future infrastructure such as lift cores, access, parking, and building services. Further clarification regarding the over station development elements is provided in Section 2.4 of this report.

Over station development would be subject to a separate planning approval process. Liaison will continue with the Department of Planning and Environment, UrbanGrowth NSW and local councils so that the future over station development would be consistent with the renewal of the social housing estate and strategic planning requirements.

It is intended that the Design Review Panel established for the Sydney Metro City & Southwest Chatswood to Sydenham project would apply to the over station developments, especially the interface between the metro station elements and the over station development elements.

6.1.2 Operational and construction impacts

Issue raised

All measures should be undertaken to minimise or adequately mitigate any impacts to the health, safety and amenity of all existing residents of the Waterloo social housing estate.

Response

Chapter 27 of the Environmental Impact Statement outlines the approach to environmental management for the project. Specifically, Table 27-1 of the Environmental Impact Statement provides a consolidated list of mitigation measures which would be implemented to minimise potential environmental and community impacts. These mitigation measures have been revised and are provided in Chapter 11 of this report.

Issue raised

Potential impacts during construction and operation of the Waterloo Station should be addressed in coordination with Land and Housing Corporation so that consideration can be given to the most vulnerable residents, including those that may suffer from mental health issues or spend extended periods at home, including during the day.

Response

Consultation would continue with Land and Housing Corporation in relation to the potential impacts and mitigation measures specific to the social housing tenants.

Issue raised

Noise events such as blasting and passage of the tunnel boring machine through Waterloo should be planned in collaboration with Land and Housing Corporation so that tenants can be given plenty of notice.

Response

The Construction Environmental Management Framework (Appendix B of this report) provides the communication and consultation strategy for the project. This includes targeted notification of works that may disturb local residents prior to those works commencing. Consultation would be carried out with Land and Housing Corporation to develop appropriate consultation strategies for social housing tenants.

Issue raised

The Environmental Impact Statement identifies two potential routes for construction traffic, with a potential route through Cope Street. Noise impacts associated with the Cope Street option have not been assessed in the Environmental Impact Statement. However, due to the potential noise impacts and cumulative impacts associated with the Cope Street route, this route should be avoided where possible.

Response

Construction access at Waterloo Station would require the use of Cope Street. Access and egress directly to and from Botany Road is restricted to the high volumes of traffic and presence of bus stops, especially during daytime periods.

A traffic noise assessment of construction vehicles using Cope Street is provided in Section 3.4 of this report. This assessment found that traffic noise would comply with the relevant criteria during the daytime periods. However there would be an exceedance during the night-time. As a result, night-time heavy vehicles movements would be restricted to Botany Road and Raglan Street unless compliance with the relevant criteria can be achieved (refer to revised mitigation measure NV2 in Chapter 11 of this report).

Issue raised

We share the concerns identified in the Environmental Impact Statement regarding cumulative impacts due to the potential overlapping timeframes for station construction and development activities on the Waterloo housing estate. We see the overlapping of activities as an opportunity to coordinate construction staging with Land and Housing Corporation's rehousing strategy to minimise potential impacts. Our continued collaboration and planning and development approach should also create opportunities for incorporating sustainability initiatives, sharing technical studies and optimising provision of services to make efficient use of public resources.

Response

As identified in Chapter 11 (mitigation measure CU1), Transport for NSW would manage and coordinate the interface with other projects under construction at the same time in order to manage the potential cumulative impacts. Depending on the timing for the renewal of the social housing estate, this would include ongoing coordination with UrbanGrowth NSW and Land and Housing Corporation.

6.2 Office of Environment and Heritage

The submission from the Office of Environment and Heritage raises a number of flood risk, biodiversity and Aboriginal cultural heritage related issues.

6.2.1 Floodplain risk management

Issue raised

Section 21.5.2 of the Environmental Impact Statement states that *"To avoid inundation, the tunnel dive structures would be designed at or above the Probable Maximum Flood level for mainstream flooding"*. Marrickville Council's Eastern Channel East Flood Study 2010, shows that the Marrickville tunnel portal is located in an area with greater than one metre depth in a 100 year average recurrence interval flood (probable maximum flood levels are not presented in the report). In Figure 6-34 of the Environmental Impact Statement, the proposed design does not indicate that flood levels have been considered, therefore Office of Environment and Heritage's previous comments are still relevant.

Response

Sections 6.7.2 and 21.5.2 of the Environmental Impact Statement identify that the Marrickville dive structure has been designed to be protected from the probable maximum flood level to avoid floodwater flowing into the tunnel. Figure 6-34 of the Environmental Impact Statement provides an indicative arrangement for the Marrickville dive structure and tunnel portal and is not intended to provide evidence that flood levels have been considered in its design.

Section 21.5.2 of the Environmental Impact Statement states 'To avoid flooding of the Marrickville dive structure, the metro tracks have been designed at a level of about 6.3 metres AHD near the start of the dive structure which is about 1.5 metres above the existing ground level'.

The track level near the start of the dive structure would be set above the probable maximum flood level, and the top of the retaining walls that would extend along the open portion of the dive structure would also be designed above the probable maximum flood level. The open area of the dive structure would be clear of existing flood overland flow paths, and the raised retaining walls would have minimal impact on flood levels in the vicinity of the project.

The top level of the covered portion of the dive structure would be set below existing ground level, and the surface restored to existing levels such that existing flood overland flow paths would not be impacted. The existing trunk drainage culvert crossing the dive structure would be reinstated above the dive structure.

Issue raised

Table 21-6 of the Environmental Impact Statement shows that within private property (corner Hogan Avenue and Bolton Streets, Sydenham) there is an increase in flood depth by the proposed development of 70mm for the 100 year average recurrence interval event and 380mm for the probable maximum flood event. There are no figures showing the flood level, extent and velocity differences from the existing terrain compared to that which incorporates the proposed infrastructure or proposed mitigation works and the floor levels of impacted properties.

There is inadequate information provided to assess the impact of the project on flooding on surrounding and downstream areas and to allow the Office of Environment and Heritage to comment on the Environmental Impact Statement (page 836) conclusion that: *"Given that the increase in flood levels would only occur at areas already subject to flooding, the project would not require changes to existing community emergency management arrangements for flooding and there would not be increased social and I or economic costs to the community as consequence of flooding".*

Response

Figure 21-3 of the Environmental Impact Statement shows the change in flood level as a result of the project in the 100 year average recurrence interval event. This figure includes information regarding the increase in flood extent as a result of the project in that flood event. This information is inclusive of the proposed drainage mitigation (10 grated inlets at about 10 metre spacing) as described in Section 6.3.2 of the Environmental Impact Statement. Section 21.5.2 of the Environmental Impact Statement also indicates that *'there would be no discernible change to flood velocities except within the Sydenham Station area where minor increases of up to 0.25 metres per second are predicted'.*

Based on the current design and current status of the flood modelling, the results indicate that there would not be a substantial impact on existing emergency arrangements for flooding. The areas where more substantial increases in flood depth are predicted to occur are currently subject to significant depth of flooding and there would be no substantial increase to flood velocities.

Mitigation measure FH9 (refer to Chapter 11 of this report) has been revised to identify that the project would be designed to, where feasible and reasonable, not worsen existing flooding characteristics up to and including the 100 year average recurrence interval event in the vicinity of the project; and to include the requirement to consider potential changes required to flood evacuation routes, flood warning systems and signage as part of flood modelling during detailed design.

Issue raised

In regard to identified flood mitigation options, the draft Environmental Impact Statement identified flood mitigation options as: 13 grated inlets (3 m x 1.2 m) at 10 metre spacing on the eastern side of the proposed metro rail tracks, each connected to Eastern Channel via two underground reinforced concrete box culverts (1.2 m x 0.9 m). Table 21-4 of the draft Environmental Impact Statement showed increases in flood depth with mitigation in five locations as (+ 70 mm, +95 mm, +110 mm, +150 mm and +300 mm). The Office of Environment and Heritage highlighted in its previous comments that 'Any adverse impacts on flood levels up to the probable maximum flood may need to be mitigated or compensated for', which should include residual impacts after implementing mitigation measures.

The Environmental Impact Statement indicates that the number of identified flood mitigation options (grated inlets) will reduce from 13 to 10, but the dimensions of the inlets will remain the same. Table 21-6 shows increases in flood depth with mitigation in five locations as (+70 mm, +70 mm, +130 mm, +160 mm and +470 mm). It is not clear on what basis these amendments have been decided and what strategy will be undertaken to deal with the increase in residual impacts, particularly the increase in flood depth within the rail corridor from 0.57 metres to 1.04 metres which would affect the Sydney Trains network.

A range of flood mitigation options (including various numbers of inlet pits) were considered through an iterative process of design development and flood modelling. This showed that benefits to upstream flooding impacts are minimal when the number of inlet pits increases above 10. The flood modelling for the Environmental Impact Statement was developed using the proposed drainage mitigation option involving 10 grated inlets at about 10 metre spacing as described in Section 6.3.2 of the Environmental Impact Statement

The NSW Government's *Flood Plain Development Manual* (DIPNR 2005), Section A2.3 states "the probable maximum flood or extreme event provides an upper limit of flooding and associated consequences for the problem being investigated. It is used for emergency response planning purposes to address the safety of people". The manual requires assessment of probable maximum flood impacts in relation to flood evacuation routes and critical infrastructure. There is no policy requirement to mitigate or offset impacts to this flood event level.

Mitigation measure FH9 (refer to Chapter 11 of this report) has been revised to identify that the project would be designed to, where feasible and reasonable, not worsen existing flooding characteristics up to and including the 100 year average recurrence interval event in the vicinity of the project; and to include the requirement to consider potential changes required to flood evacuation routes, flood warning systems and signage as part of flood modelling during detailed design.

Transport for NSW are continuing to review the drainage design and flood mitigation in the area surrounding the Marrickville dive site and surface work that extends to Sydenham Station (the latter as part of the Sydenham to Bankstown upgrade project). Section 21.5.2 of the Environmental Impact Statement indicates that:

- The flood model considers elements of the Sydenham to Bankstown project located at and to the north of Sydenham Station
- The flooding assessment at this location reflects the potential flooding impacts of both projects combined
- If required, the flood modelling carried out as part of the Sydenham to Bankstown project would update the assessment for the area between the Marrickville dive structure and Sydenham Station.

The flood mitigation solution is being developed with the objective of not worsening existing flood characteristics as a result of the project for events up to and including the 100 year average recurrence interval event where feasible and reasonable.

Issue raised

In regard to the Office of Environment and Heritage's previous comments regarding 'Flood Warning'; the Office of Environment and Heritage considers that the report contains no new information to address these concerns. Consequently, consideration should be given to our previous comments, which should be addressed appropriately.

Response

Current flood modelling indicates that there would be no substantial impact on existing emergency arrangements for flooding, because the areas where substantial increases in flood depth are predicted to occur are currently subject to substantial depth of flooding and there would be no substantial increases to flood velocities.

Mitigation measure FH9 (refer to Chapter 11 of this report) has been revised to include the requirement to consider if there are any potential changes required to flood evacuation routes, flood warning systems and signage as part of flood modelling during detailed design.

6.2.2 Biodiversity

Issue raised

The Office of Environment and Heritage has reviewed Technical Paper 9 – Biodiversity Assessment of the Environmental Impact Statement, which has correctly determined that there is little to no likelihood of impacts to threatened species and no likelihood of impacts to listed ecological communities. The Office of Environment and Heritage notes that the field assessment confirmed that most vegetation is planted or exotic regrowth and none of the vegetation falls within the description for any Plant Community Types listed in the NSW Vegetation Information System database. As a result, the Framework for Biodiversity Assessment could not be applied to ecosystem credits and additionally, no species credit species were identified within the study area. The Secretary's environmental assessment requirements for the proposal did not provide any requirements for assessment of non-Framework for Biodiversity Assessment biodiversity issues but the assessment that has been undertaken was commensurate with the ecological integrity of the sites assessed.

Response

The Office of Environment and Heritage's comments are noted.

Issue raised

The Office of Environment and Heritage notes that mitigation measure B2 in Table 13 to Section 7 of the Biodiversity Assessment states that "Potential bat roosting locations at Central Station, Waterloo Station and Marrickville dive site would be checked by a qualified ecologist or wildlife carer for presence of bats prior to demolition. Any bats found would be relocated". The Office of Environment and Heritage recommends that mitigation measure B2 be amended to state: "Any bats found would be relocated, unless in torpor, in which case the relocation will be delayed until the end of the torpor period".

Response

Mitigation measure B2 has been revised as follows (refer to Chapter 11 of this report):

Potential bat roosting locations at Central Station, Waterloo Station and Marrickville dive sites would be checked by a qualified ecologist or wildlife handler prior to demolition. Any bats found would be relocated, unless in torpor, in which case the relocation would be delayed until the end of the torpor period.

6.2.3 Aboriginal cultural heritage

Issue raised

The Office of Environment and Heritage's preference is that harm to Aboriginal objects is avoided, however if this is not possible and Aboriginal objects will be harmed as a result of the proposed works the Office of Environment and Heritage supports the recommended mitigation measures, in particular:

- a. An Aboriginal cultural heritage assessment report should be prepared.
- b. An archaeological excavation methodology should be developed for the project and should contain a component to test soil profiles to identify the nature and extent of natural intact deposits and any deposits of Aboriginal objects. Once natural intact soil profiles containing Aboriginal objects are discovered, archaeological salvage excavation should be conducted to the full extent of the footprint of the impacts where they coincide with the archaeological resource.
- **c.** The methodology should include guiding principles for interpretation and assessment of possible contact and post-contact period sites.
- **d.** Archaeological excavation should be carried out where intact natural profiles with the potential to contain significant archaeological deposits are encountered at the Blues Point temporary site, Barangaroo Station, Martin Place Station, Pitt Street Station, Central Station, Waterloo Station and the Marrickville dive site.
- e. The Office of Environment and Heritage would also like to see a methodology developed to sample and analyse the portion of buried Pleistocene valley floor beneath Sydney Harbour that will be impacted by the proposed works if a feasible option can be devised.
- **f.** The Aboriginal cultural heritage assessment report should address areas of archaeological potential associated with the power supply routes and identify appropriate mitigation measures.
- g. Further consultation should be undertaken with Aboriginal stakeholders.
- **h.** Appropriate Aboriginal heritage interpretation should be incorporated into the design for the project in consultation with Aboriginal stakeholders.

Response

The Aboriginal heritage assessment carried out for the Environmental Impact Statement identified that no known Aboriginal heritage sites would be impacted by the project. However there are areas of potential Aboriginal archaeological significance across the project sites. As a result, mitigation measure AH2 commits to the preparation of an Aboriginal cultural heritage assessment report. This has subsequently been prepared and is provided as Appendix I to this report.

The Aboriginal cultural heritage assessment report provides further information on the Aboriginal cultural heritage values of the study area, identifies and assesses Aboriginal heritage impacts of the project, details Aboriginal community consultation and recommends management measures.

In relation to potential mitigation measures for ground improvement works beneath Sydney Harbour, Transport for NSW would consult with the Office of Environment and Heritage to identify feasible and reasonable mitigation measures. This is reflected in mitigation measure AH5.

Appropriate Aboriginal heritage interpretation in the project design in consultation with Aboriginal stakeholders is committed to in mitigation measure AH4.

6.3 Heritage Council of NSW

6.3.1 Summary of submission

The submission from the Heritage Council of NSW (Heritage Council) raises issues in relation to the potential impacts on three State heritage register listed properties, seven local heritage items, and numerous archaeological sites of local and State significance along its route.

6.3.2 Blues Point temporary site (archaeological site)

Issue raised

The Blues Point temporary site has the potential to contain archaeology relating to the ownership of the site by Billy Blue, wharfage and seawalls associated with his early ferry service, mid to late 19th century shipbuilding evidence, a potential dwelling and early 20th century development.

Given the potential State significant archaeology present at this location the Heritage Council considers that an appropriately detailed site specific archaeological assessment, methodology and research design should be completed for the Blues Point temporary site prior to approval of the project. This report should be provided to the Heritage Council for comment and endorsement. This assessment should consider mitigation options to limit the impact to any archaeology present.

Response

Section 14.5.5 of the Environmental Impact Statement identifies the potential for archaeological items to be present at the Blues Point temporary site. Mitigation measure NAH2 in the Environmental Impact Statement identifies that an archaeological research design would be prepared for the Blues Point temporary site. This has subsequently been prepared and is provided as Appendix H to this report.

The archaeological research design identified that there is moderate potential for State significant archaeology to be present in one location on the site, and low potential for State significant archaeology in two other locations. The archaeological research design also sets out the proposed archaeological management for construction works at the site. The report has been provided to the Office of Environment and Heritage for review and comment.

6.3.3 Millers Point and Dawes Point Village Precinct

Issue raised

The Millers Point and Dawes Point Precinct is partially within the construction area and the 25 metre buffer zone of Barangaroo Station. Individually listed State heritage register items including terraces and shops along High Street and Argyle Place within the precinct will also be partially within the buffer zone. The project would impact, directly or indirectly, on a number of listed heritage items and heritage conservation areas including 11 individually listed State heritage items. Above ground impacts posed by the proposed Barangaroo Station are primarily associated with impacts to views and setting from the station entrance structures and service buildings.

The proposed ventilation risers and skylights fronting the Hickson Road wall would be within the precinct and will have an adverse impact on the views to the precinct and the Hickson Road wall from the Barangaroo Development Area. The Heritage Council is concerned regarding these impacts and is of the view that integration of station and rail facilities to the Barangaroo development can prevent or minimise impact to the Hickson Road wall that is the only remaining significant feature of the Hungry Mile.

If approved, the following condition is therefore recommended: *All station and rail facilities for Barangaroo Station must be integrated with the Barangaroo development to minimise impact to the Hickson Road wall, the only remaining significant feature of the Hungry Mile that forms part of the Millers Point and Dawes Point Village Precinct.*

As part of the design development to date for Barangaroo Station a visual mapping assessment of the existing condition of the Hickson Road wall was carried out that highlighted areas of exposed rock / sandstone relative to the extent of the concrete wall. This information was used to inform the options process and the proposed location of project elements in front of the wall. The Central Barangaroo Master plan was also a key consideration.

Four options for the placement of station elements on the eastern side of Hickson Road were considered as part of the design development process. These options are described below.

Option	Description			
Option 1 - two long elements in front of the Hickson Road wall	This option was discounted based on factors including visual impacts on the heritage wall and High Street, and an increased risk to the integrity of the wall and foundations associated with large excavations required to construct this station element.			
Option 2 - two long elements embedded into the Hickson Road wall and High Street cutting	This option was discounted based on substantial construction impacts (direct impacts to the wall) and long term visual impacts. This option would require cut-and-cover construction in High Street with associated traffic impacts, drilling into the wall to verify the rock profile and introduction of permanent station elements (ventilation points and louvres) up to three metres high by about 20 metres wide from the Hickson Road street level.			
Option 3 – multiple elements in front of the Hickson Road wall	This is the preferred option and the scope as assessed in the Environmental Impact Statement. Each of these elements would be separated by at least one metre. This option would minimise visual impacts to the exposed rock areas of the Hickson Road wall. This design has been assessed in Section 14.5.6 of the Environmental Impact Statement as having a minor direct impact to fabric (in the context of the precinct as a whole) and a minor to moderate indirect impact (views and vistas) with the ventilation risers and skylights fronting the Hickson Road wall assessed as having a minor impact on the setting of the precinct.			
Option 4 – multiple elements within the Hickson Road median	This option was discounted based on a number of factors. It would have precluded a future potential light rail corridor on Hickson Road, would have had substantial visual impacts on the Hickson Road streetscape and would have resulted in the need for additional surface infrastructure to manage safety hazards associated with egress stairs and other elements being located within the road.			

 Table 6-1
 Options for location of Barangaroo Station ancillary infrastructure

The design development of the station at Barangaroo is subject to an interface with the Barangaroo Delivery Authority. As with all stations, precinct works and rail infrastructure, there are numerous constraints that must be considered during design development. This includes a number of factors that have influenced the position of the ventilation risers and skylights fronting the Hickson Road wall. Transport for NSW would work with the Heritage Council and other stakeholders such as the City of Sydney Council and Barangaroo Delivery Authority to address design challenges associated with Barangaroo Station to optimise heritage outcomes, the public domain response, and station and development outcomes.

Transport for NSW would also continue to work with the Barangaroo Delivery Authority to ensure the orderly, coordinated execution of the complementary transport and development projects. Critical station and rail infrastructure within the Central Barangaroo development, along Hickson Road, and within the northern Metro station entry would be subject to more detailed design to ensure it can be fully integrated into the locality. Critical rail infrastructure includes mechanical and electrical systems, a traction substation, as well as emergency egress facilities. Collaboration with the Barangaroo Delivery Authority, and City of Sydney, will be carried out to improve and optimise the required rail infrastructure that would be required within public spaces to produce a coherent design theme. The aboveground elements of the Metro station would adopt relevant urban design principles of the Barangaroo site, integrate with the future Central Barangaroo Master Plan (once known) including existing and future elements of the public domain throughout the precinct, and consider the heritage values of the location. These aboveground elements are subject to ongoing consultation with Barangaroo Delivery Authority.

The ongoing design development of the project would be guided by the Chatswood to Sydenham Design Guidelines (Appendix A of this report), and the Sydney Metro Design Review Panel.

The design guidelines establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. They provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements. They also include objectives, principles and guidelines for heritage and archaeology and environment and sustainability that would be applied to the design.

The Design Review Panel is a group of design experts, commissioned to provide independent design advice at various stages of the project. Further, the Environmental Impact Statement (mitigation measure NAH6) commits Sydney Metro to an appropriately qualified and experienced heritage architect on the Design Review Panel to help guide decision making within the panel. Transport for NSW will also appoint a team responsible for management of built and archaeological heritage. This will include heritage management and a heritage architect advisor to assist with design development. Transport for NSW is committed to ensuring design excellence with the Design Review Panel maintaining an ongoing role in the design review process to ensure the objectives and principles contained in the design guidelines are achieved, including with regard to heritage outcomes.

Issue raised

Barangaroo Station entrances are also proposed to be located in an area of known State significant archaeological potential. Excavations for the Barangaroo development discovered multiple phases of archaeology related to various reclamation events which consisted of sea walls, building foundations, wharfs and other infrastructure, including under the north end of Hickson Road. This archaeology is often located under a large amount of fill and is considered to be of State significance.

Technical Paper 4 recognises station works have the potential to impact this archaeology related to the excavation of open shafts, foundation / ground slab for the establishment of station buildings and cut-and-cover excavation for the station box, which would result in the complete removal of any archaeology in this location.

Given the State significant archaeology likely to be present at this location the Heritage Council considers that an appropriately detailed site specific archaeological assessment, methodology and research design should be completed for Barangaroo Station prior to approval of the project. This report should be provided to the Heritage Council for comment and endorsement. This assessment should consider mitigation options to limit the impact to any archaeology present.

Section 14.5.6 of the Environmental Impact Statement identifies the potential for archaeological items to be present at the Barangaroo Station construction site. Mitigation measure NAH2 in the Environmental Impact Statement identifies that an archaeological research design would be prepared for the Barangaroo Station construction site. This has subsequently been prepared and is provided as Appendix H to this report.

The archaeological research design identified that there is low to moderate potential for State significant archaeology to be present on the site. The archaeological research design also sets out the proposed archaeological management for construction works at the site.

6.3.4 Martin Place Railway Station

Issue raised

The construction area for Martin Place Station is partially within the curtilage of the State heritage register listed item. There will be direct physical impacts to the item due to the proposed connections to the station.

Impacts to Martin Place Railway Station include removal of a portion of its built fabric including the red ceramic tiling from the western end of the Eastern Suburbs Line platform cavern and altering the configuration and movement of the passengers. The Environmental Impact Statement notes that the red ceramic tiling is a key component of the aesthetic significance of the item and its removal will result in a moderate impact. It is, therefore, recommended that the final design and location of the new connection and opening should aim to minimise removal of the significant red ceramic tiling. If approved, the following condition is therefore recommended: *The final design and location of the new connection and opening at Martin Place Railway Station should aim to minimise removal of the significant red ceramic tiling. Any tiles that are removed should be reused as part of Station interpretation.*

Response

The principles identified in the proposed condition by the Heritage Council are accepted. Accordingly, the following mitigation measures have been added (refer to Chapter 11 of this report):

The final design and location of the new connection and opening at Martin Place Railway Station would minimise removal of the significant red ceramic tiling where feasible and reasonable.

Opportunities for the reuse of any tiles at Martin Place Railway Station that are removed would be investigated.

Issue raised

The location of the two Martin Place Station access sites have been assessed as having the potential to contain State significant archaeology relating to the use of the land for both residential and businesses from the early 19th century. In general, archaeological remains in this area of Sydney tend to be intact due to the methods of demolition and construction used over the centuries and other excavations in this area have located intact archaeological sites of State significance.

Excavation during demolition work and the excavation of open shafts to allow access to the mined tunnels would remove any archaeology located within the zone of impact. Given the State significant archaeology likely to be present at this location the Heritage Council considers that an appropriately detailed site specific archaeological assessment, methodology and research design for Martin Place Station should be completed prior to approval of the project. This report should be provided to the Heritage Council for comment and endorsement. This assessment should consider mitigation options to limit the impact to any archaeology present.

Section 14.5.7 of the Environmental Impact Statement identifies the potential for archaeological items to be present at the Martin Place Station construction sites. Mitigation measure NAH2 in the Environmental Impact Statement identifies that an archaeological research design would be prepared for the Martin Place Station construction sites. This has subsequently been prepared and is provided as Appendix H to this report.

The archaeological research design identified that there is low potential for State significant archaeology to be present in one location on the site. The archaeological research design also sets out the proposed archaeological management for construction works at the site.

6.3.5 Commonwealth Bank of Australia including interior

Issue raised

The State heritage register item is located adjacent to the construction area for the Martin Place Station and is within its buffer zone. Technical Paper 2 assesses and anticipates that the vibration levels resulting from the construction works will not exceed the appropriate limits for this site. The Environmental Impact Statement further recommends, as a precautionary measure, that a dilapidation survey, vibration monitoring and a more detailed site vibration investigation be done for the State heritage register item. The Heritage Council reinforces this recommendation given potential impacts that may occur.

Response

The Heritage Council's support for the proposed mitigation measures is noted.

Issue raised

The Landscape and Visual Impact Assessment notes that demolition of the existing high rise building opposite the State heritage register item and the construction of a new station entry and above station development will have very high adverse visual impact during construction; but that during operation the project will result in high beneficial visual impact. It is noted that this development will be the subject of a separate application. The design of the future station development should be sympathetic to the form, scale and character of the State heritage register building to reduce impacts on its setting and views from Martin Place and the surrounding streets. It is recommended that this application be referred to the Heritage Council for comment prior to finalisation and approval.

Response

Over station development would be subject to a separate planning approval process. Transport for NSW would continue to work with the Heritage Council of NSW and other stakeholders to develop a design for Martin Place Station that optimises heritage outcomes, and the public domain response.

6.3.6 Sydney Water Head Office (Former 1939 Building)

Issue raised

The State heritage register item is located adjacent to the construction area for the Pitt Street Station and is partially within its buffer zone. The Heritage Impact Assessment states that the proposed demolition of the existing early to mid 20th century high rise buildings on the Pitt Street southern site opposite the State heritage register listed site will have a moderate to major visual impact on the setting of the item. The station entry and future over station development will be located opposite the heritage item, and will also have a potential adverse impact. It is noted that this development will be subject of a separate application. The design of the future over station development should be sympathetic to the form, scale and character of the former Sydney Water Head Office building. It is recommended that this application be referred to the Heritage Council for comment prior to finalisation and approval.

Response

Over station development would be subject to a separate planning approval process. Transport for NSW would continue to work with the Heritage Council of NSW and other stakeholders to develop a design for Pitt Street Station that optimises heritage outcomes, and the public domain response.

6.3.7 Pitt Street Station

Issue raised

Like Martin Place Station, the location for the Pitt Street Station entrances will require significant excavation during demolition works and excavation of open shafts to allow access to the mined tunnels. This excavation would result in the removal of any archaeological remains within the station box footprint. This archaeology is assessed as relating to early 19th century residential and business, and is likely to be substantially intact due to previous construction techniques and would be of State significance.

Based on this information, the Heritage Council considers that an appropriately detailed site specific archaeological assessment, methodology and research design should be completed for Pitt Street Station prior to approval of the project. This report should be provided to the Heritage Council for comment and endorsement. This assessment should consider mitigation options to limit the impact to any archaeology present.

Response

Section 14.5.8 of the Environmental Impact Statement identifies the potential for archaeological items to be present at the Pitt Street Station construction sites. Mitigation measure NAH2 in the Environmental Impact Statement identifies that an archaeological research design would be prepared for the Pitt Street Station construction sites. This has subsequently been prepared and is provided as Appendix H to this report.

The archaeological research design identified that there is low to high potential for State significant archaeology to be present in multiple locations across the site. The archaeological research design also sets out the proposed archaeological management for construction works at the site.

6.3.8 Sydney Terminal and Central Railway Stations Group and the Mortuary Railway Station and site

Issue raised

The construction area and buffer zone for Central Station as identified in the Environmental Impact Statement lies within the curtilage of the Sydney Terminal and Central Railway Stations Group. The Mortuary Railway Station is partially within the buffer zone. The project will result in major direct and indirect, physical and visual impacts to the items.

Impacts to Central Station will occur as a result of removal of platforms 13 to 15 to enable cut-and-cover construction of the station box, construction of a temporary bridge to connect platforms, changes to the underground pedestrian tunnels including Devonshire Street Tunnel, changes with access and egress from Eddy Avenue, construction of a Sydney Yard Access Bridge and removal of former timetable office / Rolling Stock Officers Building, Cleaners Amenities Building and the remaining garden.

It is noted that the plans, locations and designs of the new structures and layout plan are provided in the Environmental Impact Statement as indicative only. It is understood that further detailed design will be provided as part of the final design plan, however, this plan will be prepared following approval of the project, which means that any adverse impacts from the project will not be able to be completely mitigated.

It is considered that the information submitted as part of the Environmental Impact Statement does not provide adequate details of the proposed works and therefore does not allow proper assessment of the impacts of the proposal on the heritage significance of the Central Station. It is considered that further detailed design for various components of the proposal should be submitted prior to a formal approval of the proposed works. These details should clearly identify likely impacts on significant elements of the station due to their removal and replacement works. However, in the interim, the following comments are provided:

- a. The proposed mitigation and management measures outlined in Section 7 of Technical Paper 4: Non-Aboriginal Heritage Impact Assessment, dated May 2016, prepared by Artefact must be implemented
- **b.** The detailed design of the Station Box, temporary footbridge and associated works must minimise impacts on significant built fabric including the structure and fabric of the Bradfield Building.
- c. The Devonshire Street Tunnel must be reconstructed in its current alignment and position.
- **d.** Significant fabric of the platforms that are demolished must be carefully dismantled and stored safely on site for future reassembly and reuse.
- Adequate details of the proposed works, potential impacts and justification have not been provided for the removal of significant platform canopies to provide a temporary bridge connection at the location proposed. Options for locating the temporary bridge further to the south from the platform canopies should be explored to minimise its physical and visual impacts. The revised design and location of the temporary bridge should be provided to the Heritage Council for comment prior to approval being granted for this component of the proposal.
- f. Options for modifying the extents of the southern end of the station box excavation (as included in the proposed operational area of the project) should be further explored to prevent the removal of the former timetable office/Rolling Stock Officers Building, Cleaners Amenities Building and the remaining garden assessed as having high significance. The revised design should be provided to the Heritage Council for comment prior to approval being granted for this component of the proposal.

- **g.** The Sydney Yard Access Bridge is proposed to be a permanent structure. The Heritage Council considers the Mortuary Railway Station to be one of the most significant buildings on the Sydney Rail Network and has raised significant concerns regarding the adverse impacts posed by the new bridge on its views and setting, as well as on the views and setting of Sydney Terminal and Central Railway Stations group. The Heritage Council is concerned that design options have not been appropriately explored at this point, as quality design including consideration of heritage impacts should be a key consideration from an early phase of the project. It is, therefore, recommended that a more detailed options analysis be done for this component of the proposal.
- h. The design of the Sydney Yards Access Bridge must be of high quality and be sympathetic to the general character of the Sydney yards. The design must be as recessive as possible to minimise visual impacts to views from Mortuary Station and Central Station, and designed in accordance with the Central Station Conservation Management Plan. The detailed design must be undertaken in consultation with heritage specialists and the Heritage Council.
- i. Technical Paper 4 states that the vibration levels associated with excavation works for the cut-and-cover box would have minor impacts to the closest intercity and suburban platforms. Although the Environmental Impact Statement estimates the vibration levels for the main central station building and the Bradfield Building to be below the levels that can cause cosmetic damage, as a precautionary measure, it is recommended that a dilapidation survey and vibration monitoring be done to ensure that vibration levels remain below appropriate limits for these components of the State heritage item.
- **j.** All works to Central Station must be undertaken by skilled tradespeople with experience working on heritage sites, under the supervision of heritage specialists.
- **k.** Consideration must be given to careful sandstone extraction for reuse on other heritage buildings in Sydney. Contact should be made with the Minister's Stonework Program, NSW Government Public Works, for further advice on this matter.

The Sydney Metro City & Southwest Heritage Working Group has been initiated to provide for ongoing consultation on heritage-related matters for the project. The Heritage Working Group has representation from the Department of Planning and Environment, Transport for NSW, Sydney Trains, NSW Heritage Office, City of Sydney Council and selected advisors as required.

Responses to comments (a) to (k) above are as follows:

- **a.** The mitigation measures outlined in the non-Aboriginal heritage technical paper, as refined in Chapter 11 of this report would be implemented.
- b. Mitigation measures NAH6, NAH7 and NAH13 require that the design at Central Station be developed with input from a heritage architect and be subject to independent review by the Sydney Metro Design Review Panel (which also includes heritage architect and Heritage Council representation). These mitigation measures also require that the design consider the requirements of the Central Station Conservation Management Plan and consider opportunities for the retention, conservation and / or reuse of original and significant heritage fabric in consultation with Sydney Trains and the Heritage Council of NSW.

During further design development it has been identified that the temporary pedestrian bridge is not the preferred design solution to manage customer movements during construction at Central. Pedestrian continuity would be provided through maintenance of the existing underground connections at the southern end of Central Station, with potential short periods of full closures. This would result in reduced impacts to heritage fabric, including reducing impacts to platform canopies. Further information is provided in Section 9.4 of this report.

- c. The Devonshire Street Tunnel would be reconstructed in its current alignment and position.
- **d.** The Construction Environmental Management Framework (Appendix B to this report) has been updated to include the following requirement as part of the Heritage Management Plan in relation to the storage of dismantled heritage fabric: *Details for the short and / or long term management of artefacts or movable heritage*.
- e. Refer response to (b) above.
- f. Section 4.8.2 of the Environmental Impact Statement identifies options considered with respect to the design of the southern services buildings at Central Station (that includes minimising direct and indirect impacts to the Central Station Grand Concourse). Further design development for this station element would initially be subject to design review as outlined in the response to item (b) above.
- g. Options for access to Sydney Yard are discussed in Section 4.8.2 of the Environmental Impact Statement and included consideration of underground options, at-grade options and bridge options. Design for the Sydney Yard Access Bridge is ongoing and options to minimise heritage impacts are a key objective. The design principles for the Sydney Yard Access Bridge have been refined and are provided in Section 2.5 of this report. This includes further consideration of heritage requirements. Further design development for this station element would also be subject to design review as outlined in the response to item (b) above.
- h. Refer response to (b) and (g) above.
- i. The principles for management of potential vibration impacts for the main Central Station building and the Bradfield Building are accepted. Mitigation measure NV3 identifies that where vibration levels are predicted to exceed the screening criteria, a more detailed assessment of the structure and attended vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for that structure. For heritage items, the more detailed assessment would specifically consider the heritage values of the structure in consultation with a heritage specialist to ensure sensitive heritage fabric is adequately monitored and managed.

The revised Construction Noise and Vibration Strategy (Appendix C of this report) provides the minimum vibration monitoring requirements for the project.

- **j.** The intent of the requirements suggested by the Heritage Council of NSW for work to heritage fabric at Central Station is accepted. A new mitigation measure has been added to require works at Central Station to be carried out with the oversight of heritage specialists (refer to Chapter 11 of this report).
- **k.** Based on geotechnical investigation carried out to date for the project, it is unlikely that sandstone of suitable quality for reuse on other heritage buildings would be encountered by the project.

6.3.9 Sydney Terminal and Central Railway Stations Group – Archaeology Issue raised

The Central Railway Station Precinct is identified as a site of high archaeological potential as it was constructed on the site of two previous railways, the former Devonshire Street Cemetery and a number of 19th century buildings including the Benevolent Society Asylum. The 2013 Conservation Management Plan for the site identified that the location of the new Sydney Metro station box, which will require cut-and-cover excavation, was previously part of the Devonshire Street Cemetery. Technical Paper 4 indicates that there is likely to be archaeological potential across the entire Central Station site relating to former site uses. Borehole tests in the location of the proposed station box indicate that historic fill still exists which means that the presence of subsurface remains relating to the cemetery is possible. Archaeology at this site is assessed as being of local-State significance.

Excavation at Central Station will be required for the construction of shafts, foundations for new buildings, cut-and-cover excavation for the station box and for the construction of the temporary footbridge and Regent Street Bridge. This excavation will remove all traces of any archaeology within its footprint.

The Heritage Council considers that an appropriately detailed site specific archaeological assessment, methodology and research design should be completed for the Central Station Railway Station Precinct prior to approval of the project. This report should be provided to the Heritage Council for comment and endorsement. This assessment should consider mitigation options to limit the impact to any archaeology present and include a detailed Exhumation Plan in the event that burials related to the Cemetery are uncovered.

Response

Section 14.5.9 of the Environmental Impact Statement identifies the potential for archaeological items to be present at the Central Station construction sites. Mitigation measure NAH2 in the Environmental Impact Statement identifies that an archaeological research design would be prepared for the Central Station construction sites. This has subsequently been prepared and is provided as Appendix H to this report.

The archaeological research design identified that there is moderate to high potential for State significant archaeology to be present in one location on the site, and low potential for State significant archaeology in multiple other locations. The archaeological research design also sets out the proposed archaeological management for construction works at the site to mitigate impacts on archaeology.

The requirement to develop an Exhumation Policy and Guideline is provided in mitigation measure NAH3 (refer to Chapter 11 of this report). This mitigation measure has been revised to include the requirement to consult with NSW Heritage Office and NSW Health during its development.

6.3.10 General comments

Issue raised

The Heritage Council would like to reiterate the importance and value of involving them at the conceptual design stage of the project to understand and ensure that design options considered will have the least heritage impact. The Heritage Council notes that there is a significant level of work required to mitigate heritage impacts posed by the project, and believes that there is scope for changes and improvements in the detailed design of the project to achieve this. It is recommended that the Proponent further reduces the heritage impacts by seeking:

- a. Involvement and advice from an independent urban design team prior to approval to ensure there are sympathetic design and engineering solutions that will minimise heritage impacts and improve design outcomes.
- **b.** Better consideration of the integration of sympathetic urban design and engineering outcomes around places of heritage significance. More sympathetic and less intrusive designs are to be explored for proposed new structures that better consider urban design and heritage outcomes, in particular the Sydney Yards Access Bridge.
- **c.** Early collaboration with local councils on mitigating impacts to local heritage items and urban design, visual amenities and landscape treatment associated with the project.

Response

The Sydney Metro City & Southwest Heritage Working Group has been initiated to provide for ongoing consultation on heritage-related matters for the project. The Heritage Working Group has representation from the Department of Planning and Environment, Transport for NSW, Sydney Trains, NSW Heritage Office, City of Sydney Council and selected advisors as required.

As with all stations, precinct works and rail infrastructure, there are numerous constraints that must be considered during design development. Sydney Metro will work with the Heritage Council of NSW and other stakeholders to address design challenges across the project with the intent of optimising heritage outcomes, providing the appropriate public domain response, and achieving the required station and development outcomes.

The ongoing design development of the project would be guided by the Chatswood to Sydenham Design Guidelines (Appendix A of this report), and the Sydney Metro Design Review Panel (which also includes heritage architect and Heritage Council representation).

The design guidelines establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. They provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements. They also include objectives, principles and guidelines for heritage and archaeology and environment and sustainability that would be applied to the design.

The Design Review Panel is a group of design experts, commissioned to provide independent design advice at various stages of the project. Sydney Metro is committed to ensuring design excellence with the Design Review Panel maintaining an ongoing role in the design review process to ensure the objectives and principles contained in the Design Guidelines are achieved, including with regard to heritage outcomes. Further, the Environmental Impact Statement (mitigation measure NAH6) commits to an appropriately qualified and experienced heritage architect on the Sydney Metro Design Review Panel.

Issue raised

The following standard conditions are recommended:

- a. Detailed drawings showing the proposed design, including architectural and structural design details and materiality, stabilisation and conservation works, for Central Station, Barangaroo Station and Martin Place Station, must be provided to the Heritage Council for comment prior to finalisation of the project design.
- **b.** A Historical Archaeological Assessment, Methodology and Research Design must be prepared for all areas of potential impact to locally significant archaeology including Chatswood dive site, Artarmon substation, Crowns Nest Station, Victoria Cross Station, Waterloo Station and the Marrickville dive site along the project route and provided to the Heritage Council for comment and endorsement prior to the beginning of any archaeological test or salvage excavation.
- c. The archaeological investigation program is to be undertaken by an archaeological Excavation Director who can demonstrate an ability to comply with the Heritage Council's Criteria for the Assessment of Excavation Directors (July 2011) for salvage of State significant sites, and in particular must be able to demonstrate compliance with Criterion A.4 that: 'work under any approvals previously granted by the Heritage Council has been completed in accordance with the conditions of that consent and the final report has been submitted to the NSW Heritage Council.
- **d.** A final archaeological report must be submitted to the Heritage Council within one year of the completion of archaeological works on site. This report must include information on the entire historical archaeological program relating to Stage 2 of the Sydney Metro Project.
- e. During construction works, vibration monitoring and structural assessments must be carried out to ensure vibration levels remain below appropriate limits for heritage listed buildings and structures located within the construction site and the buffer zone, including Bennelong Stormwater Channel No. 29. These limits must take into consideration the structural condition and heritage values of these buildings and structures.
- **f.** Interpretation should be implemented across all areas of construction where heritage has been removed or impacted to assist the public in understanding the heritage impacted by this project.
- g. Relevant local councils should be invited to comment where local heritage items are affected.

Response

Responses to the specific issues raised are provided as follows:

- **a.** Transport for NSW would continue to consult with the NSW Heritage Office and Heritage Council of NSW through the development of the design at Barangaroo, Martin Place and Central stations.
- **b.** Mitigation measure NAH2 in the Environmental Impact Statement identifies that an archaeological research design would be prepared for relevant project sites. This has subsequently been prepared and is provided as Appendix H to this report.
- **c.** The archaeological research design (Appendix H to this report) includes a requirement for archaeological investigations to be managed by a suitably qualified Excavation Director.
- **d.** The archaeological research design (Appendix H to this report) identifies that a post-excavation analysis and final report would be prepared following completion of the on-site archaeological works. A copy of this report would be provided to the Heritage Council.

- e. This suggestion is consistent with the outcomes of mitigation measure NV3 (refer to Chapter 11 of this report). Further, the revised Construction Noise and Vibration Strategy (Appendix C of this report) provides specific vibration monitoring requirements for the project.
- **f.** This suggestion is consistent with the outcomes of mitigation measures NAH8 and NAH9 (refer to Chapter 11 of this report).
- **g.** Consultation has occurred with relevant local councils throughout the development of the Environmental Impact Statement and would be ongoing through the development of the design and construction. Each council has made a submission to the Environmental Impact Statement which raises their particular concerns regarding local heritage items. Responses to submissions from local councils are provided in Sections 6.13 to 6.17 of this report.

Issue raised

The Heritage Council would like to be further involved in the design and is willing to nominate an individual to join the Design Review Panel at its July meeting to provide further guidance to reduce heritage impacts.

Response

A specialist heritage architect will be appointed to the Sydney Metro Design Review Panel. A representative of the Heritage Council of NSW would also participate in the Design Review Panel as required.

In addition, a separate specialist heritage architect will provide support and advice to Sydney Metro during the design review process to ensure heritage architecture is included as part of design development.

6.4 Ausgrid

The submission from Ausgrid indicates its commitment to maintaining a close working relationship with Transport for NSW to work towards successful project outcomes for the Sydney Metro project, as well as providing for the ongoing safe operation of the Ausgrid electrical network.

Ausgrid has established a Sydney Metro project team to provide a single point of contact to coordinate and facilitate all project works requiring Ausgrid's input.

6.5 Fire and Rescue NSW

The submission from Fire and Rescue NSW focuses on design elements that are intended to minimise likely adverse impacts and key issues that may challenge Fire and Rescue NSW capability with respect to safe and efficient emergency incident management.

6.5.1 NSW rail network

Issue raised

Fire and Rescue NSW are required to fulfil statutory duties and function in relation to emergency incidents that may occur on the Sydney Metro network (irrespective whether being operated partially or wholly by public or private operators). It is crucial that Fire and Rescue NSW is provided with an equivalent level of emergency support services (as currently provided by the Rail Emergency Response Unit). It is a preference that the emergency support services provided to Fire and Rescue NSW in the Sydney Metro City & Southwest continue to be provided to the Rail Emergency Response Unit.

Consultation would continue with Fire and Rescue NSW to ensure appropriate emergency support services are provided during construction and operation of the project.

A rigorous fire engineering process has been carried out as part of the design process for the project in consultation with the Fire and Rescue NSW and Sydney Trains Rail Emergency Response Unit. A key aspect of this has been the development of fire and life safety objectives which achieve a level of safety that meet performance requirements of international guidelines for metros and Australian standards such as the Building Code of Australia.

6.5.2 Rolling stock

Issue raised

All rolling stock should be configured to enable occupants to evacuate trains utilising side-detrainment for the entire Sydney Metro City & Southwest corridor. The design of the metro line, including tunnel and elevated sections of the metro line, are recommended to be dimensioned to incorporate walkways that are of a sufficient width and gradient that facilitate safe and efficient occupant evacuation.

Response

As identified in Section 6.3.2 of the Environmental Impact Statement a raised walkway would be provided throughout the tunnels to provide for emergency access and exit. These walkways would be the same height as the train floor so customers could evacuate in an emergency. To facilitate emergency access and exit between the two tunnels, cross passages would be provided at maximum intervals of about 240 metres.

6.5.3 National construction code

Issue raised

All stations and ancillary buildings are recommended to comply with all relevant requirements of the National Construction Code.

Response

The Environmental Planning and Assessment Regulation 2000 identifies the National Construction Code – Building Code of Australia as the appropriate standard for the construction for buildings. Compliance with the Building Code of Australia is achieved by complying with all the Performance Requirements of the Building Code of Australia. All buildings that form part of the project would need, as a minimum, to comply with the Performance Requirements of the Building Code of Australia. These buildings include:

- Above ground stations
- Underground stations
- Above ground ancillary buildings including traction substations.

6.6 Geological Survey of NSW

The submission from the Geological Survey of NSW states that it has no concerns with the proposal as there are no impacts on mineral extractive or energy resources.

6.7 Sydney Harbour Foreshore Authority

The submission from Sydney Harbour Foreshore Authority states that it has no particular concerns as the proposal does not directly impact on The Rocks or Darling Harbour precincts.

Sydney Harbour Foreshore Authority notes the need for ongoing consultation with stakeholders during the construction process, especially in relation to the establishment of temporary construction zones around the Sydney CBD.

6.8 Sydney Water

The submission from Sydney Water raises additional NSW legislation that may be applicable to the project and the need for protection and monitoring of Sydney Water assets. Sydney Water also recommends continued engagement to discuss designs and any constraint solutions that will need to be considered for the benefit for the project.

6.8.1 NSW legislation that still may be applicable

Issue raised

Activities on a potable water supply system (isolation for adjustment works) may involve the discharge of water to the environment or receiving waters. These discharges may constitute pollution under the terms of the *Protection of the Environment Operations Act 1997*. The Environmental Impact Statement makes no reference to or how this may be addressed.

Response

Work to adjust the existing potable water supply system may result in the discharge of water to the environment or receiving waters. As identified in mitigation measure SCW3 in Section 18.5 of the Environmental Impact Statement, erosion and sediment controls would be implemented in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008a).

In relation to water discharge, the project would comply with the requirements of an Environment Protection Licence issued to the project and all other relevant legislative requirements.

6.8.2 Protection and monitoring of assets

Issue raised

Asset specific protection and monitoring measures for our major and critical assets will need to be determined to ensure that Sydney Water's Operating Licence conditions can be maintained. These assets include but are not limited to: Chatswood Reservoir, North Side Storage Tunnel, Northern Beaches Ocean Outfall System, Lavender Bay Submain, the Tank Stream, Bondi Ocean Outfall System, Prince Alfred Hospital Submain, Pressure Tunnel, City Tunnel, Sydenham Stormwater Pit, Drainage Pumping Station and Marrickville Valley Storm Water Channel.

Response

Consultation would continue with Sydney Water in relation to appropriate asset protection and monitoring requirements for their assets that may be directly or indirectly impacted by the project.

6.9 Port Authority of NSW

The submission from the Port Authority of NSW raises a number of potential shipping channel impacts, construction traffic impacts and spoil removal issues.

6.9.1 Harbour Master approval

Issue raised

Any disturbance of the bed of Sydney Harbour will require the approval of the Harbour Master under clause 67 of the *Management of Waters and Waterslide Lands Regulations NSW*. There was no specific commitment in the Environmental Impact Statement for Harbour Master Approval, and the Port Authority requests that this be specifically noted in the conditions of approval.

Response

Table 2-3 of the Environmental Impact Statement identifies planning legislation that may still be applicable to an approved State significant infrastructure project. This includes the requirement for written approval of the Harbour Master for any proposed works that would disturb the bed of the Special Port Areas defined under these regulations – which includes Sydney Harbour and any adjoining or adjacent land.

6.9.2 Impacts on shipping channels

Issue raised

It is understood that the proposed Sydney Harbour ground improvement work, depending on the methodology selected, may involve the placement of barges in the shipping channels. Although a commitment has been made to consult with the Harbour Master to ensure shipping channels are maintained during this work, it is noted that the Environmental Impact Statement focuses on shipping traffic to Gore Bay. Shipping traffic to Glebe Island and White Bay must also be considered as clear passage to Darling Harbour needs to be maintained for cruise ships, bulk carriers and other ad hoc vessels. Shipping movements to both Gore Bay and via Darling Harbour to Glebe Island and White Bay occur year round and from around October to March, movements in and out of Darling Harbour exceed those for Gore Bay, with up to four cruise ship movements per day and regular bulk carrier movements.

Further consultation with the Port Authority of NSW is required during the design development of the Sydney Harbour sediment ground improvement work with regard to potential impacts on the shipping channels. Any solution must be carefully planned and / or coordinated to ensure that shipping access to and from Gore Bay and Glebe Island and White Bay via Darling Harbour remains open and that any barges do not impede the safe navigation of vessels in these areas. Until this matter is investigated in more detail, the Port Authority also requests that the ground freezing option for the proposed ground improvement work, which would seem to not require the placement of barges in the shipping channels, be maintained as an option.

Response

Mitigation measure T17 commits that consultation prior to and during the ground improvement work would continue to be carried out with the Port Authority of NSW (Harbour Master), Roads and Maritime Services and Sydney Ferries in relation to maintaining open shipping channels and ensuring the proposed work does not impact the safety of other harbour users. This would include the maintenance of shipping channels to and from Gore Bay and Glebe Island and White Bay via Darling Harbour.

The proposed method for the ground improvement work has been subject to ongoing discussions with the Harbour Master. Section 4.6.3 of the Environmental Impact Statement provides an analysis of different ground improvement options including ground freezing. This section identifies that ground freezing may not be a suitable solution where soft silty material needs to be treated. Notwithstanding, ground freezing would be further considered during detailed design and construction planning.

6.9.3 Construction traffic impacts on Hickson Road

Issue raised

The Port Authority is concerned about the construction impacts from the proposed works in the vicinity of Barangaroo on Hickson Road, which provides access to the Overseas Passenger Terminal for semi-trailer trucks (19 metre articulated trucks) and passenger coaches.

It is acknowledged that a commitment has been made in Section 8.4.13 of the Environmental Impact Statement to consult with the Port Authority throughout the construction phase, however mitigation measure T1 does not include the Port Authority for ongoing consultation. The Environmental Impact Statement also indicates that coach and delivery vehicle movements to the Overseas Passenger Terminal occur over a short duration at arrival and departure of a ship. This is not correct as 19 metre articulated trucks, coaches and other delivery vehicle traffic to the Overseas Passenger Terminal occurs throughout the morning and mid-afternoon.

Therefore, to ensure adequate consultation and coordination, the Port Authority requests that the Port Authority is specifically noted in either an amended mitigation measure T1 or in the conditions of approval for ongoing consultation to minimise traffic and transport impacts on the Overseas Passenger Terminal during construction.

Response

The hours of access required to the Overseas Passenger Terminal are noted. As identified in Section 8.4.13 of the Environmental Impact Statement, consultation would be carried out with the Port Authority of NSW to ensure access to the Overseas Passenger Terminal via Hickson Road is maintained. Further, mitigation measure T1 has been revised to include a requirement to consult with the Port Authority of NSW (refer to Chapter 11 of this report).

6.9.4 Tunnelling under Moores Wharf

Issue raised

In the Port Authority's response to the request for the Secretary's environmental assessment requirements, it was noted that the proposed tunnel alignment appears to be directly under Moores Wharf, a heritage listed sandstone building located on Towns Place, Barangaroo owned by the Port Authority, and occupied 24/7 by operational staff. Although the Environmental Impact Statement indicates the proposed tunnel depth at this stage to be about 37 metres, ground-borne noise or vibration impacts on Moores Wharf and its occupants does not seem to have been considered. Therefore, the Port authority requests that this be considered prior to the granting of approval for the project.

Response

Figure 6-2d of the Environmental Impact Statement identifies that the tunnel alignment would pass underneath Moores Wharf at a depth of around 37 metres.

In relation to construction ground-borne noise and vibration, Section 10.4.13 of the Environmental Impact Statement provides an assessment of properties above the tunnel alignment. This section identifies that ground-borne noise levels may exceed the evening and night-time noise management levels for a few days when the tunnel boring machines are directly beneath a particular receiver. Potential noise impacts would be managed during construction in accordance with the Construction Noise and Vibration Strategy (Appendix C of this report).

Ground-borne vibration levels from tunnelling are predicted to be lower than the 7.5 mm/s cosmetic damage screening criteria and hence impacts on Moores Wharf are not expected. This is also reflected in the non-Aboriginal heritage assessment, in Section 14.2.2 of the Environmental Impact Statement.

In relation to operational ground-borne noise and vibration, Chapter 11 of the Environmental Impact Statement identifies that the project has been designed to comply with the applicable criteria.

6.9.5 Option of removal of spoil from Barangaroo Station excavation from Moores Wharf

Issue raised

In Section 8.2.3 of the Environmental Impact Statement, an option to remove spoil from Barangaroo Station excavation by barge from Moores Wharf is considered. The Port Authority does not consider the potential option to barge spoil offsite via Moores Wharf to be an acceptable solution. Moores Wharf would not be able to facilitate this type of activity.

Response

The Port Authority of NSW's comments regarding the suitability of Moores Wharf for barging activities are noted. Section 3.2 of this report provides additional details regarding potential spoil removal by barge from Barangaroo. This identifies that barging, if progressed, would be carried out from wharf frontage within the Barangaroo Delivery Authority area.

6.10 Environment Protection Authority

The submission from the Environment Protection Authority raises concerns regarding certain aspects of the Environmental Impact Statement and recommends that additional information is provided in relation to groundwater, noise and vibration.

In addition the Environment Protection Authority has provided draft recommended conditions of approval for noise and requests the opportunity to comment on the draft conditions of approval proposed by the Department of Planning and Environment.

6.10.1 Construction groundwater

Issue raised

The Environmental Impact Statement states that groundwater at the site has elevated iron and manganese and low pH in the Hawkesbury Sandstone and that seepage into the dive structures and shaft excavations is likely with volumes up to 11.8 litres per second across the whole project.

The current proposed treatment during construction is only for total suspended solids, oil and grease, and pH. The Environmental Impact Statement does not include treatment of other pollutants in the construction phase. While the Environment Protection Authority agrees that the tanked nature of the project does minimise groundwater inflow, the standard process on most construction projects is to collect inflows until sufficient volumes have been reached and then treat and discharge in bulk. This increases the impact of pollutants to the environment.

The Environmental Impact Statement should include further information on the treatment of groundwater indicating how the project will comply with section 120 of the *Protection of the Environment Operations Act 1997* for these activities.

Section 18.4.2 of the Environmental Impact Statement does not restrict treatment of groundwater to any particular parameters. Rather, the project commits (in mitigation measure SCW4) to complying with the discharge requirements of an Environment Protection Licence issued for the project. Consistent with other recent tunnelling projects, Section 18.4.2 of the Environmental Impact Statement noted that these discharge requirements are predicted to be:

- pH 6.5 to 8.5
- Total suspended solids less than 50 milligrams per litre
- Oil and grease none visible.

The details of water collection and treatment (such as collection of inflows until sufficient volumes have been reached and then treating and discharging in bulk, or continuously treating and discharging collected water) would be determined as part of detailed construction planning.

6.10.2 Noise - construction

Issue raised

The Sydney Metro City & Southwest Chatswood to Sydenham project includes significant components of demolition of office and other buildings and structures within the Sydney CBD, North Sydney and other built up areas, and excavation of access shafts to the Metro line tunnel in close proximity to residences, office buildings, hotels, pedestrian areas, cafes, restaurants and other such commercial activities. The proposed methods of demolition and excavation include extensive use, over relatively long periods, and including during the night-time, of large, hydraulic excavator rock hammers, which have the potential to generate high levels of airborne noise, ground borne noise and vibration. Predicted daytime noise and vibration levels are such that there is potential for a large number of offices to experience significant disruption to their activities over an extended duration.

The Environment Protection Authority does not usually specify noise limits for construction and other limited duration activities (such as demolition), other than for the night-time, but instead usually requires that all feasible and reasonable noise mitigation measures be implemented to minimise impacts. The Environment Protection Authority is aware of demolition and excavation techniques that can be feasibly be used instead of, or together with, rock hammers to reduce noise and vibration impacts. Such techniques include, but are not necessarily limited to, section sawing, slab sawing, wall sawing; diamond impregnated wire sawing; bursting, splitting, fracturing using bursting heads or other consistent means; portable or excavator assisted crushing.

The Noise and Vibration Technical Paper has indicated that such techniques will not be used on this project because they may be more expensive and slower than rock hammering. The Environment Protection Authority believes that this is not adequate justification and that such techniques are reasonable to implement on this project. In addition the Noise and Vibration Technical Paper appears to be indicating that works are proposed that would routinely result in noise levels more than 5dB above background at night, which has not been allowed on other similar infrastructure projects.

Therefore the Environment Protection Authority is proposing recommended conditions for this project that include airborne noise, ground-borne noise and vibration limits, which the Environment Protection Authority believes are achievable by the alternative methods other than rock hammering. Rock hammering can still be used because the Environment Protection Authority's limits are amenity based and therefore only apply when noise sensitive receiver locations are occupied or in use: they would not apply where alternative accommodation or respite offers have been applied. Because the Environment Protection Authority does not usually specify noise limits for construction – type activities other than for the night-time, the attached indicative recommended Conditions of Approval identify the limits as nominal at this stage, requiring consideration by the Department of Planning and Environment and the proponent.

Response

Since the development of the Environmental Impact Statement, construction planning has identified that rock breaking for cut-and-cover stations and stations shafts (except for Central Station) would not be required outside of standard construction hours. Support station excavation activities would still occur up to 24 hours per day and seven days per week. Further information is provided in section 9.6 of this report. This would reduce the potential noise impacts during out of hours work.

The Environment Protection Authority indicates that it intends to recommend conditions for this project that include airborne noise, ground-borne noise and vibration limits for night-time construction on the basis that these limits are achievable using alternative methods other than rock hammering.

Section 7.7.1 of the Environmental Impact Statement provides discussion of alternative excavation techniques and notes that it is unlikely that alternative techniques would be able to achieve the required excavation rate in isolation. However, the Environmental Impact Statement does not preclude the use of these techniques and states that they could be used to supplement other excavation methods in order to reduce the overall construction timeframe. As this would be determined based on more detailed construction planning, the Environmental Impact Statement carried out a conservative worst-case assessment (consistent with the requirements of the *Interim Construction Noise Guideline*) by assessing excavation through the combined use of rock hammering and blasting.

Additional investigations have been carried out in relation to the alternative excavation methods proposed by the Environment Protection Authority which indicates:

- Fracturing using bursting heads and the use of portable excavator assisted crushing would not be suitable for this particular project
- The use of circular rock saws and / or chain saws and splitting would be suitable for local trimming and trenching but not for bulk excavation
- Diamond impregnated wire sawing and bursting may be suitable for bulk excavation but would be associated with complex geometries, complex mixes of plant and significantly increased excavated durations (expected to be around 300 per cent or more based on initial assessments).

Further details of the consideration of alternative excavation methods are provided in Table 6-2.

		Potential	Comment re use for rock excavation		Summary
Technique	Typical use	use on Sydney Metro	Advantages	Disadvantages	for bulk excavation
Section sawing Slab sawing Wall sawing	Demolition, trenching	Demolition, trenching, trimming	 Reduced noise Saws can be fitted to conventional excavator chassis. 	 Primary break by saw, still requires rock breaking for removal of rock between / adjacent to cut-lines Need to arrange benches to provide faces of rock for saw cutting Complex excavation geometries Rockbreaking / other still required to create free- faces, and remove rock between cut-lines. Mix of plant and methodologies leading to loss of productivity 	Not suitable in isolation Could be used for local trenching, trimming only
Diamond impregnated wire sawing	Demolition, quarrying	Demolition	 Reduced noise Reduced cut thickness compared to other sawing techniques Cut blocks become valuable building material 	 Wires need frequent replacement Need to arrange benches to provide faces of rock for saw cutting. Complex excavation geometries Rockbreaking / other still required to create free-faces, mix of plant and methodologies leading to loss of productivity 	Not suitable. Mix of techniques and plant required would result in extended durations.

Table 6-2 Outcomes of investigations into alternative excavation methods

		Detential	Comment re use for rock excavation		Summary
Technique	Typical use	use on Sydney Metro	Advantages	Disadvantages	for bulk excavation
Bursting	Demolition, quarrying	No specific use identified	• Reduced noise	 Significant number of close-spaced drill-holes Multiple work faces and complex excavation geometries likely required to provide faces for rock for bursting Significant secondary breaking likely required 	Not suitable for bulk excavation. Mix of techniques and plant required will result in extended durations.
Splitting	Quarrying	No specific use identified	• Reduced noise	 Significant number of close-spaced drill-holes Multiple work faces and complex excavation geometries likely required to provide faces of rock for splitting Significant secondary breaking likely required 	Not suitable in isolation Could be used for local trimming only
Fracturing using bursting heads	Pipe bursting	Local use as required	 None – Plant not suitable 	 Plant not suitable for rock excavation 	Not suitable
Portable – excavator assisted crushing	Demolition	Demolition	 None – Plant not suitable 	• Plant not suitable for rock excavation	Not suitable

Additional investigation has also been carried out regarding demolition techniques. As an example, the proposed requirements in relation to demolition works for Victoria Cross Station site would include the implementation of demolition methodologies that limit the use of hydraulic hammers, rock breakers and other appliances that emit high noise levels. The methodologies would include, as a minimum, for the Victoria Cross site:

- Using hydraulic concrete shears in lieu of hammers / rock breakers for the removal perimeter walls where practical
- Using hydraulic concrete shears in lieu of hammer / rock breakers for the removal of the lower levels of the building where practical

- Using demolition sequencing to shield noise sensitive neighbours from high noise levels by retaining wall elements adjoining / shielding those properties to the end of the demolition sequence (eg floor by floor leaving the perimeter wall that aids noise screening to the end)
- Locating demolition load out areas away from the nearby noise sensitive neighbours (schools, childcare, forecourt retail, etc)
- Developing construction working hours that provide respite to neighbouring properties during the higher noise output activities (this would include works that do not use high noise level appliances but create high noise levels when assessed against background and residential noise standards)
- Developing construction methodologies that would minimise structural-borne noise to buildings that are connected or the cavity between buildings is or is likely to be bridged – this would include separating the structural connection prior to demolition through saw-cutting and propping, using hand held splitters and pulverisers or hand demolition in short respite periods (at the most advantageous times)
- Installing sound barrier screening to scaffolding facing noise sensitive neighbours where the noise and vibration management plan investigations indicate that the neighbouring property / occupancy would receive noise levels higher than the levels determined by Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report)
- Modifying demolition working sequencing and / or hours to reduce noise and dust emissions during peak pedestrian and adjoining neighbour outdoor activities and movements.

In summary, the imposition of strict airborne noise, ground-borne noise and vibration limits is not considered appropriate or necessary for the project. The approach would not be consistent with current State Government policy and guidelines nor with the conditions of approval and the management approach on other State significant infrastructure projects recently approved in Sydney and NSW.

Consistent with the approach on other projects, the preferred approach would be to impose conditions that would be consistent with the relevant guidelines (in this case the *Interim Construction Noise Guideline*) and the standard conditions of approval for critical State significant infrastructure projects.

6.10.3 Noise and vibration – blasting

Issue raised

The project includes a blasting component as a lesser – impact alternative to rock hammering once excavations are some distance from the surface. The Environment Protection Authority has proposed its usual ground vibration limits for blasting. However, the Environment Protection Authority has specified its overpressure limits in terms of Accumulated Peak Level, to allow for the potential of more than one blast per day of smaller blasts without unacceptable impacts.

Response

The proposed vibration level for blasting suggested by the Environment Protection Authority are intended to protect against human comfort and are targeted to activities that occur for long periods of time such as those at mining sites. As such, these levels can often result in unnecessary constraints when applied to construction activities (especially blasting) which typical occur for much short periods of time. The proposed restriction on blasting hours may also prevent Sydney Metro from undertaking blasting at times which result in the least impact to the surrounding receivers. For example, in locations dominated by commercial receivers it may be more appropriate to blast in periods other than 9am to 5pm.

A more practical approach is to not exceed a cosmetic damage level appropriate for individual structures. This is committed to in the Environmental Impact Statement, through the use of screening criteria and then establishment of appropriate criteria for individual structures that are predicted to be above the screening criteria.

This approach is consistent with recent approvals for major infrastructure project (for example, NorthConnex and WestConnex) which permit vibration from blasting up to 25 millimetres per second.

6.10.4 Noise - operation

Issue raised

The project can be built such that noise and vibration as a result of operation does not exceed relevant criteria in the Rail Noise Policy and the *Industrial Noise Policy*. This is reflected in the Environment Protection Authority's recommended operational limits.

Response

The Environmental Impact Statement commits to designing the rail line to meet the requirements of the *Rail Infrastructure Noise Guideline* (refer to mitigation measure OpNV2 in Section 11.5 of the Environmental Impact Statement). This guideline allows for at-property treatment where feasible and reasonable mitigation measures cannot be implemented.

In relation to fixed facilities (including substations and other ancillary infrastructure), the Environmental Impact Statement commits to designing these components to achieve the relevant criteria derived from the *Industrial Noise Policy* (refer to mitigation measure OpNV3 in Section 11.5 of the Environmental Impact Statement).

This is consistent with the approach taken on Sydney Metro Northwest.

6.10.5 Recommended indicative Conditions of Approval

Issue raised

The Environment Protection Authority provided recommended conditions of approval in relation to noise, vibration and blasting for consideration.

Response

The recommended conditions of approval are a matter for consideration by the Department of Planning and Environment.

6.11 Barangaroo Delivery Authority

The submission from Barangaroo Delivery Authority is supportive of the Sydney Metro project and the orderly, coordinated execution of the project within and adjacent to Barangaroo.

Issue raised

The submission identifies that Barangaroo Delivery Authority are working with Transport for NSW to finalise specific project Interface Agreements that will detail the scope and interfaces between the Sydney Metro and Barangaroo developments.

The design development of the station at Barangaroo is subject to interface with the Barangaroo Delivery Authority. As with all stations, precinct works and rail infrastructure, there are numerous constraints that must be considered during design development. Transport for NSW would continue to work with Barangaroo Delivery Authority and other stakeholder such as the Heritage Council and the City of Sydney Council to address design challenges associated with Barangaroo Station to optimise heritage outcomes, the public domain response, and station and development outcomes.

Similarly, Transport for NSW would continue to work with Barangaroo Delivery Authority in relation to the interface of construction works at Barangaroo. This would aim to minimise the potential impacts to the delivery of Barangaroo from the Sydney Metro works. This may require adjustments to the construction layout and arrangements described in the Environmental Impact Statement and in this Submissions and Preferred Infrastructure Report. Any changes required would be assessed in accordance with statutory requirements.

6.12 Department of Primary Industries

The submission from the Department of Primary Industries identifies that the project is likely to have limited impacts on the groundwater systems through which it traverses and that the assessment of risks and discussion of the project and its hydrogeological context has largely been completed adequately.

However, there are some specific matters which the Department of Primary Industries believe have not been adequately addressed.

6.12.1 Water quality targets

Issue raised

The water quality targets relating to aquatic foods within the Environmental Impact Statement (Table 18-8, 'Aquatic Foods' section) should be an objective for both the Cooks River and Sydney Harbour.

While commercial fishing does not occur within both waterways, recreational fishing is permitted in both waterways. The consumption of fish caught in the Cooks River and west of Sydney Harbour Bridge is not recommended due to potential contamination, however consumption of fish caught east of Sydney Harbour Bridge and Botany Bay is not discouraged. The 'aquatic foods' section of Table 18-8 should be amended to reflect this information, especially as fish in downstream waterways quite close to the Sydney Metro corridor can be captured for human consumption.

Response

The Department of Primary Industries comments regarding aquatic foods are acknowledged. The potential impacts discussion in Table 18-8 of the Environmental Impact Statement indicates that impacts on water quality, including Sydney Harbour would be negligible. Proposed mitigation measures include:

- Implementation of erosion and sediment control measures in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008a). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event
- Monitoring of discharges from the construction water treatment plants to ensure compliance with the discharge criteria within an environment protection licence issued to the project

• Deployment of a silt curtain around any ground improvement work if required within Sydney Harbour.

A water quality monitoring program would also be implemented to monitor water quality within Sydney Harbour during ground improvement work.

The water quality monitoring program would be carried out to detect any potential impacts on the water quality of Sydney Harbour from the ground improvement work and inform management responses in the event any impacts are identified.

6.12.2 Waterfront land

Issue raised

Any activities carried out on waterfront land (as defined under the *Water Management Act 2000*) should be conducted in accordance with the DPI Water Guidelines for Controlled Activities (2012).

Response

The proposed mitigation measures (refer to Chapter 11 of this report) for the project, particularly those relating to water quality and hydrology would meet the objectives of the guidelines referred to by the Department of Primary Industries. Further, the outcomes sought by the DPI Water Guidelines for Controlled Activities would be incorporated into detailed construction planning.

6.12.3 Water licensing

Issue raised

The Environmental Impact Statement indicates the project does not require a licence and / or approval under the *Water Management Act 2000* and the Groundwater Assessment Report notes Transport for NSW is exempt from the requirement to hold an access licence under Clause 18(1) of the *Water Management (General) Regulation 2011.* It is recommended that the proponent continue liaising with Department of Primary Industries (Water) to ensure that any licensing requirements are met.

Response

Transport for NSW would continue to consult with the Department of Primary Industries throughout all phases of the project. In particular this would include consultation in the development of the Groundwater Management Plan and the siting of suitable monitoring bores.

Issue raised

Department of Primary Industries (Water) previously advised and repeats that the Environmental Impact Statement should clarify the total volume of water required during construction and identify the source/s of the water supply.

Response

The total volume of water required during construction is provided in Section 7.11.11 of the Environmental Impact Statement – with an estimate of around 550,000 cubic metres to be used. The source of this water is likely to be a combination of potable water supply and re-use of water intercepted by the tunnel, station and shaft excavations.
6.12.4 Groundwater monitoring bores

Issue raised

The Environmental Impact Statement has nominated 14 former geotechnical bores installed for project investigations for monitoring of groundwater levels: these have apparently been fitted with continuous water level loggers. Unfortunately, the sites chosen have an understandable bias to the construction and consequently are not orientated to on-going management of the potential impacts to groundwater sources by the project. The nominated sites were not chosen in consultation with the Department of Primary Industries (Water).

The Department of Primary Industries (Water) considers that the 14 nominated monitoring piezometers are not adequate to assist with on-going monitoring of the groundwater sources during project construction and operation and recommends up to 20 piezometers are required for better characterisation of any impacts resulting from the project. It is anticipated, that although there will be short-term effects during construction, the most important potential impacts to the groundwater sources will occur during the operational phase.

Only three of the existing piezometers (including two associated with the dive structures) are considered suitable, with the possibility that three others may be able to substitute for a preferred installation. It is recommended that Transport for NSW discuss this matter with Department of Primary Industries (Water).

Department of Primary Industries (Water) requests that a Groundwater Monitoring and Management Plan including a Trigger Action Response Plan be prepared for the monitoring, and that this be done in consultation. The Groundwater Monitoring and Management Plan has not been prepared and there has been no consultation with Department of Primary Industries (Water).

Response

Section 3.4 of Technical Paper 7: Groundwater assessment identifies that the 14 monitoring bores are those that are presently installed by the project and that these could be used as part of the construction monitoring program. The need for and location of additional monitoring bores would be determined during the design of the groundwater monitoring program (as required by mitigation measure GWG1 – refer to Chapter 11 of this report). The Department of Primary Industries would be consulted during preparation of the monitoring program.

The Construction Environmental Management Framework (Appendix B of this report) provides a commitment to developing a Groundwater Management Plan. The Groundwater Management Plan would include impact trigger definitions and response actions and details of any required groundwater monitoring. The Department of Primary Industries (Water) would also be consulted during the preparation of the Groundwater Management Plan.

6.12.5 Groundwater inflows and take

Issue raised

During construction, unexpected groundwater inflows may occur; and during construction and operations groundwater take will occur in untanked station shafts. The reporting to Department of Primary Industries (Water) for groundwater levels should be accompanied by a considered hydrogeological report that describes measured flows in station shaft structures and reports any unusual groundwater ingress or flow events.

Department of Primary Industries (Water) recommends that the take of groundwater at all locations be recorded and reported annually and that this matter should be included in the Groundwater Monitoring and Management Plan. In Table 17-7 the estimated groundwater inflows for both the construction and operational phases of the project have been combined. These data indicate that a take of about 372 ML per year could occur from the Sydney Basin Central Groundwater Source over the period of construction at least: the data presentation is confusing as it includes an allowance for Barangaroo Station and Waterloo Station which are elsewhere identified as being "tanked".

Further clarification is required to separate estimates of on-going take from construction activities, and to be differentiated for exact project elements. There is comment in the Environmental Impact Statement that numerical groundwater modelling is likely to be required for groundwater inflow assessment to certain station shafts. This modelling will be completed during the on-going design phase. Any numerical modelling should rely on the baseline groundwater data currently being gathered for the project and should be submitted to Department of Primary Industries (Water) for review prior to its use.

Response

Chapter 17 of the Environmental Impact Statement identifies that there would be inflows of groundwater during construction and ongoing inflows during operation. Table 17-7 of the assessment provides a breakdown of the inflow rates for each project element, conservatively based on all project elements being drained. During construction, inflows would vary based on the progress of the works (eg extent of tunnelling completed, extent of tanking works completed, depth of excavation completed), up to a maximum of the volumes quoted in Table 17-7 of the Environmental Impact Statement.

Combined, the maximum inflows for the project are estimated at 372 megalitres per year (again conservatively based on all project elements being drained). The assessment also notes that the actual inflow is likely to be lower as the majority of the project elements would be tanked.

The development of a geotechnical model (including predicted changed to groundwater levels) is a commitment provided in mitigation measure GWG1 (refer to Chapter 11 of this report). The Department of Primary Industries (Water) would be consulted during the development of the geotechnical model as it relates to groundwater.

6.12.6 Other aquifer interference

Issue raised

The project has been adequately assessed in terms of the Aquifer Interference Policy, with one area of exception: in Section 3.3.3 of Technical Paper 7 (and equivalent parts of the Aquifer Interference Policy assessment in Appendix A of Technical Paper 7), potential impacts on identified bores have not been specifically addressed.

Section 3.3.3 of Technical Paper 7 contains a narrative of identified groundwater bores, however, it contains no or limited analysis on what impacts, if any, the project will have on these bores. A conclusion should be stated about potential impacts and especially in respect of groundwater bores GW106192 and GW111164 which are within 200 metres of the project alignment. There are minor other references to potential user bore impacts (without any quantification) in several documents.

There are no known or other identified groundwater dependent ecosystems that will be impacted by the project as the tunnels traverse beneath highly developed areas of Sydney City District.

The potential impact to nearby water supply works has been considered as part of the Aquifer Interference Policy assessment in Appendix A of Technical Paper 7. This section identified that:

- Expected drawdown, cumulatively, at any water supply work, would be less than two metres decline
- Expected decline in groundwater elevation due to the project would be less than two metres at any water supply work
- The project would not change groundwater quality beyond 40 metres from the activity.

The environmental performance outcomes in Table 27-2 of the Environmental Impact Statement commits that the project would make good any impact to groundwater users.

6.12.7 Presentation of groundwater data

Issue raised

Section 3.4.3 of Technical Paper 7 discusses a large amount of data derived from several previous geotechnical investigation programs. Table 3.9 of Technical Paper 7 summarises these data but is considered to be incomplete because it does not reference the measurement to a date when obtained. This information needs to be added to the Table.

These data are also represented in Figures 3.16 and 3.17 of Technical Paper 7. However, such representations can be misleading because they automatically mix water table and potentiometric pressure measurements. It would be better if the data were represented as potentiometric contours in mAHD for an applicable date or date range; this matter needs to be addressed for clarity.

Response

Whilst the Department of Primary Industries comments regarding date ranges of the data is acknowledged, it would not change the outcomes of the assessment. However, date ranges for the data (where available) may be supplied to the Department of Primary Industries for completeness.

Figures 3.16 and 3.17 are labelled as providing groundwater elevations (in metres Australian Height Datum – mAHD) and groundwater depths (in metres below ground level – mBGL) respectively.

6.12.8 Minor editorial matters

Issue raised

The Department of Primary Industries submission identifies the following minor editorial matters:

- Nominated project piezometers (Table 3.5, Technical Paper 7) are largely shown on the accompanying geological long sections (15 sheets). However, there is no obvious text to indicate that this is so, and it would be beneficial to add information to the effect that the bores of Table 3.5 are plotted. In addition, BH026 and BH043 are not shown on the plans and BH023 and BH008 are not projected onto the sections
- Some of the data listed in Table 3.7 of Technical Paper 7 contains a superscript "a". This notation has not been explained. In addition the data is listed without any reference (including in the accompanying text) to the date or time frame when it was obtained. For completeness the date information should be included.

Response

The Department of Primary Industries comments regarding the editorial matters are noted.

6.13 Willoughby Council

The submission from Willoughby Council supports the Government building an accessible, high quality transport system.

The submission raises concerns regarding numerous elements of the project outlined in the Environmental Impact Statement, particularly focusing on stakeholder engagement, adjustment of the T1 North Shore Line, widening the Pacific Highway, closure of Nelson Street, adjustment of Mowbray Road bridge, construction of Artarmon substation, noise attenuation and weekend closures of Frank Channon Walk.

6.13.1 Stakeholder engagement

Issue raised

The Secretary's environmental assessment requirements for the Sydney Metro – Chatswood to Sydenham identify key issue No. 4 as 'Consultation'. The stakeholder and community engagement details have not been provided to Council. Properties within the Local Government Area will be affected by construction activities. Council would appreciate information on the specific stakeholder and community engagement within, or relevant to the Local Government Area.

The Environmental Impact Statement does not indicate if it is intended that letters be sent to surrounding residents within a defined notification area. It is considered that letters to both the current and future owners and occupants of properties impacted and within a reasonable notification area from works associated with the project (noting that all work is proposed to be completed by 2024) should be an essential part of the community engagement process.

Council requests that a Community Consultative Committee be established for the life of the construction phase to enable substantive community input throughout the project.

Furthermore, meaningful engagement would entail meeting with the significantly impacted residents (e.g. Nelson Street residents) one-on-one to explain the process, timelines and potential impacts and to work with them to finesse mitigation measures proposed and develop a good working relationship to last throughout the construction period.

Council is aware that in a project of this size changes may be required in the future to any approval. Council would like to be assured that any significant changes to an approval will involve appropriate community engagement, with particular regard to properties directly affected.

Response

Section 5.4 of the Environmental Impact Statement outlines the engagement activities carried out in the lead up to exhibition of the Environmental Impact Statement. This involved a number of rounds of consultation in 2014, 2015 and 2016 associated with various project announcements.

Various forms of stakeholder and community engagement methods were carried out for the project including in the Willoughby Local Government Area. Information has been provided to the community via stakeholder meetings, three media releases, 41 advertisements, seven fact sheets, two newsletters delivered to 220,000 properties within one kilometre of the proposed route, five project booklets, two online forums, updates across three website, and information provided at two community information centres. The community was also invited to attend eight community information sessions in June 2015, and six sessions and two information stalls in May and June 2016.

Properties immediately adjacent to future construction sites or identified as being potentially affected by project works were either doorknocked by Transport for NSW Place Managers or meetings requested with major landowners and tenants to make them were aware of the project, the extent of the works and were provided with information to help them make a submission on the project.

Regular briefings via meetings, presentations and phone calls were held with Willoughby Council to enable any key issues to be discussed.

Future consultation is outlined in Section 5.7.2 of the Environmental Impact Statement and Chapter 4 of this report.

The Construction Environmental Management Framework (Appendix B of this report) provides the communication and consultation strategy for the project. This includes targeted notification of works that may disturb local residents prior to those works commencing as well as provision of information regarding significant events or design changes that affect or may affect individual properties, residences and businesses.

Consultation would continue with Willoughby Council throughout all stages of the project.

6.13.2 Adjustment to the T1 North Shore Line

Issues raised

The Sydney Metro Environmental Impact Statement Technical Paper 6 Landscape and Visual, Chapter 15, 'Mitigation Measures' are supported. The submissions makes the following specific comments:

- It is noted that the 'Mitigation Measures' related to the construction phase are implemented for the length of the construction phase and up until the operational phase begins
- The erection of noise barriers is generally supported. An acoustic analysis should be carried out and the designs of these barriers involve input from affected residents
- Clarification is required regarding which barriers are to be retained for the operational phase and into the future as permanent structures
- With regard to both the railway corridor and the Chatswood dive site, appropriate trees (based on species, maturity and location) should be retained where possible
- Extensive tree removal on any site is not supported.

Response

Willoughby Council's comments in relation to the support of the landscape and visual mitigation measures are noted.

The proposed locations and heights of the operational stage noise barriers along the T1 North Shore Line have been determined based on the operational noise assessment in Chapter 11 of the Environmental Impact Statement. These would be refined by a future operational noise assessment based on the detailed design of the project.

The assessment of tree removal conservatively assumes that all trees within the rail corridor would be removed. Mitigation measure LV5 identifies that trees would be retained where feasible and reasonable.

The following mitigation measures are considered necessary:

- Demolition and excavation works should be restricted as follows: Monday to Friday 7am-6pm and Saturday 8am-1pm
- Long-term vibration monitoring systems are supported for works within the North Shore Line, Chatswood dive site and Artarmon substation to ensure that vibration levels remain within the established limits
- If compliance with road traffic noise criteria cannot be achieved, night-time heavy vehicle movement on local roads should be restricted to ensure compliance
- Long-term noise monitoring systems are supported for works within the North Shore Line, Chatswood dive site and Artarmon substation to ensure that noise levels remain within the established limits.

Response

The following responses are provided to the specific proposed mitigation measures:

• Demolition works are generally proposed to be carried out during standard daytime construction hours of Monday to Friday 7am-6pm and Saturday 8am-1pm. At Chatswood dive site, excavation of the dive structure would also be generally carried out during standard daytime construction hours. Tunnelling works, and associated support activities are proposed to be carried out up to 24 hours per day and seven days per week.

Additionally, excavation of stations is proposed to be carried out up to 24 hours per day and seven days per week. Since the development of the Environmental Impact Statement, construction planning has identified that rock breaking for cut-and-cover stations and station shafts (except for Central Station) would not be required outside of standard construction hours. Support station excavation activities would still occur up to 24 hours per day and seven days per week. Further information is provided in Section 9.6 of this report.

- The Construction Noise and Vibration Strategy has been updated to provide vibration and noise monitoring requirements for the construction phase of the project. The revised Construction Noise and Vibration Strategy is provided as Appendix C of this report.
- Mitigation measure NV2 commits to restricting vehicle movements on local roads during the night-time period where compliance with the relevant criterion cannot be achieved.

Issue raised

There is little information in the Environmental Impact Statement about the amount of vegetation required to be removed along this corridor to allow for the adjustment of the rail lines.

A vegetation management plan which details trees and vegetation to be removed along the corridor; and how the spread of weeds will be minimised should be developed by a qualified arborist and submitted to Council for review prior to works commencing. Any tree removed as part of the works is to be replaced with an appropriate tree approved by Council.

Council is also concerned that if clear felling is required this will remove shade and outlook for residents living along the corridor and further add to heat gain and additional noise. Council requires the retention of viable mature native vegetation for the preservation of wildlife movement corridors and to protect the visual amenity of affected residential properties wherever possible.

It is noted that additional noise barriers will be constructed however close consultation with Council and the adjoining residents prior to finalising the detailed design should be undertaken.

The assessment of tree removal conservatively assumes that all trees within the rail corridor would be removed. Mitigation measure LV5 identifies that trees would be retained where feasible and reasonable.

The requirement for a Flora and Fauna Management Plan is detailed in the Construction Environmental Management Framework (Appendix B of this report). This includes requirements around vegetation removal and weed management.

As vegetation does not provide any shielding of noise, the removal of vegetation would not result in increased noise levels at any property. The final design of noise barriers is subject to detailed design. Consultation would occur with council and directly adjacent receivers as part of this process.

Issue raised

The adjustment of the T1 North Shore Line tracks from Chatswood Station to the dive structure located 200 metres to 300 metres south of Chatswood Station would be confined to within the rail corridor. Any increase in construction traffic outside the rail corridor would most likely be associated with project support activities. Streets surrounding the proposed track work that would be affected are Orchard Road, Mowbray Road and the Pacific Highway. Some support vehicles may also use Hampden Road although this is not likely to be a popular choice. Anticipated support vehicle volumes are not expected to be high. However, it would be best if construction traffic associated with the Metro be confined to the period outside of peak traffic flows in the morning and evening.

Response

Transport for NSW has pro-actively minimised the number of construction vehicles proposed in the AM and PM peak periods. The traffic analysis presented in Section 8.4 of the Environmental Impact Statement shows that small number of vehicles proposed in these periods would have a negligible impact to the road network.

Mitigation measure T13 further commits to management of construction site traffic to minimise movements in the AM and PM peak periods.

Issue raised

Council is concerned about the impact of construction activities on its infrastructure assets. It is recommended that the contractors engaged in carrying out construction activities by Transport for NSW be aware of the following Council requirements:

- Any construction, maintenance or restoration works to Council's civil assets, as a result of the project to Council's is to be undertaken to Council's specification and approved by Willoughby Council
- A full dilapidation report covering all Council's civil assets is to be carried out prior to the commencement of any works. This report is to include any asset that could be damaged due to construction works or vehicles travelling to and from the site. Following the completion of all railway and associated works any damaged Council assets are to be returned to their original condition
- Confirm that the construction traffic and loadings can be carried without any damage to the surrounding road pavements. Any damage caused by construction traffic is to be repaired to Council's specification
- Maintain the operation and functionality of all roads, footpaths and stormwater drainage systems during and after the works

- Appropriate action to be taken during the construction phase to minimise dust generated by the works and to prevent any silt and sediment from entering any of Council's road or stormwater drainage networks
- Safe and appropriate pedestrian access to be maintained around the site at all times
- Provide 24 hour contact details to Council and also have these details clearly provided on site so that any complaints or issues relating to the work can be quickly directed to the appropriate person for action
- Any damage to the road pavement or potholes created by the works or vehicles accessing or leaving the site is to be made safe and repaired immediately
- Any street signs or other Council signage damaged during the works or by vehicles entering or leaving the site are to be repaired immediately
- Any stormwater pit or pit lid damaged during the works or by vehicles entering or leaving the site are to be repaired immediately
- Any tree removed as part of the works is to be replaced with an appropriate tree approved by Council.

Transport for NSW would continue to consult with Willoughby Council regarding any works necessary to council assets.

Existing condition surveys would be offered to the owners of all properties, including local roads, with the potential to be affected by the project. The process for condition surveys is descried in the Construction Environmental Management Framework (Appendix B of this report).

The implementation of mitigation measures identified in Chapter 27 of the Environmental Impact Statement and the Construction Environmental Management Framework would meet the intent of the requirements suggested by Council.

6.13.3 Chatswood dive site

Issue raised

Council has concerns about the unnecessary removal of trees, both within the rail corridor and the more highly visible Pacific Highway and Mowbray Road. In particular the street trees along Mowbray Road are mature and positively contribute to the landscape. Removal of street trees is not supported unless there is a valid reason, with particular emphasis placed on the Pacific Highway and Mowbray Road and whole scale tree removal on this site is not supported.

Response

The removal of trees within the construction site near Pacific Highway and Mowbray Road is required for the Chatswood dive structure and construction area. Section 16.4.1 of the Environmental Impact Statement provides an assessment of the potential impact on landscape character and visual amenity as a result of the project in the vicinity of Chatswood. For the purposes of this assessment it has conservatively been assumed that all trees within the construction footprint would be removed. Mitigation measure LV5 identifies that trees would be retained where feasible and reasonable. The assessment concluded that during construction there would be minor and moderate adverse visual impacts on viewpoints from Nelson Street, Gilham Street, Mowbray Road and residential properties to the east of the existing rail corridor. These impacts would primarily be due to the scale and extent of the proposed work, including removal of vegetation along the rail corridor and construction activities at the Chatswood dive site. During operation, there would be minor to moderate adverse daytime visual impacts on viewpoints from residential properties to the west of the Frank Channon Walk and residential properties and streets between Nelson Street and Mowbray Road.

Mitigation measures (LV11 and LV12) have committed that, where feasible and reasonable, vegetation would be provided to screen and visually integrate sites with the surrounding area. In addition appropriate landscape treatments for Frank Channon Walk are to be identified and implemented in consultation with council.

Issue raised

Measures to address adverse impacts on surrounding residential amenity are supported. It is also recommended that an acoustic shed should be constructed over the excavation prior to any excavation works.

Response

An acoustic shed is proposed to be provided at the Chatswood dive site to manage the potential noise impacts associated with tunnelling and supporting works occurring 24 hours per day and seven days per week. Other excavation works at this site would be carried out during the standard daytime construction hours. It is not feasible or reasonable to provide an acoustic shed for excavation works which are restricted to daytime construction hours.

Issue raised

Council seeks to ensure that all heritage items are adequately protected from the impacts of works associated with the Metro, including vibration. There is specific concern with regard to Mowbray House, which is located on the Chatswood dive site. The following mitigation measures are considered necessary:

- A 10 metre curtilage be provided around Mowbray House in accordance with the Local heritage item classification under Willoughby Local Environmental Plan 2012
- As a result of the 10 metre curtilage required above, the vehicle ingress / egress point for the Chatswood dive site is to be re-examined and relocated outside of the 10 metre curtilage. All trees within the curtilage are to be retained
- All finished works should have adequate regard to and be sympathetic with neighbouring heritage items and surrounding conservation areas
- Council supports appropriate preservation actions if archaeological remains are discovered
- A detailed Structural Engineer's report shall be prepared and a copy provided to Council prior to the commencement of any work on the Chatswood dive site qualifying the structural stability of, and the means of supporting the structure during construction
- A vibration report is required to specifically consider the impact of construction and operation on each of the heritage items
- Should any portion of the existing heritage items be damaged, with specific regard to Mowbray House, all the works on-site are to cease and written notification given to Council. No work is to resume until adequate measures are agreed upon in consultation with Council to rectify the damage and ensure further damage does not occur

- Preparation of a photographic survey and report of the neighbouring Heritage Items listed below to be presented to Council and all owners of these properties. Such photographic survey and report shall be prepared by a suitably qualified person, detailing the physical condition of these properties, both internal and external including items as walls, ceilings, roof, structural members and other items as necessary
- Heritage items: Garden of Remembrance, Mowbray House is located on the Chatswood dive site, "Chatswood Reservoirs" at 366 Mowbray Road (on the corner with the Pacific Highway), Chatswood Zone Substation No. 80, located opposite Mowbray House at 348 Mowbray Road, Great Northern Hotel, Chatswood South Uniting Church and Cemetery – which is located in Lane Cove Council Local Government Area and house at 2 Orchard Road
- Any damage occurring as a result of the Metro works is to be rectified at the cost of the Transport for NSW.

Section 14.5.1 of the Environmental Impact Statement provides an assessment of the potential impacts to Mowbray House. It identifies that the item would be retained. However demolition of non-original outbuildings would be required.

No direct impacts are anticipated to the Garden of Remembrance, "Chatswood Reservoirs" at 366 Mowbray Road (on the corner with the Pacific Highway), Chatswood Zone Substation No. 80, Great Northern Hotel, Chatswood South Uniting Church and Cemetery and house at 2 Orchard Road. Any impacts to these items would be associated with views and vistas and are anticipated to be negligible.

Mitigation measures provided in the Environmental Impact Statement would generally meet the intent of Council's proposed measures, including:

- Mitigation measure NV3 Where vibration levels are predicted to exceed the screening criteria, a more detailed assessment of the structure and attended vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for that structure. For heritage items, the more detailed assessment would specifically consider the heritage values of the structure in consultation with a heritage specialist to ensure sensitive heritage fabric is adequately monitored and managed.
- Mitigation measure NAH1 Archival recording and reporting would be carried out in accordance with the NSW Heritage Office's How to Prepare Archival Records of Heritage Items (1998a), and Photographic Recording of Heritage Items Using Film or Digital Capture (2006). This includes the internal heritage fabric and any non-original elements removed from within the curtilage of Mowbray House, Chatswood.
- Mitigation measure NAH2 The method for the demolition of existing buildings and / or structures at Chatswood dive site, Victoria Cross Station, Martin Place Station, Pitt Street Station, Central Station and Waterloo Station would be developed to minimise direct and indirect impacts to adjacent and / or adjoining heritage items.
- Mitigation measure NAH7 The project design would be sympathetic to heritage items and, where reasonable and feasible, minimise impacts to the setting of heritage items.

Existing condition surveys would be offered to the owners of all properties, including local roads, with the potential to be affected by the project. The process for condition surveys is descried in the Construction Environmental Management Framework (Appendix B of this report).

Concern is expressed regarding inadequate parking on-site for workers associated with the project and the impact on surrounding on-street parking. It is recommended that a shuttle service and / or green travel plan be introduced prior to construction to provide viable non-car travel options to the site for workers.

Response

Mitigation measure T12 commits to measures to minimise construction worker parking on local streets around construction sites. This includes encouraging the use of public and active transport, ride sharing and park and shuttle transfers. The provision of car parking spaces at the two dive sites would be to facilitate central parking locations with shuttle services to the other project construction sites.

Issue raised

Council supports appropriate and satisfactory maintenance of the site between the construction and operation phases of the project. This may be extended to include any future development of the site. Council seeks to be involved at an early stage in the planning for any future development on this site. Any planning on this site should have regard to the surrounding built environment and character, Council's current local environmental plan and development control plan, as well relevant Council strategic planning documents.

Response

Any future development of the residual land at Chatswood dive site would be subject to a separate planning approval process.

Issue raised

An inspection of a large Sydney Blue Gum that resides on the Mowbray Road boundary near Pacific Highway near the Ausgrid site was conducted by Council's arborist. The following assessment was made: the tree has a healthy canopy that provides valuable feeding sites for fauna (particularly Eastern Bentwing Bat) and a safe refuge for roosting birds. It is therefore required that:

- The subject tree be retained and protected in accordance with AS 4970 2009 Protection of trees on development sites
- Remediation of surrounding dive and substation sites to include parkland that reinstates local endemic flora species in support of previous mentioned points.

Response

The removal of trees within the construction site near Pacific Highway and Mowbray Road is required for the Chatswood dive structure and construction area. This has been considered and assessed as part of the biodiversity and landscape and visual impact assessments in Section 20.4 and 16.4.1 the Environmental Impact Statement respectively. For the purposes of these assessments it has conservatively been assumed that all trees within the construction footprint would be removed. Mitigation measure LV5 identifies that trees would be retained where feasible and reasonable. Further, mitigation measure LV2 commits to protecting any trees to be retained in accordance with AS 4970 – 2009 Protection of trees on development sites and adjoining properties.

Any future development of the residual land would be subject to a separate planning approval process.

Site establishment is likely to take 12 months, with earthworks to take another 12 months. Heavy vehicle traffic and tunnelling noise will have a major effect on those that live close to the work sites. It is therefore recommended that:

- Access to the Nelson Street side of the site should be restricted to daytime hours of 7am to 6pm
- One on one consultation should be conducted with immediate neighbours of the work sites with the option to consider either acoustic insulation (windows etc.) of the homes or alternative living arrangements be made available to them for the duration of the works
- To protect the community from excessive intrusive noise and preserve amenity, compliance is required in accordance with the Environment Protection Authority's *Industrial Noise Policy*.

Response

- Mitigation measure NV2 commits to restricting the use of the Nelson Street access point unless compliance with the relevant traffic noise criterion can be achieved.
- Consultation would be carried out with all receivers around the construction sites. The process for consultation during construction is outlined in Chapter 4 of this report and in the Construction Environmental Management Framework (Appendix B of this report). The Construction Noise and Vibration Strategy (Appendix C of this report) identifies circumstances when mitigation measures such as alternative accommodation would be offered to receivers. It is not considered feasible or reasonable to provide at-property treatments for temporary construction noise impacts or alternative accommodation for the duration of the construction works.
- The *Industrial Noise Policy* is relevant to potential noise impacts from operational fixed facilities. The appropriate guideline for construction works is the *Interim Construction Noise Guideline*. This guideline would be complied with for all construction works.

Issue raised

The significant increase in rail movements in and out of Chatswood station will have an impact on nearby residents and businesses. The Environmental Impact Statement notes that the ingress and egress of trains at Chatswood would require a combination of "high attenuation" track and a small section as "very high attenuation". Given the large amount of residents living above and nearby to the station it would be prudent to have all of this section designated and constructed as "very high attenuation". This will then act as a buffer to increase rail movements over time and ensure minimisation of noise in the longer term.

Response

Section 11.4.1 of the Environmental Impact Statement identifies that initial ground-borne noise and vibration modelling has been carried out to determine the indicative track form along the tunnel alignment to meet the design objectives at receivers above the tunnels. Very high attenuation track would be required for less than one per cent of the tunnels, in very sensitive areas where the depth of the tunnel is particularly shallow. The indicative track form in the tunnel to the south of the Chatswood portal is a combination of standard, high and very high attenuation. The track form has been determined based on the ultimate capacity of the rail line.

The tunnel alignment is indicative at this stage, however during detailed design the alignment may change. Any changes to the alignment would be reviewed for consistency with the assessment contained in the Environmental Impact Statement including relevant mitigation measures, performance outcomes and any future conditions of approval. The final track form would be confirmed as part of detailed design.

Large amounts of dust can be expected to be generated due to excavation and construction activities. It is recommended that:

- Dust screens must be erected around the perimeter of the site and be kept in good repair for the duration of the work
- Water used for dust suppression must not be allowed to enter the street or stormwater system.

Other mitigation measures regarding air quality that are considered in the document are thought to be appropriate.

Council wishes to emphasize the need to adequately suppress dust resulting from above ground and underground construction activities as silica dust has been linked to the development of silicosis. The *Occupational Health and Safety Act* requires employers to take measures to ensure that workers (and nearby residents) are not exposed to silica dust.

Response

Section 22.4 of the Environmental Impact Statement provides consideration of the potential dust impacts associated with the project. This section identifies that the potential impacts are relatively minor and can be managed with the implementation of standard mitigation measures provided in Section 22.6 of the Environmental Impact Statement.

Issue raised

The Environmental Impact Statement adequately addresses Waste Management, through all stages of the project. The project's target of 90 per cent of waste to be recycled and 100 per cent spoil re-use is to be commended. Council would appreciate evidence that this has been achieved during the duration of the project. The Environmental Impact Statement addresses concerns such as handling and disposal of contaminated waste and asbestos waste which is considered acceptable.

Response

Willoughby Council's support for the proposed mitigation measures and sustainability initiatives are noted. The project would have audits to confirm compliance with the Waste Management Strategy. The process for carrying out audits is provided in the Construction Environmental Management Framework (Appendix B of this report).

Issue raised

The identification of any contaminants of concern should be examined through detailed site investigations. It is also necessary that:

- Contamination discoveries shall have a remedial action plan prepared in line with the Environment Protection Authority's 'Contaminated Sites guidelines', State Environmental Planning Policy 55, AS4482.1 and AS4482.2 Guide to the investigation sampling of sites with potentially contaminated soils and the *Contaminated Land Management Act 1997*
- An unexpected finds protocol to be incorporated into all site redevelopment works
- Proper handling of water and soils is required around specific zones of high impact to contain contaminants such as; fuels, oil etc.

Section 18.5 of the Environmental Impact Statement provides mitigation measures for water and soil contamination. Specifically this section identifies the implementation a remediation action plan, if required, in accordance with the requirements of the *Contaminated Land Management Act 1997*. Unexpected finds protocols would also be implemented as per the Construction Environmental Management Framework (Appendix B of this report).

Issue raised

Council is currently negotiating with Transport for NSW on cooperative projects where available spaces for Photovoltaic and demand sites are a shared asset. It is also noted that the NSW Government Resource Efficiency Policy Section E5: Identify and Enable Solar Leasing Opportunities supports the opportunity for this project to include high Photovoltaic penetration at the new Artarmon substation (this is based on the logic that Photovoltaic penetration in the existing network has been limited due to aging cables and voltage fluctuations). Council would like to continue to work with Transport for NSW to identify potential Photovoltaic projects.

Response

Consultation would continue with Willoughby Council to identify potential photovoltaic projects.

Issue raised

The main access to the Chatswood dive site would be via Mowbray Road at a point directly opposite where Hampden Road meets Mowbray Road. Any change to the driveway location for the retention and protection of Mowbray House and its curtilage is to occur in consultation with Council and Roads and Maritime Services. No construction traffic volumes to and from the Chatswood dive site has been provided in the Environmental Impact Statement.

There is also a lack of information about any construction traffic routes and so a detailed analysis of the impact of construction traffic from the dive site on the peripheral streets would be necessary. A traffic management plan should be prepared by Transport for NSW detailing how construction traffic to and from the site will be managed particularly during peak periods.

It should also be noted that all spoil removal trucks are to be parked on-site. Transport for NSW would be required to provide details of truck routes and route options during peak and non-peak; and weekday and weekend routes.

As the installation of the proposed signalised intersection at Hampden Road would be subject to approval by Roads and Maritime Services, it is assumed that this set of lights would be synchronised with the signals at the Pacific Highway / Mowbray Road and the Orchard Road / Elizabeth Street / Mowbray Road intersections. Given the queues along Mowbray Road during the afternoon peaks, it may be necessary for "Do Not Queue Across Intersection" signs to be installed at the proposed Hampden Road / Mowbray Road intersection. Council would appreciate involvement in any proposed modifications to the traffic signals at the Mowbray Road / Orchard Road intersection.

No construction traffic routes have been determined at this stage. Council would require a construction traffic route to be referred to Council for review and agreement prior to the commencement of any work on site so that a pavement condition audit may be carried out; and any damage to the pavement resulting from construction traffic loads must be repaired by Transport for NSW.

Construction traffic routes and anticipated construction vehicle numbers for Chatswood are provided in Section 8.4.6 of the Environmental Impact Statement. The primary haul route would be to and from the north along the Pacific Highway. The final design of the Mowbray Road / Hampden Road intersection and phasing of traffic lights would be subject to consultation with Roads and Maritime Services and Willoughby Council, and approval from Roads and Maritime Services.

Construction Traffic Management Plans would be prepared for the project. The process for developing Construction Traffic Management Plans and Traffic Control Plans is provided in the Construction Environmental Management Framework (Appendix B of this report).

Issue raised

The following are traffic matters that should be considered by Roads and Maritime Services when reviewing the operation of the traffic signals at the Mowbray Road / Pacific Highway intersection as part of the project:

- Use the opportunity to improve the pinch point (Pacific Highway and Mowbray Road) by improving intersection operation / turn movements and improving intersection safety for all road users including pedestrians and cyclists
- Consider providing a right turn movement from Mowbray Road west (eastbound) into Pacific Highway (southbound). The provision of this movement will reduce traffic movements turning right at Hampden Road and then traveling through the Artarmon Village area
- Use the opportunity to improve pedestrian / cyclists access. The intersection improvement works should consider upgrading pedestrian and bicycle facilities which would promote active transport. Safe access to the shared path (Frank Channon Walk); and completing the link to the Chatswood Interchange should be a priority
- Council agrees in principle to the Chatswood dive site preliminary construction site plan (access and egress via Nelson Street and Mowbray Road, as illustrated in Figure 7-8 of the Environmental Impact Statement). However, it would be a requirement that a detailed traffic management and control plan be developed to satisfy traffic and safety standards
- Without any operational hour details for the Nelson Street access, Council will not support 24 hours 7 days truck / construction vehicle access / movements in Nelson Street. Vehicle access hours should comply with the Building Code of Australia. Trucks accessing Nelson Street should be restricted during night-time and weekends due to the close proximity of local residents. Noise mitigation measures should be implemented to reduce localised noise level
- Council would encourage periodic audits of the Construction Traffic Management Plan prior to and during construction works. An independent accredited road safety auditor should be engaged to carry out the audits of the Construction Traffic Management Plan. Where there are non-compliances identified, the audit procedure should have a mechanism for the issuing of a formal corrective action. Corrective actions should be closed-out and registered in accordance with Council and Roads and Maritime's practice. Council staff should be invited as part of the audit team and / or a copy of all audit reports has to be submitted to Council.

Since development of the Environmental Impact Statement, concerns have been raised by stakeholders (including Roads and Maritime Services) regarding the provision of the right hand turn lanes in isolation from other long term changes required at the Pacific Highway / Mowbray Road intersection. It has also been identified that it would be desirable for all work at the intersection to be carried out at the same time to avoid traffic disruption on multiple occasions.

As a result, Transport for NSW is currently working with Roads and Maritime Services and other stakeholders to carry out a broader review of the traffic and transport needs in the precinct, the implications of the closure of the Nelson Street bridge and to identify a preferred approach to any future upgrade of the Pacific Highway / Mowbray Road intersection. The identification of the proposed solution at the Pacific Highway / Mowbray Road intersection and the carrying out of such work may not be implemented prior to the construction work that would require closure of the Nelson Street bridge. Section 9.1 of this report provides a revised traffic impact assessment for the area around Chatswood in the event that the solution cannot be implemented prior to the demolition of Nelson Street bridge.

Responses to other issues raised are as follows:

- The project would improve pedestrian and cyclist facilities in the vicinity of Chatswood dive by extending Frank Channon Walk from Nelson Street to Mowbray Road. This would be carried out in consultation with relevant stakeholders including council.
- Traffic Management Plans would be developed for the construction phase of the project. Details of the information to be included in these plans is provided in the Construction Environmental Management Framework in Appendix B of this report. This document also provides information regarding auditing of management plans and performance
- The maintenance access arrangements to the Chatswood dive during the operational phase of the project have been revised, with access now being gained from Mowbray Road. This access would be required up to 24 hours per day and seven days per week associated with dedicated maintenance periods. Further information is provided in section 2.1 of this report

Issue raised

Transport for NSW has approached Council in regards to the compulsory acquisition of two Council owned parcels of land for the Chatswood dive site.

- Lot 1 in DP 221896 a narrow strip of land adjacent to the rail corridor and the rear of the Ausgrid depot site. This land has been earmarked for an extension of Frank Channon Walk through to Mowbray Road. Initial discussions were undertaken whereby upon the redevelopment of 339 Mowbray Road (Ausgrid Depot, aka 14 Nelson Street), Council would receive a portion of the Ausgrid site to allow an adequate width for the extension of the Frank Channon Walk. Council seeks an undertaking from Transport for NSW that at the time of the redevelopment of the Chatswood 'dive site' Council receives a dedication of land to allow the extension of the Frank Channon Walk to proceed.
- Part of Bryson Street a portion of roadway bounded by the Pacific Highway, the Ausgrid depot, the Nick Scali retail outlet and the Ausgrid depot staff carpark. This parcel of land has not been earmarked for any special purpose as it served to provide access to the adjacent retail areas.

Council will not be required to arrange the closure of the road, as Transport for NSW will arrange for a Section 41 'Compulsory acquisition of land that operates as a public road'. Transport for NSW is seeking to compensate Council under Section 206 of the *Roads Act 1993*, whereby Council will be compensated for its costs in constructing the roadway and associated footpath, curb and gutters, drainage etc. Council is seeking fair and just compensation for the costs that it has expended in forming the road and its associated structures.

Transport for NSW will continue to liaise with Willoughby Council in relation to land acquisition. As part of the project Frank Channon Walk would be extended from Nelson Street to Mowbray Road in consulation with council.

6.13.4 Widening of the Pacific Highway, Chatswood

Issue raised

It is noted that under *Willoughby Local Environmental Plan 2012*, land on the Chatswood dive site, as well as land at the intersection of Mowbray Road and the Pacific Highway is identified on Council's Land Reservation Acquisition Map for the purposes of Roads and Maritime road widening. It is requested there be a coordination of the Sydney Metro project with proposed Roads and Maritime road widening prior to construction as this would assist in the management of changed traffic conditions and impacts associated with a long term project such as this. If coordination cannot be managed, an explanation is requested in order to assist Council in answering questions from Willoughby residents and other parties.

With the widening of the Pacific Highway to cater for the two additional southbound lanes, it is likely that that the stormwater drainage system in the vicinity of the Mowbray Road / Pacific Highway intersection would need to be re-designed. Broadly:

- Council supports the proposal to provide double right turns from the Pacific Highway (southbound) into Mowbray Road west (westbound)
- The right turn movements will reduce traffic congestion on local road network (Orchard Road and Mowbray Road); potentially improve traffic flow; and reduce travel times for motorists during peak hours
- Roads and Maritime needs to include Council in the intersection upgrade design and development process, including pedestrian and cyclists facilities
- Council recognises that the Chatswood dive site and associated traffic management changes will have significant impacts on the local community and through traffic in general. Council is concerned about the impacts the proposed changes will have local residents' access and its local road network during the peak periods during the construction phase of the project.

Response

Since development of the Environmental Impact Statement, concerns have been raised by stakeholders (including Roads and Maritime Services) regarding the provision of the right hand turn lanes in isolation from other long term changes required at the Pacific Highway / Mowbray Road intersection. It has also been identified that it would be desirable for all work at the intersection to be carried out at the same time to avoid traffic disruption on multiple occasions.

As a result, Transport for NSW is currently working with Roads and Maritime Services and other stakeholders to carry out a broader review of the traffic and transport needs in the precinct, the implications of the closure of the Nelson Street bridge and to identify a preferred approach to any future upgrade of the Pacific Highway / Mowbray Road intersection. The identification of the proposed solution at the Pacific Highway / Mowbray Road intersection and the carrying out of such work may not be implemented prior to the construction work that would require closure of the Nelson Street bridge. Section 9.2 of this report provides a revised traffic impact assessment for the area around Chatswood in the event that the solution cannot be implemented prior to the demolition of Nelson Street bridge.

6.13.5 Nelson Street bridge closure

Issue raised

Concern is raised regarding the demolition of the Nelson Street bridge and the adverse impact on pedestrian and bicycle connectivity in the locality. Both pedestrians and cyclists will lose an existing means of crossing the railway lines, and will now be required to utilise the nearest crossing on Mowbray Road. This new route is difficult for cyclists and is longer for pedestrians. Council is concerned about the reduction in existing connectivity. It is suggested that a shared pedestrian and cycle bridge be provided at the end of Nelson Street, connecting with the Frank Channon Walk, over the railway corridor prior to the operational phase.

Council wishes to also express its dissatisfaction that the current connection for pedestrians and cyclists would be lost following the removal of the Nelson Street bridge. In that regard, Council wishes to suggest that Transport for NSW considers a grade separated crossing for pedestrians and cyclists so that the current link may be maintained. To eliminate the concerns raised by the community, it is suggested that traffic modelling be conducted in the road network linking the Mowbray Road / Orchard Road, Mowbray Road / Hampden Road, and Pacific Highway / Mowbray Road (west) intersections.

Response

Section 9.4.3 of the Environmental Impact Statement provides an assessment of impact to pedestrians and cyclists from the removal of Nelson Street bridge. With the proposed extension of Frank Channon Walk to Mowbray Road, the additional travel distance would be around 50 to 100 metres. This is not considered to result in a significant impact to pedestrians and cyclists and, as such, the provision of new pedestrian and cyclist bridge over the rail line is not considered to be justified.

6.13.6 Mowbray Road bridge adjustments

Issue raised

There is scant information about the traffic management plans during works associated with the Mowbray Road bridge adjustments. Council requests that details of any traffic management plan be referred to Council so that the community may be informed of any likely impact they may experience.

Response

The design of the project has minimised the works required to Mowbray Road bridge. As described in Section 7.10.1 of the Environmental Impact Statement, it is likely that adjustments to Mowbray Road bridge would include:

- Soil nails and shotcrete to support the western adjustment
- A deflection wall around the existing pier columns.

Construction Traffic Management Plans would be prepared for the project. The process for developing Construction Traffic Management Plans and Traffic Control Plans is provided in the Construction Environmental Management Framework (Appendix B of this report).

6.13.7 Signalisation of the Hampden Road / Mowbray Road intersection Issue raised

It is recommended that the Mowbray Road vehicle access point for the Chatswood Dive Site be located outside the 10 metre curtilage around Mowbray House. This will have an impact on the signalisation of the Hampden Road / Mowbray Road Intersection – as the access would no longer be directly opposite Hampden Road. It is suggested that the signalisation of the Hampden Road / Mowbray Road intersection be adjusted as required by the 10 metre curtilage around Mowbray House.

Section 14.5.1 of the Environmental Impact Statement provides an assessment of the potential impacts to Mowbray House. It identifies that the item would be retained, however demolition of non-original outbuildings would be required.

The final design of the Mowbray Road / Hampden Road intersection and phasing of traffic lights would be subject to consultation with Roads and Maritime Services and Willoughby Council and approval from Roads and Maritime Services.

Issue raised

Council welcomes any involvement in the development in the design of the proposed signalisation of the Hampden Road and Mowbray Road intersection. The Artarmon community has raised concerns to Council regarding the impacts of the traffic in Hampden Road in the short and long term. As such a traffic study should be undertaken which would indicate the likely impacts on all adjacent local road networks.

Response

The final design of the Mowbray Road / Hampden Road intersection and phasing of traffic lights would be subject to consultation with Roads and Maritime and Willoughby Council and approval from Roads and Maritime Services.

The traffic impact assessment of the proposed signals at the Mowbray Road / Hampden Road intersection is provided in Sections 8.4.6 and 9.4.3 of the Environmental Impact Statement. This assessment showed that the introduction of signals at this intersection would have minimal impact on the performance of the surrounding road network.

6.13.8 Noise walls

Issue raised

With regard to noise barriers, the Environmental Impact Statement Summary states they will be increased in height to approximately four metres between:

- O Chapman Avenue and Nelson Street on the eastern side of the rail line
- The Frank Channon Walk pedestrian underpass and Albert Avenue on the western side the rail line
- O Nelson Street and Gordon Avenue on the western side the rail line.

A two metre high noise barrier will also be built to the south of Mowbray Road on the western side of the rail line. Further detail is required regarding how long this wall will be and whether they are to be permanent structures. It is recommended that the erection of noise walls are generally supported based on the recommendations above. Final design is to occur following consultation with the community.

Response

The noise walls are proposed to manage operational noise impact and, as such, would be permanent structures. The final design of noise barriers is subject to detailed design and associated refinements to the noise modelling. Consultation would occur with directly adjacent receivers as part of this process.

Issue raised

All measures conducted to attenuate both construction works and operation of this project, such as noise walls, need to be independently verified by a certified practicing acoustic consultant.

Transport for NSW is proposing to engage an Independent Construction Noise and Vibration Advisor. The role of the Independent Construction Noise and Vibration Advisor would be to verify that the noise outcomes for the project are in accordance with the relevant guidelines and conditions of approval.

The operational noise mitigation for the project would be designed to meet the requirements of the *Rail Infrastructure Noise Guideline*.

6.13.9 Artarmon substation

Issue raised

Council has identified the Artarmon Substation site, being the abovementioned Council land as well as Roads and Maritime land, under Willoughby Local Environmental 2012 for the purposes of affordable housing.

It is considered that such a site would be preferable within an industrial area having regard to potential visual and noise impacts. An explanation should be provided why this site was chosen rather than an alternative site within the nearby Artarmon Industrial Area. Council would appreciate any information pertaining to any alternative sites for the substation.

The site plan shows a number of small structures, including dangerous goods storage, located along the Butchers Lane boundary and no structures located along the boundary with 108 Reserve Road. It would appear that scope exists for the retention of some of the trees located around the boundary, which would assist in the screening of the site from neighbouring residential properties.

It is recommended that tree retention be maximised on this site, with particular regard to species, maturity and location around the site boundary. Measures to address adverse impacts on surrounding residential amenity, including the erection of a noise barrier or hoarding, are supported. It is recommended that a noise barrier be built around this site. Final design is to occur following consultation with the community.

Response

In response to the issues raised by Council and local residents surrounding the site at Barton Road / Butchers Lane, Artarmon, Transport for NSW has commenced investigations into an alternative site for the Artarmon substation within the Artarmon Industrial Area. Confirmation of an alternative site would be dependent on meeting criteria for siting. These criteria include:

- being directly located above the track running tunnels
- be accessible by a public road
- be located such that compliance with relevant NSW noise policy guidance may be achieved.

It is anticipated the site location and property requirements would be identified following determination of the project and a supplementary environmental review / assessment would be carried out and, if necessary, the appropriate approvals obtained.

Confirmation of a suitable alternative site would result in the requirement for the land at Barton Road / Butchers Lane being removed from the project.

Notwithstanding, the removal of trees within the Artarmon substation construction site has been considered and assessed as part of the biodiversity and landscape and visual impact assessments in Sections 20.4 and 16.4.2 of the Environmental Impact Statement. For the purposes of this assessment it has conservatively been assumed that all trees within the construction footprint would be removed. Mitigation measure LV5 identifies that trees would be retained where feasible and reasonable.

Temporary noise hoarding is proposed at this site and has been included in the construction noise modelling carried out in Section 10.4.2 of the Environmental Impact Statement.

The proposed substation would be designed to comply with the relevant criteria derived from the *Industrial Noise Policy*. As such, there is no requirement to provide a permanent noise barrier at this site.

Issue raised

There is some confusion as to the actual development required at the Artarmon site. Page 172 of the Environmental Impact Statement states that "The traction substation and ancillary equipment would be housed in an aboveground building (around five metres above ground level) with a shaft (with a diameter of around three metres) to reticulate cables to the tunnels below." Other sections of the Environmental Impact Statement suggest that there will also be a water treatment plant, dangerous good storage, workshop and site office. The use of this site including layout and design requires further development and a separate submission made to Council.

The site location for the substation and associated equipment and dangerous goods stores as currently indicated in the Executive Summary (page 51) is very close to residential development. Residents are likely to be concerned about possible electromagnetic radiation impacts and there is very little detail in the Environmental Impact Statement about how this will be mitigated. Council requires more information about the substation, the levels of electromagnetic radiation expected to be emitted, the impacts on the neighbouring residents and how it meets the *Draft Radiation Standard – Exposure Limits for Magnetic Fields* (Draft Radiation Standard) (Australian Radiation Protection and Nuclear Safety Agency, 2006).

Response

The permanent (ie operation stage) development with the Artarmon site is a traction substation as is described in Section 6.8.1 of the Environmental Impact Statement.

The details of the site in Section 7.10.2 of the Environmental Impact Statement (including a water treatment plant, dangerous good storage, workshop and site office) are the facilities that would be at the site during the construction stage.

The Environmental Impact Statement commits to meeting the exposure standards of the *Draft Radiation Standard – Exposure Limits for Magnetic Fields* (Draft Radiation Standard) (Australian Radiation Protection and Nuclear Safety Agency, 2006).

Issue raised

Council agrees in principle to the Artarmon substation preliminary construction site plan (access and egress via Barton Road, as illustrated in Figure 7-9 of the Environmental Impact Statement). A proper assessment of its impact on the road network in that precinct can only be made following the development of a detailed traffic management / control plans submitted to Council for final review. Council further suggests the audits be conducted periodically on the Construction Traffic Management Plan prior to and during construction. An independent accredited road safety auditor should be engaged to carry out the audits. Where there are non-compliances identified, the audit procedure should have a mechanism for the issuing of a formal corrective action. Corrective actions should be in accordance with Council and Roads and Maritime practice. Council staff should be invited as part of the audit team and / or a copy of all audits should be submitted to Council.

Construction traffic routes and anticipated construction vehicle numbers for Artarmon substation are provided in Section 8.4.7 of the Environmental Impact Statement. The primary traffic route would be to and from the west using the Gore Hill Freeway.

Construction Traffic Management Plans would be prepared for the project. The process for developing Construction Traffic Management Plans and Traffic Control Plans is provided in the Construction Environmental Management Framework (Appendix B of this report).

Additionally, road safety audits would be carried out at each construction site. Audits would address vehicular access and egress, and pedestrian, cyclist and public transport safety. This is reflected as mitigation measure T1.

Issue raised

Transport for NSW has approached Council in regards to the compulsory acquisition of a number of Council owned parcels of land that are part of the Barton Road Reserve. These consist of two lots and an unmade roadway known as Butchers Lane, Artarmon. The approximately 3,500 square metre site has been identified as being required to house an electrical substation as part of the project.

The land is currently leased to the Department of Education for the relocation of Artarmon Primary School during upgrade works to the school. The lease commenced on the 2 September 2015, with the first term set to expire on 1 September 2018 – the lease does have an option for an additional two years should the Department of Education require it.

Council had earmarked this land for the development of affordable housing as part of the Artarmon Property Strategy. The parcels adjoin a number of residential buildings. Council has concerns that the adjoining residents will be adversely affected by noise, loss of recreational areas and visual amenity, traffic and parking generated by the site etc. Despite numerous requests for further information in regards to details of the proposed works for the site, Council is yet to receive any details on the matter.

Council is seeking details of the proposal for the Barton Road sites and seeks assurances that residents will not be adversely affected by the proposed works on the Barton Road sites, at both the time of construction and into the longer term. The Barton Road sites adjoin a residential area. When preparing the valuation for these sites, Council seeks confirmation from Transport for NSW that Council will be fairly and justly compensated for the compulsorily acquired parcels and that they will be valued as residential land and not open space.

Response

Transport for NSW will continue to liaise with Willoughby Council in relation to land acquisition.

The potential overlap with the use of the site by the school is acknowledged. As identified above Transport for NSW is continuing to investigate an alternative site for the Artarmon substation within the Artarmon Industrial Area. This location would represent better land use compatibility.

The proposed works at the site and the proposed operational function of the site are described in Section 6.8.1 and 7.10.2 of the Environmental Impact Statement. The assessment of the Artarmon substation shows that this facility would have minimal ongoing impacts to existing and future residents.

6.13.10 Track access

Issue raised

Access points would be required for the maintenance of the metro network and these are located intermittently along the track. Three metro system access points are proposed. The existing T1 North Shore Line maintenance access point in Hopetoun Avenue, Chatswood would be decommissioned.

As access for track maintenance would be via residential streets, Council wishes to be consulted and invited to comment on any future modifications of metro / railway access points. As these track maintenance access points are adjacent local residents, all access schedules (time of day / day of week) and traffic control and management plans be submitted to Council for review and approval.

Response

Consultation with Willoughby Council and Sydney Trains would continue in relation to track maintenance access points.

The Chatswood to Sydenham project is critical State Significant Infrastructure and is being assessed under Part 5.1 of the *Environmental Planning & Assessment Act 1979*. Sydney Metro contractors would be required to consult with Willoughby Council representatives during Construction Traffic Management Plan preparation and implementation. The process for developing Construction Traffic Management Plans and Traffic Control Plans is provided in the Construction Environmental Management Framework (Appendix B of this report).

6.13.11 Frank Channon Walk - shared path

Issue raised

Council supports the proposed Frank Channon Walk extension. However the width of the extension is not specified in the documentation for either the purpose of a shared path or landscaping.

Council seeks to ensure that the extension functions as envisaged by Council as being a shared pedestrian and cycle zone, with potential for a side area for water and air supply as well as a rest area to enable such associated activities as tyre repair and drink stop for bike riders. Council suggests that this section of the walk be transformed to function as a fully functional and a safe shared pedestrian and cycle path, which will act as a significant entry and exit point to the overall Frank Channon Walk. Council supports proposed landscaping within the Frank Channon Walk and requests that extension be reopened for use as soon as practically possible.

Response

Consultation would continue with Willoughby Council regarding the Frank Channon Walk extension. Details of width and function of Frank Channon Walk would be subject to detailed design.

Issue raised

The local community should be notified of the temporary closure and appropriate detour safe routes provided / communicated to pedestrians and cyclists.

Response

As identified in Chapter 11 (mitigation measure T5), the community would be notified in advance of proposed road and pedestrian network changes through media channels and other appropriate forms of community liaison.

6.14 Lane Cove Council

The submission from Lane Cove Council raised concerns that traffic impacts identified in the Environmental Impact Statement had no regard to the flow on effects to the Lane Cove Local Government Area. These broader concerns have been refined into the following key issues as follows.

6.14.1 Reconfiguration of Pacific Highway and Mowbray Road Issue raised

Nelson Street, Chatswood is currently used as part of a G-Turn to access Mowbray Road west of the Pacific Highway. The Environmental Impact Statement models the option of providing twin right turn southbound bays from the Pacific Highway westbound into Mowbray Road to replace the G-Turn manoeuvre for southbound traffic into Mowbray Road via Nelson Street.

The traffic report and Environmental Impact Statement is silent on traffic volumes or the impact of additional traffic on Mowbray Road west of Pacific Highway from either one or two right turn lanes being proposed.

The expected impact of opening up Mowbray Road westbound to even more traffic is considered unacceptable given the existing levels of congestion. Mowbray Road is already at capacity as it carries over 14,000 vehicles per day. Its intersection with Centennial Avenue already needs additional capacity, it is proposed as a regional bike route, and is generally only two lanes two way for much of its length incorporating periodic traffic calming installed as part of the Lane Cove Tunnel project. Facilitating additional westbound traffic onto Mowbray Road would also be contrary to the Government's commitments on the Lane Cove Tunnel as it would encourage traffic to use it and bypass the tunnel. As such, the additional twin right turn lanes are not supported.

If there is to be any reconfiguration of the intersection, a right turn bay from Mowbray Road to Pacific Highway (eastbound to southbound) should be provided for the following reasons:

- Currently in the AM peak hours, city bound traffic turns left at Centennial or Parklands Avenue to proceed east. As Epping Road is already at capacity due to limited number of trafficable lane, there are long traffic queues in Centennial and Parklands avenues waiting to feed into Epping Road. The proposal will provide an alternate option to the Lane Cove north residents avoiding Epping Road and taking an alternate route to the city such as Mowbray Road West – Pacific Highway – Freeway. This will significantly improve the traffic congestions in the area
- Due to traffic congestion at the Epping Road / Centennial Avenue intersection, currently Lane Cove north residents suffer from 'rat running' issues such as Karilla Avenue – Kurri Street – Kyong Street – Landers Road – Parklands Avenue. As such, the proposal would ease the existing 'rat running' issues and improve residential amenity for the Lane Cove north precinct.

There are over 1,000 residential units being constructed at the Lane Cove north precinct. Therefore, an alternate travel route is required for the future residents as the existing road network is already at capacity in the area.

The introduction of right turn lanes as proposed in the Environmental Impact Statement would result in an increase in peak and off peak westbound traffic along Mowbray Road (west of the Pacific Highway). While improving access to the Lane Cove west area, the right turn lanes would allow through traffic destined for the M2 Motorway to travel via Mowbray Road west rather than remaining on the Pacific Highway to access the M2 Motorway further to the south.

Since development of the Environmental Impact Statement, concerns have been raised by stakeholders (including Roads and Maritime Services) regarding the provision of the right hand turn lanes in isolation from other long term changes required at this intersection. It has also been identified that it would be desirable for all work at the intersection to be carried out at the same time to avoid traffic disruption on multiple occasions.

As a result, Transport for NSW is currently working with Roads and Maritime Services and other stakeholders, including Lane Cove Council to carry out a broader review of the traffic and transport needs in the precinct, the implications of the closure of the Nelson Street bridge and to identify a preferred approach to any future upgrade of the Pacific Highway / Mowbray Road intersection. The identification of the proposed solution at the Pacific Highway / Mowbray Road intersection and the carrying out of such work may not be implemented prior to the construction work that would require closure of the Nelson Street bridge. Section 9.2 of this report provides a revised traffic impact assessment for the area around Chatswood in the event that the solution cannot be implemented prior to the demolition of Nelson Street bridge.

6.14.2 Crows Nest Station

Issue raised

One of the aims of the Environmental Impact Statement is to *"Drive productivity through integrated transport and land use planning"*. However the Environmental Impact Statement doesn't adequately address Council's recent planning for:

- St Leonards South precinct
- O Development approvals for properties either side of Friedlander Place
- O Development approvals and proposals for either side of St Leonards Station
- The improvements to the south side of St Leonards Station (other than incorrectly saying that the Government rejected an unsolicited proposal).

By not addressing these important land use planning matters in the Environmental Impact Statement, it has failed to take a holistic approach to the Crows Nest / St Leonards precinct and properly consider:

- Traffic impacts at the Pacific Highway / Oxley Street intersection west of the Pacific Highway for which no assessment has been reported. These impacts are both construction and operational post developments
- Cumulative construction impacts, noting that excavation for the developments either side of Friedlander Place is likely in the same timeframe as excavation for Crows Nest Station
- Pedestrian linkages proposed between St Leonards Station and Oxley Street (western side). In Council's planning for the Friedlander Precinct it has strived to provide a pedestrian pathway linking the proposed park and plaza over the rail corridor, with the proposed retail between Lithgow Street and Christie Street and south to Friedlander Place and Oxley Street. There needs to be consideration given to extending this pedestrian connectivity to the new station.

In July 2016, the Minister for Planning announced that the Department of Planning and Environment will work with Lane Cove, North Sydney and Willoughby councils to carry out strategic planning investigation of the St Leonards and Crows Nest Station Precinct. This precinct incorporates areas that are within walking distance of the existing St Leonards Station and the proposed Crows Nest Station. The outcome of the investigation will be the preparation of a Land Use and Infrastructure Strategy that provides the strategic planning framework to guide future development and infrastructure delivery over the next 20 years.

Transport for NSW is conducting further work to determine the feasibility of safeguarding an underground pedestrian link to the western side of Pacific Highway. There are a number of constraints which are being investigated including:

- The link would be into the paid side of station and would require an extra gateline
- The shallow station depth constrains opportunities for an underground pedestrian link
- There is a high likelihood of services underneath the Pacific Highway needing to be relocated
- There is potential conflict with underground car parks associated with adjacent buildings
- The customer catchment on the western side of the Pacific Highway is limited by steep grades and easy access to Wollstonecraft Station.

Transport for NSW will continue to liaise with the Department of Planning and Environment and local councils regarding this issue and the outcomes of this investigation.

Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

It is proposed to introduce a signalised pedestrian crossing (a marked foot crossing) on the northern side of the Pacific Highway / Oxley Street intersection to facilitate improved pedestrian access to and from the western side of the Pacific Highway to Crows Nest Station. The Environmental Impact Statement includes an assessment of traffic intersection performance of this intersection for both the construction and operational stages in Sections 8.4.8 and 9.4.4 respectively. This assessment found that there would be minimal impacts to the surrounding road network with the introduction of this pedestrian crossing.

Although the cumulative impact chapter of the Environmental Impact Statement does not explicitly identify Council's recent planning for the area, the process for managing cumulative impacts (refer to mitigation measure CU1 in Chapter 27 of the Environmental Impact Statement) would enable these activities to be considered in the event that construction timeframes overlap.

6.15 North Sydney Council

The submission from North Sydney Council is divided into two main sections. The first section refers to issue based concerns. The second section provides a list of specific chapter-based issues. A number of recommendations, requests and key points are made throughout the submission.

6.15.1 Key issue – pedestrian safety, amenity and access Issue raised

The Environmental Impact Statement identifies walking and cycling as the highest priority modes of station access. It is considered that all design aspects of metro stations and surrounds should reflect that priority and demonstrate a whole of journey approach to transport planning.

Similarly the Environmental Impact Statement highlights the benefits of the metro project with regard to improving the walking component of the metro journey. Despite this, the risk analysis provided in Chapter 28 (p. 948) highlights that, even if all of the mitigation measures identified are implemented, there remains a 'high' residual risk that the additional pedestrian load on walking infrastructure will result in 'less efficient pedestrian movements' during the operational phase of the project. This is particularly the case for the proposed Victoria Cross Station and surrounds.

At a minimum, the efficiency of walking infrastructure must be maintained, and preferably improved, as part of the project. As design progresses, particular consideration should be given to those road users with particular mobility requirements, for example the visually impaired, mobility impaired and those with prams.

Response

The design of the Sydney Metro stations and precincts has been carried out with consideration of the transport access hierarchy as provided in Section 9.4.2 of the Environmental Impact Statement and the customer journey philosophy as discussed in Section 3.3 of the Environmental Impact Statement.

The risk analysis identifies a high residual risk due to the redistribution of pedestrians around some stations, including on Denison Street at Victoria Cross Station. As identified in Section 9.4.5 of the Environmental Impact Statement, Transport for NSW is investigating options to resolve these residual pedestrian risks in consultation with the relevant stakeholders (including the local council and Roads and Maritime Services).

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) will be used to guide the ongoing design of the project. This includes accessibility requirements for all customers including the visually impaired, mobility impaired and customers with prams.

In addition, the metro product characteristics (in Section 6.2.2 of the Environmental Impact Statement) highlight the commitment to providing an accessible system through features such as level access between the platform and train, reduced gaps between the platform and train and fully accessible stations.

6.15.2 Key issue – active and public transport

Issue raised

North Sydney Council's submission raises the following issues related to active and public transport:

- Specific infrastructure improvement will require further discussion and modelling but should ensure that adequate facilities are provided for cyclist interchange as part of the project
- The Environmental Impact Statement notes that bus network benefits are un-costed as part of this project. The opportunity for integrating the proposed Northern Beaches Bus Rapid Transit system with the metro at North Sydney and CBD generally has not been adequately addressed in the Environmental Impact Statement, despite stated principles relating to mode connectivity and integration. As part of the commitment to transport mode integration and improved accessibility, the opportunity to provide a North Sydney CBD (Warringah Freeway) Bus Rapid Transit stop needs detailed consideration

• Delivery of this project is expected to see a 40 to 50 per cent reduction in expected passenger numbers at the existing North Sydney and St Leonards Stations. It is unclear how this reduction and other changes to the existing rail network will affect services, development potential and the delivery of supporting uses in the vicinity of existing stations along the T1 North Shore Line. Further information on the future operation of the existing line is required.

Response

Responses to the specific issues raised are as follows:

- The project would provide a number of facilities for cyclist interchange at stations. This includes cycle parking at all stations, and provision of new cycle links where required. For example, there would be a new cycle link at Crows Nest Station to link the station entry to the existing cycle network
- The Northern Beaches Bus Rapid Transit is a separate project and is subject to a separate assessment and approval process. Additional Bus Rapid Transit bus stops are outside the scope of the Chatswood to Sydenham project. The project provides adequate interchange with existing bus services at all station locations. The Northern Beaches Bus Rapid Transit will deliver transport improvements for the Northern Beaches, including an integrated program of service and infrastructure improvements to deliver a new B-Line bus service. The B-Line will provide more frequent and reliable services for customers travelling between the Northern Beaches and the Sydney CBD. This service will deliver customers to the key Sydney CBD destination without the need to interchange to rail services
- There is no proposed reduction in services on the T1 North Shore Line as a result of the operation of the project.

6.15.3 Key issue - traffic, parking and freight

Issue raised

North Sydney Council's submission raises the following issues related to traffic, parking and freight:

- Re-allocating road space to walking, cycling and bus infrastructure should be an integral part of the Metro project in order to limit future traffic growth along the metro corridor
- Consideration must be given to how local delivery requirements will be accommodated as a result of any proposed changes to surrounding infrastructure
- The arrival of the Metro should provide significant positive impacts on the Crows Nest economy via appropriate land uses and public domain improvements
- Enhance potential benefit to the North Sydney Centre by implementing appropriate commercial and retail land uses above Metro, particularly at ground level.

Response

Responses to the specific issues raised are as follows:

 Section 9.4 of the Environmental Impact Statement provides discussion on the integration of the station with the surrounding walking, cycling and bus infrastructure. The proposed stations are located within established urban areas. As such, walking and cycling access would be predominantly along existing paths and routes with some minor adjustments. Similarly, existing bus route and stops would provide efficient interchange potential with metro stations

- Section 13.4 of the Environmental Impact Statement provides an assessment of the potential impacts on local businesses as a result of the project including consideration of alterations to servicing and delivery access. Access to businesses, including for servicing and deliveries would be maintained throughout construction and operation
- North Sydney's Council's comments regarding the benefits of the project are noted
- Over station development would be subject to a separate planning approval process and therefore land uses above the metro stations would be considered as part of that process.
 Street level activation would continue to be considered as part of detailed design.

6.15.4 Key issue – Crows Nest Station

Issue raised

The submission notes that about 9,882 Metro passengers are expected to enter and exit Crows Nest Station in the morning peak hour. The submission raises the following issues related to Crows Nest Station

• Consideration should be given to pedestrianising Oxley Street in the vicinity of the station entrance to provide a significantly expanded station forecourt near the northern entrance to the station

Consideration should be given to designing Clarke Street using shared space design principles, instead of providing a mid-block crossing on Clarke Street that does not address pedestrian desire lines between the southern station entrance and the proposed link to Willoughby Road via Hume Street Park. A shared zone on Clarke Street would both improve pedestrian amenity and safety around the station and better integrate the station into the surrounding locality, including Hume Street Park, for which a major upgrade is proposed

 Consideration should be given to simplifying junction operations at the Pacific Highway / Falcon Street / Shirley Street (5-Ways) intersection and downgrading the function of the Pacific Highway to the south of Falcon Street

Response

Responses to the specific issues raised are as follows:

- The pedestrian analysis provided in Section 9.4.4 of the Environmental Impact Statement identifies that the existing footpaths around the site would be sufficient to cater for the anticipated pedestrian demand without the need to pedestrianise Oxley Street or to alter Clarke Street to a shared zone. Notwithstanding, Transport for NSW will continue to liaise with North Sydney Council regarding integration of the station with other proposed upgrades in the locality as part of the design process
- Adjustments to the Pacific Highway / Falcon Street / Shirley Street intersection and the Pacific Highway to the south of Falcon Street are outside the scope of this project.

6.15.5 Key issue – Victoria Cross Station

Issues raised

North Sydney Council's submission raises the following issues related to Victoria Cross Station:

- Consider the partial or full closure of Miller Street between Pacific Highway and Berry Street to achieve improved public domain, pedestrian amenity, and transport outcomes
- Consider the removal of slip lanes and pedestrian islands at Miller Street and Pacific Highway to accommodate pedestrian volumes and improve safety and amenity
- Consider a scramble crossing at Miller and Berry streets

- Work with Council to design and implement measures to ensure that Denison Street and the laneway network integrate successfully with metro operations
- Visitor cycle parking facilities near the Greenwood Plaza entrance are not appropriate as metro interchange parking. Provision of integrated cycle parking and end of trip facilities should be considered as part of over station development design
- Do not prioritise kiss-and-ride infrastructure over pedestrian and cycling infrastructure
- Kiss-and-ride infrastructure on the south side of one-way Berry Street is not appropriate on safety grounds
- The Victoria Cross Station development involves the demolition of existing buildings at the northern end of the platforms near the corner of Miller and McLaren streets. The proposed construction site is surrounded by items of heritage significance. Consideration should be given to offsetting the loss of commercial space and active uses on this site with some form of ground level commercial activation, should the constraints of the site allow.

Responses to the specific issues raised are as follows:

- The pedestrian analysis provided in Section 9.4.5 of the Environmental Impact Statement identifies that the existing footpaths around on Miller Street would be sufficient to cater for the anticipated pedestrian demand without the need to pedestrianise this road. Improved public domain, pedestrian amenity and transport outcomes would be delivered by the presence of the Victoria Cross Station in the commercial centre of North Sydney
- As identified in Section 9.4.5 of the Environmental Impact Statement, options to improve the pedestrian environment at the Miller Street / Pacific Highway intersection and Miller Street / Berry Street intersection would be investigated further in consultation with Roads and Maritime Services and North Sydney Council
- Similarly options to improve the pedestrian environment in Denison Street would be investigated further in consultation with Roads and Maritime Services and North Sydney Council
- Dedicated cycle parking is proposed to be provided close to the station entry on Miller Street. Section 9.4.5 of the Environmental Impact Statement notes that the existing facility near the Greenwood Plaza entrance on Mount Street would also be available. Over station development, including any associated end of trip facilities, would be subject to a separate planning approval process
- The design of the Sydney Metro stations and precincts has been carried out with consideration of the transport access hierarchy provided in Section 9.4.2 of the Environmental Impact Statement. This hierarchy prioritises walking, cycling and interchange with other public transport modes over kiss-and-ride infrastructure
- Consultation would continue with relevant stakeholders, including Roads and Maritime Services and the relevant local council regarding the final location of kiss-and-ride infrastructure
- The potential for ground level activation near the corner of Miller and McLaren streets would continue to be considered during detailed design in consultation with North Sydney Council.

6.15.6 Key issue - Blues Point temporary site

Issue raised

It is requested that Transport for NSW work with Council in planning for the reinstatement and upgrade of Henry Lawson Reserve once work is complete.

Response

Section 16.4.5 of the Environmental Impact Statement identifies that the Blues Point temporary site would be rehabilitated in consultation with North Sydney Council. For clarity, this commitment has been included as a specific mitigation measure (LV10) in Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) of this report.

6.15.7 Key issue – construction activity impacts

Issues raised

North Sydney Council's submission raises the following issues related to construction activity impacts:

- The submissions notes that 24 hour operations are only undertaken where works are confined to appropriately noise-mitigated sites, and that consideration is given to cumulative effects of multiple event occurrences. Transport for NSW will coordinate with other State agencies to mitigate cumulative impacts of other works within the vicinity of metro construction sites
- It is noted on p.313 of the Environmental Impact Statement that the vast bulk of truck movements are proposed to occur between 9am and 4pm. It is noted also that a principle of utilising the shortest possible route to major arterial roads applies to proposed truck movements. This principle is supported by Council. It is requested that after hours truck movements be limited to urgent needs and be strictly limited in terms of consecutive events
- Consider closure of Miller Street to allow for main-road truck movements and avoid unacceptable impacts on Denison Street
- It is requested that the opportunity to remove spoil from the temporary retrieval site at McMahons Point by barge be explored
- Council notes that footpath widths are proposed to be narrowed slightly as a result of hoarding placement during construction. Safe and comfortable pedestrian thoroughfares surrounding the development site should be provided during construction
- Obtain necessary approvals from Council for hoardings and work with Council to incorporate appropriate signage / public art on hoardings and scaffold cloth
- A Construction Traffic Management Plan shall be prepared for each of the three sites and submitted for approval by the North Sydney Traffic Committee prior to commencement of works.

Response

Responses to the specific issues raised are as follows:

- As identified in Chapter 11 (mitigation measure CU1), Transport for NSW would manage and coordinate the interface with other projects under construction at the same time in order to manage the potential cumulative impacts
- Out of hours truck movements are proposed to support activities occurring 24 hours per day and seven days per week. This would include tunnelling works and some station excavation activities. Station excavation by rock hammering is no longer proposed to occur at night (refer to Section 9.6 of this report)

- The traffic and transport assessment (Section 8.4.9 of the Environmental Impact Statement) identified that the potential impacts to Miller Street and Denison Street would be within acceptable limits. As such, there is no need to close Miller Street during construction. Additionally, the closure of Miller Street during construction would be likely to result in unacceptable traffic impacts to the surrounding road network
- Section 8.2.3 of the Environmental Impact Statement provides a consideration of alternative spoil transport options. For the Blues Point temporary site it was identified that barge transport of spoil may be feasible at this site subject to further investigations. These investigations would be carried out as part of detailed construction planning. This would need to consider aspects such as the infrastructure necessary to load spoil onto barges and the proposed destination of spoil
- Safe pedestrian access would be provided around construction sites. This would be considered as part of Road Safety Audits at each construction site (refer to mitigation measure T2)
- Sydney Metro contractors would consult with North Sydney Council representatives during hoarding and scaffolding plan preparation and implementation. Mitigation measure LV6 identifies that the design and maintenance of construction site hoardings would aim to minimise visual amenity and landscape character impacts, including the prompt removal of graffiti. Public art opportunities would also be considered
- Sydney Metro contractors would be required to consult with North Sydney Council representatives during Construction Traffic Management Plan preparation and implementation. The process for developing Traffic Management Plans and Traffic Control Plans is provided in the Construction Environmental Management Framework (Appendix B of this report).

6.15.8 Key issue – over station development

Issue raised

Preferred built form of over station development is informed by Council's plans and strategic vision.

Response

Over station development would be subject to a separate planning approval process. Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

6.15.9 Key issue – land use and property

Issue raised

Land uses (for Crows Nest and North Sydney) are implemented in accordance with LEP 2013 and the Sydney Metro Planning Study, and are focussed on employment growth and providing active retail frontages.

Response

Sections 12.5.3 and 12.5.4 of the Environmental Impact Statement provide consideration of how the Crows Nest Station and Victoria Cross Stations would integrate and provide opportunities for future land use and transport and support State and local strategic priorities. For Crows Nest this would include providing an incentive for investment along the Pacific Highway; whilst for Victoria Cross the station would improve connectivity to employment, residential properties, services, cultural and recreational activities.

Land uses as part of over station development would be subject to a separate planning approval process. Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

6.15.10 Chapter 5: Stakeholder and community engagement

Issue raised

Council requests that community engagement remains on-going at significant milestones in the project, and particularly during the construction phases of the project. Council requests also that the positive working relationship formed between Transport for NSW and Council continue and that Council is engaged and consulted as the project progresses, particularly with regard to design of and intervention in the public domain and above station development.

Response

Future consultation is outlined in Section 5.7.2 of the Environmental Impact Statement and Chapter 4 of this report.

The Construction Environmental Management Framework (Appendix B of this report) provides the communication and consultation strategy for the project. Consultation would continue with North Sydney Council and the community throughout all construction phases of the project.

6.15.11 Chapter 6: Project description – operation

Issue raised

The plans and impressions of the Victoria Cross Station are inconsistent with the draft outcomes discussed with Transport for NSW. Whilst it is understood that the design of stations and surrounds is on-going, the Environmental Impact Statement should make clear that this is the case, and that plans and impressions are illustrative only.

Response

The ongoing design process would also be guided through continuation of the regular working sessions that have been held with North Sydney Council. The Environmental Impact Statement generally notes that plans of stations are indicative only and are subject to design development.

6.15.12 Chapter 9: Operational traffic and transport

Issue raised

Council requests Transport for NSW assistance in helping to explore and implement opportunities to improve the public realm and user experience beyond the immediate curtilage of metro stations. This is consistent with '*A Plan for Growing Sydney*'s expectations for the economic performance of North Sydney as part of Global Sydney'. Prioritise pedestrians, cyclists and public transport users in all on-going aspects of Metro and surrounding public domain design.

Response

The ongoing design process would also be guided through the continuation of the regular working sessions that have been held with North Sydney Council. Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

6.15.13 Chapter 11: Operational noise and vibration

Issue raised

Council notes the minimal potential impact of the metro when operational, and the additional attenuation measures proposed where increased risks of impact are identified.

Response

North Sydney Council's comments are noted.

6.15.14 Chapter 14: Non-Aboriginal heritage

Issue raised

The mitigation measures, including photographic archiving of 117 Miller Street, are supported. Council also notes that correspondence between Transport for NSW and Council has sought to establish whether moral architectural rights exist on any affected property within the station construction sites. Council's historian and heritage conservation planners have provided input into this process.

Response

Transport for NSW would carry out the notification processes under moral rights legislation.

6.15.15 Chapter 15: Aboriginal heritage

Issue raised

The low potential significance for Aboriginal heritage at Crows Nest and Victoria Cross stations is noted. Council notes also that the 'moderate to high' potential at the McMahons Point temporary retrieval site will be fully explored via the proposed assessment process, and that consultation with the North Sydney Aboriginal Heritage Office will continue throughout that process.

Response

Consultation with Aboriginal stakeholders has continued through the development of the cultural heritage assessment report (refer to Appendix I of this report). Further mitigation measure AH1 commits to ongoing consultation with Aboriginal stakeholders.

6.15.16 Chapter 16: Landscape character and visual amenity

Issue raised

North Sydney Council's submission raises the following issues related to landscape character and visual amenity:

- The Environmental Impact Statement assesses impacts on landscape and visual amenity in Crows Nest during construction as 'minor adverse'. Projected operational impacts are rated as 'negligible or minor benefit' (p.640). The public domain and built form will represent a level of design excellence that significantly improves the character and visual amenity of the locality
- For North Sydney, the predicted 'minor adverse' impacts during construction are considered to understate the likely impact on amenity within the North Sydney Centre, with the potential loss of unique architecture and tree canopy and gardens associated with development. The predicted 'minor to noticeable improvement' post-construction is considered to significantly understate the opportunity to create a new landmark in terms of built form and public domain within the heart of North Sydney. The unprecedented level of intervention in the North Sydney Centre should be capitalised on and be more aspirational. Council recommends pursuing the opportunity to create a public domain and built form landmark for the North Sydney Centre

• The 'moderate to high adverse' impacts predicted for the McMahons Point temporary retrieval site are noted, as is the temporary nature of these impacts. Council requests that hoarding and site facility heights are kept to retain where possible iconic views from the McMahons Point construction site and surrounds.

Response

Responses to the specific issues raised are as follows:

- North Sydney Council's comments are noted
- The degree of visual change is described in an objective and analytical manner using the definition of sensitivity and modification levels provided in Section 16.2 of the Environmental Impact Statement. Notwithstanding, the same mitigation measures would be implemented to manage these potential impacts.

The implementation of the design guidelines (Appendix A of this report) would enable the design excellence of Victoria Cross Station and provides a new focus in the North Sydney Centre. The updated design guidelines provide a specific requirement in relation to providing a north-side city landmark at Victoria Cross Station. Transport for NSW would continue to consult with North Sydney Council regarding the integration of Victoria Cross Station with surrounding land uses and urban domain

- Mitigation measures to minimise visual impacts at the Blues Point temporary site are identified in Chapter 27 of the Environmental Impact Statement. This includes:
 - Mitigation measure LV6 The design and maintenance of construction site hoardings would aim to minimise visual amenity and landscape character impacts. This would result in the same outcome as suggested by council's submission
 - Mitigation measure LV8 Tunnel boring machine retrieval works at the Blues Point temporary site would be timed to avoid key harbour viewing events
 - Mitigation measure LV9 Benching would be used where feasible and reasonable at Blues Point temporary site to minimise visual amenity impacts.

6.15.17 Chapter 19: Social impacts and community infrastructure

Issue raised

Council notes that childcare facilities are located at 65 Berry Street, North Sydney, adjacent to the metro construction site. A childcare centre is also located in Hume Street Park on Clarke Street, opposite the Crows Nest construction site. The need to mitigate the impacts of dust and noise requires attention. It is noted that mitigation measures are covered by other sections of the Environmental Impact Statement. Proposed truck movements must consider the potential safety and noise impacts on nearby childcare facilities.

Response

These childcare facilities were considered as part of the community infrastructure impact assessment in Section 19.3.4 of the Environmental Impact Statement.

Chapter 27 of the Environmental Impact Statement provides mitigation measures to manage noise, dust and traffic impacts around all sites. In addition specific consultation (as per mitigation measure SO2) would be carried out with sensitive community facilities (including child care facilities) potentially impacted during construction. This consultation would aim to identify and develop measures to manage the specific construction impacts for individual sensitive community facilities.

6.15.18 Chapter 21: Flooding and hydrology

Issue raised

Council has provided flooding and hydrological information to Transport for NSW for the station sites and surrounds. The existing flood behaviour analysis on p.826 of the Environmental Impact Statement does not recognise the overland flow path currently existing over 155 Miller Street (Tower Square). Accommodations must be made during station and over station development design for this path. It is requested that Transport for NSW continue to liaise with Council regarding these matters.

Response

Further consideration of potential flooding implications of the project would be carried out during the detailed design phase and this would include consideration of the flooding and hydrological information provided by North Sydney Council.

6.15.19 Chapter 22: Air quality

Issue raised

Council expects that appropriate mitigation measures are employed to limit the impact of dust and exhaust fumes during construction at all three construction sites, particularly where residential properties are likely to be adversely affected.

Response

Section 22.4 of the Environmental Impact Statement provides consideration of potential impacts associated with dust and exhaust emissions during construction of the project. These impacts are anticipated to be minor and manageable with the implementation of standard air quality mitigation measures provided in Section 22.6 of the Environmental Impact Statement. This would include appropriate management of unsurfaced site areas and maintenance of plant and equipment to minimise emissions.

6.15.20 Chapter 26: Cumulative impacts

Issue raised

Council notes that there is a high probability of cumulative impacts during construction within the North Sydney Centre, with current and proposed development likely to be undertaken concurrently with Metro construction activities. Transport for NSW should liaise with Council throughout the duration of construction activities in order to be aware of potential impacts such as road closures etc. associated with other unrelated works. There is potential for a similar risk for the Crows Nest station site and surrounds.

Council requests that assistance be given where appropriate to enable Council to deliver temporary place making initiatives to mitigate the amenity lost by Metro and other concurrent development activity within the North Sydney Centre.

Response

As identified in Chapter 11 (mitigation measure CU1), Transport for NSW would manage and coordinate the interface with other projects under construction at the same time in order to manage the potential cumulative impacts.

Consultation would continue with North Sydney Council during construction of the project.
6.15.21 Appendix B: Design guidelines

Issue raised

The design guidelines provided at Appendix B offer higher-level design guidance for the design of stations and the public domain interface at new metro locations. Council supports the key design drivers identified for the Crows Nest and North Sydney stations. It is noted that the design process is ongoing. Council requests that Transport for NSW continue to liaise and work with Council on design specifics of stations and the surrounding public realm. Particularly, Council requests that the principles outlined in Council's adopted Sydney Metro Planning Study be applied to that process. Public domain elements are to be provided in accordance with Council's Public Domain Manual and Design Codes.

Insufficient information is provided regarding the function and public domain interface treatment of the northern services site at 194 Miller Street.

Response

Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) would inform the ongoing design development process. The updated design guidelines provide place-based requirements for each station. For Crows Nest Station this includes catalysing the vision for Crows Nest Village including the planned upgrades to Hume Street Park, and Clarke and Hume streets. For Victoria Cross Station these requirements include assisting with the development of a Miller Street Green Avenue and mid-block east-west connectivity through laneways.

6.15.22 Other matters

Issue raised

North Sydney Council's submission raises the following other matters:

• North Sydney LEP 2013 has a limit of 250,000 square metres of additional commercial floor space permissible within the North Sydney Centre. This limit is based on the capacity of the upgraded North Sydney Railway Station. District Plans are currently being prepared as part of the State Government's metropolitan planning process. Understanding the physical capacity of the new stations, and therefore the associated projected or possible additional worker numbers, would help Council in its understanding the need for planning interventions to provide the capacity for the expected or desired level of commercial growth.

Undergrounding of power lines needs to be undertaken in conjunction with the metro works. This is essential in delivering an appropriate public domain response to the metro.

Council has, through its planning response to the metro announcement, identified several critical matters relating to the future of Crows Nest and North Sydney. These include the need to accommodate projected residential and commercial growth throughout the metro catchments, and the obligation to ensure that the public domain presents the best possible pedestrian-focussed outcomes, improving the walkability and vibrancy of the surrounding areas. Council requests that State funding be made available for Council to undertake the work necessary to establish policy and future direction of areas influenced by the metro transport infrastructure.

• It is requested that Transport for NSW work with Council to incorporate where appropriate recommendations, guidelines or ideas made or identified through these local planning initiatives

- Council considers that as part of the ongoing design of the public domain adjacent to the Victoria Cross Station, Transport for NSW should approach, in conjunction with Council, owners of the adjoining MLC building (105 Miller Street) to negotiate the removal of the café tenancy at that site's northern end. This would achieve an unencumbered, publicly accessible linear space along the length of Miller Street between Berry Street and the Pacific Highway and significantly contribute to pedestrian movement and amenity
- The Environmental Impact Statement does not provide adequate information on the subject of connectivity between the proposed Victoria Cross Station and the existing North Sydney Railway Station, particularly whether an underground link between the metro and the existing Greenwood Plaza subterranean pedestrian link has been considered in any way. Whilst, as a general principle, Council prefers to maximise pedestrian movement and activation at ground level, such a link may provide benefits in terms of transport mode integration and accessibility.

Responses to the specific issues raised are as follows:

• Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

Consultation would continue with North Sydney Council regarding the physical capacity of new stations to inform future land use planning and opportunities to improve the public domain in the immediate vicinity of stations. This may include consideration of undergrounding of power lines

- The removal of tenancies in buildings adjacent to the metro stations is outside the scope of the project
- There are no plans for an underground connection from the proposed Victoria Cross Station to the existing North Sydney Station. This station is not proposed to fulfil a major interchange function. Interchange between Sydney Trains and Sydney Metro would be available at Chatswood, Martin Place and Central Stations. Customers wishing to interchange between Victoria Cross and North Sydney stations would be able to use the footpath network.

6.16 City of Sydney

The submission from City of Sydney supports the Sydney Metro project overall however raises concerns regarding elements of the project outlined in the Environmental Impact Statement, particularly focusing on design of the stations and their interface with the public domain and the wider transport system, heritage impacts and flooding.

6.16.1 Chapter 1 – Introduction

Issue raised

The City supports the customer experience being core to the design and planning of the metro. This approach is to be commended. The measurement of the performance of this approach will be interesting to understand how this, apart from locational choice of stations, might influence travel decisions by customers. Then, how these travel choices by customers influence strategic and service planning decisions by the Transport cluster.

Response

City of Sydney's comments are noted.

6.16.2 Chapter 2 – Planning and assessment process

Issue raised

The City recommends that any Over Station Development associated with metro should not be deemed State Significant Development and should be assessed by the City and determined by the Central Sydney Planning Committee.

Response

Over station development would be subject to a separate planning approval process. The planning approval pathway would be determined in accordance with the *Environmental Planning and Assessment Act 1979*, the *Environmental Planning and Assessment Regulation 2000* and relevant State Environmental Planning Policies. Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

6.16.3 Chapter 3 – Strategic need and justification

Issue raised

It is not clear whether the capacity provided by Sydney Metro will be enough for the growing city, and particularly the intensification of residential land uses as part of the Government's Central to Eveleigh and Sydenham to Bankstown growth corridors. This is a risk with any CBD focussed program, as it is serving a peninsula and is in the context of greater demand for residential amenity within the inner suburbs.

Strategic alignment (shown within chapter 3) is limited to State Government policy. Local Government strategies, which place local residents and businesses at their fore, should be adequately considered. Technical paper 3 (Local Business) identifies *City of Sydney's Sustainable Sydney 2030 Community Strategic Plan* as relevant government policy. It is important to note that the project also aligns with *City of Sydney's Economic Development Strategy* (2013), which is a key strategic pillar of Sustainable Sydney.

Under this framework put in place by the City, plans have also been released for four sector action plans that focus on retail, tourism, digital tech start-ups and Aboriginal and Torres Strait Islander employment and enterprise. The Environmental Impact Statement should reference the relevant actions from each plan. Particularly it is recommended that significant further consideration should also be placed on the potential economic opportunities created by the metro project for Aboriginal and Torres Strait Islander communities both during the construction and operation stages of the project.

Response

Chapter 3 of the Environmental Impact Statement provides the strategic justification and project need and, as State significant infrastructure considers the project as a whole against the State Government plans and policies. This meets the Secretary's environmental assessment requirements.

Consideration of the relationship of individual stations with local planning controls and strategies is provided in Section 12.5 of the Environmental Impact Statement. For example, in relation to Martin Place Station this section considers the *City North Public Domain Plan* (City of Sydney, 2015), *Sustainable Sydney 2030 Strategic Plan* (City of Sydney, 2008), the Sydney LEP 2012 and the Sydney DCP 2012.

The Workforce Development and Industry Participation Strategy which would be implemented for the Sydney Metro project includes specific objectives and targets relating to increasing the participation of the Aboriginal workforce and businesses in the project.

6.16.4 Chapter 4 – Project development and alternatives

Issue raised

The City would welcome the business case to be made public to understand the evaluated performance of the shortlisted (station option) scenarios.

Response

Section 4.4 of the Environmental Impact Statement provides a summary of the evaluation of the station location options.

The business case has been prepared for the Chatswood to Sydenham project and endorsed by the NSW Government. This has not been publically released as certain details are considered commercial-in-confidence.

Relevant information from the business case has been incorporated into the Environmental Impact Statement.

6.16.5 Chapter 6 – Project description – operation

Issue raised

It will be important that the design of Barangaroo is respectful of the heritage nature of the area and its connection to Walsh Bay. The station entry point at Barangaroo should not be a pavilion but should be recessed into Barangaroo central.

Response

Transport for NSW would continue to work closely with Barangaroo Delivery Authority to ensure the orderly, coordinated execution of the complementary transport and development projects. Critical station and rail infrastructure within the Central Barangaroo development, along Hickson Road, and within the northern metro station entry would be subject to more detailed design to ensure it can be fully integrated into the locality. Critical rail infrastructure includes mechanical and electrical systems, a traction substation, as well as emergency egress facilities. Collaboration with the Barangaroo Delivery Authority, and City of Sydney, will be carried out to improve and optimise the required rail infrastructure that would be required within public spaces to produce a coherent design theme. The aboveground elements of the metro station would adopt relevant urban design principles of the Barangaroo site, integrate with the future Central Barangaroo Master Plan (once known) including existing and future elements of the public domain throughout the precinct, and consider the heritage values of the location. The aboveground elements are subject to ongoing consultation with Barangaroo Delivery Authority.

Issue raised

At Martin Place, City of Sydney's key concerns are: integrating the station design the Special Character area of Martin Place, compliance with the City's planning controls, as well as the need for some crossing and / or kerb extensions to support the pedestrian volumes at the southern entry. In this heritage precinct, the station entry should not be a generic entrance hall.

Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

The Chatswood to Sydenham Design Guidelines have been updated (refer to Appendix A of this report) to include more place-based detail to guide the ongoing design process. For Martin Place this includes supporting the City of Sydney's public domain strategies and designing station entries as new public spaces.

The Sydney Metro Design Review Panel would maintain an ongoing role in the design review process to enable achievement of the objectives and principles contained in the Design Guidelines.

Issue raised

The Environmental Impact Statement has not adequately accounted for the interchange function of Pitt Street Station with York Street, or the cycle connectivity with Park Street cycleway.

Response

Pitt Street Station has been designed to provide an efficient interchange function with bus stops in the vicinity (such as those on Park and Castlereagh streets). Although this station is not proposed to have a major interchange function with transport facilities on York Street, customers would be able to transfer between the two modes using existing footpaths through the Sydney CBD.

Cycle parking is proposed to be provided at the northern Pitt Street Station entry. This would provide a convenient interchange with the Park Street cycleway which is proposed to be extended to Castlereagh Street as part of the City Centre Access Strategy.

Issue raised

It is important to plan for Central Station in the context of the growth of the broader area and future growth; including for residential, business, leisure, cultural and education purposes.

Response

Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

Transport for NSW is currently investigating the potential for additional enhancements to Central Station.

Issue raised

At Waterloo, a key opportunity that should not be missed is the ability for the station design to house uses such as retail to support the appropriate densification of the Waterloo community. The City strongly recommends introduction of a second entry to the south of the station box at Waterloo, and consideration of a third entry towards Botany Road to benefit transport interchange.

There are no plans for additional station entries at Waterloo Station.

A metro station at Waterloo would be a catalyst for urban renewal associated with UrbanGrowth NSW's Central to Eveleigh Urban Transformation and Transport Program. In addition, the metro station at Waterloo would connect the Australian Technology Park and the residents in the Waterloo and Redfern areas with Sydney Metro.

Patronage modelling summarised in the Environmental Impact Statement (refer to section 9.4.10) indicate that around 2,350 customers would be exiting the station during the 2036 AM peak hour. Stations that have two entries within the design typically have higher levels of patronage and have alternative destinations that customers would be seeking (eg 5,600 exiting at Crows Nest Station towards either Willoughby Road retail or Pacific Highway).

The station access on the corner of Cope and Raglan streets is strategically located adjacent to future civic, retail, and commercial spaces. It is also within three minutes walk to the Australian Technology Park via Henderson Road to the west. This entry point serves wider urban and civic outcomes and includes surface treatments to facilitate access in all directions.

The single entry aligns with connectivity to transport links. Interchange with the bus network is adjacent to the station entry on Botany Road. Suburban rail interchange is within 10 minutes walk to Redfern Station to the north via Wyndham Street. To the east of the station entry, a shared zone (proposed as part of future urban renewal) on Cope Street would allow for safe and convenient access to the south for pedestrians and cyclists. The single entry also provides an opportunity to activate the surrounding streets and frontage along Botany Road as customers are walking past.

The station has been designed to safeguard future entries to either the east or western side of the station via subways connecting into the concourse level. Future entries are also possible within any adjacent development should they be justified in the future.

Given the ability for customers to move within sheltered public spaces at street level along Cope Street and through a new permeable local street network associated with the future urban renewal, the addition of a second metro entry at Waterloo is not warranted. On balance, an urban design response combined with the ability to safeguard future subway connections is considered adequate.

The details of the Waterloo Station layout and transport integration arrangements are subject to detailed design. Consultation would continue with council, Land and Housing Corporation, UrbanGrowth NSW and other relevant stakeholders to enable the station arrangements to consider the broader strategic planning for the area and other relevant projects.

6.16.6 Chapter 8 – Construction traffic and transport Issue raised

While the impact on vehicular traffic in the CBD generated by metro is forecast to be small, there is still an ongoing concern about the cumulative impacts of this project along with all others. The levels of vehicles in the CBD will be significant, despite the modelling showing that the impact will be negligible. That being said, the City recognises that the Environmental Impact Statement has assessed the cumulative impacts of construction traffic to the extent that is reasonable for this particular process.

The six-month closure of Martin Place to enable construction is expected to create a pedestrian Level of Service F. This would indicate the area operating in a manner similar to an event flow every day. This is not accounting for the impact of events. It is unclear whether the existing underground traffic in an east-west direction was included in the total demand, as with the closure of the underground passages, this demand will need to be accommodated at the surface.

As identified in Chapter 27 of the Environmental Impact Statement (mitigation measure CU1), Transport for NSW would manage and coordinate the interface with other projects under construction at the same time in order to manage the potential cumulative impacts.

In relation to pedestrian access through Martin Place, Transport for NSW is reviewing and further developing construction staging and methodologies. Further detailed construction planning for the pedestrian routes to and from the existing Martin Place Station would be carried out. This would seek to maintain underground access from Martin Place Station where feasible and reasonable, to reduce impacts to street level. The revised methodology would be the subject of further pedestrian analysis so that pedestrian movements are maintained at an acceptable level of service throughout construction.

Issue raised

The City supports the implementation of a robust safety system for management of road safety.

Response

The City of Sydney's support is noted.

Issue raised

There are a number of events that occur in the CBD outside of those listed in the Environmental Impact Statement. It is recommended that Metro liaise with the City Event team to understand the forward schedule.

Response

Consultation would continue with the City of Sydney event team regarding forward event scheduling. The process for managing events, identified in Section 8.4.3 of the Environmental Impact Statement, would apply to all Class 1 and 2 events; not just the major events identified in the Environmental Impact Statement.

Issue raised

The Environmental Impact Statement states that construction worker access by public transport "will be encouraged". Given the closeness of work sites to public transport at almost all the sites, during normal construction hours it should be expected that workers will travel to site by public transport, unless they require their vehicle or cannot carry their equipment. However, it is understood that works will take place over a 24 hour period and that public transport access is not always available. The proposed mitigation of satellite parking with shuttle transfer is reasonable. It should be noted that there is no indication of the peak worker demand at any site.

Response

As identified in mitigation measure T12, alternatives to the use of private vehicles by construction workers would be encouraged. This would include the use of public or active transport, ride sharing, and alternative parking locations and shuttle bus transfers.

The peak construction workforce by site is provided in Section 7.11.2 of the Environmental Impact Statement.

The City recommends that any condition of consent requires the proponent to comply with all relevant City of Sydney policies and procedures for works during construction. This includes:

- Construction Traffic Management Plans for each site within the Local Government Area must reflect City of Sydney Construction Traffic Management Plans standard requirements and must be submitted to the City for approval
- The installation of hoarding, scaffolding and protection barriers on the road reserve under the City's control requires approval from the City of Sydney
- All temporary road closures, lane closures and / or occupation of ticket parking on streets under City of Sydney control requires endorsement from the Local Pedestrian, Cycling and Traffic Calming Committee (LPCTCC) and approval from the City
- Any modifications to pedestrian and cycling facilities within the City's Local Government Area must be reviewed and approved by the City with the endorsement from the LPCTCC prior to the commencement of works.

Response

The Chatswood to Sydenham project is critical State Significant Infrastructure and is being assessed under Part 5.1 of the *Environmental Planning & Assessment Act 1979*. Sydney Metro contractors would be required to consult with City of Sydney representatives during Construction Traffic Management Plan preparation and implementation, hoarding and scaffolding plan preparation and implementation, for short and long term road and lane closure proposals, for proposed long and short term on-street car parking displacement and kerbside changes and proposed short and long term pedestrian and cyclist facilities impacts.

Further, Transport for NSW proposes to enter into interface agreements with relevant local councils to establish appropriate working protocols during construction of Sydney Metro.

6.16.7 Chapter 9 - Operational traffic and transport

Issue raised

It would be helpful to outline a methodology for how the forecasts (for modal shares for arrival at each station) were made. This is to understand the analysis between how people travel now, and the expectations of how this will change given the changing land uses of the station and its over-site development, as well as the land surrounding it.

Response

The modelling approach is outlined in Section 9.2 of the Environmental Impact Statement.

Two models are configured and operated to produce forecast demand results. The Public Transport Project Model (PTPM) and the Enhanced Train Crowding Model (ETCM). Current and future land use assumptions are provided as an input into the models. Land use inputs and the transport network influence the probability of choosing a particular mode. The attractiveness of a mode compared to the alternatives determines the probability of being chosen. The attractiveness is calculated within the framework of the PTPM mode choice structure and mode shares are derived based on the number of people choosing to access each station by a particular mode.

It will be essential that bus priority measures are implemented in the Waterloo and Green Square areas to account for the massive growth in the area. While the Waterloo Station will cater for a large proportion of the north-south demand, there are very strong east-west trips to and from the area that rely on the bus network. Buses are also vital for shorter distance trips and provide important access for the older residents within the Waterloo social housing.

Response

Bus priority measures around Waterloo and Green Square are outside the scope of the Chatswood to Sydenham project.

Transport for NSW is currently investigating further opportunities to strengthen east/west links as part of a broader program of improvements to the bus network. Transport for NSW would continue to work collaboratively with UrbanGrowth NSW as they progress the required traffic and transport studies to inform the Central to Eveleigh Urban Transformation project.

Issue raised

There are other important parts of the regional cycle network that have been omitted from the Environmental Impact Statement. These include:

- Kent Street cycleway providing connections to the north
- Bourke Road / Street cycleway connection from the east and south
- Anzac Bridge cycleway connecting to Miller Street –although not separated, is high volume and connects the southern harbourside suburbs to the CBD
- King Street cycleway providing a city east-west connection
- Castlereagh Street although incomplete, connects Central Station to Liverpool Street.

The City recommends that the extension of Castlereagh Street cycleway to Circular Quay is an important connection to complete in order to realise the cycle connectivity that is assumed within the Environmental Impact Statement.

Response

Section 9.4 of the Environmental Impact Statement identifies the local cycle network around each proposed metro station.

The extension of the Castlereagh Street cycleway to Circular Quay suggested by Council does not form part of the scope of works for the Chatswood to Sydenham project. However, Transport for NSW would work with relevant authorities to integrate the proposed station precincts with local bicycle networks.

Issue raised

The City strongly recommends that an additional station between Waterloo and Sydenham be developed to service this area. The station should be developed under Mitchell Road or McEvoy Street.

Planning for urban renewal in the South Sydney area predates the proposed Sydney Metro City & Southwest. Masterplanning for the area has been led by the City of Sydney and has included detailed technical studies, including traffic and parking studies. In particular, an Infrastructure Plan identifies the strategic infrastructure requirements to support development of the Ashmore precinct.

During the development stage of the Sydney Metro City & Southwest, consideration was given to opportunities to improve transport accessibility, consistent with the Department of Planning and Environment's *A Plan for Growing Sydney* and UrbanGrowth NSW's Central to Eveleigh Urban Transformation and Transport Program. During this stage, the opportunity to include an additional station between Central and Sydenham was subject of a strategic evaluation of station locations.

The evaluation subjected the Sydney Metro City & Southwest to a Strategic Merit Test. A Strategic Merit Test is used to quantify expected broad benefits of a transport option against project objectives. As part of the Strategic Merit Test, Sydney Metro investigated a number of station locations between Central and Sydenham.

A range of station locations in the South Sydney area were evaluated against the project objectives. The locations included at the Australian Technology Park, Waterloo, McEvoy Street, Green Square, Erskineville, Ashmore, and St Peters. The evaluation results are provided in Section 4.4.3 of the Environmental Impact Statement. In summary, where there is an existing rail station, or the potential station location is within close proximity to an existing station there would be limited increase in rail catchment, limited change to public transport from private vehicles and no significant relief to existing public transport services.

In addition, the station location options were part of a broad public consultation process between 4 June and 17 July 2015. During this time Transport for NSW hosted an online forum and sought feedback on Sydney Metro and particularly the station options around The University of Sydney and Waterloo. The results of the consultation were considered in Section 5.6 of the Environmental Impact Statement and influenced the overall decision of the station location between Central and Sydenham.

In response to the submission from the City of Sydney, a further Strategic Merit Test has been conducted to investigate the opportunity for an additional metro station near the junction of McEvoy Street and Euston Road, Alexandria. A station at this location would serve a predominantly residential catchment with some mixed use developments and provide a new connection to the City of Sydney's Southern Employment Lands. It would have some overlapping catchments with Green Square Station, Erskineville Station and the new Waterloo Metro station, so would serve a partial new rail catchment. The size of the new catchment is relatively small and contains very limited potential for employment and population growth.

As demonstrated in Figure 6-1, this station location at Alexandria performed similarly to the Strategic Merit Test results of a metro station location at Ashmore, Australian Technology Park, Erskineville, Newtown, Redfern, St Peters and Wilson Street (Eveleigh) (as referred to in Section 4.4.3 of the Environmental Impact Statement).



Figure 6-1 Performance of a station at Alexandria

In response to the objective noted in the table above to 'improve the resilience of the transport network', analysis of Erskineville Station patronage in 2014 found that customers can experience train loading of above 135 per cent, which is the benchmark beyond which passengers start to experience crowding and dwell times can impact on-time running. However, it was one of the lower patronised stations on the Sydney Trains network (ranked 118th) with the average number of customers using Erskineville Station during the morning 3.5 hour AM peak period was 1,360 (entries and exits). A station in Alexandria may attract customers from Erskineville Station; however the number of customers would not be high.

Therefore, a more appropriate response to the overcrowding is to increase services or reduce the load on the line. Changes to the train timetable along the Bankstown Line are expected to provide some relief to St Peters (through increased services) and Erskineville stations (through reduced line loads).

It is therefore recommended to not pursue a station at this as part of the Sydney Metro City & Southwest as it would not contribute strongly to the Sydney Metro City & Southwest objectives.

Further, land use change around the McEvoy Street area would occur regardless of a new station, and would be in close proximity to a new Waterloo Metro station and the existing Green Square Station.

Waterloo Metro station is forecast to relieve Green Square Station once operational. The addition of another metro station in the South Sydney area would have significant technical, property, operational, and cost implications. On balance of all these issues to consider, the inclusion of another metro station as part of the project at this location is not supported.

Notwithstanding the above, it is noted the Central to Eveleigh is subject to significant urban transformation and studies are being progressed between Transport for NSW and UrbanGrowth NSW on how best to grow the active and public transport modes within the broader area.

It would also be beneficial for metro to define the station precinct so that there is an understanding of what will and will not be captured by metro works so that any tie-ins can be delivered or planned.

Response

Section 6.6 of the Environmental Impact Statement provides indicative station precinct planning. Transport for NSW would collaborate with key planning agencies, including the Department of Planning and Environment and local councils, to identify opportunities to integrate existing and future land uses within and around the stations. Depending on the nature of these opportunities, they may be implemented by Transport for NSW, local councils or others.

Issue raised

It is important to understand the quantum of bike parking that will be provided, particularly for Barangaroo, Central and Waterloo.

Response

As identified in Section 9.4.2 of the Environmental Impact Statement, the amount of bike parking would be determined based on the Transport for NSW Bike and Ride initiative and would reflect the forecast passenger demand at each station.

Issue raised

The City recommends metro running hours should be extended past midnight and 1am to service the late-night economy.

Response

The operating hours would be determined as part of the development of the services schedules for the project taking into account customer and maintenance access requirements. A key benefit of the metro product is the ability to offer a turn up and go service in both directions across extended hours.

Issue raised

The Environmental Impact Statement states that an existing on-road cycleway will connect with cycleways within Barangaroo. However, a line-marked cycleway is not expected to be a reasonable facility for the demand. As such the City of Sydney recommends that:

- A separated cycleway on Hickson Road be included in all road designs
- Adequate footway widths are provided to cater for increased demands and event mode
- A separated cycleway connection is provided on Napoleon Street to connect Kent Street and Hickson Road.

It should be noted that the existing footpath along Hickson Road on the eastern side is very narrow. The Environmental Impact Statement does not mention whether this will be widened, despite discussion of high pedestrian demand. We request clarification on this.

Response

Transport for NSW is working with the Barangaroo Delivery Authority in relation to future design of Hickson Road in the vicinity of the proposed Barangaroo Station. The current proposal is consistent with existing concepts developed as part of the wider Barangaroo master planning.

Cycling facilities on Napoleon Street are outside the scope of the Chatswood to Sydenham project.

Removal of street furniture is not an acceptable mitigation measure to reduce safety concern or impact at Martin Place. To mitigate safety impacts at Martin Place City of Sydney recommends the following:

- Providing a third entrance at Bligh Street to capture the demand and take it underground
- Providing a crossing extension of Martin Place on the eastern kerb of Castlereagh Street (and relocate the existing Mail Zone) and / or create a kerb extension to create more pedestrian storage space.

Response

Provision for a station entrance from O'Connell Street with an underground connection to the metro station platforms is being safeguarded (refer to Section 3.3 of this report).

Transport for NSW would consult with the City of Sydney and other relevant stakeholders regarding improvements to the public domain, including pedestrian crossing facilities, around the proposed Martin Place Station entries.

Issue raised

It will be important to define the scope of the precinct at Pitt Street Station to ensure that interchange between buses at York Street is captured in any demand assessment and Pedestrian Level of Service for this station.

Response

Pitt Street Station has been designed to provide an efficient interchange function with bus stops in the vicinity (such as those on Park and Castlereagh streets). Although this station is not proposed to have a major interchange function with transport facilities on York Street, customers would be able to transfer between the two modes using existing footpaths through the Sydney CBD.

Issue raised

It will be important that metro enables, or at least does not preclude the delivery of an underground access to the future Town Hall Square by providing a stub tunnel. The City recommends metro to provide stub tunnels to enable future connection to the future Town Hall Square.

Response

The provision of a future underground connection to the future Town Hall Square is being safeguarded in the design of Pitt Street Station.

Issue raised

The City would support the extension of the Goods Line towards the east.

Response

The extension of the Goods Line is outside the scope of the Chatswood to Sydenham project.

Issue raised

The City supports delivery of new cycle facilities on Raglan Street and Henderson Road to connect the Australian Technology Park with the metro station. However, there needs to be an indication of what type of facility this would be (keeping in mind this is a busy road with heavy vehicles) and what side of the street it would be proposed.

Response

Details of the proposed cycle route would be developed during detailed design considering the broader strategic planning for the area and other relevant projects.

6.16.8 Chapter 10 - Construction noise and vibration

Issue raised

The City recommends that all environmentally responsible measures to remove spoil generated by the project are pursued, although it is expected a meaningful degree of spoil generation will need to be removed by road. Where this occurs, all reasonable and feasible measures are to be pursued to mitigate noise and other environmental impact associated with the road transport and load out operation, particularly in relation to the vehicle fleet used.

Response

As identified in Section 8.2.3 of the Environmental Impact Statement, spoil transport by barge, rail and road were all considered. This investigation found that barging and rail transport may be feasible at certain sites subject to further investigations. Section 3.2 of this report provides further information regarding the potential for removal of spoil by barge from Barangaroo Station. Notwithstanding, the bulk of spoil generated by the project would still need to be removed by road transport. At this stage, the Environmental Impact Statement has carried out a conservative assessment in assuming all transport would be by road.

Chapter 27 of the Environmental Impact Statement provides the approach to environmental management for the project including the consolidated list of proposed mitigation measures. This includes, along with the Construction Environmental Management Framework (Appendix B of this report) and the Construction Noise and Vibration Strategy (Appendix C of this report), measures to minimise noise and other impacts associated with heavy vehicle transport.

Issue raised

The City recommends that the heavy vehicles are required to comply with contemporary EURO emissions standards for noise and air quality and incorporate add-blue catalysers from an emissions management perspective and have rubber lined bins.

Response

It would not be feasible to specify all vehicles accessing the site comply with certain EURO emission standards. These requirements are regulated by the Australian Government.

Best practice air emission and noise controls would be implemented on the project where feasible and reasonable. The focus would be on diesel powered plant that is on site for long periods of time where additional controls would offer both safety and environmental benefits.

Issue raised

The City recommends effective wheel washers, vehicle cleansing and load covering systems should be incorporated into environmental site management programs and vehicles should be inspected and signed off before they leave a site.

Response

The outcomes sought by the City of Sydney's comments are supported. These are generally covered by the proposed mitigation measures in Chapter 11 of this report and the Construction Environmental Management Framework in Appendix B of this report.

The City would like to see more consideration of alternative methodologies for demolition of large buildings. The City recommends demolition contractors must prepare demolition management plans that require minimising the use of conventional technologies which are known to cause mass disturbance to the community such as rock breakers as much as possible.

Response

The noise assessment of demolition in Section 10.4 of the Environmental Impact Statement considered a conservative worst-case methodology. Since preparation of the Environmental Impact Statement, additional investigation has been carried out regarding demolition techniques. As an example, the proposed requirements in relation to demolition works would include implementation of demolition methodologies that limit the use of hydraulic hammers, rock breakers and other appliances that emit high noise levels.

Specific methodologies identified could include:

- Using hydraulic concrete shears in lieu of hammers and rock breakers for the removal of perimeter walls where practical
- Using hydraulic concrete shears in lieu of hammer and rock breakers for the removal of the lower levels of the building where practical
- Using demolition sequencing to shield noise sensitive neighbours from high noise levels by retaining wall elements adjoining or shielding those properties to the end of the demolition sequence (eg floor by floor leaving the perimeter wall that aids noise screening to the end)
- Locating demolition load out areas away from the nearby noise sensitive neighbours (schools, childcare, forecourt retail, etc.)
- Developing construction working hours that provide respite to neighbouring properties during the higher noise output activities (this would include works that do not use high noise level appliances but create high noise levels when assessed against background and residential noise standards)
- Developing construction methodologies that would minimise structural-borne noise to buildings that are connected or the cavity between buildings is or is likely to be bridged – this would include separating the structural connection prior to demolition through saw-cutting and propping, using hand held splitters and pulverisers or hand demolition in short respite periods (at the most advantageous times)
- Installing sound barrier screening to scaffolding facing noise sensitive neighbours where the noise and vibration management plan investigations indicate that the neighbouring property or occupancy would receive noise levels higher than the levels determined by Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report)
- Modifying demolition working sequencing and / or hours to reduce noise and dust emissions during peak pedestrian and adjoining neighbour outdoor activities and movements
- Demolition of the buildings would occur using an excavator, bobcat cranes or other conventional methods following a top-down approach. Demolition would be carried out by licensed demolition contractors and in stages where possible.

The City recommends that any building within the City that is of an historic masonry construction methodology, eg sandstone, ornate plaster or has old glazing features, would automatically qualify for review by an appropriately qualified professional for potential application of the DIN4150 criteria.

Response

The assessment of vibration to buildings has considered the cosmetic damage values from British Standard BS7385 and then applied a 50 per cent reduction as a screening criterion. As identified in Section 10.2.4 of the Environmental Impact Statement, heritage buildings have not been assumed to be more susceptible to vibration. Notwithstanding, the screening criterion applied to all heritage items has been set at a lower 7.5 mm/s (typically applied to light framed, unreinforced buildings) rather than the higher 25 mm/s (typically applied to reinforced or framed buildings).

Issue raised

External criteria for awakenings are derived from the sleep disturbance methodology in the Road Noise Policy which is referred to in other NSW EPA noise policy. The methodology provides for a screening criteria limiting that night noise impacts should not exceed the lesser of an instantaneous sound pressure level which exceeds the background noise by more than 15 dB or, frequent internal noise levels that exceed a level of 50 – 55 dB. The Environmental Impact Statement essentially provides that a screening level of 10 dB above this internal limit will be utilised for screening purposes, implying that a facade will provide 10 dB of protection.

This is likely to occur in the Sydney CBD around Martin Place and Pitt Street where ambient noise levels are already high, even at night and windows and doors already need to be kept closed to afford a degree of internal amenity adequate for sleeping purposes. But, this is not necessarily correct for those residents outside of the CBD such as along Hickson Road adjacent to the Barangaroo works or those around Waterloo whose residents may need to have glazing open at night to afford ventilation.

Regardless of whether the 10 dB comfort factor is employed, the Environmental Impact Statement provides that widespread exceedances of sleep disturbance thresholds in excess of 20 dB will occur. If this 10 dB factor was removed, the exceedances would still indicate an issue for these other locations. The Environmental Impact Statement provides a methodology to address this issue should it occur, but the extent of the problem risks being under-appraised if the screening methodology is incorrect.

Response

The sleep disturbance assessment and screening criterion has been carried out consistent with guidance provided in the Road Noise Policy, and consistent with the approach taken on other infrastructure projects.

Since the development of the Environmental Impact Statement, construction planning has identified that rock breaking for cut-and-cover stations and station shafts (except for Central Station) would not be required outside of standard construction hours. Support station excavation activities would still occur up to 24 hours per day and seven days per week. Further information is provided in Section 9.6 of this report. This would reduce the potential sleep disturbance impacts during out of hours work.

6.16.9 Chapter 11 - Operational noise and vibration

Issue raised

The City notes that the desktop forecast of compliance with ground-borne noise criteria is borderline at locations throughout the City's Local Government Area. Caution should be taken as implementation is progressed.

Response

The assessment of ground-borne noise from operation of the trains within the tunnels, provided in Section 11.4.1 of the Environmental Impact Statement, predicts that compliance would be achieved with the relevant criteria from the *Rail Infrastructure Noise Guideline* in all locations. Additional noise modelling would be carried out during detailed design. This process would determine the final mitigation (such as track form) to achieve compliance with the relevant criteria.

6.16.10 Chapter 12 – Land use and property

Issue raised

City of Sydney notes that the metro project aspires to:

- Establish a strategic framework for urban integration
- Identify opportunities to integrate existing and future land uses within and around stations
- Set project scope around urban design and city building solutions for the station precincts
- Facilitate positive change through new stations
- Maximise opportunities for place making and good urban outcomes.

Section 12 of the Environmental Impact Statement then goes on to describe the existing land uses in a general sense, alongside the existing environmental planning instrument zoning controls, without discussion on the mechanisms or consultations that would be required to establish and to achieve the project aspirations.

The Environmental Impact Statement provides a factual, high level, account of the local planning instruments and their broad effects. Some discussion is then provided on matters which are viewed as opportunities around each station, with the conclusion that these opportunities would be further developed in consultation with NSW Planning and Environment, Greater Sydney Commission and the relevant local council. Demonstration of how this would be achieved is necessary.

Section 12.6 of the Environmental Impact Statement, in relation to "mitigation measures" for Land Use and Property states as follows: "*There are no specific mitigation measures that would be implemented to address potential land use and property impacts*". This statement is incorrect. Section 12 of the Environmental Impact Statement needs to go into far greater detail on safeguards and mechanisms that will be incorporated into the project to ensure that future development of the station precincts respects the existing planning processes and requirements of the local consent authorities. A failure to acknowledge the existing local planning requirements (such as building address, activation of ground floor, adherence to sun access planes, view sharing and use of materials) would lead to haphazard outcomes manifest in sub-optimal, un-activated, less accessible and poorly integrated aboveground structures in the City context.

Section 12.5 of the Environmental Impact Statement identifies how each of the stations would integrate with surrounding land use and transport. The ongoing consideration of local planning and land use integration is appropriately dealt with as part of the Design Guidelines.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. The guidelines provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements. The updated guidelines include additional place-based detail to guide the ongoing design process.

The Sydney Metro Design Review Panel is a group of design experts, commissioned to provide independent design advice at various stages of the project. Transport for NSW is committed to providing opportunities for design excellence. The Design Review Panel would maintain an ongoing role in the design review process to enable achievement of the objectives and principles contained in the Design Guidelines.

Transport for NSW would continue to work with the City of Sydney and other stakeholders to integrate the stations with existing and future land uses and the public domain.

Issue raised

Specifically in relation to the integration of the project with adjoining land uses within the CBD, the existing planning controls in the *Sydney Local Environmental Plan 2012* (SLEP 2012) and the *Sydney Development Control Plan 2012* (SDCP 2012) need to be acknowledged within the Environmental Impact Statement as policies that will be used as guiding safeguards for any future development. Specifically SDCP 2012 is very relevant in the design of towers (Clause 3.2 and 3.3). How the project captures the essential requirements of SLEP 2012 and SDCP 2012 needs to be documented in the Environmental Impact Statement.

Response

Section 12.5 of the Environmental Impact Statement provides consideration of the *Sydney Local Environmental Plan 2012* and the *Sydney Development Control Plan 2012* in relation to the stations within the City of Sydney Local Government Area. These would be further considered during detailed design through the implementation of the Chatswood to Sydenham Design Guidelines (Appendix A of this report).

Over station development and consideration of the above planning controls would be subject to a separate planning approval process. Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

Issue raised

All sites except Waterloo are affected by Sun Access Planes, and any breach of those would cause significant and unacceptable environmental impacts. Also, if the tower setbacks above the podium are not adequate, the developments could create highly intolerable, adverse or even unsafe wind impacts in adjacent public spaces. The City has streamlined modelling processes for identifying various envelopes under different environmental performance scenarios.

Response

Over station development would be subject to a separate planning approval process. Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

The City recommends all over station development and facilities external to the station envelope are assessed and determined by the City (consistent with the requirements of the ISEPP), and are subject to the City's Design Competition process.

The City recommends over station development in the CBD is for strategic purposes rather than residential.

Response

Over station development would be subject to a separate planning approval process. The planning approval pathway would be determined in accordance with the *Environmental Planning and Assessment Act 1979*, the *Environmental Planning and Assessment Regulation 2000* and relevant State Environmental Planning Policies.

It is intended that the Design Review Panel established for the Sydney Metro City & Southwest Chatswood to Sydenham project would apply to the over station developments.

Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

6.16.11 Chapter 13 – Business impacts

Issue raised

The City recommends that the proponent work in partnership with local government, businesses and business representative groups to further develop the business impacts mitigation strategies, should the project be approved.

The consultation process for the Environmental Impact Statement involved phone calls with only 83 businesses across the project area. This is a limited number of responses for the scale of the project. The City would expect comprehensive further consultation with businesses and business representative groups to occur both prior to and throughout project development and construction.

Response

Further consultation with businesses potentially impacted during construction would be carried out to identify and develop measures to manage the specific construction impacts for individual businesses. This is committed to in mitigation measure BI1 in Chapter 11 of this report.

As identified in Chapter 11 (mitigation measure BI2), a business impact risk register would be developed to identify, rate and manage the specific construction impacts for individual businesses.

Issue raised

Within the Local Government Area, metro has identified 38 business properties that require acquisition (Martin Place – 4, Pitt Street – 11, Central – 5, and Waterloo – 18). Significant further detailed discussions with the City and partners will be required to examine the potential impact of each of these properties on local business owners and business precincts.

The City's recent experience as a key partner in the delivery of the George Street Light Rail project shows that these impacts to business need to be carefully considered and detailed mitigation strategies will need to be developed to minimise negative business impacts. The Environmental Impact Statement does not include sufficient information in regards to the timing, process and partners involved in the development of these strategies.

The City is supportive of the recognised need in the Environmental Impact Statement for further business consultation and development of a business impact risk register. However, very limited detail is provided on the communications and consultation strategies that are proposed, especially those required prior to and during construction. The City strongly suggests that businesses and business representative groups are comprehensively involved in the development of more detailed and extensive mitigation strategies as the project develops.

It is recommended that Metro confirms details of communications and consultation strategies to manage issues arising from construction including: access and traffic changes, hours of works, noise, safety, and loss of amenity and public space. Respite for residents and visitors should be built into construction programming.

Response

Further consultation (as per mitigation measure BI1) would be carried out with businesses potentially impacted during construction to identify and develop measures to manage the specific construction impacts for individual businesses.

Future consultation is outlined in Section 5.7.2 of the Environmental Impact Statement and Chapter 4 of this report.

The Construction Environmental Management Framework (Appendix B of this report) provides the communication and consultation strategy for the project. This strategy includes notification and consultation requirements during construction. This strategy would form the basis of a detailed Stakeholder and Community Involvement Plan.

6.16.12 Chapter 14 - Non-Aboriginal heritage

Issue raised

The City recommends that it would be preferable for the new entrance structures to be incorporated into the new building envelopes in Barangaroo Central in order to minimise built incursions into the new parkland and improve views from Hickson Road to the parkland and harbour.

Response

The proposed southern entry at Barangaroo Station is proposed to be incorporated into a new building envelope. The northern entry is proposed to provide efficient access to Barangaroo Reserve and serve major events in this location.

Transport for NSW would continue to work closely with Barangaroo Delivery Authority to ensure the orderly, coordinated execution of the complementary transport and development projects. Critical station and rail infrastructure within the Central Barangaroo development, along Hickson Road, and within the northern metro station entry would be subject to more detailed design to ensure it can be fully integrated into the locality. Critical rail infrastructure includes mechanical and electrical systems, a traction substation, as well as emergency egress facilities. Collaboration with the Barangaroo Delivery Authority, and City of Sydney, will be carried out to improve and optimise the required rail infrastructure that would be required within public spaces to produce a coherent design theme.

The design of the aboveground elements of the metro station would be guided by the Design Guidelines (Appendix A of this report) and be subject to review by the Design Review Panel to ensure that the design adopts relevant urban design principles of the Barangaroo site, integrates with the future Central Barangaroo Master Plan (once known) including existing and future elements of the public domain throughout the precinct, and considers the heritage values of the location. The aboveground elements are subject to ongoing consultation with Barangaroo Delivery Authority.

The City provides the following comments on Pitt Street:

- The attributed *neutral* direct impact on St George's Church may be optimistic as the existing stone spire of the church is structurally weak and is currently scaffolded for safety reasons. The spire will be very susceptible to constructional and operational vibrations
- The selected site for the open shaft in the Pitt Street south work site is immediately adjacent to the heritage listed Edinburgh Castle Hotel. In order to minimise the risk of damage to the hotel, re-location of the shaft further away from the hotel should be considered.

Response

Further consideration of potential vibration damage to St George's Church would be carried out during detailed construction planning. If required, this would include determining a specific cosmetic damage level for this structure.

Excavation works at the Pitt Street south site would encompass the majority of the site. Mitigation measures, including application of an appropriate cosmetic damage level (as per mitigation measure NV3) and the adoption of appropriate demolition methods (as per mitigation measure NAH4) would provide appropriate protection for the adjacent heritage listed Edinburgh Castle Hotel.

Issue raised

The City provides the following comments on Sydney Terminal and Central Railway Station:

- While the Heritage Impact Assessment makes some comment on the amelioration of the heritage impacts of the project, and invokes the conservation policies of the Central Station Conservation Management Plan (p216), a deeper analysis and detailed design will be required to ensure a successful conservation outcome for this place. This is particularly relevant in the creation of a new 'Railway Square' between Pitt Street and the station building in the vicinity of the external roadways and ramps. This is one of the three squares in the City's public domain plans
- With the very best conservation and design advice, it is possible to introduce the new station box and related works and the future square, in a manner that conserves and highlights adjacent significant fabric. There are good international precedents for this such as Kings Cross / St Pancras in London.

Response

Transport for NSW is working with the Heritage Council of NSW and other relevant stakeholders in relation to the design outcomes for Central Station. In addition, the Sydney Metro Design Review Panel would include a heritage architect to provide independent review throughout detailed design.

The creation of a new Railway Square between Pitt Street and the station building is not within the scope of the Chatswood to Sydenham project.

The City recommends that on the basis of the information contained in the Environmental Impact Statement, the demolition of 7 Elizabeth is avoidable. The building is at the south east corner of the proposed Martin Place North Work Site. The arrangement of construction site facilities shown in the Environmental Impact Statement (p77 of summary) for this site show the south western corner of the site is unoccupied.

The facilities currently proposed for the 7 Elizabeth Street site could be placed here and so allow retention and conservation of the heritage item. A closer examination of the work site layout must be carried out to consider alternative layouts. If demolition is unavoidable, the City recommends the following actions must be carried out:

- External archival photography
- Internal archival photography including the Marion Hall Best interiors
- Archival measured drawings
- Salvage of fabric of the intact Marion Hall Best interiors and other significant elements of internal or external fabric
- Incorporation of salvaged elements into interpretative installations in the new station.

Response

The need to acquire and demolish 7 Elizabeth Street is not related to the construction site layout.

The opportunity to retain or only partially demolish the building at 7 Elizabeth Street was investigated during design development. This investigation concluded that the full demolition of the building would deliver the most optimum station planning and constructible configuration. The retention of the building would lead to increased risk and safety issues and a more complex construction methodology as the site is too constrained. This would result in a significantly compromised station design outcome for customer experience. The reduced excavation area required by the retention of this building would also result in restricted below ground station areas and therefore reduced pedestrian circulation areas in the paid and unpaid concourse creating potential congestion issues.

Emil Sodersten is considered to be one of Australia's most influential architects (Emil Sodersten) from the 1930s and numerous building designed by Sodersten remain in Sydney. Sodersten's most highly regarding commercial office building are the CML Building at 60-66 Hunter Street and Bryant House at 80-82 Pitt Street. In relation to residential buildings, Sodersten's most important building is considered to be Birtley Towers, Elizabeth Bay. Although 7 Elizabeth Street is considered to be significant as an important work, it is not considered to be at the forefront of Sodersten's work, and its relatively modest scale has been overwhelmed by more recent and lesser quality adjacent development.

It is understood that Marion Hall Best's input to 7 Elizabeth Street was limited to the decoration of the apartment interiors. It cannot be confirmed whether any evidence remains of Best's original decorative scheme, however it is considered unlikely. Any surviving fragments, if present, would not substantially contribute to the significance of the building.

Transport for NSW would also carry out notification processes under the moral rights legislation.

Mitigation measure NAH1 commits to archival recording of the exterior, interior and setting of 7 Elizabeth Street.

The City notes unacceptable impacts omitted from the Heritage Impact Assessment and recommends the following:

- The Tom Bass P&O wall fountain should be carefully salvaged, conserved and incorporated into the new building on the site in its existing location
- The unattributed mid-20th century bas relief sculpture on the west façade of 55 Hunter Street be carefully salvaged, conserved and incorporated into the new building on the site in a location similar to its existing location
- Investigate salvaging and re-installing / re-building the Douglas Annand glass screen in the new building or in the public spaces of the new Martin Place station.

Response

The items identified by the City of Sydney are not heritage listed items and, as such, were not considered in the Heritage Assessment.

The P&O fountain is considered in the Landscape Character and Visual Impact Assessment (Technical Paper 6). Further, mitigation measure LV15 commits to the reinstatement of this fountain at a location determined in consultation with the City of Sydney.

Transport for NSW would continue to consult with the City of Sydney and any other parties that may hold an interest in opportunities to salvage and reinstate the mid-20th century bas relief sculpture and the Douglas Annand glass screen.

Transport for NSW would also carry out notification processes under the moral rights legislation.

Issue raised

According to figures 161 and 162 of the Heritage Impact Assessment, construction of, and access to, the proposed Sydney Yard Access Bridge requires the demolition of existing terraces at 56 to 64 Regent Street. The assessment is not explicit as to whether 56 (recently adapted with a substantial boarding house at the rear) will be retained although it is clear that the remainder of the row will be demolished. The row is not a heritage item but should be appropriately documented. If 56 is retained, it will require works to turn what is currently part of a row, into a corner building. The City recommends the following:

- External archival photography
- Internal archival photography including characteristic interiors and elements
- Archival measured drawings
- Salvage of fabric for use in the conservation of 56 (if retained) and the resolution of its south (corner) wall
- Use of salvaged fabric from the terraces in the public domain design in the vicinity of the new road to interpret the demolished terraces
- Sale of salvaged fabric surplus to the requirements of the metro project to a dealer in heritage building materials.

The proposed Sydney Yard Access Bridge would require the demolition of 56 to 64 Regent Street. This is clearly identified in Section 7.10.9 of the Environmental Impact Statement. As these buildings are not heritage listed items, they have not been considered as part of the Heritage Assessment. Heritage listings represent a sound basis on which heritage impacts can be assessed and mitigation measures can be developed. It is not reasonable for the project to carry out archival recordings and salvage fabric of items that are not heritage listed.

Issue raised

The City recommends that for all heritage places identified in the report, the following measures will be necessary to ameliorate impacts and facilitate repairs to any damage resulting from the project:

- Dilapidation surveys of affected properties including a comprehensive photographic record of the pre-construction state of the place
- Installation of 'tell tales', laser / electronic monitoring devices or other suitable structural monitoring systems to existing structural cracks or faults to allow assessment of any structural movement or failure during or after the works
- Detailed structural investigation of St George's Church is required to determine necessary measures to prevent damage or collapse of the structure during or after the metro works.

Response

Section 14.6 of the Environmental Impact Statement provides appropriate mitigation measures to protect heritage items in the vicinity of the construction site. This would include the use of cosmetic damage screening criteria and condition surveys of all items with the potential to be impacted by the project.

Issue raised

It is a long-standing City of Sydney policy that all buildings within the Local Government Area are photographed prior to demolition for the record and that the photographs are included in a report lodged with the City's Archives. The City recommends that metro undertake detailed archival recording for all buildings prior to their demolition, regardless of heritage listing. In addition the City has provided a list of buildings in addition to the table 119 of the Heritage Impact Assessment that require archival recording prior to demolition.

Response

Heritage listings represent a sound basis on which heritage impacts can be assessed and mitigation measures can be developed. It is not reasonable for the project to carry out archival recordings of items that are not heritage listed.

Issue raised

A number of buildings proposed for demolition as part of this project, while not being statutory listed heritage items, are older than 50 years and form significant components in existing streetscapes and as the setting for retained heritage items. The City recommends the following:

- Demolished buildings should be the subject of permanent, high quality interpretative displays in the vicinity of their locations
- A consent condition should be included to require heritage interpretation of demolished or changed places that are heritage items or more than 50 years old.

Where demolition of adjacent buildings would potentially impact the setting of retained heritage items, this has been considered as part of the heritage assessment. For example, the assessment of the Edinburgh Castle Hotel at Pitt Street (in Section 14.5.8 of the Environmental Impact Statement), identifies that there would be minor to moderate impacts associated with views and vistas due to the demolition of adjacent buildings.

Local heritage listings are compiled by councils as part of a systematic evaluation of heritage values across a local government area. They represent a sound basis on which heritage impacts can be assessed and mitigation measures can be developed. It is not reasonable for the project to carry out interpretive displays for items that are not heritage listed.

6.16.13 Chapter 15 – Aboriginal heritage

Issue raised

The City recommends that any Aboriginal cultural heritage items found during construction be considered in the City's Eora Journey initiatives.

Response

The management of any Aboriginal cultural heritage items found during construction would be determined in consultation with relevant Aboriginal parties and stakeholders and may be communicated to council as appropriate.

Issue raised

Section 8 of the Sydney Metro City & Southwest Chatswood to Sydenham Technical Paper 5 – Aboriginal Heritage – Archaeological Assessment (AHAA) recommends measures for the mitigation and management of impacts. These measures are appropriate and are supported. The City recommends the following mitigation measures:

- Engage with and inform the Metropolitan Local Aboriginal Land Council, and any stakeholders nominated by them, at all times during the planning and implementation of the project
- Consider all elements of Aboriginal cultural heritage encountered by this project as opportunities for understanding and promoting Aboriginal and Torres Strait Islander culture
- Actively anticipate the research, site investigation, salvage and culturally appropriate safekeeping of Aboriginal cultural heritage uncovered by this project
- Develop an Aboriginal Cultural Heritage Interpretation Plan that incorporates knowledge and artefacts uncovered by this project in a culturally appropriate way to explain the Aboriginal history of the affected places and inform the place making of the new stations (refer to Mitigation Measure AH4)
- For areas within the City of Sydney Local Government Area, metro should contact the Metropolitan Local Aboriginal Land Council directly for cultural advice
- The Metropolitan Local Aboriginal Land Council is the custodian of Aboriginal culture and heritage within the Sydney region. The website is: http://metrolalc.org.au
- City of Sydney staff refer to the Metropolitan Local Aboriginal Land Council for any cultural advice or representation under the Principles of Cooperation signed by the Metropolitan Local Aboriginal Land Council and the City of Sydney in 2006 (http://www.cityofsydney.nsw.gov.au/__ data/assets/pdf_file/0020/113672/Principles-of-cooperation.pdf)
- For more information about Sydney's Aboriginal and Torres Strait Islander communities, please see the City's website: http://www.cityofsydney.nsw.gov.au/com.

The outcomes of the mitigation measures recommended by the City of Sydney would be achieved through the mitigation measures proposed in Section 15.5 of the Environmental Impact Statement.

Transport for NSW has carried out further consultation with Aboriginal stakeholders during the development of the cultural heritage assessment report (refer to Appendix I of this report).

6.16.14 Chapter 16 - Landscape character and visual amenity

Issue raised

It is noted that this chapter does not fully address the requirements of the Secretary's environmental assessment requirements for urban design. The methodology of assessing the landscape impact is effective only in assessing impact on landscape character, not on urban design, and does not adequately account for the important functional roles of the public domain.

The degree of change and the determined visual impact is not complete. In the absence of plans illustrating the extent and nature of works, it is difficult to determine the degree of change and this is noted anecdotally instead.

The City recommends that ongoing liaison be formalised through a Design Review Panel or similar with the City in any Conditions of Consent to manage the impact of construction on the character and activity of the City, particularly in the CBD.

Response

The Secretary's environmental assessment requirements in relation to urban design request identification of urban design aspects of the proposal and consideration of urban design principles adopted by councils or within each station precinct. This is addressed through the project description (Chapter 6 of the Environmental Impact Statement) and the Chatswood to Sydenham Design Guidelines (Appendix A of this report).

The impact assessment component of this part of the Secretary's environmental assessment requirements relates to impacts on urban, rural and natural fabric and on visual amenity. These aspects are specifically addressed in the landscape character and visual amenity assessments (refer to Chapter 16 and Technical Paper 6 of the Environmental Impact Statement). The degree of visual change is described in an objective and analytical manner and is supported by plans and visualisations.

The continued involvement of the City of Sydney will be important in maximising the success of the design outcomes. It is envisaged that the regular working sessions that are currently occurring between the City of Sydney and Transport for NSW would continue to occur through design development. This forum would provide the City of Sydney with greater opportunities for design involvement than participation in the existing Design Review Panel, which is an independent body focused on design review rather than design development.

Issue raised

The Landscape Impact Assessment must consider the envisaged or future landscape character beyond the *Sydney Local Environmental Plan 2012* (SLEP) and *Sydney Development Control Plan* (SDCP). The City's public domain strategies, plans, policies and codes should also apply. These include: Sustainable Sydney 2030 Big Moves, City North Public Domain Plan (Martin Place), Harbour Village North Public Domain Plan (Barangaroo), Lighting Code (and Creative Lighting Strategy), Liveable Green Network, Chinatown Public Domain Plan (Central Station), City of Sydney Open Space and Recreation Needs Study and Urban Forest Strategy. In the case of Barangaroo and Waterloo stations, the future context will be significantly changed from the existing as a result of major development managed by State Government Authorities. The change should be designed in accordance with City of Sydney Streets Design Code. The City recommends that all final street design, fixtures, materials, finishes and trees are agreed to and approved by the City of Sydney.

The city recommends that any conditions of consent are to require that the proponent comply with all relevant City of Sydney policies during detailed design, construction and operation of the metro.

Response

The Landscape Character and Visual Impact Assessment in Chapter 16 of the Environmental Impact Statement considers the *Sydney Local Environmental Plan 2012, Sydney Development Control Plan* and a number of local strategies, plans and policies relevant to each of the station site with the City of Sydney Local Government Area.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. The guidelines provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements. The updated guidelines include additional requirements that respond more specifically to a number of the key initiatives of the City of Sydney. For example, for Martin Place Station the updated guidelines include supporting the City of Sydney's public domain strategies.

In relation to Barangaroo, Transport for NSW would continue to work closely with Barangaroo Delivery Authority to ensure the orderly, coordinated execution of the complementary transport and development projects. Critical station and rail infrastructure within the Central Barangaroo development, along Hickson Road, and within the northern metro station entry would be subject to more detailed design to ensure it can be fully integrated into the locality. Critical rail infrastructure includes mechanical and electrical systems, a traction substation, as well as emergency egress facilities. Collaboration with the Barangaroo Delivery Authority, and City of Sydney, will be carried out to improve and optimise the rail infrastructure that would be required within public spaces to produce a coherent design theme. The aboveground elements of the metro station would adopt relevant urban design principles of the Barangaroo site, integrate with the future Central Barangaroo Master Plan (once known) including existing and future elements of the public domain throughout the precinct, and consider the heritage values of the location. The aboveground elements are subject to ongoing consultation with Barangaroo Delivery Authority.

Issue raised

The City recommends any new trees are to be of a size and species consistent with the City's policies and are to be approved by the City prior to installation. In addition the City notes the following:

- Construction lighting (especially at night) should be managed on a site-by-site basis with shading or directional lighting devices
- It is expected that metal-clad acoustic enclosures structures will have an external finish that is visually recessive and non-reflective and maintain a high quality appearance throughout the construction period, as they will be very obvious in the landscape setting of the station. Integration of public art may assist with this
- Many heritage items will be lost and these have been an integral part of the landscape character. Interpretive design consideration for proposed development and station design
- Thomas Bass Sculpture should be integrated into new building and remain a part of the streetscape

- The most beneficial impact this development can have is to activate the street, with fine grain retail frontages or community uses in the ground floor
- Pedestrian guard-railing should not be installed and instead, where some kind of safety intervention is required; that it is consistent with providing a more amenable and attractive public domain.

Transport for NSW would consult with the City of Sydney regarding any tree plantings around the metro stations within the Local Government Area.

The proposed measures by the City of Sydney are generally committed to in the Environmental Impact Statement. For example:

- Mitigation measure LV3 Lighting of construction sites would be oriented to minimise glare and light spill impact on adjacent receivers
- Mitigation measure LV7 The selection of materials and colours for acoustic sheds would aim to minimise their visual prominence
- Mitigation measure NAH8 Appropriate heritage interpretation would be incorporated into the design for the project in accordance with the NSW Heritage Manual, the NSW Heritage Office's *Interpreting Heritage Places and Items: Guidelines* (August 2005), and the NSW Heritage Council's *Heritage Interpretation Policy*
- Mitigation measure LV15 The P&O Fountain at 55 Hunter Street would be reinstated at a location determined in consultation with City of Sydney Council

Transport for NSW would also carry out notification processes required under moral rights legislation in relation to the P&O Fountain.

Street level activation would continue to be considered as part of detailed design.

The nature of any pedestrian safety interventions would be considered in accordance with the Chatswood to Sydenham Design Guidelines (Appendix A of this report).

Issue raised

The assessment of Barangaroo Station should have considered the City's Harbour Village North Public Domain Plan in the end state of landscape.

Response

Transport for NSW would work with the City of Sydney Council and Barangaroo Delivery Authority to consider the City's Harbour Village North Public Domain Plan during the ongoing design development of Barangaroo Station.

Issue raised

The proposed northern station exit (Barangaroo station) is supported but its location in the parkland is not supported. The City does not support the location of ventilation shafts and skylights at the eastern footway on Hickson Road in a public domain. Our reasons for not supporting the ventilation shafts are for safety (abutments into the public domain provide places to hide and limit access during event mode), access (the width of the footpath will be reduced) and future demand reasons. The City recommends the following:

- Consider alternative design arrangements for structures in the public domain to site them wholly within a development site
- Any structures in the public domain should be subject to a design excellence process
- A CPTED analysis should be conducted on the final proposition.

Transport for NSW would continue to work closely with Barangaroo Delivery Authority to ensure the orderly, coordinated execution of the complementary transport and development projects. Critical station and rail infrastructure within the Central Barangaroo development, along Hickson Road, and within the northern metro station entry would be subject to more detailed design to ensure it can be fully integrated into the locality. Critical rail infrastructure includes mechanical and electrical systems, a traction substation, as well as emergency egress facilities. Collaboration with the Barangaroo Delivery Authority, and City of Sydney, would be carried out to improve and optimise the required rail infrastructure that would be required within public spaces to produce a coherent design theme. The aboveground elements of the metro station would adopt relevant urban design principles of the Barangaroo site, integrate with the future Central Barangaroo Master Plan (once known) including existing and future elements of the public domain throughout the precinct, and consider the heritage values of the location. The aboveground elements are subject to ongoing consultation with Barangaroo Delivery Authority.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. The Guidelines provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements. The updated design guidelines provide specific place-based requirements in relation to the northern entry and integration of the services into the streetscape.

Transport for NSW is committed to facilitating design excellence. The Design Review Panel would maintain an ongoing role in the design review process to enable achievement of the objectives and principles contained in the Design Guidelines.

All aspects of the project would be subject to a CPTED analysis.

Issue raised

The City recommends the consideration of the installation of a lift to connect Millers Point and Barangaroo, and this should integrate with the Barangaroo Central development.

Response

It is acknowledged that the grade separation between Millers Point and Barangaroo forms a barrier to pedestrian movement. Broader precinct connectivity is being addressed as part of the Central Barangaroo development, including the Sydney Steps which will connect Central Barangaroo to the Sydney CBD. The provision of a lift to Millers Point would not be within the scope of the project.

Notwithstanding, this opportunity would be further explored with Barangaroo Delivery Authority and City of Sydney Council. Any ancillary connectivity proposal would require appropriate assessment and approval.

Issue raised

Metro needs to liaise with the City to plan for and provide better pedestrian amenity in and around Martin Place during construction. Particularly in regards to:

- Pedestrian level of service F on the remaining station exit stair at Martin Place is not acceptable in this busy commercial centre of national significance. A temporary stair exit should be installed in the temporary plaza throughout construction to relieve this
- If a temporary plaza is to be provided, it should be activated with temporary uses, including seating, planting and public art
- Many cultural and civic events are held in Martin Place. The Environmental Impact Statement identifies that the Pedestrian Level of Service falls to 'F' during construction. This does not account for events and is likely to have significant safety implications for pedestrians.

Transport for NSW is reviewing and further developing construction staging and methodologies. Further detailed construction planning for the pedestrian routes to and from the existing Martin Place Station would be carried out. This would seek to maintain underground access from Martin Place Station where feasible and reasonable, to reduce impacts to street level. The revised methodology would be the subject of further pedestrian analysis so that pedestrian movements are maintained at an acceptable level of service throughout construction, including during special events. Consultation would be carried out with the City of Sydney regarding temporary place making initiatives in any temporary plaza or pedestrian routes through Martin Place.

Issue raised

The City recommends the inclusion of a condition of consent a requirement of the Metro project to reinstate Martin Place as per the Martin Place Masterplan, including trees, topographic works and furniture.

Response

Consultation would continue with the City of Sydney regarding the reinstatement of the section of Martin Place directly affected by the metro construction work. The updated Chatswood to Sydenham Design Guidelines (Appendix A of this report) provide a specific requirement to support City of Sydney's public domain strategies at Martin Place including the master plan for the renewal of Martin Place.

Issue raised

The City recommends that an exit directly to Martin Place is not included in the station design to enable (and not conflict with) the predominant east-west pedestrian movements along the edges of Martin Place.

Response

Transport for NSW would continue to consult with the City of Sydney regarding the integration of Martin Place Station with existing and future land uses and the public domain.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements.

Issue raised

The City recommends that any hoardings around Martin Place be overlaid with imagery depicting a realistic view of Martin Place from that location, be that historic or future. The hoarding imagery may include both or change over the period of construction as the station develops. Any hoarding design is to be agreed with the City.

Response

Mitigation measure LV6 identifies that the design and maintenance of construction site hoardings would aim to minimise visual amenity and landscape character impacts, including the prompt removal of graffiti. Public art opportunities would be considered.

City of Sydney would be consulted in relation to hoarding design.

City of Sydney recommends the following for the station design of Martin Place:

- That the Martin Place Special Character is maintained by ensuring the built form of the station sits within the existing and future fabric of Martin Place
- Provide back-of-house facilities within the station development for future food and beverage service to Martin Place
- That signage visible from the street, dynamic or static, is not commercial in nature
- O That a strong sandstone masonry presence is incorporated into the station design.

Response

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. The guidelines provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements. The updated Design Guidelines include additional place-based details to guide design development. The ongoing design process would also be guided by outcomes from working sessions held between the City of Sydney and Transport for NSW.

Issue raised

The Environmental Impact Statement has not captured the interchange function of York Street buses with the future Pitt Street Station and this should be rectified. Buses using the York Street interchange service provide an important connection for customers from the inner western harbour-side suburbs and the north to service to the east and south. The design of the station should not include any exits to a corner, and this appears to have been reflected in the Environmental Impact Statement.

Response

The Pitt Street Station has been designed to provide an efficient interchange function with bus stops in the vicinity (such as those on Park and Castlereagh streets). Although this station is not proposed to have a major interchange function with transport facilities on York Street, customers would be able to transfer between the two modes using existing footpaths through the Sydney CBD.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. The guidelines provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements.

Transport for NSW would continue to consult with the City of Sydney regarding the integration of Pitt Street Station with existing and future land uses and the public domain.

The City does not accept that a suitable mitigation measure to provide for more pedestrian space is the deletion of trees or street furniture, as has been suggested in the Traffic and Transport assessments. The City recommends new or replacement trees should be considered in consultation with the City and are to be in accordance with the City's Street Tree Masterplan.

Response

Additional pedestrian space is generally provided through ground level station entry plazas. Notwithstanding, due to the redistribution of pedestrians associated with the new metro stations, there may need to be some additional pedestrian space provided on footpaths in the vicinity of the stations. Strategies to provide additional pedestrian space, where required, would be considered in consultation with the City of Sydney and other relevant stakeholders.

Transport for NSW would consult with the City of Sydney regarding any tree plantings around the metro stations within the Local Government Area.

Issue raised

Given the significance and visibility of Pitt Street Station on the corner of Pitt and Park streets, the City recommends that the building design should be reflective of the scale, form, articulation and materiality of other buildings around the future square.

The Pitt Street Station building will occupy a large proportion of the frontage to Park Street on that street block. Facade design must be considered as a mitigating measure, where opaque sections of the façade would enable a reduction of light spill into Park Street beyond an ambient level. High levels of light emission along that frontage would distract from the lighting design on building facades of heritage buildings around Town Hall, and draw the focus away from Town Hall for pedestrians in the future Square. Consideration of a more masonry character to these facades should be given. In addition the visualisations provided do not show awnings. The City recommends that awnings are required on all street facades and should be of a height matching the surrounding developments.

Response

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. The guidelines include various requirements regarding awnings at station entries, particularly in relation to the awnings relating to their context. They also include guidance on the built form design in areas of heritage sensitivity. The updated Design Guidelines include additional place-based details to guide the ongoing design process. This includes specific requirements at Pitt Street Station relating to linking Hyde Park to the civic precinct. The ongoing design process would also be guided by working sessions with the City of Sydney and advice from the Sydney Metro Design Review Panel.

Transport for NSW would continue to consult with the City of Sydney regarding the integration of Pitt Street Station with existing and future land uses and the public domain.

The City recommends the Sydney Yard Bridge should be designed to minimise impact on pedestrians, by:

- Utilising a shared zone solution between Regent Street and the bridge, where one or more trucks may wait for passage across the bridge
- Providing a footpath continuation across the vehicular crossing
- Minimise the extent of vehicular crossing by allowing the turning circles of vehicles crossing into and out of Regent Street to overlap.

Response

The need for sensitive design of the Sydney Yard Access Bridge is acknowledged. A revised set of design principles has been developed in consultation with heritage stakeholders and is included in Section 2.5 of this report and in the updated Design Guidelines (Appendix A of this report). These principles address issues of pedestrian connectivity along Regent Street.

Issue raised

The City provides the following concerns for Waterloo Station:

- Both the landscape and visual impact of the metro at Waterloo could be significantly improved if the eastern edge of the development block was to be set back from Botany Road
- It is proposed that 16 trees are to be removed, and the City expects that the mitigation measures for this station would include replacing all trees
- Development of this scale and intensity requires a higher quality public domain to cope with the additional pedestrian volumes and circulation. Reinstatement of streetscapes should consider this and apply a quality of finish from the City of Sydney Streets Code appropriately, including furniture
- It is expected that Cope Street will be a slow zone with pedestrian and cycle priority, providing access to the services contained in the station development and integrating with the adjacent residential precinct. Cope Street should be reinstated to meet that desired outcome
- The City strongly recommends that metro consider implementing a second entrance to the south of the station box to capture demand from the south of the intensified Waterloo estate, to customers along McEvoy Street, and to the north of Zetland
- The design of the station and the associated buildings should consider the scale and form of the northern and southern intersections with Botany Road.

Response

The details of the Waterloo Station are subject to detailed design. Consultation would continue with the City of Sydney, Land and Housing Corporation, UrbanGrowth NSW and other relevant stakeholders to enable the station arrangements consider the broader strategic planning for the area and other relevant projects.

There are no plans to provide additional station entries at Waterloo Station.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) establish the design standard for the Sydney Metro City & Southwest Chatswood to Sydenham project. The guidelines provide guidance on the interface of the stations and their locality including the entries, transport interchange facilities, landscaping and other public domain elements. The updated Design Guidelines include additional place-based details to guide the ongoing design process. For Waterloo Station this includes specific requirements related to east-west connectivity, and defining and activating the public domain.

6.16.15 Chapter 18 – Soils, contamination and water quality

Issue raised

The City notes that risks associated with contamination extending deeper than 10 metres below ground level have not been considered as part of the remediation detailed in the Environmental Impact Statement. It is understood that construction elements below Barangaroo Station could extend to 30 metres below height datum. The City recommends that potential contamination risks below 10 metres will therefore need to be addressed by design and managed during construction.

Response

Section 18.4.2 of the Environmental Impact Statement identifies potential contamination at Barangaroo in relation to reclaimed land and for former gasworks. Mitigation measure SCW1 identifies the need for further contamination investigations in this location.

Issue raised

The City endorses the engagement of a NSW EPA accredited site auditor to review site specific contamination reports and approve any proposed remedial strategy in order to confirm through the Site Audit statement process that these sites can and will be made suitable subject to implementation of the approved Remedial Action Plan.

Response

The City of Sydney's comments are supported.

6.16.16 Chapter 19 – Social impacts and community infrastructure Issue raised

There is a significant grade separation of approximately 10 – 13 metres between the Barangaroo Station entrance and Millers Point, which will form a substantial barrier for many rail users who are older, mobility impaired or have small children including those with prams. The City recommends that there is an important opportunity to investigate the inclusion of a station entrance with elevator linking the station to the elevated area of Millers Point, (e.g. in the vicinity of Kent Street) and the CBD north so there is better on-grade accessibility to the east of the station catchment.

Response

It is acknowledged that the grade separation between Millers Point and Barangaroo forms a barrier to pedestrian movement. Broader precinct connectivity is being addressed as part of the Central Barangaroo development, including the Sydney Steps which will connect Central Barangaroo to the Sydney CBD. The provision of a lift to Millers Point is not within the scope of the Chatswood to Sydenham project.

Notwithstanding, this opportunity would be further explored with Barangaroo Delivery Authority and City of Sydney Council. Any ancillary connectivity proposal would require appropriate assessment and approval.

Issue raised

The block from Raglan Street to Wellington Street is a long block, approximately 215 metres. The City recommends inclusion of an on-grade, mid-block, through-site link between Cope Street and Botany Road at Waterloo Station.

The provision of a mid-block link between Cope Street and Botany Road is a matter for broader land use planning in the location. Consultation would continue with the City of Sydney, Land and Housing Corporation, UrbanGrowth NSW and other relevant stakeholders to enable the station arrangements consider the broader strategic planning for the area and other relevant projects.

Issue raised

The City of Sydney's Public Toilet Strategy specifically identifies two key locations for additional public toilets in places where stations are planned. These locations are Barangaroo and George Street light rail corridor (which could be serviced from Pitt Street Station). The City recommends that new station toilet facilities are accessible to people both travelling at that time and those who are using the station generally without needing to enter ticket gates.

Response

All metro stations would provide toilet facilities for customers. These facilities would be provided behind the gateline.

Issue raised

The City recommends the inclusion of at least one 'Changing Places' toilet facility at Pitt Street, Central Station and / or Martin Place stations; with the primary preference being Pitt Street. These would need to be accessible from in front of ticket gates. The City notes that Changing Places facilities are not currently required under the Building Code of Australia or the Access to Premises Standards and therefore are not mandatory in any building.

Response

The provision of 'changing places' toilet facilities would be considered in consultation with City of Sydney during detailed design.

It is proposed to provide 'family rooms' at all stations as part of the project. At this stage it is envisaged that two family rooms would be provided at Martin Place and Pitt Street stations, and one family room at all other stations. These facilities would be provided behind the gateline.

Issue raised

The City requests to be included in the development of the *Sustainable Procurement Strategy* to link to local partners and inform the targeting of initiatives at key employment inclusion objectives for the Local Government Area. This is of particular relevance in Waterloo where there are key employment needs particularly for Aboriginal and Torres Strait Islander people and is a key focus area for the City's Eora Journey Economic Development Plan.

Response

The Workforce Development and Industry Participation Strategy, which would be implemented for the Sydney Metro project, includes specific objectives and targets relating to increasing the participation of Aboriginal workforce and businesses in the project.

Issue raised

The City recommends the inclusion of additional key population groups for targeted employment inclusion in the *Sustainable Procurement Strategy* and workforce development plan. These should include: people with a disability (including those with mental health issues), asylum seekers and older people.

Transport for NSW has developed a Workforce Development and Industry Participation Strategy for Sydney Metro. The objective of this strategy is to increase workforce diversity and inclusion, and a desired outcome of this strategy is to provide better employment opportunities for under-represented groups.

Issue raised

At Flinders Street Station in Melbourne, Travellers Aid provides a range of services that assist people with disability as visitors including: hire of mobility services, storage of luggage and mobility equipment, medical companions, supports use of accessible toilets or provides a place for rest. The City recommends the inclusion of a 'Travellers Aid' service at Central Station.

Response

Central Station currently provides a Station Help Point and is attended by station staff. Existing accessibility features at Central Station include hearing loops, tactile tiles, wheelchair accessible toilet, wheelchair accessible payphone, and wheelchair accessible car space(s). Baggage Storage by SmarteCarte offers secure baggage storage solutions for short and long term storage needs.

The implementation of a Travellers Aid service is a wider Transport for NSW policy decision.

Issue raised

The Sustainability Chapter includes positive inclusions around community benefits such as investigate and implement feasible opportunities to use residual land to benefit local communities. However, the Design Guidelines do not provide guidance on how this will be achieved. The City recommends the inclusion of guidelines on using residual land for community benefits, and setting targets for amounts of new public open space.

Response

Further development of residual land would be subject to a separate planning approval process. The design guidelines (Appendix A of this report) are focussed on the specific design outcomes for the Sydney Metro infrastructure and issue of use of residual land and open space targets are beyond their scope.

Issue raised

This inclusion of place-making in the design guideline section 3.2.2 is strongly supported and we recommend the City be involved throughout the design phase to ensure integrated place outcomes. The City recommends the following:

- Suggested additional point, "Include spaces for community and cultural uses and facilities in station and over station development to enhance the character, distinctiveness and inclusiveness of the station precincts". This can support the achievement of the sustainability objective noted on page 875 of "implement feasible opportunities to use residual land to benefit local communities." Waterloo Station will be a key opportunity for provision of spaces for community and cultural uses or facilities
- Suggest separating out 'retail and night time economy' from other elements mentioned here to be its own guideline. Design considerations for this are quite distinct from events and pop-ups, which should also have their own guideline point.
The inclusion of community and cultural uses and facilities in stations may be an appropriate outcome. The design guidelines (Appendix A of this report) are not defining uses beyond those directly related to the primary function of stations, as this will be identified through further design development. Community and cultural uses and facilities are not precluded at this stage of the process.

Design considerations related to retail and night-time economy would be defined in subsequent design development stages.

Issue raised

The City recommends that 'In high traffic areas, additional opportunities for seating is to be integrated into entrances, walls, fences, and circulation elements and spaces' be included in Design Guideline section: 4.2.3 Furniture.

Response

In response to the City of Sydney's comment, the updated Design Guidelines (Appendix A of this report) include additional guidance in relation to integration of seating into structural elements of the stations. The guideline highlights the importance of this seating not impeding pedestrian flows.

Issue raised

The City makes the following recommendations in relation to Design guideline section 3.1.5 Customer safety:

Intermodal connections

- Include reference to fast and convenient intermodal transfer points, particularly station interfaces with potential bus and taxi services. This should also consider: hours of operation and vehicle and station operating requirements
- Make reference to how timetables will be linked for the expected intermodal transfers at different times of the day and what design responses there may be in light of this. This is to manage crime risks associated with different wait times for certain modes at different times of day
- Include more specific information in relation to minimum service frequency and the proposed number of staff at each station to meet customer expectations. They should also reference the likely standards of security across different modes and possible design responses.

Maintenance

 Provide more specific information with regard to materials used and proposed maintenance and management regimes as transport interchanges are commonly targets for graffiti, vandalism, anti-social behaviour and loitering.

Response

The need for fast and convenient intermodal transfer points is an important consideration in the project design. Section 3.3.1 (dot point 2) of the design guidelines (Appendix A of this report) addresses this interchange issue.

The operational regime of the station, including timetables and staff numbers will be addressed in subsequent project planning stages and is not within the scope of the design guidelines.

Additional detail has been added to Section 4.3.4 of the design guidelines regarding materials to be used to manage graffiti and vandalism.

6.16.17 Chapter 20 - Biodiversity

Issue raised

The key issue of concern in relation to the assessment and report is that there was no discussion or identification of possible improvements to the local urban biodiversity. The City recommends opportunities to propose novel habitat creation within the urban landscape such as illustrated by the artist's impression to create a green roof with habitat value on Waterloo Station (Figure 6-29) is encouraged and strongly supported.

Response

Opportunities for urban landscaping and improvements to local urban biodiversity would be explored during detailed design in consultation with the City of Sydney.

Issue raised

The City supports the identified mitigation measures but would like to emphasise the need to ensure the provision of awareness and training to workers on site if fauna is identified or encountered during construction, particularly for microbats.

Response

The City of Sydney's support for the proposed mitigation measures is noted.

6.16.18 Chapter 21 – Flooding and hydrology

Issue raised

Overall the Flooding and Hydrology assessment in the Environmental Impact Statement incorporates a very high level broad scale flood impact assessment that does not adequately address the assessment requirements as listed in the Secretary's environmental assessment requirements. The City recommends that a full scale flood impact assessment be carried out either as part of this Environmental Impact Statement or as a separate exercise for each flood prone site within the project area that will adequately address the requirements of the Secretary's environmental assessment requirements.

Table 21-4 "Description of existing flood behaviour" summarises existing flood behaviour around or within each station location. However, this section failed to articulate the flood impact of the proposed stations on the surrounding floodplain, existing assets, and infrastructures and, private and public properties and vice versa. This understanding of the flood impact should have been carried out as per the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands Policy* as set out in the *NSW State Government's Flood Prone Lands* and the proposal.

Section 21.4.1 'Surface hydrology and drainage infrastructure' of the Environmental Impact Statement report includes general statements about redistribution of surface runoff during construction activities. The Environmental Impact Statement or any of the supporting documents does not present how surface runoff is going to be redistributed and its associated impacts on the existing stormwater behaviour within immediate surrounds of the five station sites in the City's Local Government Area.

Further consideration of potential flooding implications of the project would be carried out during the detailed design phase.

Mitigation measure FH9 (refer to Chapter 11 of this report) has been revised to identify that the design of the project would, where feasible and reasonable, not worsen existing flooding characteristics up to and including the 100 year average recurrence interval event in the vicinity of the project. Detailed flood modelling would consider:

- Potential changes to flood prone land and flood levels
- Potential changes to overland flow paths
- Redistribution of surface runoff as a result of project infrastructure
- Behaviour of existing stormwater runoff
- Potential changes required to flood evacuation routes, flood warning systems and signage.

Flood modelling and consideration of mitigation measures would be carried out in consultation with the relevant local councils, the Office of Environment and Heritage and the State Emergency Services.

Issue raised

Similarly, the flood impact assessment in Section 21.4.2 'Flooding Stations and Ancillary Infrastructure' of the Environmental Impact Statement is not based on site specific assessments. It appears that mitigating flood impacts at the Barangaroo Station construction site will rely heavily on the Central Barangaroo development drainage infrastructure upgrade works.

There is no mention of the ability of the upgrade works to accommodate the additional stormwater flows from the Barangaroo Station development. Nor is there discussion on the timing of the two construction projects. Poor timing between the drainage infrastructure upgrade works and the station construction may cause adverse stormwater effects to the surrounding downstream areas.

In addition substantive drainage infrastructure recently built for the Barangaroo development in Hickson Road is likely to be affected by the proposed works.

Response

Consultation has occurred with the Barangaroo Delivery Authority in relation to flooding and stormwater impacts at the Barangaroo Station site. A concept for the adjustment of existing stormwater and modifications to proposed stormwater design at Barangaroo has been developed as part of ongoing design development.

The revised mitigation measure FH9 (refer to Chapter 11 of this report) would also apply to the Barangaroo Station site.

Issue raised

Flood mitigation measures for both construction and operational phases are proposed to be considered in the detailed design phase. The general approach listed in Table 21-7 and Table 21-8 to address flood impacts appears to be acceptable. The City recommends that the detrimental flood impacts and feasibility of potential flood mitigation measures are assessed as part of the concept design, prior to the detailed design phase of the project. The City has full 2D flood models of the entire Council area and is willing to provide these to any party involved in this project.

Further to this, the City's Interim Floodplain Risk Management Policy regards any entry / opening / vent etc. to the underground infrastructure needs to be above the probable maximum flood. The City draws particular attention to the Barangaroo and Martin Place sites.

Relevant GIS files of flood levels and the 2D flood models have been provided to the Sydney Metro design team by the City of Sydney Council. This data has been reviewed and would be used to inform ongoing flood modelling during the detailed design of the project.

An additional mitigation measure has been included (refer to Chapter 11 of this report) to identify the design criteria for the project. These are:

- Locate station and service entrances to underground stations above the greater of the 100 year average recurrence interval flood level plus 500 mm or the probable maximum flood level
- Provide site surface grading and drainage collection systems at the Chatswood and Marrickville dive structures to manage the risk of local catchment and overland flooding for events up to and including the probable maximum flood event
- Locate aboveground rail system facilities (such as traction power supply sub stations) at least above the 100 year average recurrence interval flood level plus 500 mm
- Protect facilities that are identified as being critical to emergency response operations from the probable maximum flood level.

Alternative flood protection measures such as automated flood gates would be considered where it is not feasible or reasonable to set entrance levels above the specified flood levels due to the interface with adjacent infrastructure.

These requirements are generally consistent with Council's Interim Floodplain Risk Management Policy.

6.16.19 Chapter 22 - Air quality

Issue raised

The Environmental Impact Statement does not provide a description of the air quality impacts. The City recommends the submissions report should provide further information on the proposed ventilation shafts on Hickson Road including: height or exact function and any impacts to the residential properties on High Street. The City proposes that these structures are either relocated into the development envelope, or recessed into the wall.

Response

Section 22.5 of the Environmental Impact Statement provides an assessment of potential air quality impacts during operation of the project. This assessment identifies that emissions vented through the fresh air ventilation system would be in very low concentrations and it is unlikely that the project would impact on air quality.

The design of the ventilation infrastructure on Hickson Road would be subject to detailed design in accordance with the Sydney Metro City & Southwest Chatswood to Sydenham Design Guidelines (Appendix A of this report). These guidelines have been updated to include place-based requirements for each station. For Barangaroo Station this includes the integration of the services into the streetscape.

Issue raised

The City recommends and would expect that any ambient air quality requirements were consistent with the amended Council of Australian Governments (COAG) National Ambient Air Quality particle standards.

Response

Section 22.5 of the Environmental Impact Statement provides an assessment of potential air quality impacts during operation of the project. This assessment identifies that emissions vented through the fresh air ventilation system would be in very low concentrations and it is unlikely that the project would have air quality impacts on the surrounding environment.

6.16.20 Chapter 25 - Sustainability

Issue raised

To ensure that the sustainability objectives will be met, if the project is approved, the City recommends that the conditions of consent must make a clear and strong commitment to deliver the project against the Infrastructure Sustainability Council of Australia (ISCA) framework.

Response

The sustainability strategy and objectives are outlined in Section 25.2 and 25.3 of the Environmental Impact Statement respectively, with supporting mitigation measures provided in Section 25.8 of the Environmental Impact Statement.

Transport for NSW is committed to achieving a high performance rating against nationally recognised and relevant rating schemes, such as ISCA and GreenStar.

Issue raised

The City notes reference to the NSW Aboriginal Participation in Construction Policy and would like to draw attention to City of Sydney's Reconciliation Action Plan in case the City is able to collaborate in the delivery of employment and training opportunities for our Aboriginal and Torres Strait Islander residents on the project.

Response

The Workforce Development and Industry Participation Strategy, which will be implemented for the Sydney Metro project, includes specific objectives and targets relating to increasing the participation of Aboriginal workforce and businesses in the project.

Issue raised

Having stated that the Sydney Metro project will seek to demonstrate "industry leadership" in the Environment and Sustainability Policy, this section on Governance is the only place in the entire document that references ISCA, whose framework provides the industry standard against which to measure and report sustainability performance against industry standards. It is good that is mentioned here, but insufficient that it forms one line item in the table, rather than a key initiative with a firm commitment. It is important that accountability and public reporting are addressed here but the wording needs to go further. It is vital that this becomes a commitment, not merely a "potential initiative".

Response

Transport for NSW is committed to achieving a high performance rating against nationally recognised and relevant rating schemes, such as ISCA and GreenStar.

Issue raised

The City strongly supports the suggested initiatives and targets. To strengthen the objective "reduce energy use and carbon emissions during construction", the table should include a bullet stating that low-carbon concrete will be used in construction where it's structural integrity is not negatively affected (noting that the pylons of the ANZAC Bridge contain 65 per cent ground granulated blast furnace slag to offset the Portland cement content). This is mentioned briefly on p874 in the table looking at "Consider embodied impacts in material selection" but a more specific commitment is required.

Against the objective "Reduce energy use and carbon emissions during operations", the wording of the potential initiatives and targets is inconsistent. The first bullet will be established, the second bullet will be established and tracked. The City would like the document to be amended so that all initiatives and targets are not only established, but tracked as well. This need to avoid non-committal wording applies to all of Section 25.

Response

The performance of all sustainability initiatives and targets would be tracked.

Issue raised

Against the objective to "minimise waste through the project lifecycle", the City would like to see these initiatives extend to the selection of rolling stock to consider the end of life material impacts. Against the objective "Consider embodied impacts in material selection" the wording is encouraging in direction, though not strong enough in commitment. Similarly, to "establish targets to reduce embodied energy and high impact materials" would be a terrific initiative, but when other initiatives state they will be established and achieved (as with biodiversity conservation), the language used in this example undermines the City's confidence that this will be delivered.

Response

The project lifecycle refers to all aspects of the project including rolling stock and end of life considerations.

The sustainability strategy and objectives are outlined in Section 25.2 and 25.3 of the Environmental Impact Statement respectively, with supporting mitigation measures provided in Section 25.8 of the Environmental Impact Statement. Opportunities such as those identified by the City of Sydney form part of the strategy and would be considered further during design development.

Issue raised

Against the objective "Provide comfortable accessible, safe and attractive stations and precinct", the bullet point states that the project will have the potential initiative / target to "provide thermal comfort including consideration of local control for occupants". This is a good objective but should be broadened to factor in the changing climate and the likely increase in extreme heat days.

Response

Section 25.4 of the Environmental Impact Statement identifies that the project design considers climate change scenarios, including the likely increase in extreme heat days.

Issue raised

The last five bullet points against the workforce development theme and objective could be significantly strengthened through the engagement of a group training organisation (such as the not-for-profit WPC Group http://www.wpcgroup.org.au/).

Response

The Workforce Development and Industry Participation Strategy would be implemented for the Sydney Metro project and includes specific objectives and targets relating to training.

Issue raised

"Optimise over station development" is a very broad target. In terms of sustainability it should be made more specific and measurable by setting 5 Star Green Start and 5 Star NABERS targets.

Response

Over station development would be subject to a separate planning approval process. Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

During the development of the City's Adaptation Strategy, we learned that a comprehensive understanding of climate risks and the best responses to them requires an interdependency analysis to take account of the knock-on impacts of other infrastructure systems and organisations. The methodology of the Sydney Metro risk assessment, although multi-disciplinary does not appear to have involved external stakeholders or a consideration on other types of infrastructure systems. The City recommends that metro undertake an interdependency analysis and would welcome the opportunity to participate in such a multi stakeholder process.

Response

The design of the project has considered climate change scenarios (refer Section 25.4 of the Environmental Impact Statement) consistent with the best practice approach taken on other major infrastructure projects.

Issue raised

The City requests that the metro project team makes contact with this Sydney-based Cooperative Research Centre for Low Carbon Living to explore the latest opportunities and application of lower carbon concrete to ensure this is indeed an industry leading demonstration of sustainability infrastructure.

Response

The sustainability strategy and objectives are outlined in Section 25.2 and 25.3 of the Environmental Impact Statement respectively, with supporting mitigation measures provided in Section 25.8 of the Environmental Impact Statement. Opportunities regarding material with lower embodied energy form part of the strategy and would be considered further during design development.

Issue raised

The City would like to note that its own climate adaptation project identified extreme heat as the biggest direct climate risk to be addressed. The track buckling incidents of Melbourne's Metro rail should serve as a reminder of the possible outcomes of not considering extreme heat and its increasing frequency, intensity and length due to climate change over the lifetime of the project.

Response

Section 25.4 of the Environmental Impact Statement identifies that the project design considers climate change scenarios, including the likely increase in extreme heat days.

6.16.21 Chapter 26 – Cumulative impacts

Issue raised

At Martin Place, any additional pedestrian access closures that occur will have to be carefully managed if they coincide with the Martin Place closure. It is recommended that these be avoided wherever possible, particularly when major events are on.

Response

Transport for NSW is reviewing and further developing construction staging and methodology. The revised methodology would be the subject of further pedestrian analysis so that pedestrian movements are maintained at an acceptable level throughout construction, including during events.

Waterloo Station cumulative impacts should consider in more detail the impact of WestConnex Stage 2 and additional impacts of developments in Green Square and Mascot that will have demands on the road network. Spoil removal routes for metro and WestConnex are likely to converge around the Princes Highway in St Peters and this may have impacts on areas that have not been assessed in this Environmental Impact Statement.

Response

Section 26.3.12 of the Environmental Impact Statement provides consideration of the potential cumulative impacts with WestConnex New M5. These potential impacts are more related to the potential interface of construction traffic from the Marrickville dive site. At this stage of a project, it is not feasible to accurately forecast the potential overlap of construction activities from these two projects in the future. As per mitigation measure CU1, Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time. This would include:

- Provision of regular updates to the detailed construction program, construction sites and haul routes
- Identification of key potential conflict points with other construction projects
- Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
 - Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
 - Co-ordination of traffic management arrangements between projects.

Issue raised

There should be an assessment of the upper threshold of tolerance for the road network and make an assessment on how the demand for space can be managed without additional capacity being the outcome.

Response

Section 26.3 of the Environmental Impact Statement provides an appropriate level of assessment of the potential cumulative impacts of the project. As per mitigation measure CU1, Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time. This would include:

- Provision of regular updates to the detailed construction program, construction sites and haul routes
- Identification of key potential conflict points with other construction projects
- Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
 - Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
 - Co-ordination of traffic management arrangements between projects.

6.16.22 Sustainability and design guidelines – urban design and the Secretary's environmental assessment requirements

Issue raised

The Design Guidelines are not sufficient in lieu of an Urban Design chapter within the Environmental Impact Statement. The City has raised this point multiple times in pre-Environmental Impact Statement engagement with metro. The City is of the view that without a dedicated Urban Design chapter, metro has not adequately responded to the Secretary's environmental assessment requirements.

The specific assessment requirements outlined by the Secretary's environmental assessment requirements for urban design comprise an essential part of the Environmental Impact Statement. City of Sydney has identified requirements as a benchmark for assessing the gaps in the Environmental Impact Statement. High-level benchmarks are listed as follows:

- 1. Identify the urban design and landscaping aspects of the project and its components
- 2. Include consideration of urban design principles adopted by each council or within each station precinct
- 3. Assess the impact of the project on the urban, rural and natural fabric
- 4. Explore the use of CPTED principles
- 5. Identify urban design strategies and opportunities to enhance healthy, cohesive and including communities

Response

The Secretary's environmental assessment requirements in relation to urban design request identification of urban design aspects of the proposal and consideration of urban design principles adopted by councils or within each station precinct. This is addressed through the project description (Chapter 6 of the Environmental Impact Statement) and the Chatswood to Sydenham Design Guidelines (Appendix A of this report).

The impact assessment component of this part of the Secretary's environmental assessment requirements relates to impacts on urban, rural and natural fabric and on visual amenity. These aspects are specifically addressed in the landscape character and visual amenity assessments (refer to Chapter 16 and Technical Paper 6 of the Environmental Impact Statement). The degree of visual change is described in an objective and analytical manner and is supported by plans and visualisations.

Notwithstanding, the design guidelines have been updated (Appendix A of this report) and incorporate a number of the issues and concerns raised by the City of Sydney.

Issue raised

At the most basic level, the Environmental Impact Statement lacks an analysis and description of how projected pedestrian numbers and level of service compare with footpath widths, spatial constraints such as furniture, surface infrastructure and trees.

The Environmental Impact Statement does not adequately illustrate how the City's streets and spaces will be altered to fully understand the environmental impact of the project. It is therefore unclear what the extent of additional works to City assets will be, and how workers, residents and visitors will be affected.

Assessment of pedestrian movements associated with the new metro stations is provided in Section 9.4 of the Environmental Impact Statement. In most cases, the existing footpath network would adequately provide for the forecast pedestrian numbers. However in some locations the assessment identified the need for further investigations in consultation with relevant stakeholders including councils.

6.16.23 Sustainability and design guidelines – urban design guidelines Issue raised

Generally, in regards to Urban Design, the Guidelines are too brief to adequately address the City's Urban Design requirements or design considerations, or the Secretary's environmental assessment requirements for urban design. City of Sydney recommends any project approval should be conditioned to ensure that the City is consulted in the development of Station and Precinct plans, the application of the Urban Design Guidelines and is represented on an Urban Domain Reference Group or Review Panel to guide the detailed designs.

Response

The design guidelines have been updated and are provided in Appendix A of this report. The updated guidelines include additional place-based information to guide the ongoing design development process. The ongoing design process would also be guided through continuation of the regular working sessions that have been held with the City of Sydney.

6.16.24 Sustainability and design guidelines – design development and Implementation

Issue raised

City of Sydney proposes the development of Sub-plans for each station and precinct and provide details of proposed content of each station Sub-plan. The extent of each precinct should be defined considering the catchment for customers living or working at each station, the distance to interchange with other transport modes, and the destinations serviced by the stations. The Sub-plans would include a greater level of detail than is shown in the Environmental Impact Statement including plans and sections of streets and open spaces, indicating existing and proposed kerb alignments, trees, extent of station entries, bike parking, bus stops, street trees, furniture and other surface infrastructure.

Response

As part of the developing design, each station has been and will continue to be considered on a precinct basis. Each key design stage would present a progressively greater level of detail in terms of precinct response, with the participation of the City of Sydney through the continuation of the regular working sessions that are currently occurring.

Issue raised

Further work needs to be undertaken by metro to resolve interventions to the public domain required to accommodate additional or altered pedestrian numbers and movements in the CBD and Waterloo. City of Sydney recommends an expanded area beyond the immediate vicinity of stations should be considered, to ensure that interchange from the stations to other transport destinations is adequately captured. This is particularly applies at Pitt Street, where a high degree of east-west pedestrian movement is anticipated in interchanging between the metro and various locations.

Response

Transport for NSW would continue to work with stakeholders, including the City of Sydney, to identify opportunities to integrate existing and future land uses and transport infrastructure within and around the stations.

Pedestrian Level of Comfort should be considered as a tool for assessing pedestrian flow and designing a response. Fruin's Pedestrian Level of Service is too generic to properly conceptualise people's experience of space within different contexts and land uses. The Pedestrian Level of Comfort provides a more useful tool to apply.

Response

Fruin's pedestrian level of service is considered to be an appropriate tool to assess the potential impacts or identify the need to upgrade the surrounding pedestrian network. Further, the level of service ratings would provide an indication of level of comfort for pedestrians.

Issue raised

Averaging the level of service on footpaths around stations is difficult to interpret and respond to. Further analysis is required to identify where space is inadequate and how kerb alignments and the various physical and spatial components of the street will be reorganised to meet the demands of pedestrians in a safe and comfortable way.

The City supports the prioritisation of street spaces as outlined in the City Centre Access Strategy. The City has a well-developed and steadily executed Cycle Strategy and Action Plan that lays out the key routes for cycling. It will be important to ensure that the Castlereagh Street cycleway that connects Belmore Park and Liverpool Street is extended further north to create a safe cycle access to Pitt Street and Martin Place stations without an unnecessary circuitous detour to the Kent Street cycleway.

The City expects that engagement with metro will continue as this information is acquired and designs are developed. It is also expected that streets and public spaces will be designed, detailed and constructed in accordance with the City's Design Codes and Specifications to ensure the efficient long term maintenance of these assets.

Response

Assessment of pedestrian movements associated with the new metro stations is provided in Section 9.4 of the Environmental Impact Statement. In most cases, the existing footpath network would adequately provide for the forecast pedestrian numbers. However in some locations the assessment identified the need for further investigations in consultation with relevant stakeholders including councils.

Pedestrian level of service is considered to be an appropriate tool to assess the potential impacts or identify the need to upgrade the surrounding pedestrian network.

Cycling integration around each of the stations is described in Section 9.4 of the Environmental Impact Statement. The cycle routes identified by City of Sydney are outside the scope of the project.

Transport for NSW would continue to work with stakeholders, including the City of Sydney, to identify opportunities to integrate existing and future land uses and transport infrastructure within and around the stations.

The City of Sydney provides the following comments in relation to station and built form design:

- The ground and first floor building design is critical to the successful integration of the stations and associated development into the City. The City has a set of urban design principles that form the foundation of the SLEP and SDCP controls. All Over Station Development must comply with the City's SLEP, SDCP and Design Excellence standards and controls.
- Any security bollards deemed to be necessary at stations should be accommodated within the building line as footpaths are highly constrained by services, fixtures and pedestrian movement.
- The increased natural light to stations below is not an appropriate offset for the loss of public space. Skylights in the public domain in the City of Sydney are an inefficient use of space.
- All stations within the City of Sydney must accommodate infrastructure within the station box (or associated development) to manage flood levels safely and efficiently.

Response

Transport for NSW agrees that the ground floor and first floor building design would be critical to the integration into the surrounding urban fabric and acknowledge that the City of Sydney can provide important input into the design process. Over station development will be the subject of a separate approvals process. Liaison will continue with the Department of Planning and Environment and local councils as part of the separate approval process for over station development.

Transport for NSW agrees that placement of bollards within building lines, as opposed to the public domain is generally a preferred outcome. There may however be some situations where this cannot be achieved, in which case bollard placement would need to ensure safe and efficient pedestrian movement. Transport for NSW agrees that skylights should not be located such that the useable space within the public realm is affected.

Issue raised

In Sydney CBD, it is expected that cycle parking will be integrated into the station entries and exits, and not occupy space on streets or any other public space. Despite our awareness of Transport for NSW's policy on cycle parking at stations, it would be useful for the Environmental Impact Statement to advise the proposed quantum. Similarly, the Environmental Impact Statement does not adequately account for access routes to and from all stations. Integration and interface of proposed and existing cycle movements with the station entries and exits needs to be investigated and resolved, ensuring that access is direct and does not conflict with pedestrian circulation in the vicinity of the station.

Response

Section 9.4 of the Environmental Impact Statement provides information on integration of the stations with the cycle network, and the provision of cycle parking at each station. The specifics of the integration between the cycling network (including the quantum of bicycle parking) and stations would be determined during detailed design, in consultation with the City of Sydney.

Issue raised

All works to the public domain, including footpaths, trees, furniture, signage, kerb extensions, will require approval by the City of Sydney. Provided the City of Sydney's policies, plans, codes and standards are applied, then the outcome of any application is often straightforward.

Response

Public domain design would make reference to the City of Sydney's policies, plans, codes and standards where appropriate.

The integration of public art into an infrastructure project of this scale is encouraged, and the Guidelines outlined in the document are sound. The City provides the following recommendations in relation to public art:

- Engage with artists early, in the design development stage, to ensure a successful art strategy for metro
- Engage an experienced curator to develop a Public Art Strategy
- The Public Art Strategy should outline a process for engagement with artists, the City and other relevant stakeholders including Arts NSW

Response

Transport for NSW is committed to an effective public art strategy for Metro that includes appropriate engagement with artists and other stakeholders.

6.16.25 Technical Paper 1: Traffic and transport – traffic modelling Issue raised

ssue raised

It is assumed that the base models were calibrated to traffic flows (amount of traffic passing a particular point), hence the model outputs indicate good levels of service for the intersections. It is requested that the base models to be calibrated to traffic demands (amount of traffic wanting to pass through) and validated to existing queue lengths to reflect observed traffic conditions for better project outcomes. It will be beneficial for modelled queue lengths to be presented in the report for further comments.

The City also questions the assumption that background traffic flows would be the same in 2056 as 2015. There is no reasoning given as to this assumption and the testing of its reasonableness.

The City recommends that an explanation of the reason for the good CBD Level of Service and use of 2015 traffic as the base for 2056 should be given in the Response to Submissions.

Response

Traffic surveys to inform the traffic models provide the number of vehicles that pass the stop line at an intersection. As a result, traffic models were necessarily calibrated to traffic flows.

The assessment of traffic impacts necessarily focuses on the change in intersection performance from the introduction of construction vehicles associated with the project. This assessment shows that construction vehicles would have a negligible impact on intersection performance.

Background traffic flows for 2015 were not used for 2056 modelling purposes. Intersection modelling for the operation stage is provided in the assessment where the project is introducing new traffic signals or adjusting existing traffic signals. As the project would not generate traffic itself, this assessment shows the impact of the new signals compared to the existing situation. There is no requirement to carry out intersection modelling for 2056.

6.16.26 Technical Paper 1: Traffic and transport – catchment and precincts Issue raised

The Environmental Impact Statement is not necessarily clear on the scope of the study catchments or the definition of a precinct. The Environmental Impact Statement states that Metro Precinct Plans were used as part of the traffic and transport assessment methodology. It would be useful if these plans were provided to understand the scope and spatial reach of each station's precinct.

Response

The precinct plans referred to as part of the assessment are the station location and transport integration figures provided in Section 9.4 of the Environmental Impact Statement. The assessment is based on the existing interchange infrastructure present and the infrastructure proposed to be implemented by the project.

6.16.27 Technical Paper 1: Traffic and transport – City and South East Light Rail Issue raised

It appears that the light rail has not been included in the forecast modal shares for station arrival. As the light rail project is well advanced, it is expected that there would be solid data on patronage forecasts along the route. Given the light rail will be in operation by the time metro opens, this should be incorporated into the data and analysis. The City recommends that metro should provide data and analysis on the expected mode share of light rail as an entry / exit point for the metro network at relevant stations.

Response

The model assumptions include both the Inner West Light Rail and the CBD & Southeast Light Rail. The main interchange stations between Light Rail and Sydney Metro will be Dulwich Hill and Central stations.

6.16.28 Technical Paper 1: Traffic and transport – pedestrian modelling Issue raised

There is no modelling results diagram for Barangaroo Station. We assume this is due to the relative linear nature of the corridor. However, it would be useful to understand the expectations of travel demand and how they might change particularly as pedestrian connections such as Wynyard Walk are complete, and what the outcome would look like if a lift was provided to connect Millers Point. The City recommends that pedestrian modelling results should be provided for Barangaroo Station, including the results with all pedestrian connections completed (including the proposed lift).

Response

The Barangaroo Central precinct was subject to a competitive bid process and the urban design of the precinct was not yet determined. As a consequence pedestrian modelling could not be carried out. Notwithstanding, the assessment identified that the pedestrian infrastructure that is likely to be implemented as part of the Barangaroo development would provide a satisfactory outcome.

Transport for NSW continues to work closely with Barangaroo Delivery Authority and relevant stakeholders so that the urban domain would be designed to provide sufficient capacity for pedestrians, including customers from the Barangaroo Station.

A lift to Millers Point as suggested by Council does not form part of the scope of works for the Chatswood to Sydenham project. Notwithstanding, this opportunity would be further explored with Barangaroo Delivery Authority and City of Sydney Council. Any ancillary connectivity proposal would require appropriate assessment and approval.

While the outputs are generally consistent with our expectations of observed behaviour, the forecast split for pedestrians at Waterloo Station is surprising. While the dominant foot traffic towards the Australian Technology Park in the AM peak is expected, the PM peak shows a majority demand from the south. It is not clear why this is the case. However, if this is correct, this strengthens the transport need for an entry to the south.

Response

The figures for the proposed Waterloo Station show a majority demand for AM peak boarding from the south and AM peak alighting towards Australian Technology Park. These figures would be reversed in the PM peak. Footpaths around the proposed station would provide an adequate pedestrian environment for customers accessing the station from the south. There are no plans to provide additional station entries at Waterloo Station.

Issue raised

The operational modelling outputs for the proposed metro at Central Station show a strong pedestrian demand to and from the west, and would indicate that an underground pedestrian thoroughfare at Central Station would be useful to service this demand. The Devonshire Street Tunnel is located to the south and the Environmental Impact Statement shows it has a low demand compared to other access points. If a more mid-point link provides a more useful connection, then this should be considered as the primary eastwest movement corridor that does not require access to the station itself. It is assumed that this would connect with a western forecourt.

Response

Transport for NSW is currently investigating options to improve pedestrian movements within Central Station.

6.16.29 Technical Paper 1: Traffic and transport – parking

Issue raised

The removal of on-street parking in streets under the City's control must be consulted with the affected community, endorsed by the Local Pedestrian, Cycling and Traffic Calming Committee (LPCTCC) and approved by the City.

Response

The Chatswood to Sydenham project is State Significant Infrastructure and is being assessed under Part 5.1 of the *Environmental Planning & Assessment Act 1979*. Sydney Metro contractors would be required to consult with City of Sydney representatives in relation to the removal of any on-street car parking.

6.17 Inner West Council

The submission from Inner West Council supports the Sydney Metro project overall however raises concerns regarding elements of the project outlined in the Environmental Impact Statement, particularly focusing on flooding and surface transport.

The submission also notes that the outcomes of discussions between Sydney Metro and Council prior to the exhibition of the Environmental Impact Statement do not appear to be reflected in the exhibited material.

6.17.1 Strategic context

Issue raised

The Environmental Impact Statement indicative construction timeframe is noted, highlighting the need for careful co-ordination of timing all stages of metro with the NSW Government's Sydenham to Bankstown Urban Renewal Corridor Strategy to ensure new development does not run too far ahead of metro implementation and to ensure that the necessary period of the closure of the T3 Bankstown Line does not cause undue disruption.

Response

The NSW Government is working closely with City of Canterbury Bankstown Council, Inner West Council and the local community to look at opportunities for more homes, jobs, better public spaces, shops and cafes that are within walking distance from the 11 train stations between Sydenham and Bankstown.

A draft corridor strategy was prepared by the Department of Planning and Environment in 2015. The purpose of the strategy is to establish a strategic planning framework to guide future development and infrastructure delivery throughout the corridor over the next 20 years.

The strategy was the subject of community consultation in early 2016. An amended draft strategy, incorporating feedback from the community, councils and other government agencies is expected to be released for public exhibition in late 2016.

In the event that urban renewal works commence currently with the metro construction works, Transport for NSW would manage and coordinate the interface with other projects under construction at the same time to manage the potential cumulative impacts (as identified in Chapter 27 of the Environmental Impact Statement (mitigation measure CU1)).

The need to manage impacts of the closure of the Bankstown Line would be assessed as part of the Environmental Impact Statement for the Sydenham to Bankstown component of Sydney Metro City & Southwest.

Issue raised

Council has no plans to amend the zoning of the Marrickville dive site or its surrounds. Notwithstanding, the NSW Government has approved the following developments within proximity of the dive site: expansion of the Marrickville Metro shopping centre on its existing site and the adjacent site on the southern side of Smidmore Street; a large homemaker store on the corner of Edinburgh Road and Sydney Steel Road and; WestConnex Stage 2, which includes a widening of Campbell Street / Campbell Road and associated impacts on Camdenville Park.

Response

The Inner West Council's comments are noted. Issues of rezoning are a matter for the Department of Planning and Environment.

As identified in Chapter 27 of the Environmental Impact Statement (mitigation measure CU1), Transport for NSW would manage and coordinate the interface with other projects under construction at the same time to manage the potential cumulative impacts.

Whilst acquisition of industrial lots is recognised as a necessary action to progress this project, this must be carried out in a way that the number of lots acquired is minimised and landowners and businesses are duly compensated.

Response

Transport for NSW only acquires properties necessary to facilitate the operation or construction of the project.

All property acquisition would be managed in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991.* This Act sets out the steps to be followed including how compensation is calculated.

Issue raised

Council encourages the addition of an extra station as part of the project, located between Waterloo and Sydenham stations. The Alexandria / Ashmore areas continue to experience significant employment and residential growth; an additional Sydney Metro Station in this vicinity would allow access to increased employment opportunities in the Southern Sydney employment area and provide much needed public transport connectivity for residential growth already occurring in this precinct.

Response

Planning for urban renewal in the South Sydney area predates the proposed Sydney Metro City & Southwest. Masterplanning for the area has been led by the City of Sydney and has included detailed technical studies, including traffic and parking studies. In particular, an Infrastructure Plan identifies the strategic infrastructure requirements to support development of the Ashmore precinct.

During the development stage of the Sydney Metro City & Southwest, consideration was given to opportunities to improve transport accessibility, consistent with the Department of Planning and Environment's *A Plan for Growing Sydney* and UrbanGrowth NSW's Central to Eveleigh Urban Transformation and Transport Program. During this stage, the opportunity to include an additional station between Central and Sydenham was subject of a strategic evaluation of station locations.

The evaluation subjected the Sydney Metro City & Southwest to a Strategic Merit Test. A Strategic Merit Test is used to quantify expected broad benefits of a transport option against project objectives. As part of the Strategic Merit Test, Sydney Metro investigated a number of station locations between Central and Sydenham.

A range of station locations in the South Sydney area were evaluated against the project objectives. The locations included at the Australian Technology Park, Waterloo, McEvoy Street, Green Square, Erskineville, Ashmore, and St Peters. The evaluation results are provided in Section 4.4.3 of the Environmental Impact Statement. In summary, where there is an existing rail station, or the potential station location is within close proximity to an existing station there would be limited increase in rail catchment, limited change to public transport from private vehicles and no significant relief to existing public transport services.

In addition, the station location options were part of a broad public consultation process between 4 June and 17 July 2015. During this time Transport for NSW hosted an online forum and sought feedback on Sydney Metro and particularly the station options around The University of Sydney and Waterloo. The results of the consultation were considered in Section 5.6 of the Environmental Impact Statement and influenced the overall decision of the station location between Central and Sydenham.

In response to the submission from the City of Sydney, a further Strategic Merit Test has been conducted to investigate the opportunity for an additional metro station near the junction of McEvoy Street and Euston Road, Alexandria. A station at this location would serve a predominantly residential catchment with some mixed use developments and provide a new connection to the City of Sydney's Southern Employment Lands. It would have some overlapping catchments with Green Square Station, Erskineville Station and the new Waterloo Metro station, so would serve a partial new rail catchment. The size of the new catchment is relatively small and contains very limited potential for employment and population growth.

As demonstrated in Figure 6-2, this station location at Alexandria performed similarly to the Strategic Merit Test results of a metro station location at Ashmore, Australian Technology Park, Erskineville, Newtown, Redfern, St Peters and Wilson Street (Eveleigh) (as referred to in Section 4.4.3 of the Environmental Impact Statement).



Figure 6-2 Performance of a station at Alexandria

In response to the objective noted in the table above to 'improve the resilience of the transport network', analysis of Erskineville Station patronage in 2014 found that customers can experience train loading of above 135 per cent, which is the benchmark beyond which passengers start to experience crowding and dwell times can impact on-time running. However, it was one of the lower patronised stations on the Sydney Trains network (ranked 118th) with the average number of customers using Erskineville Station during the morning 3.5 hour AM peak period was 1,360 (entries and exits). A station in Alexandria may attract customers from Erskineville Station; however the number of customers would not be high.

Therefore, a more appropriate response to the overcrowding is to increase services or reduce the load on the line. Changes to the train timetable along the Bankstown Line are expected to provide some relief to St Peters (through increased services) and Erskineville stations (through reduced line loads). It is therefore recommended to not pursue a station at this as part of the Sydney Metro City & Southwest as it would not contribute strongly to the Sydney Metro City & Southwest objectives.

Further, land use change around the McEvoy Street area would occur regardless of a new station, and would be in close proximity to a new Waterloo Metro station and the existing Green Square Station.

Waterloo Metro station is forecast to relieve Green Square Station once operational. The addition of another metro station in the South Sydney area would have significant technical, property, operational, and cost implications. On balance of all these issues to consider, the inclusion of another metro station as part of the project at this location is not supported.

Notwithstanding the above, it is noted the Central to Eveleigh is subject to significant urban transformation and studies are being progressed between Transport for NSW and UrbanGrowth NSW on how best to grow the active and public transport modes within the broader area.

6.17.2 Heritage

Issue raised

The Environmental Impact Statement states that the visual impact on the Sydenham Drainage Pit and Pumping Station, which is listed on the State Heritage Register as well as the Marrickville LEP, would be temporary, yet there appears to be no information about what will replace this visual impact upon completion of construction.

The Environmental Impact Statement also identifies a minor visual impact in the case of the tunnel entrance 75 metres away, but again there is an insufficient level of detail to accurately understand the level of this impact. Council requests further information in order to assess the visual impact and concurs with concerns raised by the Office of Environment and Heritage (OEH) regarding archaeological impacts and a need for the imposition of standard conditions to this end.

Response

The works associated with the Chatswood to Sydenham project in the immediate vicinity of the Sydenham Drainage Pit and Pumping Station would be temporary. As identified in Section 12.5.11 of the Environmental Impact Statement, the future use of this residual land would be identified in consultation with the Inner West Council. This future use would be subject to separate planning approval processes.

Section 14.5.11 of the Environmental Impact Statement identifies that the potential heritage impacts associated with views and vistas to the Sydenham Drainage Pit and Pumping Station would be minor due to the establishment of the temporary construction site and the location of operational elements. Additional analysis regarding visual impacts around Marrickville is provided in Section 16.4.12 of the Environmental Impact Statement.

Notwithstanding, further assessment of any potential impacts to the Sydenham Drainage Pit and Pumping Station will be considered as part of the Environmental Impact Statement for the Sydenham to Bankstown upgrade project. At this stage, further operational and design work is required to understand any heritage or visual implications on the Sydenham Drainage Pit and Pumping Station as part of that project.

The Aboriginal heritage assessment carried out for the Environmental Impact Statement identified that no known Aboriginal heritage sites would be impacted by the project, however there are areas of potential Aboriginal archaeological significance across the project sites, including Marrickville dive site. As a result, mitigation measure AH2 commits to the preparation of an Aboriginal cultural heritage assessment report. This has subsequently been prepared and is provided as Appendix I to this report. This document sets out the test excavation methodology relevant to the Marrickville dive site.

6.17.3 Flooding

Issue raised

The assessment of flooding does not meet the Secretary's requirements. The Environmental Impact Statement has not completed sufficient analysis to characterise the flood impacts of the project around the Marrickville dive site. The report goes so far as to say this on page 830 and then states that there may be adverse impacts on page 832. The flooding situation at this location is complex and requires more planning prior to consent being granted, or the imposition of conditions to this end. A separate technical report is warranted to identify mitigation options.

The submission raises the following specific issues in relation to flooding include:

- Additional drainage infrastructure is needed between the Marrickville dive structure and Edgeware Road (south) as well as underneath the existing rail tracks to Bolton Street connected directly to the Eastern Channel or Sydenham Basin in order to mitigate increases in flooding caused by the project
- The Marrickville dive structure conflicts with a stormwater culvert, which drains an upstream catchment of 50 hectares; very broadly an area spanning from the dive structure up to the Princes Highway to the north and east. As a result of this conflict, the existing stormwater culvert, from Edgeware Road to Murray Street, will have to be reconstructed along a different alignment for a length of at least 250 metres and must occur before any excavation of the dive structure takes place. No details of any proposed works are provided in the Environmental Impact Statement despite the inevitability of the works required. Given the flat topography, shallow outlet structure and subsequent lack of grade, it is essential that further planning and design is undertaken to see if there actually is a feasible remedial option, otherwise the project will result in increased flood risk and damages to residents and road users
- The report identifies increases in flood depths in Bolton Street and to the existing commercial premises. No mitigation measures are proposed at this location. The report states that *"Given that the increase in flood levels would only occur at areas already subject to flooding, the project... would not result in increased social and / or economic costs to the community as consequence of flooding"*. Clearly this is not the case as an increase in flood level and frequency will result in increased damages due to flood events.

Figure 21-3 shows no change in flood level near Edgeware Road and Lord Streets, which is grossly misleading. It is incorrect to assume that there will be no impact when a major trunk drain servicing 50 hectares is demolished. At this location the model used seems to assume no change to drainage upstream of the eastern channel, which is incorrect

• The mitigation measures proposed are so broad that it is impossible to measure their potential usefulness. The mitigation measures set out are essentially a collection of statements implying issues will be considered during detailed design, despite no technical analysis having been undertaken to date as to whether any of the mitigation measures are actually feasible.

Operation phase flood management - Marrickville dive structure

The Marrickville dive structure is described in Section 6.7.2 of the Environmental Impact Statement. Figure 6-34 of the Environmental Impact Statement provides an indicative long section that provides an overview of the spatial extent of the dive structure subject to open cut excavation and to cut-and-cover construction. The open section of the proposed dive structure has been located outside the area affected by flood events up to and including the 100 year average recurrence interval event. The covered (cut-and-cover) portion of the dive structure would be partially located within areas affected by existing flooding. An existing flood overland flow path near the northern end of the proposed Marrickville dive structure flows south west along the existing rail corridor boundary from Edinburgh Road before turning west and flowing across the alignment of the Marrickville dive structure toward Murray Street.

The covered component of the dive structure would be returned to the existing surface level to avoid impacts to existing flood characteristics and to maintain the existing overland flow path. An existing council stormwater trunk drain, which would be affected by the construction of the dive structure, would be reinstated in its current location after construction is completed. Provision would be made for a future trunk drainage duplication proposed by Inner West Council as part of the design (ie, it could be introduced around the northern perimeter of the dive structure).

These measures would minimise the impact of the Marrickville dive structure on flood levels within the adjacent catchments. Modelling of the probable maximum flood event also indicates that the dive structure would have minimal impact on flood behaviour, because the existing overland flow path would be reinstated once construction is completed.

Operation phase flood management - Sydenham Station to Marrickville dive structure

Section 21.5.2 of the Environmental Impact Statement notes "The flood model considers the Chatswood to Sydenham project as well as elements of the Sydenham to Bankstown project located at and to the north of Sydenham Station. As such, the assessment at this location reflects the potential flooding impacts of both projects combined. The Sydenham to Bankstown Environmental Impact Statement would refine and update the flood modelling if required, in the area between the Marrickville tunnel portal and Sydenham Station."

A number of mitigation options are being considered to manage flood impacts in the area between Sydenham Station and the Marrickville dive site as part of the Sydenham to Bankstown project. A flood mitigation solution is being developed with the objective of, where feasible and reasonable, not worsening existing flood characteristics in the vicinity of the project for events up to and including the 100 year average recurrence interval event.

Construction phase flood management

Section 21.6 of the Environmental Impact Statement outlines the proposed construction phase mitigation measures, including requirements for flood risk to be considered as part of detailed construction planning (mitigation measure FH1) and management of overland flow paths in consultation with relevant stakeholders including Inner West Council (mitigation measures FH2 and FH3). These mitigation measures have been revised and are provided in Chapter 11 of this report.

The proposed Marrickville dive structure is largely located outside flood affected areas, except for an existing flood overland flow path near the northern end of the proposed Marrickville dive structure. As indicated above, this overland flow path flows south west along the existing rail corridor boundary from Edinburgh Road before turning west and flowing across the alignment of the Marrickville dive structure toward Murray Street. This overland flow path would cross the cut-and-cover portion of the dive structure and the open excavation of this area would cut across the alignment of the overland flow path.

To manage potential impacts to the overland flow path during construction, construction methods (subject to detailed construction planning) could include:

- Staging of the excavation of the cut-and-cover section of the dive structure to maintain a suitable overland flow path across the excavation
- Temporarily diverting the overland flow path around the northern end of the dive structure and along the western side of the structure to Murray Street.

Works to replace the existing trunk drainage culvert that crosses the dive structure could also be staged with the installation of temporary culverts or a new permanent culvert spanning the excavation. Construction phase stormwater management would be further developed during the detailed design and construction planning.

Mitigation measure FH3 (refer to Chapter 11 of this report) has been revised to identify that during construction of the project, overland flow diversions at the Marrickville dive site would, where feasible and reasonable, not worsen existing flooding characteristics up to and including the 100 year average recurrence interval event in the vicinity of the project.

6.17.4 Traffic and transport

Issue raised

The proposed upgrade of the Edinburgh Road / Bedwin Road / Edgeware Road intersection shown in the Environmental Impact Statement does not reflect Council's comments from previous meetings with Sydney Metro. In line with objectives of the NSW Long Term Transport Master Plan, the intersection must improve pedestrian priority when it is upgraded. The proposed arrangement with three crossing legs on the western side is not acceptable. Consideration also needs to be given to improving pedestrian and cyclist amenity at the intersection of Bedwin Road and Edgeware Road (south).

Response

Transport for NSW will continue to work with Inner West Council, Roads and Maritime Services and other stakeholders to achieve an intersection arrangement that achieves a favourable construction and end state outcome. An optimum outcome would need to be a balanced consideration of road user safety, pedestrian and cyclist accessibility and traffic flow efficiency. Transport for NSW is committed to a signalised intersection outcome at this location that achieves the optimum balance between these often competing considerations. Transport for NSW will seek input from Council, Roads and Maritime Services and other stakeholder on strategies to reduce the number of staged pedestrian marked foot crossings shown in the preliminary intersection design. This is reflected in a new mitigation measures in Chapter 11 of this report.

Issue raised

As part of the project, and in light of extra construction vehicle movements that are set to take place around Bedwin Road, improvements to Bedwin Road Bridge must be made in order to enable safe pedestrian and cycle movement. The bridge between Campbell Street and Edgeware Road currently has four lanes for traffic, a narrow and unsafe pedestrian footpath and no provision for bicycles. It is an important missing connection in regional cycle routes.

The works proposed for Campbell Street as part of the New M5 Project in the vicinity of the St Peters Interchange will place even greater importance on this cycle route. A dedicated cycleway is proposed along Campbell Street / Campbell Road from Bourke Street to Bedwin Road. Sydney Metro's mobilisation of construction activity along the rail corridor and beneath the bridge presents a unique opportunity to look at adding capacity to this bridge for dedicated cycle infrastructure. Being intrinsically linked to rail infrastructure and active transport would place this well within the scope of this project. This significant opportunity could be realised through cross-government collaboration with Sydney Motorways Corporation.

Response

Augmentation of the bridge as suggested by Inner West Council is not within the scope of the Chatswood to Sydenham project.

Issue raised

Construction of a proposed off-road cycleway connecting Edgeware Road with Sydenham Station adjacent to the proposed Marrickville dive site should be undertaken as part of this project. This will connect to the existing covered Sydney Water Eastern Channel at the Sydenham detention basin with a link into Garden Street. The existing cycle route travels along roads with a high percentage of heavy vehicles and this is highly likely to be severely impacted by the project with many additional heavy vehicle movements; as such this should take place, as far as practicable, prior to construction commencing. Council will be investigating options for this route in 2016 / 2017.

Response

Provision of an off-road cycleway connecting Edgeware Road with Sydenham Station does not form part of the Chatswood to Sydenham project. Active transport links to Sydenham Station will be considered as part of the Sydenham to Bankstown project.

Issue raised

The proposal for 300 car parking spaces within the Marrickville dive site would likely create several hundred daily additional vehicle movements on local roads that are already at or nearing capacity. Whilst there is an acknowledgement within the Environmental Impact Statement of the proximity of Sydenham Station and that it may be utilised for employee movements, there is no commitment to this and the provision of such a large car park is only likely to encourage movements by private vehicle.

Conditions should be placed on any consent to this end in order to encourage fewer vehicle movements to the site during construction and thus minimise the impact on local streets and local residents.

Response

Mitigation measure T12 commits to measures to minimise construction worker parking on local streets around construction sites. This includes encouraging the use of public and active transport, ride sharing and park and shuttle transfers. The provision of car parking spaces at the two dive sites would be to facilitate central parking locations with shuttle services to the other project construction sites. The traffic impact assessment for the Marrickville dive site in Section 8.14.8 of the Environmental Impact Statement suggests that the project would not have a material impact on the surrounding road network during construction.

6.17.5 Construction

Issue raised

Council has concerns regarding the potential noise impacts during the day on St Pius' Catholic School on Edgware Road; the Environmental Impact Statement states that the impact of construction on this area is likely to be significant but makes no attempt to reduce or mitigate for this.

Response

Section 10.4.12 of the Environmental Impact Statement assesses the potential impact of noise and vibration during construction of the project in the vicinity of the Marrickville dive site. St Pius' Catholic School has been identified as an educational receiver located in Receiver Area B.

During site establishment works, track works and earthworks during the daytime moderate exceedances of between 10 dB to 20 dB of the noise management levels (NMLs) are predicted at St Pius' Catholic School. During tunnelling and use of the site as a precast facility during the daytime a minor exceedance (of less than 10 dB) is predicted. Other works such as acoustic shed construction and fit out are predicted to comply with NMLs.

The Construction Noise and Vibration Strategy (Appendix C of this report) provides a robust approach for managing potential construction noise and vibration impacts, including standard mitigation measures which would be implemented at all construction sites.

In addition specific consultation (as per mitigation measure SO2) would be carried out with sensitive community facilities (including educational institutions) potentially impacted during construction. This consultation would aim to identify and develop measures to manage the specific construction impacts for individual sensitive community facilities.

Issue raised

Council also wishes to highlight concerns raised by local businesses that may be impacted by the construction compound and associated vehicular movements – this is particularly so for sensitive businesses such as food production. In this regard it is anticipated that their concerns will be duly considered and acted upon.

Response

Specific consultation would be carried out (as per mitigation measure BI1) with businesses potentially impacted during construction. Consultation would aim to identify and develop measures to manage the specific construction impacts for individual businesses.

Issue raised

Council would like to be reassured that there is a transparent process in place for prompt resolution of complaints during construction and operational stages.

Response

The Construction Environmental Management Framework (Appendix B of this report) provides the communication and consultation strategy for the project, including a complaints handling procedure. Further information regarding consultation during the construction period is provided in Chapter 4 of this report.

Whilst the timeframe of construction is not explicitly detailed in the Environmental Impact Statement, it is expected to be synchronous with that of the New M5 WestConnex project. However, within the cumulative traffic impact assessment (p914) there are no mitigation measures proposed and no detailed description behind the statement that *'there is not expected to be any significant cumulative impact when combined with the New M5 Project'*. The other aforementioned approved planning projects in proximity of the dive site must also be taken into consideration.

Response

Section 26.3.12 of the Environmental Impact Statement provides consideration of the likely cumulative impacts with WestConnex New M5 and WestConnex M4-M5 Link. This section identifies that potential construction impacts would most likely be related to construction traffic and transport, construction noise and vibration, business impacts, visual impacts and air quality impacts. The Environmental Impact Statement identifies a process (refer to mitigation measure CU1) for managing and coordinating the interface with other projects under construction at the same time to manage potential cumulative impacts.

Issue raised

It is also unclear whether future scenarios of projected traffic volumes have taken account of all proposed changes in the surrounding area. As part of the approval for the New M5 Project, Campbell Street / Campbell Road between Unwins Bridge Road and Euston Road is proposed to be widened and will carry significantly higher volumes of traffic than at present. The operation of St Peters Interchange is expected to significantly increase traffic volumes and travelling patterns on the surrounding road network. These predicted changes should be taken into account to enable a robust assessment of the traffic impact during the construction stages of Sydney Metro.

Response

Changes to traffic volumes and patterns associated with WestConnex New M5 are a matter for assessment as part of that project. The traffic assessment for Chatswood to Sydenham takes into account the potential impact associated with introduction of construction traffic vehicles against the current background traffic volumes.

The Environmental Impact Statement identifies a process (refer to mitigation measure CU1) for managing and coordinating the interface with other projects under construction at the same time to manage potential cumulative impacts.

Issue raised

In addition, there are discrepancies in the predicted level of service for Bedwin / Campbell / Unwins Bridge Road / May Street intersection between different tables within the Environmental Impact Statement – this raises concerns as to how accurate any of the predictions are.

Conditions ought to be placed on any consent to ensure that local traffic conditions do not become significantly inferior.

Response

The construction traffic assessment table (Table 8-29 of the Environmental Impact Statement) includes the addition of a right turn phase from May Street to Bedwin Road. The operational traffic assessment table (Table 9-5 of the Environmental Impact Statement) does not include the above right turn phase as this is required for construction purposes only. The difference in the predicted level of service at this intersection is as a result of inclusion of the right turn phase during construction only.

The construction and operational traffic assessment show that the impact of the project on surrounding intersection performance would be negligible.

Depending on construction timeframes, construction traffic should utilise a widened Campbell Street / Campbell Road rather than May Street to enter and exit the construction site.

Response

The potential use of Campbell Street is identified as a secondary haul route in Section 8.4.18 of the Environmental Impact Statement. The proposed primary haul route via May Street has been chosen to limit the potential for direct interface with the WestConnex New M5 works along Campbell Street. Depending of timing of the two projects, there may be opportunities to use Campbell Street once road widening works have been completed by WestConnex.

Issue raised

A Traffic Management Plan with Traffic Control Plans should be prepared for both long term and short term events.

Response

The process for developing Construction Traffic Management Plans and Traffic Control Plans is provided in the Construction Environmental Management Framework (Appendix B of this report).

Issue raised

Swept path assessments should be undertaken to ensure that the largest construction vehicles are able to access and negotiate required local roads and intersections, without causing damage to kerbs or impacting significantly on other road users.

Response

Swept path analysis, where required, would be carried out as part of detailed construction planning and the development of Construction Traffic Management Plans and Traffic Control Plans. As identified in Chapter 11 (mitigation measure T2) Road Safety Audits would be carried out at each construction site. Audits would address vehicular access and egress, and pedestrian, cyclist and public transport safety.

Issue raised

Temporary pedestrian crossings should be designed to the same level of safety and protection as permanent marked pedestrian crossings. Temporary ramps should be provided along any alternative pathway where necessary.

Response

Pedestrian safety and the needs of people with mobility difficulties would be considered during the design of temporary pedestrian facilities.

Chapter 27 of the Environmental Impact Statement provides a number of mitigation measures in relation to the movement and safety of pedestrians around construction sites. These mitigation measures include:

- Mitigation measure T2 Road Safety Audits would be carried out at each construction site. Audits would address vehicular access and egress, and pedestrian, cyclist and public transport safety
- Mitigation measure T3 Directional signage and line marking would be used to direct and guide pedestrians around construction sites.

BUSINESSES AND EDUCATIONAL INSTITUTIONS

CHAPTER SEVEN

7 Businesses and educational institutions

This chapter provides responses to issues raised in submissions from businesses and educational institutions directly impacted by the project:

- Macquarie Bank
- Commonwealth Bank of Australia
- MLC Centre Company
- Sydney Airport
- KU Children's Services
- Labsonics
- Seven Network
- NSW Masonic Club and Castlereagh Boutique Hotel
- Monte Sant' Angelo Mercy College
- Australian Catholic University
- Mirvac Real Estate Pty Ltd and K-REIT Asia (Keppel Land Limited)
- Ambient Psychology
- Casa Del Australia Pty Ltd
- Harvey Norman Alexandria
- ISM Studios Pty Ltd
- Comfort and Fit
- The Printing Department
- Cromwell Property Group (Northpoint Tower)
- Anonymous.

7.1 Macquarie Bank

7.1.1 Building heritage fabric

Issue raised

Construction activity may affect the heritage listed fabric. Macquarie Bank would like to understand what modelling has been done to assess potential effects and how the current condition will be assessed and documented.

Response

Section 14.5 of the Environmental Impact Statement provides an assessment of the potential indirect impacts to non-Aboriginal heritage items. These indirect impacts are mainly associated with views and vistas, or the potential for impacts from vibration from construction activities.

Vibration modelling was carried out as part of the noise and vibration assessment. Vibration modelling was based on vibration levels measured on other Sydney tunnelling projects. The modelling calculates a three-dimensional slant distance from the works to each sensitive receiver. Further details on vibration modelling can found in Section 3.3.3 of Technical Paper 2: Noise and Vibration.

The main potential impact to the Macquarie Bank building would be associated with vibration from adjacent excavation and tunnelling work (for pedestrian tunnels) beneath the building. As part of the assessment, a conservative cosmetic damage screening criterion of 7.5 mm/s has been applied to all heritage items (which is half the value when cosmetic damage would be expected to occur for light-fame structures). The assessment found that the closest façade of the Macquarie Bank building to the construction work is not predicted to experience vibration above the 7.5 mm/s screening criterion during mined excavation of the underground pedestrian connections between the station concourse and platforms.

However, the assessment found that demolition of the adjacent and adjoining structures may result in vibration levels above the screening criterion. Therefore, a more detailed assessment of the structure would be carried out to ensure vibration levels remain below a specific cosmetic damage level for that structure which would also take into account the listed heritage value of the building. This may involve determining a different cosmetic damage vibration level specific to the building and / or adjusting construction methods to reduce potential vibration levels.

Prior to construction building condition surveys would be carried out and the building condition would be monitored in accordance with the Construction Noise and Vibration Strategy.

The process for condition surveys is provided in the Construction Environmental Management Framework (Appendix B of this report).

7.1.2 Construction noise Issue raised

The Environmental Impact Statement noise impact modelling finds high to moderate exceedances above set noise management levels at various stages of the construction. Macquarie Bank would like to understand how these exceedances will be managed.

Response

The assessment of potential construction noise impacts in the Environmental Impact Statement presents a worst-case 15-minute assessment in accordance with the approach required by the *Interim Construction Noise Guideline*. This approach assumes that all construction equipment for a particular construction scenario is operating at the same time and at the closest point on the site to any receiver. In reality, construction equipment would operate in varying locations around the site and would rarely all be in use at the same time. As such, the actual noise levels experienced would vary throughout the construction works and at most times would be lower than the worst-case scenarios provided in the Environmental Impact Statement.

In relation to the Macquarie Bank building, the noise and vibration assessment in the Environmental Impact Statement found that:

- There are anticipated airborne noise exceedances of the noise management levels of greater than 20 dB during demolition and site establishment and between 10 and 20 dB during earthworks and aboveground station building construction. Compliance with the noise management levels is predicted during other activities including underground excavation and structural works
- Ground-borne noise levels are predicted to comply with the relevant noise management levels
- Vibration levels are predicted to comply with the 7.5 mm/s screening criterion during mined excavation of the underground pedestrian connections, however, demolition of the adjacent and adjoining structures may result in vibration levels above the screening criterion.

The Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report) provides the process for carrying out more detailed construction noise and vibration impact statements prior to each construction activity based on further understanding of the construction equipment and construction processes, which would be confirmed during detailed construction planning. This process would provide further detail regarding the actual noise levels which would be experienced by individual receivers.

As part of this process, consultation would be carried out with Macquarie Bank (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to Macquarie Bank.

The Construction Noise and Vibration Strategy provides standard noise mitigation measures which would be implemented on all sites. This includes measures such as provision of noise barriers around sites and use of dampened rock hammers among others. The Construction Noise and Vibration Strategy identifies additional mitigation measures which would be implemented when defined exceedances of the noise management levels are predicted to occur.

7.1.3 Access to loading dock and car park

Issue raised

Access to the loading dock and car park for 50 Martin Place is via Castlereagh Street. Macquarie Bank would like to understand access restrictions to Castlereagh Street.

Response

An assessment of potential construction traffic and transport impacts around Martin Place is provided in Section 8.4.14 of the Environmental Impact Statement. In the vicinity of the Martin Place Station, the assessment identified that construction vehicles would have a negligible impact on the surrounding road network. Access to neighbouring properties (including car parking and loading docks) would be maintained during construction.

In particular, there are no proposed access restrictions on Castlereagh Street during construction. In the event that temporary night-time partial road closures are required, these would be managed in consultation with the relevant road authority. In this event, notification would be provided to affected properties and alternative arrangements provided where feasible and reasonable.

Prior to the commencement of construction, a Site Specific Access and Management Plan would be prepared. This plan would be specific to the Martin Place Station construction site and would identify proposed traffic and parking management measures to facilitate the construction activities at this site. One of the objectives of preparing these plans would be to minimise disruption to access for adjoining properties.

7.1.4 Martin Place access to banking chamber

Issue raised

The main entrance to the banking chamber is from Martin Place. Macquarie Bank would like to understand details of pedestrian flow, particularly during the temporary closure of Martin Place between Elizabeth and Castlereagh streets.

Response

The potential for impacts to active transport (including pedestrian access to surrounding buildings) is considered and assessed in Section 8.4 of the Environmental Impact Statement. This section identifies that construction sites would be arranged to maintain safe access to surrounding properties at all times.

In relation to the construction works in Martin Place, Transport for NSW is reviewing and further developing construction staging and methodology for Martin Place Station. The revised methodology will be the subject of further pedestrian analysis so that pedestrian movements would be maintained at an acceptable level of service throughout construction and that appropriate access is maintained to surrounding properties.

Signage would also be provided (in accordance with mitigation measure BI3 – refer to Chapter 11 of this report) to provide visibility to businesses.

7.1.5 Evacuation stair discharge point

Issue raised

The main evacuation stair of 50 Martin Place discharges onto Castlereagh Street. Macquarie Bank would like to understand hoarding arrangements around the discharge point to ensure that staff safety is not compromised in the event of building evacuation.

Response

Construction sites would be arranged to maintain emergency access and exit arrangements to adjacent buildings at all times. Provision of construction hoarding would be placed predominantly at the facade of the construction site and would be designed to limit obstruction or restriction of space to any neighbouring building and maintain clear minimum footpath widths for pedestrians.

Further consultation would occur with owners and occupiers of any affected adjoining properties to advise of proposed works and address issues regarding impacts to circulation and queuing spaces to enable safe and convenient pedestrian movement. This would include consideration of the emergency exit arrangements from 50 Martin Place so that these are maintained.

7.1.6 Adjustments to utility services (electricity, sewer, gas, telecommunications, sewer / drainage)

Issue raised

Adjustments to utility services may adversely affect business operations. Macquarie Bank would like to understand how building owners and tenants will be consulted ahead of time so suitable arrangements can be made.

Response

Any works to utilities would be managed to eliminate or minimise the duration of any interruption of supply to users. Where interruption would be required, potentially affected users would be notified in advance of the disruption.

Transport for NSW would continue to consult with Macquarie Bank. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

7.1.7 Access to brigade booster valve assembly

Issue raised

Booster valve assembly for 50 Martin Place is located at the corner of Castlereagh Street and Martin Place. Macquarie Bank would like to understand if there will be any impacts to firefighting ability.

Response

Potential disruption to emergency services access is considered in Section 8.4.2 of the Environmental Impact Statement. This section identifies that construction sites would be arranged to ensure emergency access to nearby buildings and precincts is maintained (including access to emergency firefighting infrastructure). In addition there would be ongoing consultation with emergency service providers and building owners in relation to any changed traffic conditions around construction sites that may affect emergency services.

7.2 Commonwealth Bank of Australia

7.2.1 Consultation

Issue raised

The Commonwealth Bank of Australia is a tenant of the ground floor and lower ground floor areas of 48 Martin Place Sydney. The Commonwealth Bank of Australia was not consulted or made aware of the planning exhibition until the final day of exhibition and will review the documentation and provide comments as soon as possible.

Response

As outlined in Chapter 5 of the Environmental Impact Statement and supported in Appendix C, community engagement around the extension to the Sydney Metro network, including Chatswood to Sydenham, commenced in June 2014.

Almost two years of engagement around an extension to the Sydney Metro network occurred, prior to the statutory required consultation. The aim of this consultation was to gather feedback during the development of the project and feed into the preparation of the Environmental Impact Statement.

Properties immediately adjacent to future construction sites or identified as being potentially affected by the project were either doorknocked by Transport for NSW Place Managers or meetings requested with major landowners and tenants so that they were aware of the project and the extent of the works and were provided with information to help them make a submission on the project.

Transport for NSW would continue to consult with the Commonwealth Bank of Australia. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

Transport for NSW will continue to engage closely with stakeholders and affected properties owners and occupiers through all stages of design, planning, and construction. Further information regarding consultation during construction is provided in Chapter 4 of this report.

7.3 MLC Centre Company

7.3.1 Construction stage

Issue raised

The approved works to the podium and basement levels of the MLC Centre (D2015/66) have not been acknowledged in the cumulative impacts section of the Environmental Impact Statement. The MLC Retail Redevelopment works may be undertaken concurrently with the Sydney Metro works at Martin Place, requiring detailed coordination between the two projects.

Based on the above, MLC identify that there may be opportunities to share construction zones and potential road closures, in which the MLC Centre would welcome a further discussion.

Section 26.3 of the Environmental Impact Statement identifies the potential for cumulative impacts with a range of other projects during the construction of the Sydney Metro City & Southwest Chatswood to Sydenham project. This assessment focussed on projects where there is the potential for construction works to overlap based on project location and timing, and projects that are typically large-scale developments. Although the MLC Retail Redevelopment was not specifically identified in the Environmental Impact Statement, the approach for managing cumulative impacts (mitigation measure CU1) would still apply to this project. This approach is:

Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time to minimise the potential cumulative impacts. Co-ordination and consultation with relevant stakeholders would include:

- Provision of regular updates to the detailed construction program, construction sites and haul routes
- Identification of key potential conflict points with other construction projects
- Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
 - Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
 - Co-ordination of traffic management arrangements between projects.

This process would also identify potential opportunities to share road closures and construction zones to minimise overall impacts to the community, noting that shared construction zones would need to be subject to workable contractual arrangements so responsibilities and accountabilities between potentially two different contractors are clear.

Issue raised

Pedestrian ingress and egress to the MLC Centre, across Castlereagh Street and Martin Place will be constrained and disrupted during construction of the Sydney Metro project when Martin Place is temporarily closed. The MLC joint owners would like to discuss how these impacts will be managed and minimised for all parties.

Response

The potential for impacts to active transport (including pedestrian access to surrounding buildings) is considered and assessed in Section 8.4 of the Environmental Impact Statement. This section identifies that construction sites would be arranged to maintain safe access to surrounding properties.

In relation to the construction works across Castlereagh Street and Martin Place, Transport for NSW is reviewing and further developing construction staging and methodologies. Further detailed construction planning for the pedestrian routes to and from the existing Martin Place Station would be carried out. This would seek to maintain underground access to Martin Place Station where feasible and reasonable, to reduce impacts at street level. The revised methodology will be the subject of further pedestrian analysis so that pedestrian movements are maintained at an acceptable level of service throughout construction and that appropriate access is maintained to surrounding properties.

Construction Traffic Management Plans would be prepared for the project. These plans would address the need to minimise disruption to pedestrian flows and the safe movement around construction sites. The area allocated as available for pedestrian access through Martin Place would be consistent with and in some cases better than that adopted on a regular basis in the Amphitheatre of Martin Place during events.

The process for developing Construction Traffic Management Plans and Traffic Control Plans is provided in the Construction Environmental Management Framework (Appendix B of this report).

Issue raised

Dust, noise, construction traffic, pedestrian obstructions and temporary way finding associated with the construction of Sydney Metro will impact upon the popularity, ambience and attractiveness of the bars, restaurants and cafes in the plaza (which all have outdoor seating areas) of the MLC. The MLC Food Court which utilises natural ventilation would also be affected as well as Luxury Retail outlets along Castlereagh Street in the proximity of the construction zone. Consultation and collaboration on the construction management plans would be welcomed by the MLC joint owners.

Response

It is inevitable that a project of this scale and size would result in some temporary impacts on existing amenity to surrounding businesses. Consideration of potential amenity and access impacts for surrounding businesses is considered in Section 13.4 of the Environmental Impact Statement. In relation to the MLC Centre, this assessment found that:

- Construction work could result in amenity related impacts (noise, vibration and dust). These impacts would be most noticeably experienced by businesses such as outdoor cafes and bars
- Construction sites, hoardings, changes to access routes and perceived access challenges could disrupt pedestrian access in the vicinity of businesses. There could also be some loss of passing trade to the MLC Centre as a result of the closure of the existing underground pedestrian link between Martin Place Station and the MLC Centre.

Conversely, the presence of the construction site and construction workers would present opportunities for increased trade for businesses such as food and beverage outlets in the MLC Food Court.

Consultation would continue with the MLC Centre (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop tailored mitigation measures to manage the specific construction impacts to the MLC Centre businesses. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

Issue raised

The MLC joint owners would like to further understand, when available, any potential impacts from some of the significant construction activities for the Sydney Metro project, including but not limited to:

- Site preparation, shaft and cavern excavation and spoil removal from both the Martin Place north and south work sites
- The tunnel excavation and construction
- Impacts associated with interruptions and diversions of services and communications; proposed post construction ventilation stacks (depending on where the stacks are to be located)
- Vehicular movements into and out of the Sydney Metro sites, particularly during key activities such as spoil removal.

The anticipated construction methods at the Martin Place construction sites are described in Chapter 7 of the Environmental Impact Statement, particularly in Section 7.10.7. This includes a description of the shaft and cavern excavation for the new Martin Place Station, and a description of tunnel excavation and construction.

An assessment of potential construction traffic and transport impacts around Martin Place is provided in Section 8.4.14 of the Environmental Impact Statement. This section identifies the anticipated construction vehicle numbers to and from the Martin Place construction sites during the various construction stages and vehicle access routes.

Any works to utilities would be managed to eliminate or minimise the duration of any interruption of supply to users. Where interruption would be required, potentially affected users would be notified in advance.

Consultation would continue with the MLC Centre as construction methods are refined as part of detailed construction planning. This consultation would provide an opportunity to understand the anticipated construction activities and what management and mitigation would be in place to minimise any potential impacts to the business.

7.3.2 Final design outcomes

Issue raised

The MLC joint owners request further consideration to be given to the proposed permanent closure of the direct pedestrian link from Martin Place Station to the MLC Centre, and note that the MLC Centre was not consulted on this prior to publication of the Environmental Impact Statement. MLC wish to discuss opportunities to retain, modify or provide a new pedestrian connection directly from Martin Place Station to the MLC Centre.

Response

Transport for NSW is proposing to reinstate areas of Martin Place affected by construction consistent with the City of Sydney's masterplan. This includes the relocation of the station entries within Martin Place to improve the public domain. The addition of a new metro entrance, with a direct connection to the existing Martin Place Station would provide the opportunity to fulfil this objective while maintaining accessibility to both the Sydney Metro and Sydney Trains services at this location. The proposed southern entry and exit to the metro station at Martin Place would provide efficient access between the stations and the MLC Centre using the existing footpath network.

The design of the metro station at Martin Place does not preclude a connection back into the MLC building and attempts have been made to safeguard a location for an unpaid link at concourse level. However, at this stage Transport for NSW does not propose to provide this underground link. Further, due to significant level changes and the presence of numerous services (some heritage listed) it would be difficult to provide a compliant link.

Consultation would continue with the MLC Centre during detailed design. This would include discussions around opportunities for pedestrian connectivity to the MLC Centre.
Issue raised

The MLC joint owners would like to understand how potential impacts on pedestrian movements are being addressed, specifically relating to:

- The immediate locality as a result of the works in and below Martin Place, on the eastern side of Castlereagh Street and at 37-51 Martin Place
- General pedestrian movements towards the MLC Centre, especially if the underground connections to the existing Martin Place Station, to and from the MLC Centre are closed.

Response

Section 9.4.7 of the Environmental Impact Statement provides an assessment of pedestrian integration around the Martin Place Station. This assessment found that the majority of the footpaths in the area, including the locations identified by the MLC Centre submission, would continue to operate at a level of service B or better. Level of service B is a situation when normal walking speeds are only occasionally restricted, there is some occasional conflict with passing, crossing and reverse movements.

Pedestrians travelling from Martin Place Station to the west (towards the MLC Centre) would be able to exit the station from the new southern entry and walk through Martin Place. This would also provide access to the MLC Centre.

Issue raised

The MLC joint owners have concerns about the proposed main discharge of passengers from the station onto Castlereagh Street. The current proposals appear to have circa 14,500 passengers discharging onto a three metre side footpath (Castlereagh Street). Those users then need to turn north to reach the pedestrian crossing, creating potential safety issues and 'bottle necks'. The MLC joint owners would like consideration given to extending the pedestrian crossing further south and / or discharging passengers onto the expanse of Martin Place, rather than the three metre wide Castlereagh Street footpath. Consideration on how any proposed discharge locations impact on the MLC Centre will need to be reviewed and discussed.

Response

The current design of the Martin Place Station southern entry includes a pedestrian plaza which opens onto both Castlereagh Street and Martin Place. As such, pedestrians would be able to exit the station and use the existing pedestrian crossing across Castlereagh Street without creating a bottleneck. Efficient pedestrian movements to and from the station entries is a priority and would continue to be considered during detailed design.

Issue raised

The MLC joint owners would like to ensure there is appropriate activation along the Castlereagh Street frontage that is commensurate with the current and proposed (as part of the MLC Retail Redevelopment) street environment. As one of Sydney's premier luxury shopping boulevards, MLC suggest that the current 'artistic impression' included within the Environmental Impact Statement of the Martin Place Station provides for a quality of design commensurate with the Castlereagh Street and / or Martin Place precinct, and significantly limits activation at these locations.

Street level activation at Martin Place Station (including on Castlereagh Street) would be determined during detailed design in consultation with relevant stakeholders. This would follow the place-making principles described in the Chatswood to Sydenham Design Guidelines (Appendix A of this report) including supporting the City's public domain strategies through enhancement and activation of the public domain and designing the entries at Martin Place as new public spaces. They also include guidance on the built form design in areas of heritage sensitivity. The Design Guidelines have been updated to include additional place-based details to guide the ongoing design process. The ongoing design process would also be guided by working sessions with the City of Sydney and advice from the Sydney Metro Design Review Panel.

Issue raised

The MLC joint owners would like to ensure due consideration is given to the potential adverse impacts associated with the location of ventilation shafts (the proposed location of which is currently not identifiable).

Response

Tunnel ventilation and draught relief would be provided at all station sites to provide fresh air to the stations and tunnels and aid the circulation of air. The metro trains are electric and emissions would be limited to brake dust, which would be minimised through the implementation of a regenerative brake system. Any emissions from the ventilation shafts would be in very low concentrations. On this basis no adverse impacts would be expected.

The exact location of the fresh air ventilation shafts would be determined during detailed design.

Issue raised

The MLC joint owners would request that adequate assurance is provided that no alteration to the existing solar access to the MLC Centre, particularly to the publicly accessible plaza areas. MLC request that due consideration is given to over station development in the location of the existing 39 Martin Place building and the setback of any future buildings is as per the site boundary of the existing building envelope.

Response

The aboveground elements of the metro station at Martin Place would be relatively low in height and would not affect solar access to adjacent properties.

Over station development will be subject to a separate approval processes. This will include consideration of council planning policies regarding building setbacks and solar access planes.

Issue raised

The MLC joint owners note that this Environmental Impact Statement does not cover over station development specifically, and understand that this will be addressed separately. MLC request being consulted with any proposals for the over station development as it progresses, ensuring appropriate consideration is given to how this impacts on and interfaces with both the MLC Centre, and the wider Martin Place and Castlereagh Street environments.

Response

Over station development will be subject to a separate approval processes. This will include appropriate consultation activities with neighbouring stakeholders (including MLC), and assessment of potential impacts.

7.4 Sydney Airport

7.4.1 Prescribed airspace

Issue raised

It is of vital importance that new developments around the proposed new stations, particularly at Waterloo and Sydenham, do not compromise aviation safety or reduce the efficiency of Sydney Airport by intruding into its prescribed airspace. Given the location of the land in question relative to Sydney Airport, it would appear that the Obstacle Limitation Surface (OLS), the Procedures for Air Navigation Services- Aircraft Operations (PANS-OPS) surfaces and the Precision Approach Path Indicator (PAPI) system surfaces are the relevant components of Sydney Airport's prescribed airspace. Airlines may also have developed what are called "engine out (emergency) procedures" that may also be relevant and would also need to be taken into account.

While the future development of land around new stations in general would need to have regard to airspace-related issues, the redevelopment of the area around the proposed Waterloo Station in particular is very likely to be affected. Consideration should also be given to the temporary impact on prescribed airspace of cranes and other construction equipment at the Waterloo Station and around the Marrickville dive site.

At the site around the proposed Waterloo Station, the OLS varies between 60 and 70 metres above sea level (AHD), while the PAPI and PANS-OPS surfaces are located at or around 125 metres. Therefore if the buildings constructed as part of the urban redevelopment of this area are built to this maximum height, they may penetrate the OLS.

We also note that at the Marrickville dive site, which is much closer to the airport, the OLS varies between 30 and 50 metres AHD, with the PAPI and PANS-OPS surfaces located at around 40 to 50 metres AHD. This same issue would apply to any construction equipment, such as a crane that could potentially intrude into this protected airspace, even if only temporarily. In the case of the Marrickville dive site, this issue is especially vital, as the proposed works site is located under the extended centre line of Sydney Airport's main north south runway (ie. directly in line with the runway on final approach for aircraft landing from the north or aircraft taking off to the north.)

While a structure (including a building or crane) that penetrates the OLS is not automatically prohibited, approval from the Department of Infrastructure and Regional Development is required. However, permanent intrusions of PANS-OPS are prohibited by Commonwealth law. Sydney Airport's website outlines the assessment process in more detail.

Sydney Airport would be pleased to provide you with more definitive advice in the future concerning these proposed building height limits, and work with you to reach a positive resolution to the benefit of this proposal.

Response

The highest structure on the Waterloo and Marrickville dive sites are anticipated to be the acoustic sheds at around 15 metres high. This would be below the OLS at these sites. Notwithstanding, other equipment may be located temporarily at these sites (such as cranes) and are not likely to extend above the OLS. Should extension into the OLS be required, Sydney Metro would obtain the necessary approvals.

Over station development will be subject to a separate approval processes. This process would consider the potential impacts of the over station development, including Sydney Airport airspace requirements.

7.4.2 Future employment lands

Issue raised

Another issue of importance when considering the development of land around stations is the protection of employment lands.

As Sydney Airport and Port Botany both continue to grow, an adequate supply of industrially zoned employment lands in close proximity to the airport and port will be vital to ensuring the full economic and employment benefits of such developments are realised. This will rely on zoning determinations, and particularly the maintenance of existing industrial zoned lands.

While we acknowledge the importance of boosting Sydney's housing supply, it is important that the rezoning of industrially-zoned land in close proximity to the airport, and in particular to the north of the airport, be undertaken in a coordinated manner with proper regard to the strategic planning implications. To this end, Sydney Airport have urged the Greater Sydney Commission to recognise within relevant district plans that an adequate stock of appropriately zoned employment lands in the vicinity of Sydney Airport must be protected to facilitate the airport' ongoing operation and long term growth.

Response

Issues of re-zoning and protection of employment lands are outside the scope of the Sydney Metro City & Southwest Chatswood to Sydenham project. These issues are currently being addressed by the Department of Planning and Environment and UrbanGrowth NSW.

7.4.3 Traffic impact of construction

Issue raised

The Environmental Impact Statement discusses the impact of increased construction vehicles upon local traffic at each of the work sites. Of particular interest to Sydney Airport are the Waterloo Station and Marrickville dive sites, which are sufficiently close to the airport that the increased traffic for each could impact on traffic heading to the airport.

In particular, Sydney Airport note that the southern haul route from the Waterloo Station site follows Botany Road and passes through the interchange with Mill Pond Road, Southern Cross Drive and General Holmes Drive. This is a critical intersection for traffic approaching the airport. While the modelling in the Environmental Impact Statement suggests that the impact on traffic could be minimal or even beneficial, there will nevertheless be an increase in the number of heavy vehicles on these roads at a time that coincides with the morning peak of traffic heading to the airport.

Therefore, Sydney Airport would like to request that project managers and representatives of the Roads and Maritime Services (RMS) liaise closely with the Ground Transport team at the airport throughout construction of the metro to ensure these impacts are minimised and can be well communicated to stakeholders.

An assessment of potential construction traffic and transport impacts around Waterloo Station and Marrickville dive site is provided in Sections 8.4.17 and 8.4.18 of the Environmental Impact Statement respectively. The construction traffic assessment for Waterloo Station presented two haul route options with the Mill Pond Road / Southern Cross Drive / General Holmes Drive interchange being assessed as part of the southern haul route option. This assessment found that there may be a slight deterioration in performance at the interchange during some periods. However, this interchange is already performing at or above capacity during peak periods. This assessment also assumes that all construction vehicles would use the southern haul route. In reality, it is likely that there would a split of construction vehicles between the two routes which would reduce the potential impacts described in the Environmental Impact Statement. Based on this assessment, there is not anticipated to be impacts to airport-bound traffic from the project.

Section 26.3 of the Environmental Impact Statement identifies the potential for cumulative impacts with a range of other projects during the construction of Sydney Metro Chatswood to Sydenham, including WestConnex.

Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time to minimise the potential cumulative impacts. Co-ordination and consultation with relevant stakeholders would include:

- Provision of regular updates to the detailed construction program, construction sites and haul routes
- Identification of key potential conflict points with other construction projects
- Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
 - Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
 - Co-ordination of traffic management arrangements between projects.

7.5 KU Children's Services

7.5.1 Noise and sleep disturbance

Issue raised

The Environmental Impact Statement identifies that KU Lance will be exposed to excessive and unsafe levels of noise for the duration of the project, levels well in excess of acceptable community standards. These excessive levels will continue not just for a few days and weeks, but for years.

KU Lance draw attention to the detrimental impact this noise will have on the development and safety of children attending this service. Elevated noise levels are known to create stress, and stimulate aggression and other anti-social behaviours in children, with toddlers and babies particularly vulnerable.

The levels predicted in the Environmental Impact Statement will make it difficult for children to hear speech from educators, from their peers, and from themselves. The first five years of life are critical for the acquisition and development of language skills. The ability to hear from others or yourself is essential for development of speech, and constant and excessive noise can have devastating, life-long impacts of affected children.

The unpredictable nature of the noise, for example from piling, blasting and traffic movements will add additional strain to the children and staff at this centre.

Unfortunately KU Lance has already experienced several years' of construction related noise from the site remediation works and the development of the Barangaroo Headland Park. These concerns are based on first-hand experience of construction noise. KU Lance is surrounded by rock, and we expect the reflected noise from the cliff wall behind the centre will accentuate the noise problem. The information supplied, indicates this new construction will experience even higher noise levels than previous works.

The teaching program at KU Lance includes music and storytelling as essential elements. Both of these experiences will be affected by noise disturbance. The children at KU Lance play and eat lunch outdoors. With the change in conditions to the environment, these experiences may not even be possible.

Language and social interactions go hand in hand. If children are having difficulty hearing and being heard, social interactions may be impaired, as children find it difficult to engage in conversations with each other or with staff.

General child wellbeing may also be affected by the unpredictable noises causing interruption to concentration and heightened anxiety particularly in our babies.

Unexpected noises are known to interrupt sleep patterns. The babies at KU Lance sleep at times throughout the day. While babies will sleep through background noises, the unexpected noises caused by trucks being filled with waste, metal on metal, or blasting is a concern for the child's wellbeing.

KU Lance identify that tired children are not happy children, and a child or baby being woken from deep sleep, changes their whole routine.

KU Lance expect all rooms, but especially the nursery, will require upgrades to the air conditioning unit, or additional air purifiers to create background noise to mask the unwanted external noise and increase sleep quality.

Suggested solutions include:

- Noise / sound abatement measures at the site of construction
- Acoustic shielding and vibration controls on all preparatory work
- Increased sound insulation in the building
- Green zones, and / or vertical gardens at the front and back of the building to assist with noise control
- Internal curtains to assist with noise control
- Air purifiers
- Upgraded air conditioner.

Response

The assessment of potential construction noise impacts in the Environmental Impact Statement presents a worst-case 15-minute assessment in accordance with the approach required by the *Interim Construction Noise Guideline*. This approach assumes that all construction equipment for a particular construction scenario is operating at the same time and at the closest point on the site to any receiver. In reality, construction equipment would operate at varying locations around the site and would rarely all be in use at the same time. As such, the actual noise levels experienced by individual receivers would vary throughout the construction works.

In relation to the KU Lance child care centre, the noise and vibration assessment in the Environmental Impact Statement found that:

- There are anticipated airborne noise exceedances of the noise management levels of greater than 20 dB during demolition and site establishment, between 10 and 20 dB during earthworks and construction of the aboveground station building, and up to 10 dB during station excavation works.
- Ground-borne noise levels are predicted to exceed the relevant noise management levels by up to 10 dB
- Vibration levels are predicted to comply with the relevant screening criterion

The Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report) provides the process for carrying out more detailed construction noise and vibration impact statements prior to each construction activity based on further understanding of the construction equipment and construction processes, which would be confirmed during detailed construction planning. This process would provide further detail regarding the actual noise levels which would be experienced by individual receivers.

As part of this process, consultation would be carried out with KU Lance (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to the KU Lance child care centre.

The Construction Noise and Vibration Strategy also provides a list of standard noise mitigation measures which would be implemented at all construction sites for the project. This includes some of the measures identified by KU Lance including noise abatement measures at the construction site and acoustic shielding.

7.5.2 Dust

Issue raised

KU Lance expect dust and perhaps other airborne problems will change the environment at KU Lance. KU Lance are very concerned about the impact of dust and any other airborne particles on children and staff. KU Lance have many children with respiratory conditions, including asthma, and are concerned that the increase in dust and other contaminates in the environment will impact on the ability of the children to use the outdoor play spaces.

The nature of known contaminants on the Barangaroo site, including asbestos, heavy metals, PCBs and other toxins that will be disturbed during the construction phase, is of great concern.

Suggested solutions include:

- Green zones, and / or vertical gardens at the front and back of the building to assist with airborne contaminant control
- Upgraded air conditioner
- Air purifiers
- Compensation for extra cleaning costs to reduce dust and airborne contaminates that cause respiratory problems
- Measures to absorb dust possibly including the installation of screens.

Section 22.4 of the Environmental Impact Statement provides an assessment of potential air quality impacts of the project. This assessment found that dust emissions from the project would be readily manageable to appropriate standards through the implementation of standard mitigation measures such as installing hard surfaces on long term haul routes and regularly damping down unsurfaced work areas (as identified in Section 22.6 of the Environmental Impact Statement and revised in Chapter 11 of this report).

Specific consultation (as per mitigation measure SO2) would be carried out with sensitive community receivers (such as child care facilities) potentially impacted during construction. This consultation would aim to identify and develop specific measures to manage construction impacts for individual sensitive community and business receivers.

The Barangaroo Station site is identified as having high and moderate contamination risks. The location of the former gasworks along Hickson Road at Barangaroo would represent a high risk and is a known source of contamination including hydrocarbons, heavy metals and metalloids in soil and groundwater and potential vapour issues. Reclaimed land within Barangaroo represents a moderate risk and is a known source of isolated contamination associated with unknown historical use and potential waste materials within the soil (ie metals, hydrocarbons, pesticides, PCB, asbestos and gasworks wastes). Further desktop contamination assessments would be carried out for the Barangaroo Station site to determine whether detailed contamination assessments, including collection and analysis of soil and groundwater samples are required (refer to mitigation measure SCW1 in Chapter 11 of this report). This would inform remediation and management plans.

7.5.3 Increased traffic and impact on parking access

Issue raised

KU Lance expect that traffic around KU Lance will increase dramatically. These concerns are for the safety of children being dropped off and collected.

Additional parking is required for the safe drop off and collection of children.

Response

Construction traffic to and from the Barangaroo construction site is anticipated to travel along Hickson Road to access the Western Distributor. KU Lance is accessed from High Street which is separated from Hickson Road by the Hickson Road wall. There is not anticipated to be any construction traffic on High Street associated with the project. As such, there is not anticipated to be any impacts to child safety associated with the drop off and collection of children from KU Lance.

7.6 Labsonics

7.6.1 Noise management levels

Issue raised

This company is the most sensitive of sensitive receivers, and have the absolute need to retain our current Studio background noise level of 25dB (as correctly reported in Environmental Impact Statement), and need to do so with zero intermittent, nor any other kind of increase to it.

The recommended "acceptable" level of L_{Aeq} + 5dB is unacceptable to the function of the Studios.

Furthermore, the *Interim Construction Noise Guideline* recommendation for higher levels of noise intrusion during working hours is precisely opposite to those that serve our functional needs.

The noise and vibration assessment in the Environmental Impact Statement was carried out in accordance with the Secretary's environmental assessment requirements. In particular, noise management levels for receivers were set based on guidance provided in the *Interim Construction Noise Guideline*.

A revised assessment of construction noise impacts at Crows Nest Station is provided in Section 9.6.1 of this report. In relation to Labsonics, this assessment found that:

- There are predicted exceedances of the airborne noise management levels of greater than 20 dB during enabling works, earthworks, construction of the acoustic shed and construction of aboveground station buildings; and predicted exceedances of 10 to 20 dB during excavation working during the daytime
- Ground-borne noise levels at Labsonics could be higher than 75 dB during the daytime period.

These predicted noise levels are based on a worst-case 15-minute assessment carried out in accordance with the approach required by the *Interim Construction Noise Guideline*. This approach assumes that all construction equipment for a particular construction scenario is operating at the same time and at the closest point on the site to any receiver. In reality, construction equipment would operate at varying locations around the site and would rarely all be in use at the same time. As such, the actual noise levels experienced would vary throughout the construction works.

It is acknowledged that some receivers are particularly sensitive to noise and vibration at different periods of the day. This would be considered as part of the Construction Noise Impact Statement process (described in the Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report)). As part of this process, consultation would be carried out with Labsonics (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to Labsonics' operations.

7.6.2 Noise impacts

Issue raised

Labsonics note that it is proposed for special sensitive receivers such as their facility to receive the site specific assessment attention required. However, their submission notes that excessive airborne, and especially structure-borne ground noise intrusion, as generated by blasting, rock breaking, jack hammering, excavators, bulldozers, pile drivers etc., will be almost impossible to mitigate if it is proximate.

Labsonics note that the Environmental Impact Statement identifies that as a possible additional mitigation measure Sydney Metro may provide alternative accommodation in some cases.

However, Labsonics know of no vacant commercial standard recording studios of matching size elsewhere in the city and consequently regard the proposal as likely impossible to fulfil. In which case, Labsonics remain exposed to the very real possibility of total commercial extinction at worst, or major commercial damage at least.

Given that works are scheduled to start at the end of this year / early next, and that a major lead time of 12 months minimum would be required to make any alternative arrangements – provided the assumed Government compensation allows it – the matter is now urgent.

Accordingly, with genuine urgency, Labsonics requests advice as to how Sydney Metro proposes to manage, compensate, assist or otherwise deal with the potentially massive commercial damage the project will cause to the organisation.

Consultation would be carried out with Labsonics (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to the Labsonics business. This would include a detailed examination of all high impacting construction activities. Where feasible and reasonable, specific mitigation and management measures would be identified that would best meet the requirements of maintaining the operations of the business. This would include consideration of alternative construction methods, adjustments of working hours around key period for the Labsonics business and / or options for adjustments to the Labsonics business hours around required construction activities. This consultation process would also aim to identify noise and vibration attenuation measures already in place at the Labsonics business and refine the potential noise and vibration impacts.

7.7 Seven Network

7.7.1 Noise and vibration assessment methodology

Issue raised

The Environmental Impact Statement refers to Australian standard AS2107 which specifically provides that it is not intended for the assessment of construction noise or railway noise.

Response

Australian Standard AS2107 was used in the construction noise assessment to determine the relevant construction noise management levels for some sensitive receiver types where the *Interim Construction Noise Guideline* does not provide guidance. AS2107 was not used as part of the operational noise assessment. The construction assessment was carried out in accordance with the Secretary's environmental assessment requirements for noise and vibration – amenity and noise and vibration – structural, and the *Interim Construction Noise Guideline*. In this context, the use of AS2107 is considered appropriate.

Issue raised

Although our Martin Place premises have been identified as a sensitive receiver in the Environmental Impact Statement with sensitivity similar to a theatre, the Environmental Impact Statement has not examined in detail the impacts of the construction noise and vibration on the Seven Network, nor set appropriate criteria.

The external noise level of 79 dB(A) indicated in the Environmental Impact Statement for our premises for construction works:

- Exceeds both the general commercial limit of 70 dB(A) nominated in the Environmental Impact Statement and the external limit of 50 dB(A) nominated for a television station in the Environmental Impact Statement
- Would not provide a satisfactory internal area for our staff and would present issues with respect to broadcasts to air within our studio.

Response

Appropriate criteria for the Seven Network building have been set for both construction and operation in accordance with the *Interim Construction Noise Guideline* (for construction) and the *Rail Infrastructure Noise Guideline* (for operation).

Section 10.4.8 of the Environmental Impact Statement notes that construction noise levels are predicted to be up to 79 dBA at the external façade of the Seven Network building. This section also notes that this level would be similar to external noise levels from heavy vehicles and buses using Castlereagh Street and general city noise. Internal noise levels would be much lower given the attenuation by the building walls and glass.

Consultation would be carried out with the Seven Network (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to the Seven Network.

Issue raised

There is no assessment of ground-borne vibration from construction activities being regenerated into the Seven Network's premises.

Response

Potential ground-borne noise impacts are assessed in Section 10.4.8 of the Environmental Impact Statement, with specific building mapping provided in Technical Paper 2: Noise and vibration. This assessment found that ground-borne noise at the Seven Network building would comply with the relevant noise management levels.

Issue raised

There is no discussion in the Environmental Impact Statement as to the internal noise levels within our premises during construction that would be a combination of external noise and regenerated noise from ground-borne vibration.

Response

Noise levels within a building from construction works would generally be dominated by either airborne or ground-borne noise. The dominant noise type would depend on factors such as the type of construction works occurring and the nature of building itself. It would be rare that airborne noise and ground-borne noise would combine to result in a higher noise level. As a result, noise assessments do not typically provide a combined noise level from airborne and ground-borne noise.

As indicated above, internal noise levels are not expected to change significantly during construction of the project given that predicted external noise levels are similar to those currently experienced – due to buses and heavy vehicles on Castlereagh Street.

Issue raised

The nominated maximum internal limit that should be required to apply to the Seven Network studios and edit suites is NR25 for both the construction and operation of the Sydney Metro. This level would comply with the nominated 30 dB(A) Leq level suggested for the studio in the Environmental Impact Statement.

Response

Appropriate criteria for the Seven Network building have been set for both construction and operation in accordance with the *Interim Construction Noise Guideline* (for construction) and the *Rail Infrastructure Noise Guideline* (for operation).

For operational rail noise, the project would meet the nominated maximum internal limit of NR25 for the Seven Network building.

Construction noise management levels are typically higher than operational noise objectives given the temporary nature of construction activity. Issues concerning construction noise have been addressed elsewhere in this response to the Seven Network.

7.7.2 Construction noise and vibration impacts

Issue raised

Seven Network's concerns need to be considered in the context of the nature of the premises.

The broadcast studio, the edit suites and the newsroom (although a busy area) require a quiet environment.

The Seven Network's premises also include high-tech equipment that is sensitive to vibration.

The master control room is used to monitor transmission and bring in live local, national and international feeds. The redundant presentation site provides a back-up presentation system for the entire network. It can control the programming and advertising content for all national markets if required. The central technical area room houses all major technical equipment to facilitate the production of television programs within our premises. The equipment includes back-end servers to support the newsroom workflow systems, graphics devices, media storage services and similar such equipment. The technical equipment has a total value in the millions of dollars. This area also includes multiple hard disk drives which are sensitive to vibration. Potentially high vibration could cause the failure of the hard disk drives, which could prevent the Seven Network's ability to produce programming from its Martin Place premises.

The Seven Network's concerns are based on reality, not on fear. Unfortunately, the Seven Network has already had experience of the disruption caused to our operations at Martin Place as a result of demolition and construction works. In 2012, the Seven Network had to take urgent injunction proceedings in the Land and Environment Court against the owner, developer and builder of 52 Martin Place in relation to construction noise and vibration as a result of refurbishment works carried out to the building. The proposed construction works for the Sydney Metro undertaken in Martin Place will be substantially greater than the refurbishment works that were carried out at 52 Martin Place.

Response

It is acknowledged that the Seven Network building is particularly sensitive to noise and vibration impacts due to the nature of equipment and activities carried out within the building.

- The noise and vibration assessment carried out as part of the Environmental Statement found that:
- Airborne construction noise levels are predicted to be up to 79 dBA at the external façade of the Seven Network building. This level would be similar to external noise levels from heavy vehicles and buses using Castlereagh Street and general city noise. The building external to internal noise reduction would therefore adequately attenuate noise from the works to the Seven Network building
- Ground-borne noise levels are predicted to comply with the relevant noise management level
- Vibration levels would comply with the relevant cosmetic damage screening criterion.

Notwithstanding, it is acknowledged that equipment in the Seven Network building would be more sensitive to vibration impacts.

Consultation would be carried out with Seven Network (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to the more sensitive equipment in the Seven Network building. This would particularly include detailed examination of all high noise impacting construction activities. Where feasible and reasonable, specific mitigation and management measures would be identified that would best meet the specific requirements of the Seven Network. This would include consideration of alternative construction methods and adjustments of working hours around key periods for the Seven Network. This consultation process would also aim to identify noise and vibration attenuation measures already in place at Seven Network and if feasible and reasonable refine the potential noise and vibration impacts.

7.7.3 Dust management

Issue raised

Seven Network's high tech equipment also requires a relatively clean environment. Dust can damage the equipment by blocking or reducing airflow into the individual cooling fans and filters on each piece of equipment.

Seven Network request a commitment to address dust generation and management in the vicinity of the Martin Place premises.

Response

Section 22.4 of the Environmental Impact Statement provides an assessment of potential air quality impacts of the project. While it is acknowledged that the Seven Network building contains equipment which is particularly sensitive to dust, potential dust emissions from the project are anticipated to be minor and would be managed to applicable standards through the mitigation measures, such as installing hard surfaces on long term haul routes and regularly damping down unsurfaced work areas, identified in Chapter 11 of this report.

7.7.4 Operational noise and vibration

Issue raised

The Environmental Impact Statement indicates that standard track attenuation in the vicinity of Seven Network's Martin Place premises is proposed. Seven Network request that if standard track attenuation would not be able to achieve the nominated maximum internal limit of NR25 at the Seven Network's premises, then high attenuation track or very high attenuation track measures should be used.

Seven Network request a commitment that consideration will be given by Transport for NSW and the Department of Planning and Environment to implementing high or very high attenuation track measures, and not standard attenuation measures at Martin Place.

Response

The project has been designed with the aim of achieving the noise and vibration objectives from the *Rail Infrastructure Noise Guideline*. Further, the assessment has been carried out to meet the Secretary's environmental assessment requirements and in accordance with the *Rail Infrastructure Noise Guideline*.

For the Seven Network building, a design objective of NR25 has been established. The operational noise level at this building is predicted to be less than NR23 with standard attenuation track treatment.

7.7.5 Role as an emergency broadcaster

Issue raised

Seven Network request a commitment to address the function of the Seven Network as an emergency broadcaster and the continuity of service of the fibre optic network used to send our broadcasts.

Response

The role of the Seven Network as an emergency broadcaster is acknowledged. Any works to utilities would be managed to eliminate or minimise the duration of any interruption of supply to users. This would include consideration of the need to maintain utility supply to key locations such as the Seven Network as an emergency broadcaster. Where interruption would be required, potentially affected users would be notified in advance.

7.7.6 Ongoing consultation

Issue raised

The Seven Network must be given individual briefings on a fortnightly basis throughout the Sydney Metro project about the impacts of construction activities and mitigation measures that will be implemented by Transport for NSW.

Response

Transport for NSW would continue to engage closely with stakeholders and affected properties owners and occupiers through all stages of design, planning, and construction.

The Construction Environmental Management Framework (Appendix B of this report) provides the communication and consultation strategy for the project. A range of communication methods would be used including briefings to communicate the progress of works, impacts and mitigation measures to affected stakeholders, as well as other activities such as construction notifications, doorknocks, emails, newsletters, and advertising. Further information on consultation during construction is provided in Chapter 4 of this report.

Transport for NSW would continue to consult with the Seven Network. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

7.8 NSW Masonic Club and Castlereagh Boutique Hotel

7.8.1 Aboveground building and over station development

Issue raised

It is acknowledged that the future above-station development does not form part of the Environmental Impact Statement and will be subject to further development consent. It is recommended that a six metre setback is required of any above-ground development associated with Pitt Street Station (north). Such a setback would enable the preservation and enhancement of the heritage listed building and facilitate increased ventilation and amenity. The NSW Masonic Club and Castlereagh Boutique Hotel would seek to be involved in community consultation processes associated with the design and assessment of the Pitt Street Station (north) development.

Response

The suggestion by the NSW Masonic Club and Castlereagh Boutique Hotel regarding setbacks for new over station development is acknowledged.

The Chatswood to Sydenham Design Guidelines (Appendix A of this report) include design requirements for aboveground station buildings. This would include consideration of adjacent heritage items.

Over station development would be subject to a separate planning approval process. This will consider potential impacts neighbouring properties and consideration of council planning policies regarding building setbacks, heritage and solar access planes.

7.8.2 Noise and vibration

Issue raised

For the purposes of construction, the Environmental Impact Statement identifies and classifies each of the uses surrounding the proposed construction works. The subject site is inaccurately classified as commercial receiver, rather than a residential receiver. As such the assessment of predicted noise and vibration impacts and exceedance of appropriate standards is inaccurate. It is important that all future assessments and management plans identify the NSW Masonic Club and Castlereagh Boutique Hotel as a residential receiver, and therefore apply the relevant sensitive receiver requirements.

Response

It is acknowledged that the NSW Masonic Club and Castlereagh Boutique Hotel was incorrectly classified as a commercial receiver in the Environmental Impact Statement. Section 2.5 of this report provides a clarification of these receiver types and an assessment of the potential construction noise impacts.

With respect to the NSW Masonic Club and Castlereagh Boutique Hotel, the revised assessment indicated the following:

- Predicted exceedances of the airborne noise management levels of between 10 and 20 dB during enabling works and earthworks, and of up to 10 dB during aboveground station construction. Compliance with noise management levels are predicted during other activities including excavation of the station
- Internal ground-borne noise levels during rock breaking works would be greater than 75 dB during the daytime. The overall duration of this impact could be potentially reduced from around 24 days to around 13 days through the adoption of blasting as an alternative excavation technique.

Issue raised

The Environmental Impact Statement suggests that out of hours works will be required for a number of significant development scenarios, including excavation of station shafts, excavation of station caverns, operation of tunnel boring machines and spoil removal and transportation from site. Given the proposed nature of works and uses to be located in the Pitt Street Station (north) site, out of hours works will be required and likely adversely impact acoustically and vibrationally the NSW Masonic Club. Further information is required to demonstrate the ability of the proposed works to comply with the *Interim Construction Noise Guidelines* that recommends maximum internal noise levels for a Hotel of 50dBA for bars and lounges in the daytime and evening, and 40dBA for sleeping areas at night-time.

Response

Since the development of the Environmental Impact Statement, ongoing construction planning has identified that rock breaking for Pitt Street Station would no longer be required outside of standard construction hours. This would greatly reduce the potential airborne and ground-borne noise impacts during the more sensitive night-time period. Support station excavation activities would still occur up to 24 hours per day and seven days per week. Mitigation measures would be implemented on the site to manage the impacts of noise and vibration. Further information is provided in Section 9.6 of this report.

The revised assessment found that out of hours excavation supporting works would comply with the applicable noise management levels at the NSW Masonic Club and Castlereagh Boutique Hotel.

Issue raised

The NSW Masonic Club has concerns regarding the proposed management of vibration noise sources. Further information is required to demonstrate that ability of the proposed works to not exceed the maximum noise management level of 40dBA on all Hotel floors, particularly those including components of accommodation and not exceed maximum perceived levels of noise and vibration.

Response

The ground-borne noise assessment found that during rock breaking excavation works internal ground-borne noise levels would be greater than 75 dB during the daytime at the NSW Masonic Club and Castlereagh Boutique Hotel. As identified above, further construction planning has identified that rock breaking works would no longer be required outside of standard construction hours. As such, ground-borne noise impacts at night from station excavation works are not anticipated at the NSW Masonic Club and Castlereagh Boutique Hotel.

The overall duration of this impact could be reduced from around 24 days to around 13 days through the adoption of blasting as an alternative excavation technique. All blasts would be designed to meet applicable noise and vibration standards.

Issue raised

The Environmental Impact Statement identifies a number of trucks will be servicing the Pitt Street Station (north) site. Further information is required to demonstrate that appropriate noise protection is implemented to ensure compliance with the maximum noise management level of 40dBA for the hotel as a sensitive receiver.

Response

Noise impacts from construction vehicles has been assessed based on guidance in the *Road Noise Policy*. This assessment (provided in Section 10.4.9 of the Environmental Impact Statement) indicated that the predicted noise level increase associated with construction traffic would exceed the base criteria, however the increase would comply with a 2 dB allowance (2 dB is generally the limit noticeable by the human ear – as such increases of less than 2 dB are considered to be negligible).

Issue raised

The Environmental Impact Statement identified that during construction, generators will be located adjoining the boundary of the NSW Masonic Club and Castlereagh Boutique Hotel. It is requested that the acoustic impacts to Club members and Hotel guests are appropriately addressed by detailed construction management plans. The Club and Hotel must be consulted during preparation and approval of more detailed design and management plans to ensure all off-site acoustic impacts as a result of the Sydney Metro are mitigated.

Response

The presence of generators on the site has been considered in the predicted noise impacts for Pitt Street Station as provided in Section 9.6 of this report. Mitigation measures provided in Chapter 11 of this report would be implemented to further reduce the potential noise impacts, including consideration of the layout of construction sites to identify opportunities to shield receivers from noise as well as the possibility of enclosures.

Transport for NSW would continue to consult with the NSW Masonic Club and Castlereagh Boutique Hotel. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

Issue raised

Given the structural interface of the hotel and proposed station, the Hotel use is not isolated and therefore is increasingly susceptible to ongoing vibration impacts associated with the operation of the station and metro. It is recommended that the proposed rail track bed is isolated from the station to ensure compliance with Australian Standard AS/NZS 2107.

Response

The project has been designed with the aim of achieving the noise and vibration objectives from the *Rail Infrastructure Noise Guideline*. Further, the assessment has been carried out to meet the Secretary's environmental assessment requirements and in accordance with the *Rail Infrastructure Noise Guideline*.

The indicative track form for the current design of the tunnels, trains and operations (which has been determined to meet the noise and vibration trigger levels from the *Rail Infrastructure Noise Guideline*) is shown in Section 11.4.1 of the Environmental Impact Statement. For the area in the vicinity of the NSW Masonic Club and Castlereagh Boutique Hotel, the need for high attenuation track has been identified.

As identified in Section 6.3.1 of the Environmental Impact Statement, the tunnel alignment is indicative at this stage, and has been used for the purposes of the noise assessment. During detailed design the alignment may change (horizontally and / or vertically). Any changes to the alignment would be reviewed for consistency with the assessment contained in this Environmental Impact Statement including relevant mitigation measures, performance outcomes and any future conditions of approval. The final track form would be confirmed as part of detailed design and would meet the requirements of the *Rail Infrastructure Noise Guideline*. Transport for NSW would continue to engage with the NSW Masonic Club and Castlereagh Boutique Hotel regarding any changes to the alignment.

Issue raised

It is also noted that construction noise and vibration is expected to increase as a result of the cumulative noise and vibration from the Sydney Metro Chatswood to Sydenham over station development, the CBD and South East Light Rail and the 115-119 Bathurst Street redevelopment. It is recommended that all NSW Masonic Club and Castlereagh Hotel southern and eastern windows are double glazed to assist in the mitigation of the projected acoustic impacts.

Response

Section 26.3 of the Environmental Impact Statement identifies the potential for cumulative impacts with a range of other projects during the construction of Sydney Metro City & Southwest Chatswood to Sydenham project. This included consideration of nearby the 115-119 Bathurst Street redevelopment and CBD and South East Light Rail.

Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time to minimise the potential cumulative impacts. Co-ordination and consultation with relevant stakeholders would include:

- Provision of regular updates to the detailed construction program, construction sites and haul routes
- Identification of key potential conflict points with other construction projects
- Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
 - Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
 - Co-ordination of traffic management arrangements between projects.

The predicted noise impacts from the project are provided in Section 9.6 of this report and outlined above. Based on these predicted impacts, mitigation measures such as at-property treatments are not considered to be justified.

7.8.3 Structural engineering Issue raised

Given the structural nature of the building, it is considered to be very susceptible to both movements and vibration transmission. Although the nominated vibration limit of 7.5 mm/s for a sensitive receiver is structurally appropriate to the NSW Masonic Club and Castlereagh Boutique Hotel, the high level of vibration will potentially significantly exceed the acceptable perceived vibration for guests.

Response

As people will hear vibration before they feel it, the noise and vibration assessment uses the ground-borne noise assessment as a proxy human comfort vibration assessment. It is acknowledged that there may be periods during construction when the human comfort vibration management levels would be exceeded in the NSW Masonic Club and Castlereagh Boutique Hotel.

To minimise the frequency and duration of these impacts, blasting is proposed as an alternative excavation technique. All blasts would be designed to meet applicable noise and vibration standards. Additional investigation has also been carried out regarding demolition techniques. The proposed requirements in relation to demolition works would include the implementation of demolition methodologies that limit the use of hydraulic hammers, rock breakers and other appliances that emit high noise and vibration levels.

Transport for NSW would continue to engage with the NSW Masonic Club and Castlereagh Boutique Hotel as construction methodologies are finalised. Once construction is underway, consultation would occur with the NSW Masonic Club and Castlereagh Boutique Hotel prior to high noise and vibration works commencing.

Issue raised

The most significant structural impact to the NSW Masonic Club and Castlereagh Boutique Hotel will occur during the demolition phase of the proposed Sydney Metro works. Likely adverse impacts include

- Excessive vibration from continuous rock-hammering
- Excessive vibration from isolated rock blasting
- Foundation movements from stress-relief of large and deep excavations
- Underpinning and or shoring works to retain the NSW Masonic Club site's footings and basement floor-slab.

The potential for concussive impact on the southern wall of the NSW Masonic Club and Castlereagh Boutique Hotel site is very high, and the demolisher's Work Plan must state particular attention to this aspect, of ensuring appropriate separation of the two buildings at all times. It is understood that this may require careful manual demolition at specific times of the demolition work.

Response

The potential impacts to adjoining structures during demolition work is acknowledged. Additional investigation has also been carried out regarding demolition techniques. As an example, the proposed requirements in relation to demolition works would include the implementation of demolition methodologies that limit the use of hydraulic hammers, rock breakers and other appliances that emit high noise and vibration levels.

The methodologies would include, as a minimum:

- Using hydraulic concrete shears in lieu of hammers / rock breakers for the removal perimeter walls where practical
- Using hydraulic concrete shears in lieu of hammer / rock breakers for the removal of the lower levels of the building where practical
- Using demolition sequencing to shield noise sensitive neighbours from high noise levels by retaining wall elements adjoining / shielding those properties to the end of the demolition sequence (eg floor by floor leaving the perimeter wall that aids noise screening to the end)
- Locating demolition material removal areas away from the nearby noise sensitive neighbours (schools, childcare, forecourt retail, etc)
- Developing construction working hours that provide respite to neighbouring properties during the higher noise output activities (this would include works that do not use high noise level appliances but create high noise levels when assessed against background and residential noise standards)
- Developing construction methodologies that would minimise structural-borne noise to buildings that are connected or the cavity between buildings is or is likely to be bridged – this would include separating the structural connection prior to demolition through saw-cutting and propping, using hand held splitters and pulverisers or hand demolition in short respite periods (at the most advantageous times)
- Installing sound barrier screening to scaffolding facing noise sensitive neighbours where the noise and vibration management plan investigations indicate that the neighbouring property / occupancy would receive noise levels higher than the levels determined by Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report)
- Modifying demolition working sequencing and / or hours to reduce noise and dust emissions during peak pedestrian and adjoining neighbour outdoor activities and movements.

Issue raised

The subject site is currently well maintained and in good condition. The exterior and interior condition of the building fabric should be comprehensively recorded in dilapidation survey reports to be undertaken at various stages of construction and operation of the metro. It is recommended that dilapidation surveys be completed at the following stages:

- Prior to any works commencing (just before demolition works commence)
- After demolition, but prior to excavation and commencement
- Prior to commencement of the station construction; and completion of the works and opening of the Pitt Street Station (north).

The dilapidation surveys should be complemented by concurrent noise and vibration assessment to measure the direct impact to the building. It is also recommended that the use of deep vertical rocksaw cuts parallel to the site's southern boundary be done ahead of nearby rock-hammering so as to isolate rock-mass below the NSW Masonic Club and Castlereagh Boutique Hotel building from on-going vibration.

Given the projected accumulation of acoustic, geotechnical and vibrational impacts, it is likely that structural impacts may impose irreversible damage to the heritage listed structure, detrimentally impacting the significant internal and external fabric of the building.

Existing condition surveys would be offered to the owners of all buildings with the potential to be affected by the project. The process for carrying out existing condition surveys is provided in the Construction Environmental Management Framework (Appendix B of this report).

In relation to potential vibration impacts, a conservative cosmetic damage screening criterion of 7.5 mm/s has been set for the NSW Masonic Club and Castlereagh Boutique Hotel as a heritage listed item. The assessment in the Environmental Impact Statement found that demolition of existing adjacent and adjoining structures may result in vibration impacts above the screening level for cosmetic damage. In this case a more detailed site specific assessment of the structure would be carried out to ensure vibration levels remain below an appropriate limit for the structure.

The NSW Masonic Club and Castlereagh Boutique Hotel would be offered a building condition survey prior to works commencing.

The need for rocksaw cuts on the boundary prior to rock hammering would be determined during detailed construction planning based on more detailed geotechnical information.

7.8.4 Traffic and pedestrian management

Issue raised

The primary traffic and pedestrian management concerns for the Masonic Club include:

- There is only a single access to the Hotel and Club, available from the Castlereagh Street frontage. No alternative access / loading points exist nor can any be implemented
- It is indicated in the Environmental Impact Statement that road network closures may be required to facilitate construction. The Pitt Street Station is identified for full or partial temporary closure at night time only. Given the range of commercial, retail and residential (tourist accommodation) uses located on a site, requiring 24/7 access via a single access fronting Castlereagh Street, it is essential the pedestrian and vehicular traffic on Castlereagh Street is not temporarily or permanently closed at any time.

Accordingly, the following recommendations are made:

- The retention of existing loading facilities and taxi zones located on the site's street frontage should be incorporated into the detailed construction traffic management plan, as these facilities are fundamental to the continued operation of the Hotel
- The Hotel should be consulted prior to any changes either temporary or permanent being made to the existing parking, drop-off and loading zone
- Construction traffic, particularly traffic that employs the secondary traffic route identified along Castlereagh Street, should be managed to ensure only low levels of light vehicles use this route to limit the commercial impact of all uses on the NSW Masonic Club site
- It is noted in the Environmental Impact Statement that construction vehicles will load and unload inside the construction site to minimise impacts to bus travel times along Elizabeth, Castlereagh and Park streets. It should be conditioned that no construction trucks and vehicles park on-street along Castlereagh Street.

Response

The recommendations of the NSW Masonic Club and Castlereagh Boutique Hotel are acknowledged and would be considered in the development of Construction Environmental Management Plans and implemented if feasible and reasonable. The assessment of potential construction traffic and transport impacts around Pitt Street (refer to Section 8.4.15 of the Environmental Impact Statement) found that construction vehicles would have a negligible impact on the surrounding road network.

Furthermore, access to the NSW Masonic Club and Castlereagh Boutique Hotel would generally be maintained during construction and there would be no proposed access restrictions or changes to loading and taxi zones on Castlereagh Street during construction. However, temporary night-time partial road closures may be required, which would be managed in consultation with the relevant road authority. In this event, notification would be provided to potentially impacted properties in advance and alternative arrangements provided where feasible and reasonable.

Further, as identified in Chapter 4 of this report, notification of any works which may disturb businesses would be provided at least seven days prior to those works commencing. Transport for NSW would continue to consult with the NSW Masonic Club and Castlereagh Boutique Hotel. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

7.8.5 Geotechnical

Issue raised

The primary geotechnical issues raised are:

- If the proposed excavation is brought up to the NSW Masonic Club's southern boundary, and the Hotel is not founded on consistent medium strength rock (as expected by records), it will be necessary for the relevant Metro contractors to progressively and carefully underpin the Hotel
- Significant excavation to the station platform will allow the adjacent intact rock to stress relieve and move inwards towards the excavation. The potential impact of this movement is that the building will stretch, giving rise to cracking within the structure. This potential impact reinforces the recommendations made above concerning dilapidation surveys.

As a result, it should be conditioned that a two to three metre buffer zone is required between the proposed excavation and the Hotel foundations.

Response

Ground movement typically results from either the release or redistribution of stress in rock formations during excavation, or from ground consolidation following the drawdown of groundwater (during construction and / or operation). While the specific risk to buildings and structures due to ground movement depends on geotechnical conditions, distance from construction activities and building characteristics, preliminary ground movement contours indicate that for most of the project alignment there would be a negligible ground movement risk, with superficial damage to buildings unlikely. Some buildings and structures close to station and dive sites excavations may be at risk of superficial damage and therefore may require future building strain and structural assessment to address settlement related risks.

Mitigation measure GWG1 commits to the development of a detailed geotechnical model that would allow more specific assessment of the potential for damage to structures, services, basements and other sub-surface elements through settlement or strain. Where building damage risk is rated as moderate or higher (as per adopted risk based criteria), a structural assessment of the affected buildings and structures would be carried out and specific measures implemented to address the risk of damage. The requirement for a two to three metre buffer zone would be subject to the outcomes of a detailed geotechnical investigation that would be carried out as part of the detailed design process.

As noted above, existing condition surveys would be offered to the owners of all buildings with the potential to be affected by the project. The process for carrying out existing condition surveys is provided in the Construction Environmental Management Framework (Appendix B of this report). The need (or otherwise) to underpin adjacent structures would be determined during detailed design based on more detailed geotechnical information.

7.8.6 Air quality

Issue raised

The submission suggests that the Air Quality Assessment and Construction Environmental Management Plan that informed the Environmental Impact Statement are highly inadequate. The detailed discussion of the potential impacts to be experienced at each work site is not provided within the air quality assessment and in the case of the Pitt Street Station, no discussion of the demolition works and potential for contamination from this demolition is provided.

The Environmental Impact Statement does not provide any level of certainty that:

- The activities to be performed at any location have been fully characterised
- The impacts which may arise as a result of those activities have been appropriately considered
- The level of management, mitigation and monitoring are sufficient to manage those impacts.

The submission advocates that a major re-assessment of air quality impacts be performed for this project. Upon completion of this re-assessment, opportunities for public consultation should occur to ensure that submissions can be made regarding direct impacts projected for land uses such as the NSW Masonic Club and Castlereagh Boutique Hotel.

Response

The assessment provided in the Environmental Impact Statement is considered appropriate in terms of the potential level of impact of the project.

This assessment included:

- The location of sensitive receivers around construction sites
- The potential impacts associated with dust emissions (including potential hazardous materials on contaminated soils and from the demolitions of buildings)
- The types of activities with the greatest potential to generate dust.

The assessment identifies that potential dust impacts would be minor and would be readily manageable with the implementation of well understood and tested standard environmental mitigation measures provided in Chapter 11 of this report. This includes managing demolition to minimise dust generation.

7.8.7 Operational impacts to NSW Masonic Club

Issue raised

The aforementioned acoustic, vibration, structural engineering, traffic and pedestrian, geotechnical and air quality impacts have the potential to both individually and cumulatively significantly impact the commercial operation of the NSW Masonic Club and Castlereagh Boutique Hotel. The Club and Hotel has been part of Sydney's CBD fabric and character for nearly 100 years and this contribution should not be lost or "glossed over" despite the broader public benefit arguments for such a significant piece of new infrastructure as a metro system. Unless potential impacts identified in this submission are addressed, the real risk is that the Club and Hotel will be lost.

For this reason, it is disappointing that the Environmental Impact Statement fails to truly analyse economic costs and benefits at a granular scale to give our client any comfort that their use can viably continue. The EIS lacks sufficient detail to qualify or quantify the commercial impact to the NSW Masonic Club and Castlereagh Boutique Hotel. Our analysis highlights that the Masonic Club and Castlereagh Boutique Hotel is itself an already highly constrained property and therefore has little tolerance to any significant disturbance to its physical neighbourhood. These issues must be properly managed and in our opinion, the Environmental Impact Statement does not provide any comfort that these issues can be effectively managed without affecting the ongoing viability of the Masonic Club and Castlereagh Boutique Hotel.

The NSW Masonic Club and Castlereagh Boutique Hotel has recently experienced the unfavourable commercial impacts of demolition and construction phases associated with an adjoining site, the ANZ Tower. During the redevelopment of the adjoining site, the Castlereagh Boutique Hotel on the upper 6 floors of the NSW Masonic Club, experienced a 20 per cent decline in patronage, due to guest's exposure to adverse impacts associated with accessibility, noise, vibration, air quality and amenity. Although these impacts were considered compliant by relevant approval conditions and standards, Castlereagh Hotel guests perceived these impacts as adverse to the functionality of the building and significantly diminishing the quality of the Castlereagh Hotel experience. This resulted in a significant impact to the commerciality of the Hotel, questioning its ability to adequately function in similar circumstances in the future.

It is important to note that since that redevelopment, guest experiences are increasingly shared and distributed on social media networks such as TripAdvisor. Should the projected unacceptable impacts of the construction and operation of the Sydney Metro hinder the guest experience, it is likely that the commercial viability of both the NSW Masonic Club and Castlereagh Boutique Hotel will be threatened.

The aforementioned key issues highlight that the proposed construction and operational works associated with the Metro, and particularly the Pitt Street Station (north), will have a significant impact on the southern façade of the NSW Masonic Club. With more than 40 habitable rooms directly adjoining the southern façade, and a potential for 34 rooms (at the existing 80 per cent occupancy rate) to be directly impacted by the proposed works, this will have a significant impact on the commercial viability of these rooms and therefore the entire hotel function.

Therefore it is necessary that appropriate mitigation measures be imposed to all works associated with the Chatswood to Sydenham Metro that could constrain the current functionality of the NSW Masonic Club, and all associated uses.

Moreover, the NSW Masonic Club is already limited to a single pedestrian entrance via Castlereagh Street. Given the nature and myriad of uses currently accommodated on site, it is a critical for business viability that existing access for both pedestrian and vehicular deliveries is retained as accessible 24/7.

Response

Transport for NSW acknowledges that appropriate mitigation and management measures would be important to minimise construction and operation impacts on the NSW Masonic Club and Castlereagh Boutique Hotel.

The potential impacts and the proposed measures are discussed above. Potential business impacts have been considered in the Environmental Impact Statement (refer to Section 13.4.1) and moderate adverse impacts in terms of services / delivery access, customer access / passing trade, changed consumer behaviour and impacts on amenity (noise, vibration and dust) have been identified.

Further consultation with the aim of developing measures to best manage the specific construction impacts (including access and servicing) would be carried out with the NSW Masonic Club and Castlereagh Boutique Hotel to ensure identify specific impacts and develop specific mitigation measures (refer to mitigation measures BI1 to BI3). Measures to address amenity related impacts during construction are discussed in the responses to the specific amenity related issued above and are detailed in Chapter 11 of this report. In particular this would include the implementation of the Construction Noise and Vibration Strategy (Appendix C of this report) and the development of Construction Noise Impact Statement. As part of this process, consultation would be carried out with the NSW Masonic Club and Castlereagh Boutique Hotel (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to the business.

Transport for NSW would continue to consult with the NSW Masonic Club and Castlereagh Boutique Hotel. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

7.8.8 Other issues

Issue raised

The Environmental Impact Statement identifies that the Pitt Street (north) station will include a power substation that will be used for future metro lines. It is recommended that potential impacts, particularly off-site impacts, and appropriate mitigation measures are assessed and identified in detail. The facilities provided in the club, including telephone, internet and WiFi should not be adversely impacted by Electro-Magnetic Radiation generated by the construction or future operation of such a substation.

Response

The potential impacts associated with electric and magnetic fields are considered in Section 19.4.3 of the Environmental Impact Statement.

The *Draft Radiation Standard – Exposure Limits for Magnetic Fields* (Draft Radiation Standard) (Australian Radiation Protection and Nuclear Safety Agency, 2006) identifies exposure limits that are typically applied when considering electric and magnetic fields from new developments.

The detailed design of electrical infrastructure for the project would require that the exposure limits as identified in the Draft Radiation Standard would not be exceeded within sensitive areas.

7.8.9 Ongoing consultation

Issue raised

The NSW Masonic Club and Castlereagh Boutique Hotel would welcome the opportunity to further outline and discuss the important concerns and details of this submission and be involved in future discussions to inform more detailed design and management of the Chatswood to Sydenham Metro.

Response

Transport for NSW would welcome the opportunity to further discuss the issues and concerns as raised by the NSW Masonic Club and Castlereagh Boutique Hotel.

Transport for NSW would continue to consult with the NSW Masonic Club and Castlereagh Boutique Hotel. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

In addition there would be a range of communication methods would be used including briefings to communicate the progress of works, impacts and mitigation measures to affected stakeholders, as well as other activities such as construction notifications, doorknocks, emails, newsletters, and advertising. Further information on consultation during construction is provided in Chapter 4 of this report.

7.9 Monte Sant' Angelo Mercy College

7.9.1 Airborne and ground-borne construction noise

Issue raised

Ambient noise monitoring in the Noise Catchment Area covering Monte Sant' Angelo College is not representative of the area. As a result construction noise management levels and operational noise criteria are at least 10 dBA too high. As a result the impacts from airborne construction noise are understated.

Response

The ambient (background) noise monitoring location closest to the northern construction site was at 237 Miller Street. This location is on the nearest eastern residential building to the northern construction site, on the western side of the pool area, facing the construction site. The building has apartments on levels 1 and above and review of the graphical results did not show any anomalies.

A second ambient (background) noise monitoring location was also carried out in the vicinity of Victoria Cross (on the balcony of a unit at 77-81 Berry Street). This location is on the nearest residential apartment building to the southern construction site. The building has apartments on levels 9 and above and is representative of the nearest residential receiver. Review of the graphical results did not show any anomalies.

The background (or RBL) results from these two locations are similar to each other, and are similar to those background results obtained from the Sydney CBD and are consistent with what would normally be expected in this type of environment. Review of the graphical results did not shown any anomalies, and the logging locations were at locations at and representative of the nearest residential buildings to the construction sites. The results are therefore considered to be valid for the setting of construction noise management levels and design criteria.

Issue raised

The Environmental Impact Statement fails to identify the specific uses of the College that have a higher acoustic sensitivity, such as the Theatre, Main Hall and Recording areas. Therefore impacts from airborne and ground borne noise are significantly underestimated.

Response

It is acknowledged that the Environmental Impact Statement did not correctly classify some specific uses within the College. The construction noise assessment has since been revised based on reclassifying the buildings at the College consistent with its use (ie as a theatre) and relevant criteria applied (refer to Section 9.6.2 of this report). Based on this reassessment, exceedances of criteria for various construction activities are predicted at the theatre building.

The assessment of potential construction noise impacts in the Environmental Impact Statement and in this document presents a worst-case 15-minute assessment in accordance with the approach required by the *Interim Construction Noise Guideline*. This approach assumes that all construction equipment for a particular construction scenario is operating at the same time and at the closest point on the site to any receiver. In reality, construction equipment would operate at varying locations around the site and would rarely all be in use at the same time. As such, the actual noise levels experienced by individual receivers would vary throughout the construction works. In the early phases of construction predicted noise exceedances would be primarily related to airborne noise. These in turn relate to noise levels at the facade of the theatre building, with noise levels inside the building being a function of the level of attenuation inherent in the building design. Noting the potential impacts, there a range of alternative demolition methods which are being further investigated, to minimise noise and vibration impacts. Further details on the consideration of alternative demolition methods are provided in the response to the submission from the Environment Protection Authority in Section 6.10.2 of this report and would include:

- Using demolition sequencing to shield noise sensitive neighbours from high noise levels by retaining wall elements adjoining / shielding those properties to the end of the demolition sequence (eg floor by floor leaving the perimeter wall that aids noise screening to the end)
- Developing construction working hours that provide respite to neighbouring properties during the higher noise output activities (this would include works that do not use high noise level appliances but create high noise levels when assessed against background and residential noise standards)
- Installing sound barrier screening to scaffolding facing noise sensitive neighbours where the noise and vibration management plan investigations indicate that the neighbouring property / occupancy would receive noise levels higher than the levels determined by Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report)
- Modifying demolition working sequencing and / or hours to reduce noise and dust emissions during peak pedestrian and adjoining neighbour outdoor activities and movements.

Ground-borne noise levels would largely be a function of the chosen excavation method. The reported levels in both the Environmental Impact Statement and Section 9.6.2 of this report are based on use of rock breakers. As detailed in Section 9.6.2 of this report, the use of blasting in combination with rock-breaking is proposed and would reduce the number of periods of exceedance by around 55 per cent compared to a rock-breaking only method. Both blasting and rock-breaking can be timed to avoid periods when there would be a higher impact on the facility. Transport for NSW would liaise with Monte Sant' Angelo Mercy College to identify such periods.

The Construction Noise and Vibration Strategy (Appendix C of this report) establishes the process for carrying out more detailed construction noise and vibration impact statements prior to each construction activity based on further understanding of the construction equipment and construction processes, which would be confirmed during detailed construction planning. This process would provide further detail regarding the actual noise levels which would be experienced by individual receivers and how these impacts would be mitigated.

Issue raised

The Environmental Impact Statement fails to identify the nearest residence to the northern access shaft and the impact construction noise and vibration on these residences which will be unacceptable.

Response

The residential building within the school grounds was assessed in the Environmental Impact Statement as a residential receiver. The results are presented in Table 10-15 of the Environmental Impact Statement (as location B – Residential to the west on McLaren Street). However, it had been depicted incorrectly on the corresponding Figure 10-4 of the Environmental Impact Statement as an educational receiver. However, the error on the figure does not change the assessment results.

Issue raised

The Environmental Impact Statement does not provide the confidence and commitments that noise and vibration from construction can be adequately managed to all the receivers associated with Monte Sant' Angelo College, therefore the northern shaft site should be relocated away from the school and residences and reassessed.

Response

Transport for NSW acknowledge the concerns of Monte Sant' Angelo Mercy College regarding potential noise and vibration impacts. The Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report) does however provide an extremely robust process for identifying specific construction impacts and the identification of appropriate mitigation measures. These would be discussed with the College when more detailed construction planning is underway and more specific detailed design information is available.

Issue raised

Operational assessment fails to take into account the Theatre which is 10 metres below the ground level whereby noise levels will be several decibels higher. Therefore the need for track isolation should be considered in light of the theatres' location and sensitivity to noise and vibration.

Response

Ground-borne noise has been re-assessed in Section 9.6.2 of this report on the basis of a reclassification of the theatre. This assessment takes into account the depth of the theatre below the ground. Operational ground-borne noise levels are predicted to be 24 dBA, which would be below the criterion for drama theatres.

In accordance with mitigation measure OpNV2, track form would be confirmed during the detailed design process to meet the relevant ground-borne noise and vibration criteria. Further information would be provided to the College at the conclusion of this process.

Issue raised

Noise objectives for the operation of services plant associated with the Victoria Cross station should be revised to reflect representative noise levels of the area.

Response

As discussed above, a review of the background noise levels have been carried out and the results as presented in the Environmental Impact Statement are considered to be appropriate.

Issue raised

In conclusion, their [Wilkinson Murray acoustic consultants] findings are that:

- The impacts on the education components, particularly the entire Arts and Creativity Common, around the northern shaft will be significant and will render these areas not fit for use
- In the case of residences which are immediately to the west of the northern shaft the impacts at the two residential buildings, particularly at night will render these buildings uninhabitable.

Response

Transport for NSW acknowledges that there would be temporary impacts to Monte Sant' Angelo Mercy College as a result of the project. Such impacts are unavoidable during the construction phase of major transport infrastructure projects in urban environments. Transport for NSW is committed to ongoing consultation with the College to minimise and mitigate impacts as far as feasible and reasonable. Further and more detailed discussions would occur through the detailed construction planning phase of the project to address residual impacts.

7.9.2 Impacts on student safety, access and amenity

Issue raised

What is not however clearly explained in the Environmental Impact Statement is the projected heavy vehicle movements of approximately 23 per hour between the times of 9am to 4pm. While undoubtedly the concentration of trucks during these hours is designed to avoid the traditional peak hour periods (7am-9am and 5pm-7pm), this approach ignores the significant early peak generated by the school. This school peak occurs from around 3pm Monday to Friday.

In summary, we submit that the northern construction site is unsuitable and will have significant adverse impacts on the immediate environment which is exacerbated by the heavy truck movements that will be generated on a consistent basis throughout the daytime period both for the removal of spoil and the delivery of materials. Conversely, limiting heavy construction access to the main site at the intersection of Berry Street would alleviate this impact and should be further investigated.

Response

The truck movement graph in the Environmental Impact Statement shows truck movements dropping from 23 per hour to six per hour between 2pm and 3pm. These are combined figures for both Victoria Cross construction sites. Of this total, 85 per cent of truck movements are predicted to be associated with the southern site and 15 per cent with the northern site. This volume of traffic is very low in the context of existing traffic flows and the changes to traffic would be minor.

The location of Victoria Cross Station was chosen partly as it:

- Provides a station entry on the eastern side of Miller Street with a direct connection to the primary station catchment within the North Sydney commercial core
- Maximises the distance from the Sydney Harbour crossing, providing a reduced depth to the platforms and improved transit time to the street level for customers.

All metro stations require services infrastructure to support station functioning. At Victoria Cross Station, the majority of the services infrastructure has been located at the southern end of the station. However, design standards require emergency egress to be provided at each end of the platform at every station. This allows for efficient and safe evacuation of the station in the event of an emergency, minimising the need for customers to walk past an incident to evacuate.

Fresh air ventilation to the station and tunnels is also required at both ends of the station to support operations, including to manage air pressure and temperatures within the station and tunnels, and to minimise energy use in operation.

Based on the need for a northern services building at Victoria Cross Station, the location was chosen based on a number of factors including:

- Proximity to the northern end of the platforms a site as close as possible to the northern end of the platforms is required to minimise emergency egress times, and provide the optimum location for draught relief
- The minimum space requirements for the services and construction work this is balanced against avoiding unnecessary and unjustified acquisition of oversized properties
- Avoiding heritage listed properties (there are heritage listed properties to the immediate north and south of the selected location)
- Avoiding, where possible, strata properties and large buildings due to the displacement of residents and / or commercial tenants.

Based on the above factors, the consideration of alternative sites was limited to properties to the south of McLaren Street to provide the necessary proximity to the northern end of the platforms. Alternative sites on the western side of Miller Street were ruled out due to heritage considerations. Alternative sites on the eastern side of Miller Street were ruled out due to:

- The size of the properties would have resulted in unnecessary acquisition and poor value for money
- The use of the buildings would have resulted in the displacement of residential properties and / or a larger number of commercial tenants
- The size of the buildings would have resulted in a longer duration of demolition and associated impacts for surrounding receivers (such as noise, vibration and traffic).

Any alternative location for the services building would result in similar construction impacts to adjacent receivers. Although the northern services building is located adjacent to Monte Sant' Angelo Mercy College, on balance, this site was considered to provide the best location for a services building required for the Victoria Cross Station.

Issue raised

It is our submission that any reduction in the width of the footpath along the Miller Street frontage is not sustainable based on this [*school peak*] pedestrian volume.

Response

The Miller Street footpath would only be reduced immediately (and temporarily) adjacent to the construction site. A minimum width of 2.4 metres would be maintained during construction at all times. Based on the existing width of the footpath in this location, it is likely that the remaining width would be greater than 2.4 metres. The main source of footpath crowding in this area is the bus stop. This would be relocated in consultation with Roads and Maritime Services, the CBD Coordination Office (for relevant locations), the relevant local council and bus operators to an area (to be determined) where the footpath width has not been reduced.

Issue raised

The Environmental Impact Statement recognises the loss of an existing bus stop located immediately within the frontage of the northern construction site. As illustrated in Pictures 12 and 13 [*photos included in the submission*], this is an important bus stop to service the school population. There is no indication as to the potential alternative locations for the bus stop, but one would presume that it would need to be located further to the north in Miller Street, north of McLaren Street. While inconvenient, this will also increase the level of pedestrian movement across the frontage of the construction site which is undesirable from a safety and security perspective.

Response

There has been no decision on whether the bus stop would be relocated to the north or south. The new location for the bus stop would be based on the availability of adequate footpath capacity (see the above response), and the composition of the bus stop catchment, acknowledging that Monte Sant' Angelo Mercy College is the major contributor to this. As mentioned above, the relocation of the bus stop would in be carried out in consultation with Roads and Maritime Services, the CBD Coordination Office (for relevant locations), the relevant local council and bus operators.

Issue raised

Given the volume of movements in and out of the northern construction site, the proposed strategy to mitigate risks to the School and broader community is manifestly inadequate. The footpath access north along Miller Street is an important access point for students and there are no measures or commitments proposed to manage safety and security. This reinforces our submission that the location of a major construction site directly adjacent to the School and a highly trafficked footpath is ill-conceived and alternative locations need to be considered for the project.

Response

The need and justification for the northern services building is provided in the responses above.

As also identified in the responses above, the relocation of the bus stop would be carried out such that the safety of school students and the broader community is not compromised. The comment regarding the strategy to minimise safety risks appears to be referring to a single sentence in Chapter 19 of the Environmental Impact Statement which states that 'an increase in construction traffic, including heavy vehicles, on Miller Street and surrounding roads may present possible safety risks for students or impact on community perceptions of safety for students'. This section of the Environmental Impact Statement goes on to provide information on a number of strategies proposed to mitigate and manage this potential safety risk. In addition to this, a range of mitigation measures are proposed to minimise safety risks to the public. These include:

- Mitigation measure T2 Road Safety Audits would be carried out at each construction site. Audits would address vehicular access and egress, and pedestrian, cyclist and public transport safety.
- Mitigation measure T3 Directional signage and line marking would be used to direct and guide drivers and pedestrians past construction sites and on the surrounding network. This would be supplemented by Variable Message Signs to advise drivers of potential delays, traffic diversions, speed restrictions, or alternate routes.
- Mitigation measure T5 The community would be notified in advance of proposed road and pedestrian network changes through media channels and other appropriate forms of community liaison.
- Mitigation measure T6 Vehicle access to and from construction sites would be managed to ensure pedestrian, cyclist and motorist safety. Depending on the location, this may require manual supervision, physical barriers, temporary traffic signals and modifications to existing signals or, on occasions, police presence.
- Mitigation measure T7 Additional enhancements for pedestrian, cyclist and motorist safety in the vicinity of the construction sites would be implemented during construction. This would include measures such as:
 - Use of speed awareness signs in conjunction with variable message signs near construction sites to provide alerts to drivers
 - Community educational events that allow pedestrians, cyclists or motorists to sit in trucks and understand the visibility restrictions of truck drivers, and for truck drivers to understand the visibility from a bicycle; and a campaign to engage with local schools to educate children about road safety and to encourage visual contact with drivers to ensure they are aware of the presence of children
 - Specific construction driver training to understand route constraints, expectations, safety issues, human error and its relationship with fitness for work and chain of responsibility duties, and to limit the use of compression braking

- Use of In Vehicle Monitoring Systems (telematics) to monitor vehicle location and driver behaviour
- Safety devices on construction vehicles that warn drivers of the presence of a vulnerable road user located in the vehicles' blind spots and warn the vulnerable road user that a vehicle is about to turn.
- Mitigation measure T14 Construction site traffic immediately around construction sites would be managed to minimise movements through school zones during pick up and drop off times.

Further consultation would also be carried out with Monte Sant' Angelo Mercy College to identify additional measures which could be implemented. This may include working with the school to redistribute students to other school entry and exit points.

7.9.3 Operational impacts

Issue raised

Wilkinson Murray has identified in its assessment that no track vibration treatment is proposed in the vicinity of the school. This is a result of the failure of the proponents to have identified the sensitivity of the Arts and Creativity Common, including the Theatre and recording facilities.

As a result a higher noise criterion of 40 – 45 dBA has been adopted for a standard school. A lower noise criterion is warranted for these areas consistent with Sound Recording Studios in Table 83 of the technical report.

In addition noise predictions of train noise are based on buildings at ground level. As the performance space is located 10 metres below the ground the resultant noise levels can be expected to be several decibels higher than those presented in the Environmental Impact Statement.

Response

The ground-borne noise levels would comply with the relevant criterion at the theatre during operation of the project, with ground-borne noise levels predicted to be 24 dBA, which is below the criterion for drama theatres. The predicted ground-borne noise levels take into account the depth of the building below ground level.

In accordance with mitigation measure OpNV2, track form would be confirmed during the detailed design process in order to meet the relevant ground-borne noise and vibration criteria at all receivers (residential, educational class rooms, theatres, etc).

Issue raised

While a broad visual impact assessment has been undertaken of the precinct as part of the Environmental Impact Statement, there is no design detail of the proposed services building to be located on the northern site. It is therefore impossible to assess the likely impact of the future development when no design detail or indeed key principles are articulated. The need for such detail is heightened given the location of this site amongst heritage listed buildings.

We submit that there is insufficient design detail to satisfy the Secretary's environmental assessment requirements and to have any certainty regarding the design quality and visual impact of the future development.

The visual impact assessment in the Environmental Impact Statement is detailed in terms of its analysis of each representative viewpoint. The visual impact assessment is based on the scale of the services building which in the context of existing buildings in the area and proposed development would be minor.

Design quality would be assured through the Chatswood to Sydenham Design Guidelines (Appendix A of this report). This includes a series of specific guidelines relating to services buildings and guidelines around integration with adjacent heritage. These guidelines, among others, include:

- Services buildings and facilities should form an integrated solution with the station architecture and precinct taking into account the scale, context and purpose of the structure
- Opportunities to provide for active uses and frontages should take priority over service related structures
- Elements in major urban settings need to consider impacts including visual, environmental and acoustic on the streetscape
- Sydney Metro is to be fully integrated within, and sensitive to, its heritage context. This includes built and natural heritage, European and Indigenous archaeology and may include places, buildings, works, relics, moveable objects or precincts
- New work is to be based on an understanding of the heritage significance of heritage items, heritage conservation areas and places.

Issue raised

The northern site will house mechanical plant, such as fans, when operational. These will need to incorporate noise controls to protect the acoustic amenity of residences to the west of the site. Currently a night time noise criterion of 56 dBA at nearby residences is presented in the Environmental Impact Statement. This is based on incorrect noise monitoring as previously detailed. If applied noise from plant would be 16 dBA above background noise levels at these residences. This would represent an unacceptable impact on these residences where a criterion of 45 dBA is appropriate.

In addition, air quality impacts associated with tunnel ventilation and the adjacency of the school grounds and the residence is of concern and requires further details to be provided.

Response

As discussed above, the background noise data has been reviewed in response to this submission and no anomalies have been identified. The noise criterion included in the Environmental Impact Statement is therefore regarded as appropriate.

7.9.4 Inadequacies of the Environmental Impact Statement and consultation Issue raised

It is our submission that the Environmental Impact Statement has not been properly informed by this consultation noting the significant omissions and the lack of understanding of the sensitivities and specific uses on the Monte campus. As evidenced from the Wilkinson Murray report, the acoustic analysis has incorrectly and inadequately assessed the site interfaces and also overestimated the background noise levels. As a result, the impacts on the Monte Campus are completely understated.

Response

Transport for NSW acknowledges an omission in the Environmental Impact Statement concerning the classification of the theatre. The revised assessment in Section 9.6.2 of this report addresses this issue.

As discussed above, a review of background noise monitoring has revealed no anomalies.

Issue raised

Section 12.5.4 of the Environmental Impact Statement provides an assessment of the direct impacts on existing land uses surrounding the Victoria Cross Station. The Environmental Impact Statement states:

The direct impact on land use at this site would be a change in land use from commercial core / mixed use to transport infrastructure. Given the small scale of the change, the land use impacts would be minor. This minor impact may be mitigated by the replacement and / or expansion of areas of mixed use land associated with potential over station development.

This assessment completely ignores impacts associated with land uses adjacent to the northern services building.

Response

Section 12.5.4 of the Environmental Impact Statement addresses permanent land use changes that would occur as a result of the project. Impacts on amenity of adjacent land uses are addressed in other chapters of the Environmental Impact Statement, particularly Chapter 11 (Construction noise and vibration), Chapter 11 (Operational noise and vibration), Chapter 16 (Landscape character and visual amenity) and Chapter 22 (Air quality).

Issue raised

Despite recognition of the potential for impact, there is little or no analysis of specific impact assessment or detail of effective mitigation measures. The Environmental Impact Statement states:

The implementation of mitigation measures, in conjunction with ongoing consultation and communication with local communities, would help to manage potential impacts on community health (refer to Chapter 11 (Construction noise and vibration)).

In the absence of real and effective mitigation measures, we submit that consultation and communication is of no assistance or purpose. The Wilkinson Murray review of the acoustic report identifies that there are very limited measures capable of mitigating the expected significant impacts during the construction phase. Wilkinson Murray identify that the key uses immediately surrounding the northern construction site (the Arts and Cultural Common and the Sisters of Mercy residence) will be rendered unusable for the duration of what is a lengthy construction phase.

The only effective mitigation measure is for alternative locations to be investigated for the construction site and future services building if indeed such facility is actually required to support the Victoria Cross Station.

Response

The need and justification for the northern services building is provided in the responses above.

As discussed in Chapter 11 of this report and identified in the Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report), there are a range of mitigation measures, such as acoustic barriers around construction sites and using dampened rock hammers, that may potentially be implemented to reduce the impact on Monte Sant' Angelo Mercy College. Transport for NSW is committed to continuing consultation with the school during the preparation of relevant Construction Noise Impact Statements to identify a suite of specific mitigation measures tailored to the needs of the school.

Consultation would continue with Monte Sant' Angelo Mercy College (in accordance with mitigation measure SO2 – refer to Chapter 11 of this report) to identify and develop tailored mitigation measures to manage the specific construction impacts to the College. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

Issue raised

The proposal involves a significant shaft excavation immediately adjacent to the Monte Campus. Notwithstanding the significance of these works, there is scant detail on:

- The size and setbacks of the tunnel;
- Detail on the method of construction;
- Design and scale of the future services building.

Given the sensitive interfaces and the precinct generally (being surrounded by heritage items), a far more substantive level of design detail is required to properly assess the impacts of the proposed works.

Response

The design has been developed to an appropriate level for an accurate (and conservative) assessment of impacts. Subsequent stages of design development would (in part) be aimed at reducing impacts from those predicted in the Environmental Impact Statement. Transport for NSW would continue to engage with the College as detailed design of the project progresses.

Issue raised

It is our submission that the Environmental Impact Statement has not been properly informed by this consultation noting the significant omissions and the lack of understanding of the sensitivities and specific uses on the Monte campus. As evidenced from the Wilkinson Murray report, the acoustic analysis has incorrectly and inadequately assessed the site interfaces and also overestimated the background noise levels. As a result, the impacts on the Monte Campus are completely understated.

Response

The assessment in the Environmental Impact Statement in combination with additional assessment in this document (that reclassifies some noise sensitive receivers) provides a typically conservative assessment of impacts to Monte Sant' Angelo Mercy College. Transport for NSW acknowledge that there are complexities associated with the operation of the school that will require detailed ongoing consultation during detailed design and construction planning so that mitigation is tailored to the school's specific needs. Transport for NSW would continue to engage with the College so that its specific concerns are considered.

7.10 Australian Catholic University

7.10.1 Benefits of Victoria Cross Station

Issue raised

The Australian Catholic University welcomes this proposed new transport network and the envisaged significance the Victoria Cross station will have in contributing positively to the public transport opportunities already available to North Sydney's business community.

For the University, the Sydney Metro station will offer additional choice in transport connections and in closer proximity to our campus for students, staff and visitors. In turn, this could have a positive effect on retail and other services through customer access along Berry Street, the short route connecting the campus with Victoria Cross station, absorbing the street level amenities of the new office developments along the Pacific Highway / Berry Street corner. The Australian Catholic University fully supports the Authority in identifying North Sydney as an important stop for the Metro line and the opportunity this station will provide in our campus' access to an important rail network almost on our doorstep.

Support for the benefits of the project for North Sydney businesses and educational institutions is acknowledged.

7.10.2 Station design

Issue raised

The Australian Catholic University would welcome the opportunity, as a strong stakeholder participant in future discussions, to contribute in the design development and place-making aspects of the Victoria Cross Station. As a viable entity in this CBD, the Australian Catholic University could participate on the more micro level detail; such as naming and badging at the station and opportunities for visual branding and signage to identify the University's and other educational institutions in this locality.

We welcome all possible opportunities for continuing dialogue with the Authority on this project and to add commuter user value to this important transport node.

The North Sydney education precinct, in conjunction with the adjoining and surrounding residential community comprising an area of around 26 hectares, would equally constitute an important metro commuter group. The University's teaching timetable which commences before, and extends beyond, normal business hours, together with weekend campus access will, when combined with local residents, provide a major user group. This permanent community precinct encompassing the educational institutions would benefit in being acknowledged with place-marking in the Victoria Cross station. Other schools which extend the significant educational presence outside this zone and immediately north of Berry Street include North Sydney Girls' High School, Monte Sant' Angelo Mercy College and Cammeraygal High School, all potential commuters of the Sydney Metro network.

Response

The design development at Victoria Cross Station would be guided by the Chatswood to Sydenham Design Guidelines (Appendix A of this report). These guidelines include specific requirements in relation to place-making, wayfinding and signage (which would include information on destinations in the local precinct).

Transport for NSW would continue to engage closely with stakeholders and affected properties owners and occupiers through all stages of design, planning, and construction. The Construction Environmental Management Framework (Appendix B of this report) provides the communication and consultation strategy for the project. A range of communication methods would be used including briefings to communicate the progress of works, impacts and mitigation measures to affected stakeholders, as well as other activities such as construction notifications, doorknocks, emails, newsletters, and advertising, meetings and briefings to communicate the progress of works, impacts and mitigation measures to affected stakeholders.

Transport for NSW would continue to consult with the Australian Catholic University. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

Further information on consultation during construction is provided in Chapter 4 of this report.

7.10.3 Pedestrian integration

Issue raised

An equally important aspect, and one which is a focal point in the North Sydney Council education precinct plan, is the safety consideration of pedestrians, particularly children and students, and providing input into effective communication of information regarding safe access to / from the Victoria Cross metro station to the University and the precinct schools.

Response

The safety of pedestrians, including children and students, would continue to be a priority for the project. The Chatswood to Sydenham Design Guidelines (Appendix A of this report) will be used to guide the ongoing design of the project. This includes the provision for adequate pedestrian weather protection, safe crossing and ensures effective interchange between different modes of transport.

Pedestrian access between the station and Australian Catholic University (and other key educational institutions) would be using the existing pedestrian footpath network and key road crossing facilities.

7.11 Mirvac Real Estate Pty Ltd and K-REIT Asia (Keppel Land Limited)

7.11.1 Duration of works

Issue raised

There is concern regarding the duration of demolition, earthworks and construction at Martin Place Station, and proximity to the 8 Chifley Square building.

Response

The construction program provided in the Environmental Impact Statement represents a realistic timeframe to complete construction of the project. The construction program and construction methodology aims to provide a balance between the efficient completion of construction and minimising impacts to adjacent receivers. Specific impact issues raised in the context of the program are addressed in the other sections of this report.

Further, detailed construction methods would be developed during construction planning. This would take into account the potential for disturbance over long durations and the issues raised, including any conditions of approval from the Minister for Planning.

7.11.2 Station design

Issue raised

There is concern with the built form and scale of future above station development at the northern entry to Martin Place Station and proximity to the 8 Chifley Square building, acknowledging that this would be subject to further planning approvals.

Response

The design of the aboveground station buildings would be guided by the Chatswood to Sydenham Design Guidelines (Appendix A of this report).

Over station development would be subject to a separate planning approval process. This process would include appropriate consultation with neighbouring properties and will consider the potential impacts of the over station development, including impacts on adjoining properties.
7.11.3 Future consultation

Issue raised

It is suggested that regular meetings with an Owners Group around Victoria Cross Station and Martin Place Station are undertaken by Transport for NSW to inform affected parties about imminent works, road closures, pedestrian impacts and general updates on the progress of the project

Response

Transport for NSW would continue to engage closely with stakeholders and affected properties owners and occupiers through all stages of design, planning, and construction. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

The Construction Environmental Management Framework (Appendix B of this report) provides further details on the communication and consultation strategy for the project. A range of communication methods would be used including briefings to communicate the progress of works, impacts and mitigation measures to affected stakeholders, as well as construction notifications, doorknocks, emails, newsletters and advertising. Further information on consultation during construction is provided in Chapter 4 of this report.

7.11.4 Construction noise and vibration

Issue raised

There is insufficient information to understand the potential impacts on tenants of 8 Chifley Square on a day-to-day basis. In particular, the Environmental Impact Statement does not recognise that 8 Chifley operates outside of typical business hours. A 70 dBA noise management level should be applied evening and night.

There are concerns regarding impacts on commercial receivers at 8 Chifley due to exceedance of acceptable airborne noise standards by demolition and excavation works and exceedance of noise management levels during the construction period at Martin Place Station. This includes impacts on internal noise levels within commercial tenancies.

Response

The construction noise and vibration assessment provided in Section 10.4 of the Environmental Impact Statement and Section 3 of Technical Paper 2 has been carried out in accordance with the Secretary's environmental assessment requirements and the relevant guidelines. An external noise criterion of 70 dB(A) has been set for commercial offices consistent with the EPA's *Interim Construction Noise Guideline* (DECC, 2009).

The potential noise impacts from the Martin Place Station site to 8 Chifley are assessed in Section 10.4.8 of the Environmental Impact Statement. In summary, the assessment found that there are predicted to be exceedances of the airborne noise management levels for commercial receivers of between 10 and 20 dB during demolition, site establishment and earthworks; and up to 10 dB during aboveground station building construction.

Since the exhibition of the Environmental Impact Statement, it has been determined that rock breaking would only be required during standard daytime construction hours and has removed the predicted exceedances of noise management levels at residential receivers in Areas A, B and E (refer to Section 3.3.5 of this report). This change in construction methodology would have similar benefits to commercial tenants who currently operate outside standard business hours, such as those in 8 Chifley.

The assessment of potential construction noise impacts in the Environmental Impact Statement presents a worst-case 15-minute assessment in accordance with the approach required by the *Interim Construction Noise Guideline*. This approach assumes that all construction equipment for a particular construction scenario is operating at the same time and at the closest point on the site to any receiver. In reality, construction equipment would operate in varying locations around the site and would rarely all be in use at the one time. As such, the actual noise levels experienced by individual receivers would vary throughout the construction works.

The Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report) provides the process for carrying out more detailed construction noise and vibration impact statements prior to each construction activity based on further understanding of the construction equipment and construction processes, which would be confirmed during detailed construction planning. This process would provide further detail regarding the actual noise levels which would be experienced by individual receivers.

The Construction Noise and Vibration Strategy also provides a list of standard noise mitigation measures which would be implemented at all construction sites for the project. Further, the Strategy provides additional mitigation measures which would be implemented when defined exceedances of the noise management levels are predicted to occur. These mitigation measures would meet the outcomes of the mitigation proposed in submissions.

Issue raised

The Environmental Impact Statement does not identify food outlets located on the site, which warrant a 60 dBA noise management level. Further, there are concerns regarding amenity impacts on customer experiences at businesses providing outdoor dining at 8 Chifley, near Martin Place Station. It is suggested that mitigation measures are implemented to prevent impacts of construction noise on businesses.

Response

The *Interim Construction Noise Guideline* refers to AS 2107 which establishes recommended maximum internal noise levels for other commercial uses, including food outlets (cafes, bars and restaurants). In the case of food outlets that have external seating, the external noise goal is 60 dBA.

The nearest noise logger to the Martin Place Station construction site and 8 Chifley indicates that existing external noise levels are above this external noise goal – likely as a result of existing road traffic noise.

It is acknowledged that at times construction noise levels would be above the recommended maximum noise goal for food outlets during the various stages of construction activity at the Martin Place Station construction site, given exceedances predicted at nearby residential receivers. As acknowledged in the Section 13.4.1 of the Environmental Impact Statement, there is the potential for moderately negative impacts to businesses during construction, including impacts to amenity due to construction noise.

Further consultation with the aim of developing measures to manage the specific construction impacts would be carried on an individual business basis including the food outlets at 8 Chifley (refer to mitigation measures BI1 to BI3). Measures to address noise / vibration during construction are detailed in Sections 10.5 and 22.6 of the Environmental Impact Statement respectively and would include:

- Provision of noise barriers around each construction site
- The coincidence of noisy plant working simultaneously close together would be avoided
- Offset distances between noisy plant and sensitive receivers would be increased

- Residential grade mufflers would be fitted to all mobile plant
- Dampened rock hammers would be used
- O Non-tonal reversing alarms would be fitted to all permanent mobile plant
- High noise generating activities would be scheduled for less sensitive period considering the nearby receivers
- The layout of construction sites would consider opportunities to shield receivers from noise
- Alternative demolition techniques that minimise noise and vibration levels would be investigated and implemented where feasible and reasonable.

The Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report) also provides the process for carrying out more detailed construction noise and vibration impact statements prior to each construction activity based on further understanding of the construction equipment and construction processes. This process would provide further detail regarding the actual noise levels which would be experienced by individual food outlets at 8 Chifley.

7.11.5 Ground-borne noise

Issue raised

There are concerns regarding exceedance of acceptable ground-borne noise standards by early works and rock breaking at Martin Place Station and impacts on commercial receivers at 8 Chifley.

Response

There are predicted exceedances of the ground-borne noise management level by up to 10 dB during rock breaking works. These impacts are predicted when rock breaking is occurring at the surface and would be expected to reduce as the excavation work progress.

As detailed in Section 3.3.5 of this report, rock breaking has been restricted to daytime standard construction hours and, consistent with the approach taken in the Environmental Impact Statement, blasting has been considered due to the level and duration of ground-borne noise exceedances associated with rock breaking. All blasts would be designed to meet applicable noise and vibration standards.

The results of the revised assessment (presented in Table 3-12) indicates that the adoption of blasting as an excavation technique would reduce impacts to commercial receivers during the daytime period at all sites. For the Martin Place Station (north) construction site, the use of blasting with rock breakers would significantly reduce the number of daytime periods where ground-borne noise levels are above noise management levels.

Further detailed construction planning, through the development of Construction Noise Impact Statements (as required by the Sydney Metro Construction Noise and Vibration Strategy in Appendix C of this report) would determine the exact construction activities with the aim of reducing ground-borne noise impacts to receivers. For example, this could involve the consideration of different sized rock breakers at different periods, and the positioning of rock breakers within the site during different periods.

With careful planning and positioning of equipment it may be possible to avoid consecutive periods of noise management levels exceedances to any one receiver, effectively providing respite periods. For any residual exceedances of the noise management levels, additional mitigation measures would be implemented in accordance with Chapter 11 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report).

7.11.6 Construction noise and vibration strategy

Issue raised

The Environmental Impact Statement does not provide clarity as to potential impacts from noise and vibration on 8 Chifley, and the success of location specific construction noise management plans is in doubt.

It is suggested that the Construction Noise and Vibration Management Strategy for Martin Place Station is updated to include mitigation measures to mitigate noise and vibration impacts and avoid significant adverse effects on receivers at 8 Chifley.

Alternative construction techniques should also be assessed under the category of 'reasonable and feasible' consistent with EPA guidelines, and appropriate measures such as respite and rock saws should be considered.

Response

The Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report) provides the overall noise and vibration management approach during construction of the project.

This includes the process specific Construction Noise and Vibration Impact Statements based on a more detailed understanding of the construction methods, plant and equipment. This would also include the identification of specific mitigation measures. Depending on the nature of the works, the Construction Noise and Vibration Impact Statements may be activity specific or location specific.

With careful planning and positioning of equipment it may be possible to avoid consecutive periods of noise management levels exceedances to any one receiver, effectively providing respite periods. For any residual exceedances of the noise management levels, additional mitigation measures would be implemented in accordance with Chapter 9 (Revised environmental mitigation measures and environmental performance outcomes) and the Sydney Metro Construction Noise and Vibration Strategy (Appendix C of this report).

Section 7.7.1 of the Environmental Impact Statement provides discussion of alternative excavation techniques and notes that it is unlikely that alternative techniques would be able to achieve the required excavation rate in isolation. However, the Environmental Impact Statement does not preclude the use of these techniques and states that they could be used to supplement other excavation methods in order to reduce the overall construction timeframe. As this would be determined based on more detailed construction planning, the Environmental Impact Statement carried out a conservative worst-case assessment (consistent with the requirements of the *Interim Construction Noise Guideline*) by assessing excavation through the combined use of rock hammering and blasting. Further details on the consideration of alternative excavation methods are provided in the response to the submissions from the Environment Protection Authority in Section 6.10.2 of this report.

7.11.7 Construction dust emissions

Issue raised

There are concerns regarding localised impacts on air quality during demolition, earthworks and construction phases of the project at Martin Place Station, particularly given the scale of the works and volume of spoil generated by the project. The Environmental Impact Statement does not adequately assess the magnitude and potential impact of dust emissions on commercial premises surrounding the Martin Place Station site.

The Environmental Impact Statement does not contain sufficient detail on dust mitigation measures to limit impact on 8 Chifley, which has design features that contribute to the environmental performance of the building. Similarly, the risk of dust emissions compromising solar access is a concern.

Potential dust emissions from the construction site for the Martin Place Station will have a significant impact on the amenity and useability of the publicly accessible space on the northern side of 8 Chifley. It is suggested that mitigation measures take into account food safety for businesses providing outdoor dining.

It is requested that an Air Quality Management Plan be prepared in consultation with affected landowners surrounding the proposed Martin Place Station.

Response

Section 22.4 of the Environmental Impact Statement provides an assessment of potential air quality impacts of the project. Dust emissions from the project would be readily manageable to appropriate standards through the implementation of standard mitigation measures, such as installing hard surfaces on long term haul routes and regularly damping down unsurfaced work areas (as identified in Section 22.6 of the Environmental Impact Statement and revised in Chapter 11 of this report).

Specific consultation (as per mitigation measure BI1 in Chapter 11 of this report) would be carried out with businesses within 8 Chifley that may be potentially impacted during construction. This consultation would aim to identify and develop specific measures to manage construction impacts for individual sensitive business receivers. These would be incorporated into the Air Quality Management Plans.

The Construction Environmental Management Framework (Appendix B of this report) provides information on the training, awareness and competence requirements for Principal Contractors on Sydney Metro.

As a minimum this would include site induction, regular toolbox talks and topic specific environmental training, including informing workers of the environment surrounding the construction sites and appropriate measures to minimise impacts to nearby receivers.

The Construction Environmental Management Framework also outlines the requirements for the development of Construction Environmental Management Plans, Spoil Management Plans and Air Quality Management Plans. These plans would be reviewed by Transport for NSW and an independent environmental representative. Depending on the conditions of approval, certain sub-plans may also require the approval of the Department of Planning and Environment. All management plans required by the conditions of approval would be made available on a project website.

7.11.8 Construction traffic and transport

Issue raised

There are concerns regarding the impacts to the road network and property access during the construction of the project in the vicinity of Victoria Cross Station and Martin Place Station.

Construction works for Victoria Cross Station are to be managed to minimise disruption to the North Sydney CBD.

With regard to Martin Place Station, there are concerns regarding impacts of vehicular movements on access to 8 Chifley and general road network performance, with particular concerns regarding the expected volume of construction vehicles transporting spoil.

The proposed left-out exit driveway is located immediately opposite the access driveway to the basement level of 8 Chifley, which would have an adverse impact on accessibility and operational safety of the driveway for 8 Chifley (including safety for cyclists).

The construction vehicle exit driveway at Martin Place Station should be sited and designed to avoid operational and safety impacts on the existing access driveway to the 8 Chifley building. This should be incorporated into the Road Safety Audit for Martin Place Station.

Response

The potential traffic and transport impacts due to the Victoria Cross Station and Martin Place Station construction sites are assessed in Sections 8.4.9 and 8.4.14 of the Environmental Impact Statement respectively. The construction traffic impact assessment shows that there would be a negligible change in the performance of surrounding intersections during peak periods from the introduction of construction vehicles.

Responses to specific issues raised with respect to Martin Place Station are below:

- The exact details and location of the site exit from the Martin Place Station construction sites would be determined during detailed construction planning, taking into account surrounding business operations. Access to neighbouring properties would be maintained and requirements for businesses would be considered during preparation of relevant Site Specific Traffic Access and Management Plan
- The Site Specific Traffic Access and Management Plan would be prepared for Martin Place station construction site and would be informed by the Road Safety Audit (mitigation measure T2). The audit would address vehicular access and egress, and pedestrian, cyclist and public transport safety. This would include conflicts with other driveways of adjoining or nearby properties
- Additional mitigation measures (for example T6 and T7), as detailed in Chapter 11 (Revised environmental management measures and environmental performance outcomes), would also be implemented which focus on managing construction vehicle access and egress to ensure pedestrian, cyclists and motorists safety. This includes additional enhancements for pedestrians, cyclists and motorist safety in the vicinity of construction sites.

Issue raised

The six month closure of the existing Martin Place Station entrance to the south of Elizabeth Street will place additional pressure on remaining entrances, reduce their level of performance during peak periods and special events, inconvenience commuters and present a potential safety issue in an emergency situation.

Response

The potential for impacts to active transport is considered and assessed in Section 8.4 of the Environmental Impact Statement.

Transport for NSW is reviewing and further developing construction staging and methodology for the pedestrian routes to and from the existing Martin Place Station, in consultation with relevant stakeholders. This would include maintaining underground access to and from Martin Place Station where feasible and reasonable, to reduce impacts at street level. The revised methodology will be the subject of further pedestrian analysis to ensure that pedestrian movements are maintained at an acceptable and safe level of service throughout construction and that appropriate access is maintained to surrounding properties. Construction Traffic Management Plans would be prepared for the project. These plans would address the need to minimise disruption to pedestrian flows and the safe movement around construction sites, in particular during special events and emergency situations.

A process for managing construction works during special events is described in Section 8.4.3 of the Environmental Impact Statement. This section identifies that liaison would occur with the organisers of class 1 and 2 events and (as relevant) the CBD Coordination Office and Roads and Maritime Services to provide appropriate management of construction vehicles to manage potential impacts to event goers, the general public and the construction works.

Issue raised

It is requested that Construction Traffic Management Plans are prepared in consultation and in collaboration with landowners. The plans should include site specific mitigation and management measures, defined roles and responsibilities, as well as monitoring and reporting requirements.

Response

The Construction Environmental Management Framework (Appendix B of this report) provides information on the training, awareness and competence requirements for Principal Contractors on Sydney Metro.

As a minimum this would include site induction, regular toolbox talks and topic specific environmental training, including informing workers of the environment surrounding the construction sites and appropriate measures to minimise impacts to nearby receivers.

The Construction Environmental Management Framework also outlines the requirements for the development of Construction Traffic Management Plans, which will include Site Specific Traffic Access and Management Plans. These plans would detail site specific responses to potential conflicts, including the maintenance of access and safety of transport networks.

Specific consultation would be carried out with agencies, stakeholders and the community (including businesses) regarding traffic management. This includes consultation with the CBD Coordination Office and Roads and Maritime Services.

These plans would be reviewed by Transport for NSW and an independent environmental representative. Depending on the conditions of approval, certain plans may also require the approval of the Department of Planning and Environment. All management plans required by the conditions of approval would be made available on a project website.

7.11.9 Pedestrian integration

Issue raised

Victoria Cross Station

Further consideration should be given to a Greenwood Plaza to Victoria Cross Station underground pedestrian link to improve pedestrian safety and relieve pressure at the Pacific Highway / Miller Street intersection and Dennison Street, North Sydney.

There are no contingency measures to address pedestrian safety issues, in the event that Denison Street is not fully pedestrianised.

Martin Place Station

The permanent changes to station access / egress points for Martin Place Station as a result of the closure of entries and exits within Martin Place would have an impact on tenants and visitors to 8 Chifley.

Response Victoria Cross Station

Pedestrians wishing to travel between the proposed Victoria Cross Station and Greenwood Plaza would be able to walk along the Miller Street footpath and use the escalators at the corner of Pacific Highway, Miller Street and Mount Street, thereby avoiding the need to cross at the Pacific Highway / Miller Street intersection. As such, the provision of a direct underground connection would not change pedestrian congestion levels or safety at this intersection.

The other driver for a direct connection would be to enable interchange between the proposed Victoria Cross Station and North Sydney Station. Victoria Cross Station is not proposed to fulfil a major interchange role with Sydney Trains services at North Sydney Station. This interchange function is provided at other stations along the metro line including Chatswood, Martin Place and Central stations. Notwithstanding, customers wishing to interchange between North Sydney and Victoria Cross stations would be able to use the existing footpath network- primarily along Miller Street.

As a result of the above, there are no plans for an underground connection between the proposed Victoria Cross Station and Greenwood Plaza.

Section 9.4.5 of the Environmental Impact Statement identifies that pedestrian volumes are predicted to increase on Denison Street. Transport for NSW is currently working with North Sydney Council to investigate opportunities to improve the pedestrian environment on Dennison Street while maintaining servicing and delivery access for businesses within the buildings.

Martin Place Station

Transport for NSW would implement the project in an integrated manner and in direct collaboration with relevant agencies, including the Department of Planning and Environment and the City of Sydney, to identify opportunities to integrate existing and future land uses within and around the stations. This process would include further consideration of improvement to the pedestrian network around Martin Place Station and the interface of the station with Martin Place.

The project is expected to enhance connectivity of 8 Chifley to Martin Place Station through the introduction of a new metro line and station access and exit point directly across Elizabeth Street.

7.12 Ambient Psychology

7.12.1 Consultation

Issues raised

Ambient Psychology was not notified by building owners regarding the proposal for Crows Nest Station or the metro tunnel. The business request a representative from North Sydney Council visit the premises to describe the construction project, impacts, staging and noise management measures. Ambient Psychology would also like to understand if there is a mandate for landlords requiring tenants to be informed of an action which will directly affect their business.

Response

As outlined in Chapter 5 of the Environmental Impact Statement and supported in Appendix C, community engagement around the extension to the Sydney Metro network, including Chatswood to Sydenham, commenced in June 2014.

Almost two years of engagement around an extension to the Sydney Metro network occurred, prior to the statutory required consultation. The aim of this consultation was to gather feedback during the development of the project to inform the preparation of the Environmental Impact Statement.

Information has been provided to the community via stakeholder meetings, three media releases, 41 advertisements, seven fact sheets, two newsletters delivered to 220,000 properties within one kilometre of the proposed route (including the property occupied by Ambient Psychology), five project booklets (Environmental Impact Statement Summary, brochures, project overviews, project updates), two online forums, updates across three website, and information provided at two community information centres. The community was also invited to attend eight community information sessions in June 2015, and six sessions and two information stalls in May and June 2016.

Properties immediately adjacent to future construction sites or identified as being potentially affected by the project were either doorknocked by Transport for NSW Place Managers or meetings requested with major landowners and tenants to provide information about the project, describe proposed construction activities and to provide information to assist in making a submission as part of the formal planning process.

Transport for NSW would continue to engage closely with stakeholders and affected properties owners and occupiers through all stages of design, planning, and construction. Specific consultation would occur with businesses adjacent to construction sites to identify and develop measures to manage the specific construction impacts for individual businesses (refer to mitigation measure Bl1 in Chapter 11 of this report).

7.12.2 Construction noise and vibration issues

Issues raised

We are a group of clinical psychologists. We need a quiet environment from which to work as we conduct both assessments and therapy. The offices are occupied on a full time basis. Some of our interventions include hypnotherapy and mindfulness and need an ongoing quiet environment in which to discuss painful issues to these clients. Many of us work with clients that have post-traumatic stress disorder, a symptom of which is reactivity to loud noise.

We would like to understand the environmental impact that this demolition and construction will have upon us and those we support. The noise level may not be manageable and will affect the desirability of the site to clinicians that are casual renters.

Response

The construction noise and vibration assessment has been carried out in accordance with the requirements of the Secretary's environmental assessment requirements and applicable guidelines, particularly the *Interim Construction Noise Guideline*. Details of the methodology of the assessment are provided in Technical Paper 2: Noise and Vibration of the Environmental Impact Statement. The assessment of construction and operational noise and vibration impacts for Crows Nest Station is provided in Sections 10.4.3 and 11.4.1 of the Environmental Impact Statement, and revised in Section 9.6.1 of this report. Ambient Psychology is located in receiver Area D which is predicted to have:

- Exceedances of the airborne noise management levels of greater than 20 dB during enabling works and earthworks, between 10 and 20 dB during aboveground building construction and up to 10 dB during construction of the acoustic shed
- Exceedances of the ground-borne noise management levels of up to 10 dB during the daytime.

These predicted noise levels are based on a worst-case 15-minute assessment carried out in accordance with the approach required by the *Interim Construction Noise Guideline*. This approach assumes that all construction equipment for a particular construction scenario is operating at the same time and at the closest point on the site to any receiver. In reality, construction equipment would operate in varying locations around the site and would rarely all be in use at the same time. As such, the actual noise levels experienced would vary throughout the construction works.

It is acknowledged that some receivers such as Ambient Psychology would be particularly sensitive to noise and vibration at different times of the day. This would be considered as part of the Construction Noise Impact Statement process (described in the Sydney Metro Construction Noise and Vibration Strategy in Appendix C of this report). As part of this process, consultation would be carried out with Ambient Psychology (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts to the business. This would include consideration of alternative construction methods, adjustments of working hours around key period for the Ambient Psychology business and / or options for adjustments to the Ambient Psychology business hours around required construction activities.

7.13 Casa Del Australia Pty Ltd

7.13.1 Traffic and parking impacts

Issues raised

Casa Del understands from the proposal that the elbow end of Murray Street will be closed off and the proposed main entry to the Sydney Metro will be accessed through this location. This is opposite the Casa Del drive way which means it will interfere with trucks delivering goods to customers, unloading shipping containers, receiving goods from suppliers and garbage trucks accessing bins.

Another issue is the trucks that access the Casa Del premises are quite large. 40 foot semi-trailers that cannot simply fit into the driveway use the elbow end of Murray Street to turn around / reverse and drive back to the street to exit at Edinburgh Road. Therefore the proposal of closing the elbow end of Murray Street is not acceptable and is a huge detriment to daily operations. An alternative entry should be sought for Sydney Metro.

Casa Del request that the entry to the development not be located in Murray Street and instead uses an entry at Sydney Steel Road, Marrickville.

Casa Del also request consideration of the current roundabout at Murray Street and Edinburgh Road as part of the project. This area is a major hazard without the additional large trucks the proposal will bring onto the site. Normal light vehicles do not have enough room to go around the roundabout without traveling over it. Casa Del suggest a set of traffic lights be erected for safety and for traffic to flow easily considering the extra traffic that will be there once the proposal commences.

Response

An assessment of potential construction traffic and transport impacts around Marrickville is provided in Section 8.4.18 of the Environmental Impact Statement. The assessment identified that construction vehicles would have a negligible impact on the surrounding road network.

The Marrickville dive site is proposed to provide two functions during construction – to support the tunnel boring machine and use as a temporary concrete pre-cast facility. Two access points are proposed for the Marrickville dive site to provide separation of vehicles accessing different parts of the site and manage potential traffic impacts. Closing a section of Murray Street, as proposed by the project, would not block the access to Casa Del, although it is acknowledged that it could result in some access restrictions for larger trucks. Consultation would be carried out with Casa Del so that sufficient space is provided for all vehicles to access the Casa Del facility. This may involve the provision of alternative access arrangements. Consultation would continue with all relevant stakeholders regarding potential traffic impacts and changed traffic conditions associated with the project.

In relation to the roundabout at Murray Street and Edinburgh Road, further analysis would be carried out of the proposed vehicle access and egress locations (in accordance with mitigation measures T2 and T6 in Chapter 11 of this report). This would address potential pedestrian, cyclist and motorist safety issues. Depending on the location and the findings this may result in measures such as manual supervision, physical barriers or temporary traffic signals being implemented.

Issue raised

Staff parking is already limited. Staff car parking will be impacted with the proposal of closing the elbow end of Murray Street because it will take 50 per cent of the spaces available on Murray Street. Will there be extra parking available for staff during the development?

Response

Where feasible and reasonable, and in accordance with mitigation measures T19, alternative parking facilities would be provided where existing parking is removed to facilitate construction activities.

7.13.2 Construction stage flooding, hydrology and drainage infrastructure Issues raised

Murray Street is a high risk flooding area. During heavy rain periods, flooding occurs occasionally at the end of the Casa Del driveway on Murray Street.

This is a major concern especially if the proposed Sydney Metro site has mud and bacteria that can spread and worsen the already existing problem. It is important that Sydney Metro address this issue, ensure there is extra drainage in the area and advise of a procedure.

Response

Potential flood impacts during construction of the Marrickville dive structure would be managed through detailed construction planning, including the development of appropriate site layouts and staging of construction activities, to avoid or minimise obstruction of overland flow paths and limit the extent and duration of flow diversions required.

Mitigation measure FH3 (refer to Chapter 11 of this report) has been revised to identify the following criteria to be met, where feasible and reasonable, during construction at the Marrickville dive site:

- Not worsen existing flooding characteristics up to and including the 100 year average recurrence interval event in the vicinity of the project (this includes not increasing the potential for soil erosion and scouring)
- Dedicated evacuation routes would not be adversely impacted in flood events up to and including the probable maximum flood. This may include the requirement for changes to existing arrangements for flood warning systems and signage.

Construction planning for the Marrickville dive site would be carried out in consultation with the State Emergency Services and Inner West Council.

7.13.3 Construction dust emissions

Issues raised

Casa Del is a highly sensitive food manufacturing factory which must meet certain legal requirements and standards. If the standards are not met, NSW Food Authority can order Casa Del to shut down until rectified.

Trucks which are used to deliver goods on a daily basis are parked outside the premises. It is crucial to ensure there is no dust inside these trucks to maintain the quality assurance of our goods.

Casa Del also has suppliers who deliver ingredients which contain raw products. Casa Del would like to know how dust can be managed when the rollers doors must be opened to accept raw material deliveries and stop the dust from going onto stocked raw materials, other ingredients, unused cartons and factory machinery. Casa Del would like to know what will be implemented on an ongoing basis to manage and mitigate dust impacts to ensure Casa Del is not affected.

Casa Del suggest a dust containment system is considered to protect and aid the business in meeting Occupational Health and Safety requirements as well as ensuring maintenance of quality assurance.

Response

Section 22.4 of the Environmental Impact Statement provides an assessment of potential air quality impacts of the project. Dust emissions from the project would be readily manageable to appropriate standards through the implementation of proven management and mitigation measures as identified in Section 22.6 of the Environmental Impact Statement.

It is acknowledged that some receivers such as Casa Del are particularly sensitive to dust emissions. Specific consultation (as per mitigation measure BI1) would be carried out with Casa Del in relation to the potential impacts of dust to their business operations and to identify and develop specific measures to manage construction dust impacts.

The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

7.13.4 Disruption to services and utilities during construction

Issues raised

Casa Del is a power sensitive business with no back up of power to the site and has high power consumption. Casa Del wish to be assured that there is a procedure in place to deal with any loss of business due to unforeseen incidents during construction.

Response

Any works to utilities would be managed to eliminate or minimise the duration of any interruption of supply to users. This would include consideration of the need to maintain utility supply to power sensitive businesses such as Casa Del. If interruption were to be required, potentially affected users would be notified in advance of any disruption.

7.13.5 Consultation

Issues raised

Casa Del request effective communication before and during construction to ensure business needs are understood and issues are resolved immediately.

Response

Transport for NSW would continue to engage closely with stakeholders and affected properties owners and occupiers through all stages of design, planning and construction. Specific consultation would occur with adjacent businesses to identify and develop measures to manage the specific construction impacts for individual businesses; including access and servicing (refer to mitigation measure Bl1 in Chapter 11 of this report).

Transport for NSW would continue to consult with Casa Del. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

7.14 Harvey Norman Alexandria

7.14.1 Consultation

Issues raised

Harvey Norman was not notified of the proposed underground tunnel alignment and associated corridor underneath their property, despite the extent to which our client's property will be potentially adversely affected.

Response

As outlined in Chapter 5 of the Environmental Impact Statement and supported in Appendix C, community engagement around the extension to the Sydney Metro network, including Chatswood to Sydenham, commenced in June 2014.

Almost two years of engagement around an extension to the Sydney Metro network occurred, prior to the statutory required consultation. The aim of this consultation was to gather feedback during the development of the project and feed into the preparation of the environmental impact assessment.

Information has been provided to the community via stakeholder meetings, three media releases, 41 advertisements, seven fact sheets, two newsletters delivered to 220,000 properties within one kilometre of the proposed route (including the property occupied by Harvey Norman), five project booklets (Environmental Impact Statement Summary, brochures, project overviews, project updates), two online forums, updates across three website, and information provided at two community information centres. The community was also invited to attend eight community information sessions in June 2015, and six sessions and two information stalls in May and June 2016.

As noted in Section 6.3.1 of the Environmental Impact Statement the tunnel alignment may change during detailed design. Once the tunnel alignment (horizontal and vertical) has been confirmed, Transport for NSW would contact property owners with more information regarding potential impacts and mitigation measures, and the substratum acquisition process.

It will be necessary to acquire an area of land for the tunnel corridor below the surface of properties under the *Transport Administration Act 1988*. Properties above the corridor would be contacted by the project team once the project has been approved and the tunnel alignment has been finalised. Tunnelling would occur using the best technology available so that impacts are minimised.

7.14.2 Tunnel alignment

Issues raised

Harvey Norman understand that there would be a future statutory corridor for the project established under the *State Environmental Planning Policy (Infrastructure) 2007* and any future development in this corridor would require referral to Transport for NSW for concurrence. The Environmental Impact Statement indicates that the project corridor would extend 30 metres either side of the tunnel alignment. It is also noted that the Environmental Impact Statement indicates that the current proposed alignment is subject to change. To that extent, there is concern that any such change has the potential to further adversely impact on the Harvey Norman property. Accordingly, we seek an assurance that any such change will be subject to further consultations with affected landowners.

Response

Indicatively, the project corridor would extend 30 metres either side of the tunnel alignment. The project would require a substratum acquisition envelope around the tunnel, including any tunnel anchors required. The introduction of the subsurface stratum, and the tunnel itself, has the potential to limit development above the alignment. The project alignment is generally shallowest at stations and at tunnel portals (at stations tunnel depths are typically greater than 20 metres). Between stations the tunnel depths there would be a minor impact with respect to limiting future development potential above the project.

Development applications within the project corridor would be referred to Transport for NSW for concurrence and to ensure that project infrastructure is not impacted by proposed developments.

Transport for NSW will continue to engage closely with stakeholders and affected properties owners and occupiers through all stages of design, planning, and construction. The project team can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

7.14.3 Substratum acquisition

Issues raised

According to the Environmental Impact Statement, we understand that where tunnel will be constructed, it will be necessary to acquire stratum below the surface of the properties for the construction of the project. There appears to be no discussion with regards to the impact upon future excavation, foundations, piers depths and density of development that could be supported above the tunnel alignment / corridor. The extent to which the development potential of the Harvey Norman property will be limited is therefore not clear. Accordingly, we request that this be clarified as it has the potential to have a direct and material impact on the value of the property.

We note that the Environmental Impact Statement suggests that for the purposes of acquiring stratum below the surface properties for the construction of the project including where required for the development of underground infrastructure, compensation is not payable under the *Transport Administration Act 1988.* To the extent to which the Harvey Norman property is affected by the proposed alignment and corridor, we note our strong concern in relation to the potential financial implications on the value of the property.

Response

Property values are based a number of complex factors including demand at a certain point in time, general location, accessibility, traffic and traffic noise on the street and proximity to transport infrastructure. Properties located above the rail tunnels are not anticipated to experience a reduction in value as a result of the project. A decline in property values above the tunnels has not been evident along the Epping to Chatswood Rail Line or other underground rail lines in Sydney.

7.14.4 Restrictions on future development

Issues raised

The property is in an area the City of Sydney has identified as "investigation areas". These "investigation areas" are not currently zoned for market housing however the City of Sydney has indicated (by way of site specific planning guidelines) that they will consider planning proposal requests to rezone sites and allow mixed used (residential) development in these areas at significantly increased densities.

In short, the Harvey Norman property is considered to have significant residential redevelopment potential. We request the proponent realign the tunnel and associated corridor between Waterloo Station and Sydenham Station away from the "investigation areas" and the Harvey Norman property to ensure the future development potential of the site is not unreasonably impacted.

Response

The existence of tunnels below the property would not necessarily impact the ability to redevelop a site for residential purposes. In the vicinity of the Harvey Norman property in Alexandria, the tunnels would be around 36 to 37 metres below ground level. Based on this depth, there would be a minor impact with respect to limiting future development potential, although this would be dependent on the specifics of the development proposed in the future.

7.15 ISM Studios Pty Ltd

7.15.1 Noise and vibration

Issue raised

ISM Studios operate two sound recording studios – one located at 20 Clarke Street, Crows Nest and one at 8 Clarke Street, Crows Nest. ISM Studios have concerns regarding noise and vibration from the project, in particular the transmission noise through the building from large equipment and blasting / mining.

Response

The construction noise assessment in Section 10.4.3 of the Environmental Impact Statement and revised in Section 9.6.1 of this report found that the ISM Studios ground-borne noise levels could be higher than 75 dB during the daytime period.

These predicted noise levels are based on a worst-case 15-minute assessment carried out in accordance with the approach required by the *Interim Construction Noise Guideline*. This approach assumes that all construction equipment for a particular construction scenario is operating at the same time and at the closest point on the site to any receiver. In reality, construction equipment would operate in varying locations around the site and would rarely all be in use at the same time. As such, the actual noise levels experienced would vary throughout the construction works.

It is acknowledged that some receivers such as ISM Studios would be particularly sensitive to noise and vibration at different periods of the day. These particular receivers would be considered as part of the Construction Noise Impact Statement process (as described in the Sydney Metro Construction Noise and Vibration Strategy in Appendix C of this report). As part of this process, consultation would be carried out with ISM Studios (in accordance with mitigation measure BI1 – refer to Chapter 11 of this report) to identify and develop mitigation measures to manage the specific construction impacts. This would include a detailed examination of all high impacting construction activities. Where feasible and reasonable, specific mitigation and management measures would be identified that would best meet the requirements of maintaining the operations of the business. This would include consideration of alternative construction methods, adjustments of working hours around key period for the ISM Studios business and / or options for adjustments to the ISM Studios business hours around required construction activities. This consultation process would also aim to identify noise and vibration attenuation measures already in place at the ISM Studios business and refine the potential noise and vibration impacts.

7.16 Comfort and Fit

7.16.1 Customer access Issue raised

The Comfort and Fit store at 372 Pacific Highway has parking at the back on Nicholson Place (which is a one way street from Hume Street to Shirley Road). Currently customers need to come via Hume Street crossing the Pacific Highway to enter to the car park. The Pacific Highway doesn't have right turn on Hume Street currently. It isn't convenient at all if Hume Street is closed or right turn isn't allowed from the Pacific Highway onto Hume Street to enter into Nicholson Place.

Response

As described in Section 7.10.3 of the Environmental Impact Statement, Hume Street would need to be closed for a short period (around six months) whilst cut-and-cover station excavation is carried out through this section.

During the period when Hume Street is closed, motorists would be able to use a number of alternative routes to access the western side of the Pacific Highway. For example, this could include left at Albany Street, right at Oxley Street then straight across the Pacific Highway.

7.17 The Printing Department

7.17.1 Artarmon Industrial Area Station

Issue raised

The Sydney Metro is a much needed addition to the Sydney's current infrastructure that The Printing Department wholeheartedly support but believe improvements need to be made to maximise the return for the huge amounts of capital being spent on this project and other North Shore important infrastructure it should provide access to.

The Printing Department note with interest that the planned station for the Artarmon Industrial Area / Royal North Shore Hospital precinct has been deleted from the planned route. The concerns regarding this missing station impact issues including traffic, noise, business impacts, social impacts and community infrastructure, sustainability and cumulative impacts.

Traffic and noise / congestion at Chatswood Station, Central Station or North Sydney Station will increase markedly as workers / hospital patients and visitors change trains to reach the Artarmon Industrial / Hospital Area.

Business will be impacted by the lack of access for employees. The Printing Department note Artarmon is an industrial area. By very nature this provides jobs of lower remuneration. The employees of these businesses currently commute from either the Central Coast or the South West of Sydney where this train line will continue. The Lower North Shore real estate is desirable and therefore expensive and out of reach of the vast majority of industrial employees. To attempt to maintain an industrial area without transport links to the areas industrial employees can afford does not add up. Already it is difficult to find employees willing to make the 11/2 hour commute from these areas and to have to change to a second form of transport to complete the trip will make it prohibitive. It is suspected that the biggest employer on the north side, Royal North Shore Hospitali's medical staff will make the Hills trip to Chatswood and then have to change, and the hospitality staff will be travelling from the South West and have to change at Central to complete the journey. Two modes of transport for these groups while the metro essentially passes their workplace will not attract the calibre of staff required who are willing to spend the extra time and money to work on the North Shore.

Social impacts and community infrastructure are the concerns for the patients and visitors to Royal North Shore Hospital. Patients are by their very nature less mobile and easy access is required or they will need to use other government services like the ambulance service or their own vehicles to reach the destination, creating more traffic and parking issues.

Sustainability of the whole Artarmon area is called into question if the above traffic, parking and congestion issues are not addressed.

Cumulative impact of all this will be to see frustration at lack of access reduce Artarmon Industrial Area in viability.

Response

A range of station locations north of Sydney Harbour were investigated as part of the stations options evaluation process described in Section 4.4 of the Environmental Impact Statement. The round of consultation in June 2015 also sought feedback on the station locations to the north of Sydney Harbour.

A station in the Artarmon Industrial Area was considered as part of the station options evaluation process as the Artarmon Industrial Area provides an important role with light industrial, and specialist health and media activities. Consultation with stakeholders, including Willoughby Council, indicated that there was limited support for such a major land use change due to the importance of the existing industrial use. As a result of the above factors, a station within the Artarmon Industrial Area was not pursued.

People accessing the Artarmon Industrial Area (including workers and patients / visitors at the hospitals) would be able to continue to access these areas as they do now. Further, they may be able to use the new metro network for part of their journey, providing a benefit in travel time savings.

Customers changing trains at Chatswood, North Sydney and Central stations are not anticipated to have a major impact on the road network or have a noise impact on the surrounding areas. Efficient interchanges would be provided between the Sydney Trains network and the Sydney Metro network at key locations including Chatswood, Martin Place and Central stations. Interchanges would occur within the station areas without the need for customers to exit one station and enter another.