

Appendix F

Staging Report



Transport
for NSW

Parramatta Light Rail Stage 2

Staging Report

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Table of Contents

1	Introduction.....	5
1.1	Project description	5
	Key features of the project.....	5
	Light rail track and bridges.....	5
	Active and public transport integration	5
	Other works.....	6
1.2	Statutory context.....	8
1.2.1	Exempt and complying development	8
1.3	Proponent and delivery.....	8
1.4	Purpose of this Staging Report	9
2	Project staging	13
2.1	Low impact works	13
2.2	Construction staging.....	14
2.2.1	Stage A – Bridge between Melrose Park and Wentworth Point.....	14
2.2.2	Stage B – Main alignment construction works and supply, operate and maintain system works.....	19
2.3	Operational staging	22
2.4	Timing.....	22
2.5	Managing cumulative impacts.....	22
2.5.1	Other major projects.....	23
2.5.2	Project cumulative impacts.....	23
2.5.3	Principles and mechanisms to minimise cumulative impacts.....	24
3	Addressing the mitigation measures	29
3.1	Requirements of the mitigation measures	29
3.2	Compliance.....	29
4	Review.....	79

4.1	Changes to delivery strategy	79
4.2	Project determination and changes to the planning approval	79
5	References	80



Glossary and Definitions

Acronym / Term	Description
CBD	Central business district
CEMP	Construction environmental management plan
CSSI	Critical State Significant Infrastructure
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
ICNG	<i>Interim Construction Noise Guideline</i>
NML	Noise Management Level
OOHW	Out-of-hours work
Planning approval	Collective term for the Parramatta Light Rail Stage 2 Environmental Impact Statement, Response to Submissions, Amendment Report and Infrastructure Approval
The project	Parramatta Light Rail Stage 2
Transport	Transport for NSW (the proponent)

1 Introduction

This Staging Report has been developed for the Parramatta Light Rail Stage 2 project (the project). It describes how construction of the project will be staged and has been prepared in accordance with the *State Significant Infrastructure Template Conditions of Approval (Linear Infrastructure)* (Department of Planning and Environment (DPE), 2022).

1.1 Project description

Parramatta Light Rail will be delivered in stages to ensure the infrastructure needed to support growth and development is in place:

- Stage 1 will connect Westmead to Carlingford via the Parramatta central business district (CBD) and Camellia
- Stage 2 ('the project') will connect the Parramatta CBD and Stage 1 to Camellia, Rydalmere, Ermington, Melrose Park, Wentworth Point, Sydney Olympic Park and the Carter Street precinct in Lidcombe, adjacent to Sydney Olympic Park.

This Staging Report applies to the Parramatta Light Rail Stage 2 project.

Key features of the project

The project comprises two main elements:

- Construction of about 10 kilometres of light rail infrastructure between Camellia and the Carter Street precinct adjacent to Sydney Olympic Park
- Operation of about 13 kilometres of light rail alignment between the Parramatta CBD and the Carter Street precinct, including a section of infrastructure constructed by Parramatta Light Rail Stage 1 between Camellia and the Parramatta CBD.

Light rail track and bridges

- A new 10 kilometre long dual light rail track, with 14 stops, between the Parramatta Light Rail Stage 1 line in Camellia and the Carter Street precinct, adjacent to Sydney Olympic Park
- Two bridges over the Parramatta River between Camellia and Rydalmere, and between Melrose Park and Wentworth Point
- A bridge over Silverwater Road between Rydalmere and Ermington
- Other bridge works in Ken Newman Park and Sydney Olympic Park.

Active and public transport integration

- About 9.5 kilometres of new active transport links between Camellia and the Carter Street precinct, which will connect with the existing cycling and pedestrian network
- Interchanges with other forms of public transport, including trains, ferries, buses and Sydney Metro West, with the main interchanges located in the Parramatta CBD, Rydalmere and Sydney Olympic Park
- A shared light rail and pedestrian zone (no through vehicle access) within Sydney Olympic Park along Dawn Fraser Avenue between Australia Avenue and Olympic Boulevard
- Bus access over the proposed bridge between Melrose Park and Wentworth Point.

Other works

Works proposed to support the project's operation:

- Turnback facilities, including along part of Macquarie Street in the Parramatta CBD
- Adjustments to the Parramatta Light Rail stabling and maintenance facility at Camellia
- Five new traction power substations to convert electricity to a form suitable for use by light rail vehicles
- New and improved open spaces and recreation facilities at Eric Primrose Reserve, Ken Newman Park and the Atkins Road stop.

The project is shown on Figure 1-1.

1.2 Statutory context

The Parramatta Light Rail Stage 2 project is declared State significant infrastructure in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act). It is classified as Critical State Significant Infrastructure (CSSI).

As State significant infrastructure, the project needs approval from the NSW Minister for Planning and Public Spaces. An Environmental Impact Statement is needed to support the application for approval for State significant infrastructure under the EP&A Act. The *Parramatta Light Rail Stage 2 Environmental Impact Statement* (Transport for NSW, 2022) (EIS) assessed impacts for the project and was on public exhibition from 9 November to 16 December 2022. It is located at Department of Planning and Environment's major projects website:

<https://www.planningportal.nsw.gov.au/major-projects/projects/parramatta-light-rail-stage-2>

The project has also been determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and requires approval from the Australian Minister for the Environment and Water.

This Staging Report identifies how Transport for NSW (Transport) and its contractors will stage construction and operation of the project, and comply with the updated mitigation measures within Appendix B of the Response to Submissions.

1.2.1 Exempt and complying development

Exempt development does not require assessment under Part 4 or Part 5 of the EP&A Act. Exempt development is defined in the State Environmental Planning Policy (Planning Systems) 2021, the State Environmental Planning Policy (Transport and Infrastructure) 2021, the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 and under relevant Local Environmental Plans. The State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 also defines complying development. In situations where work is carried out as exempt or complying development, it is not part of the project and is not covered by this Staging Report.

Examples of exempt activities include investigations (including geotechnical and other testing, surveying and the placement of survey marks, and sampling), demolition of buildings or structures and installation of fences.

State Environmental Planning Policy (Planning Systems) 2021, schedule 5, clause 35 also excludes the following activities from the project: surveys, test drilling, test excavations, geotechnical investigations or other tests, sampling or investigation for the purposes of the design or assessment of the project.

Each stage may utilise exempt provisions available under the State Environmental Planning Policies and planning instruments, subject to due diligence and environmental assessments of exempt development works being undertaken by Transport and its contractors prior to works commencing.

1.3 Proponent and delivery

Transport for NSW (Transport) is the proponent for the Parramatta Light Rail Stage 2. The design, construction, maintenance and operation of the project is being delivered through separate contracts on behalf of Transport.

1.4 Purpose of this Staging Report

The purpose of this Staging Report is to provide an outline of the proposed staging of works for the project. It guides the reader through each stage of the project to understand how and when the mitigation measures will be addressed throughout construction and operation of the project.

This Staging Report has been prepared to allow Transport to construct the project in stages. It:

- Describes the construction stages, including details of works and activities to be carried out in each stage and general timing
- Describes the operational stages, including details of activities to be carried out in each stage and the general timing
- Identifies how the mitigation measures will be complied with across and between each of the stages of the project
- Identifies how cumulative impacts arising from the proposed staging will be managed.

The Staging Report has been developed in accordance with the *State Significant Infrastructure Template Conditions of Approval (Linear Infrastructure)* (refer to Table 1-1).

Table 1-1: Conditions of approval from the *State Significant Infrastructure Template Conditions of Approval (Linear Infrastructure)* relevant to the Staging Report

ID	Condition	Document Reference	How addressed
A9	<p>The CSSI may be constructed and operated in stages (including but not limited to temporal, location or activity based staging). Where staged construction and/or operation is proposed, a Staging Report (for either or both construction and operation as the case may be) must be prepared. The Staging Report must be endorsed by the ER and then submitted to the Planning Secretary for information no later than one (1) month before the commencement of construction of the first of the proposed stages of construction (or if only staged operation is proposed, one (1) month before the commencement of operation of the first of the proposed stages of operation), or as required by Condition A15.</p> <p><i>Note: Unless otherwise specified in this approval, early works are a stage of construction.</i></p>	Section 2	<p>The purpose of this Staging Report is to provide an outline of the proposed staging of construction of the project. Construction of the project will be implemented in two stages as described in section 2.</p> <p>This Staging Report has only been provided for construction of the project. It was submitted to the Department of Planning and Environment as part of the Response to Submissions, prior to determination of the project.</p> <p>Should Transport decide to stage operation of the project at a later date this Staging Report will be revised, endorsed by the Environmental Representative and submitted to the Department of Planning and Environment prior to the commencement of the operational stage.</p>
A10	<p>The Staging Report must:</p> <p>(a) if staged construction is proposed, set out how the construction of the whole of the CSSI will be staged, including details of work and activities to be carried out in each stage and the general timing of when construction of each stage will commence and finish;</p>	Section 2	<p>Details of the two construction stages are provided in section 2. Whilst commencing at different times, each stage will have periods during which the works will overlap.</p> <p>The proposed timing for each stage of the project is outlined in section 2.</p>

ID	Condition	Document Reference	How addressed
	<p>(b) if staged operation is proposed, set out how the operation of the whole of the CSSI will be staged, including details of activities to be carried out in each stage and the general timing of when operation of each stage will commence and finish (if relevant);</p> <p>(c) specify how compliance with conditions will be achieved across and between each of the stages of the CSSI; and</p> <p>(d) set out mechanisms for managing any cumulative impacts arising from the proposed staging.</p> <p><i>Note: A Staging Report may reflect the staged construction and operation of the project through geographical activities, temporal activities or activity-based contracting and staging.</i></p>	<p>N/A</p> <p>Section 3</p> <p>Section 2.5</p>	<p>Staged operation is not currently proposed for the project. Should Transport decide to stage operation of the project at a later date this Staging Report will be revised, endorsed by the Environmental Representative and submitted to the Department of Planning and Environment prior to the commencement of the operational stage.</p> <p>Should the project be approved, Transport would update this Staging Report to specify how compliance with the Infrastructure Approval conditions would be achieved across each stage of the project. Section 3 outlines how the mitigation measures will be addressed across each stage of the project. Table 3-1 identifies the mitigation measures applicable to the stages of the project.</p> <p>Mechanisms in place to manage cumulative impacts are described in section 2.5.</p>
A11	<p>The CSSI must be staged in accordance with the Staging Report, and submitted for information to the Planning Secretary.</p>	<p>This table</p>	<p>This document outlines the construction stages proposed for the project and will be implemented during construction of the project, should the project be approved. It was submitted to the Department of Planning and Environment as part of the Response to Submissions, prior to determination of the project.</p>

ID	Condition	Document Reference	How addressed
A12	Where staging is proposed, the terms of this approval that apply or are relevant to the work or activities to be carried out in a specific stage must be complied with at the relevant time for that stage.	Section 4.2	Should the project be approved, Transport would update this Staging Report to specify the conditions of approval relevant to the construction stages. Table 3-1 identifies the mitigation measures that are triggered or not triggered by the specific construction stages of the project.
A13	Where changes are proposed to the staging of construction or operation, a revised Staging Report must be prepared, endorsed by the ER and submitted to the Planning Secretary for information no later than one (1) month prior to the proposed change in the staging.	Section 4	Should Transport decide to amend staging of the construction or operation of the project at a later date, this Staging Report will be revised, endorsed by the Environmental Representative and submitted to the Department of Planning and Environment prior to the commencement of the stage.
A14	Should a Construction Environmental Management Framework (CEMF) be submitted for approval under Condition A15, the Staging Report must be submitted with the CEMF, i.e. no later than one (1) month before the lodgement of any CEMP, CEMP sub plan or CMP to the Planning Secretary for approval.	This table	A Construction Environmental Management Framework has been developed for the project. It was submitted to the Department of Planning and Environment as part of the Response to Submissions (refer to Appendix G), prior to determination of the project, with this Staging Report.

2 Project staging

This chapter outlines how construction of the project will be staged. The core principles of the Staging Report, to construct the project in the minimum, reasonable practicable time, are:

1. Align the construction of broader project with market capacity.
2. Allow low impact work with negligible environmental impact to progress ahead of construction.
3. Prioritise low and medium risk construction works in advance of the main high risk construction works to minimise disruption to receivers.
4. Where practicable, coordinate works to manage cumulative impacts of the project and, if reasonable, other local construction projects.

Cumulative impacts will be identified by considering any overlap in the extent of environmental impact by separate activities. For example, whether the maximum distance of noise impact intersects with other noise generating works, or the extent of modified pedestrian access interfaces with another activity resulting in an undesirable outcome. Preference will be given to managing cumulative impacts within the project and external to the project, where possible, to reduce the length of disruption caused by environmental impacts in any affected area.

At the time of writing, it is envisaged that the project will be constructed in two stages, with substages. Whilst commencing at different times, each stage will have periods during which the works will overlap. The substages have been staged during construction to meet the core principles of this Staging Report as noted above.

2.1 Low impact works

Some works will be undertaken outside the stages and substages identified or as 'exempt development' in accordance with section 76(2) of the EP&A Act. 'Exempt development' is discussed further in section 1.2.1.

Where works are undertaken outside of the stages identified in section 0 but are still part of the project, these 'low impact works' will not be defined as 'Construction' in accordance with the definition of 'Construction' provided in the *State Significant Infrastructure Template Conditions of Approval (Linear Infrastructure)*.

The following will be undertaken prior the commencement of the low impact work:

- Consideration of relevant regulatory requirements
- Identification of relevant updated mitigation measures
- Preparation of a low impact works approval form by the relevant contractor and for review and approval by Transport to confirm that the works do not represent 'Construction' in accordance with the template conditions. This application must include (as a minimum):
 - A detailed description of the proposed works
 - An environmental risk assessment (including identification of actual and potential environmental impacts)
 - Identification of mitigation measures to be implemented to address any actual or potential environmental risks and/or impacts (including details on community consultation relevant to the works)
 - An environmental control map
 - Endorsement by the Environmental Representative (as required).

2.2 Construction staging

Construction of the project will be staged to align with the procurement and delivery strategy for the project, and achieve project completion in the minimum, practically reasonable time, while managing community and environmental impacts using suitably qualified and experienced contractors for specialised components. This approach is further described below for each stage.

The project will be constructed in two stages (refer to Figure 2-1):

- Stage A – Bridge between Melrose Park and Wentworth Point
- Stage B – Main alignment construction works and supply, operate and maintain system works.

Each contractor (including sub-contractors) and Transport are responsible for complying with relevant requirements of the EIS, Response to Submissions, Amendment Report and Infrastructure Approval for the project (collectively referred to as the planning approval). An allocation of responsibilities is defined in contracts between Transport and the contractors.

Coordination of work under each of the stages is further discussed in section 3, including the proponent’s role in ensuring compliance (section 3.2), and the approach for managing cumulative impacts is outlined in section 2.5.

The staged commencement of works will mean that development and submission for approval (where applicable) of project plans (environmental management plans, sub plans and reports) will also be staged and reflect the complexity and degree of environmental risk associated with each stage of the project. Plans relating to activities commencing later in the project will be prepared and submitted prior to those stages commencing (and will exclude activities already undertaken).

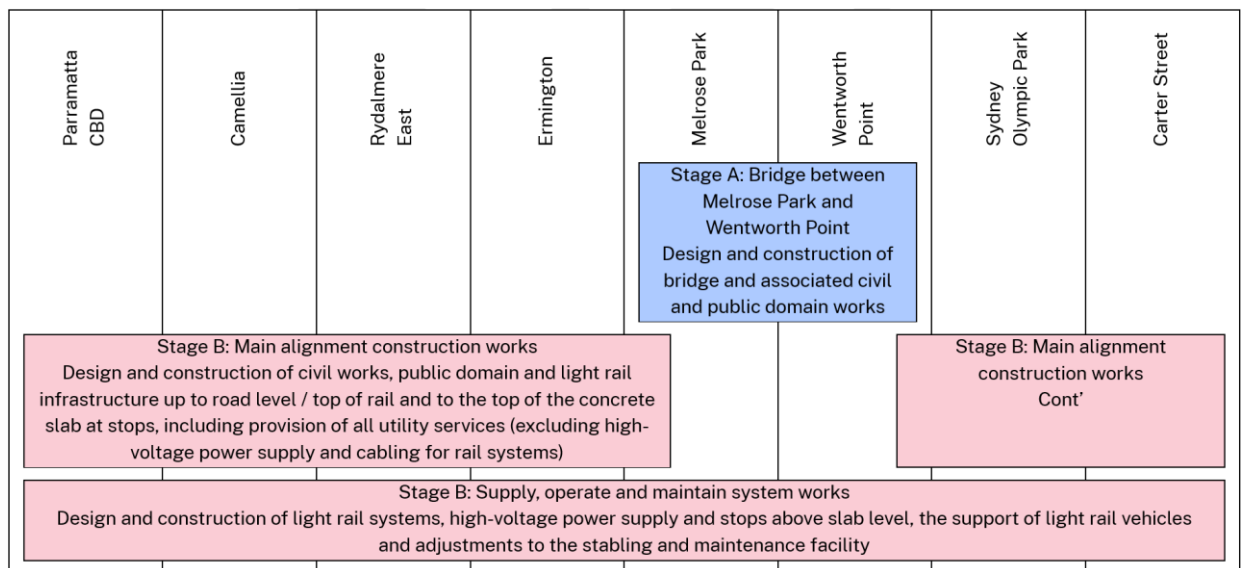


Figure 2-1: Summary of project stages by geographic location

2.2.1 Stage A – Bridge between Melrose Park and Wentworth Point

Stage A of the project will include construction of the bridge between Melrose Park and Wentworth Point. The general extent of the work area is shown in Figure 2-2. By building this bridge over the Parramatta River and its approaches first, Transport will align construction of the broader project with market capacity. This stage of work will include the following substages:

- Substage A1 – Pre-construction and site establishment, including heritage investigations
- Substage A2 – Utilities relocation
- Substage A3 – Temporary works
- Substage A4 – Main construction works and testing and commissioning.

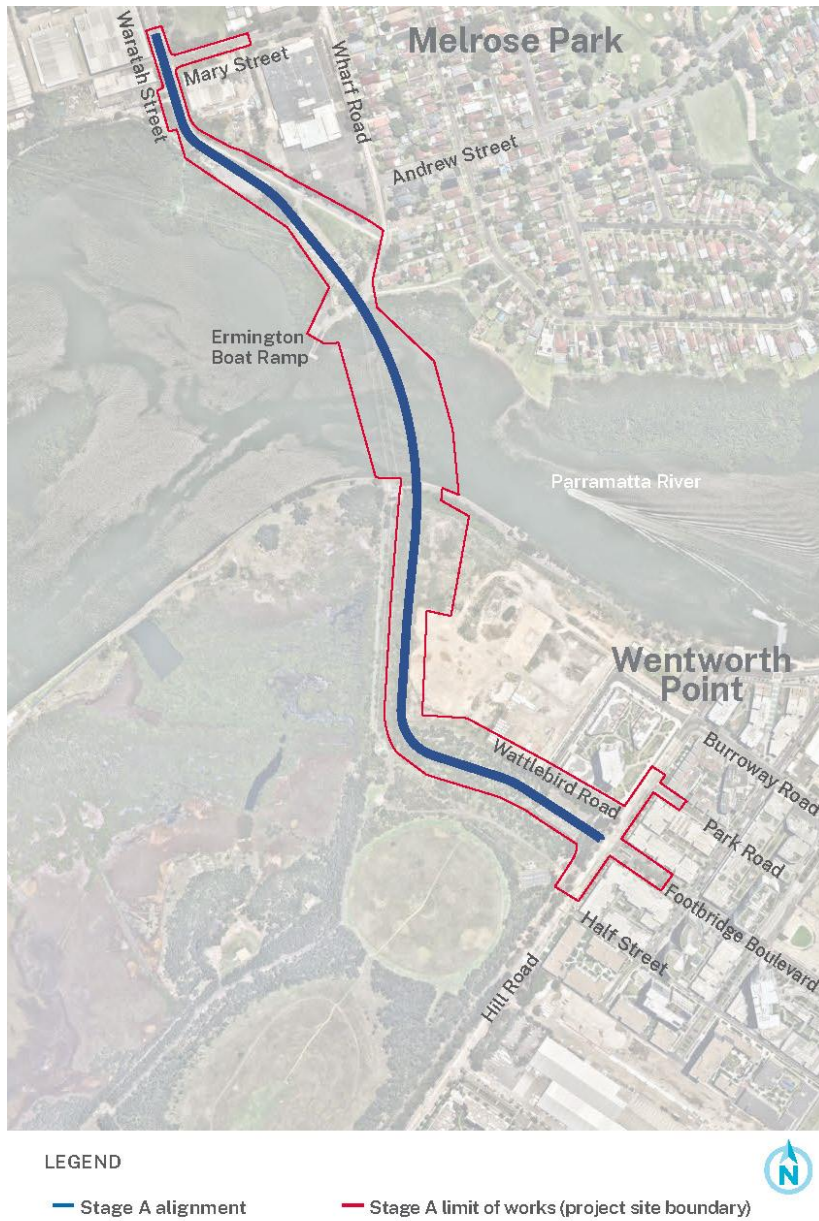


Figure 2-2: Extent of works for Stage A – Bridge between Melrose Park and Wentworth Point

2.2.1.1 Substage A1 – Pre-construction and site establishment

The pre-construction and site establishment activities (low impact works) substage will commence before other works in Stage A, such as main construction works, however it may continue concurrently with and be completed during the main construction works. The works in Substage A1 are required to:

- Provide additional design information
- Inform heritage, contamination and other environmental investigations
- Enable the area for construction and / or operation.

Activities that are proposed to be undertaken before construction works commence will include:

- a) Survey works
- b) Investigations including investigative drilling, contamination investigations and excavation, heritage investigations, utility investigations and dilapidation surveys
- c) Site clearing and establishment work approved by the Department of Planning and Environment under a Site Establishment Management Plan, including the demolition of structures and establishment of fencing and internal haulage roads

- d) Use of ancillary facilities if the Environmental Representative has determined the operational activities will have minimal impact on the environment and community
- e) Minor clearing and relocation of native vegetation, as identified in the EIS, Response to Submissions and Amendment Report
- f) Installation of mitigation measures including heritage salvage, erosion and sediment control, temporary exclusion fencing for sensitive areas and at-property treatments
- g) Property acquisition adjustment works including installation of property fencing
- h) Relocation and connection of utilities where the relocation or connection has been determined with the Environmental Representative to have a minor impact to the environment and the community
- i) Archaeological testing under the *Code of practice for archaeological investigation of Aboriginal objects in NSW* (Department of Environment, Climate Change and Water (DECCW), 2010), archaeological investigations to inform design or archaeological monitoring undertaken in association with [a]-[h] above to ensure that there is no impact to heritage items
- j) Maintenance of existing buildings and structures required to facilitate the carrying out of the project
- k) Other activities determined by the Environmental Representative to have minor impact on the environment and the community, which may include but not be limited to construction of minor access roads, temporary relocation of pedestrian and cycle paths and the provision of property access.

However, the above activities will not be completed during Substage A1:

- Where heritage items (excluding those impacted by activities in (f), (h), (i) and (j) above), or threatened species, populations or ecological communities (within the meaning of the *Biodiversity Conservation Act 2016* or *Environment Protection and Biodiversity Conservation Act 1999*) are affected or potentially affected the work, that work may only be implemented in Substage A1 if determined (approved) by the Planning Secretary, following consultation with Heritage NSW, Environment and Heritage Group or Department of Primary Industries (Fisheries) (in the case of impact upon fish, aquatic invertebrates or marine vegetation).
- Any night time hours (as defined by the *Interim Construction Noise Guideline (ICNG)*) work that exceeds the following noise management and vibration levels:
 - i. Works that cause $L_{Aeq(15\text{ minute})}$ noise levels:
 - No more than 5 dB(A) above the rating background level at any residence in accordance with the ICNG, and
 - No more than the 'Noise affected' Noise Management Levels (NML) specified in Table 3 of the ICNG at other sensitive land use(s)
 - ii. Works that cause:
 - Continuous or impulsive vibration values, measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.2 of *Assessing Vibration: a technical guideline* (Department of Environment and Conservation (DEC), 2006), or
 - Intermittent vibration values measured at the most affected residence are no more than the preferred values for human exposure to vibration, specified in Table 2.4 of *Assessing Vibration: a technical guideline* (DEC, 2006).

Table 3-1 identifies the applicable mitigation measures for this stage.

2.2.1.2 Substage A2 – Utilities relocation

Where utility protection, relocation and connection works are determined to have a minor impact to the environment and the community by the Environmental Representative they will be completed as part of Substage A1. It is anticipated that the following utilities works will be completed in Substage A1 (pending determination by the Environmental Representative that they have a minor impact):

- At the intersection of Waratah Street and Mary Street:
 - Relocation of Sydney Water potable water utilities (excluding works during the night time period of 10pm – 7am)
 - Removal of Sydney Water potable water utilities
 - Relocation of Jemena gas utility (excluding works during the night time period of 10pm – 7am)
 - Relocation of telecommunication utilities (excluding works during the night time period of 10pm – 7am)
- Relocation and protection of the VIVA petroleum pipeline utility between the intersection of Mary and Waratah streets and Wharf Road (excluding works during the night time period of 10pm – 7am)
- Relocation of Endeavour Energy Utility distribution network assets between the intersection of Mary and Waratah streets and Wharf Road (excluding works during the night time period of 10pm – 7am)
- At Wharf Road, south of Waratah Street:
 - Relocation of Sydney Water potable water and waste water utilities (excluding works during the night time period of 10pm – 7am)
 - Relocation of telecommunication utilities
 - Relocation of Ausgrid electricity utilities (excluding works during the night time period of 10pm – 7am)
 - Relocation of Endeavour Energy electricity utilities
- At the intersection of Hill Road and Footbridge Boulevard:
 - Removal of Sydney Olympic Park Authority irrigation utility
 - Relocation of Sydney Olympic Park Authority communications utility (excluding works during the night time period of 10pm – 7am)
 - Relocation of Sydney Water recycled water and waste water utilities (excluding works during the night time period of 10pm – 7am)
 - Relocation of Jemena gas utility (excluding works during the night time period of 10pm – 7am)
 - Removal, relocation and protection of Ausgrid electricity utilities (excluding works during the night time period of 10pm – 7am)
 - Relocation of telecommunication utilities (excluding works during the night time period of 10pm – 7am)
- Relocation of the Ausgrid 132kV overhead electricity utility spanning the Parramatta River between Melrose Park and Wentworth Point, including installation of new poles at Melrose Park, removal of the existing pylon at Melrose Park and tie-in to existing pylons (excluding works during the night time period of 10pm – 7am)
- Removal of Ausgrid electricity utilities at the former Ausgrid Transmission Substation on Hill Road.

All other utility works will be completed in Substage A2 and are required to remove clashes between existing utilities and the construction of the project. The Substage A2 works will include:

- At the intersection of Waratah Street and Mary Street:
 - Works during the night time period of 10pm – 7am for the relocation of Sydney Water potable water utilities
 - Works during the night time period of 10pm – 7am for the relocation of Jemena gas utility

- Works during the night time period of 10pm – 7am for the relocation of telecommunication utilities
- Works during the night time period of 10pm – 7am for the relocation of the VIVA petroleum utility between the intersection of Mary and Waratah streets and Wharf Road
- Works during the night time period of 10pm – 7am for the relocation of Endeavour Energy Utility distribution network assets between the intersection of Mary and Waratah streets and Wharf Road
- At Wharf Road, south of Waratah Street:
 - Works during the night time period of 10pm – 7am for the relocation of Sydney Water potable water and waste water utilities
 - Works during the night time period of 10pm – 7am for the relocation of Ausgrid electricity utilities
- At the intersection of Hill Road and Footbridge Boulevard:
 - Works during the night time period of 10pm – 7am for the relocation of Sydney Olympic Park Authority communications utility
 - Works during the night time period of 10pm – 7am for the relocation of Sydney Water recycled water and waste water utilities
 - Works during the night time period of 10pm – 7am for the relocation of Jemena gas utility
 - Works during the night time period of 10pm – 7am for the relocation of Ausgrid electricity utilities
 - Works during the night time period of 10pm – 7am for the relocation of telecommunication utilities
- Works during the night time period of 10pm – 7am for the relocation of the Ausgrid 132kV overhead electricity utility spanning the Parramatta River between Melrose Park and Wentworth Point, including installation of new poles at Melrose Park, removal of the existing pylon at Melrose Park and tie-in to existing pylons.

The works in Substage A2 will commence before other works in Stage A, such as main construction works, however they may continue concurrently with and be completed during the main construction works.

2.2.1.3 Substage A3 – Temporary works

The temporary works substage of the project will include the construction of temporary structures, including temporary working platforms, and infrastructure to enable construction of the bridge and other permanent works. The works in this stage will include:

- Transfer of construction equipment via barge
- Installation of new navigation aid piles and marine site delineation
- Construction of a new crew transfer / safety evacuation pontoon
- Installation of temporary mooring piles (if required)
- Installation of temporary working platforms including, piling, installation of prefabricated steel headstock and pile bracing, installation of primary beams and decking and fitting of handrails.

The works in Substage A3 will commence before Substage A4, however they may continue concurrently with and Substage A3 may be completed during the main construction works.

2.2.1.4 Substage A4 – Main construction works and testing and commissioning

Substage A4 will include the remainder of the works require to complete the design, construction, testing and commissioning of the bridge between Melrose Park and Wentworth Point, excluding system operations works (these will be completed as part of Stage B).

In summary the works in Substage A4 include:

- Removal of remaining trees and vegetation and offset planting
- Remaining earthworks and retaining structures

- Road works including connections to the existing road network:
 - Removing existing kerb, gutters, median strips and redundant infrastructure
 - Milling and excavation to the level required for the installation of the track slab
 - Placing and compacting road base and road pavement works
 - Integration with existing road pavements (where required)
 - Constructing new kerbs, gutters and other drainage
 - Erection of directional, wayfinding, regulatory and other signage
 - Erection of roadside furniture
 - Road paving and pavement marking
 - Constructing tie-ins to existing roads
 - Installing / modifying traffic lights, induction loops and signage
- Drainage works
- Light rail civil infrastructure and track and stop slabs, including installation of services conduits, placing steel reinforcement and concrete formwork and pouring concrete
- New bridge between Melrose Park and Wentworth Point:
 - Excavation works at approaches and supports
 - Construction of bridge abutments on the approaches to the bridge
 - Piling and construction of pile caps
 - Construction of bridge piers
 - Constructing bridge superstructure, which may include:
 - Lifting and installing concrete girders and/or precast concrete bridge segments using cranes
 - Off-site assembly of structural elements and lifting into place
 - In-situ concrete pouring of bridge superstructure elements
 - Concrete pouring the bridge deck
 - Other bridge fit-out works, including installing handrails and other safety and operational infrastructure.
- Provision of active transport links for pedestrians and cyclists
- Urban and architectural design and finishes of the corridor and public domain, including replacement public car parking and construction of a new amenities building (if required)
- Landscaping
- Testing and commissioning of the infrastructure works.

2.2.2 Stage B – Main alignment construction works and supply, operate and maintain system works

Stage B of the project will include construction of the remainder of the project alignment and supply, operate and maintain system works. The general extent of the work area is shown in Figure 2-3, with the interface between the main alignment construction works and supply, operate and maintain system works shown in Figure 2-3. This stage will comprise the following:

- Main alignment construction works from the western extent of the project in Camellia to the intersection of Waratah and Mary streets, and from the intersection of Hill Road and Footbridge Boulevard to the south extent of the project in Lidcombe. This will include:
 - Property demolition
 - Tree and vegetation removal and offset planting
 - Earthworks and retaining structures
 - Road works including connections to the existing road network:
 - Removing existing kerb, gutters, median strips and redundant infrastructure
 - Milling and excavation to the level required for the installation of the track slab
 - Placing and compacting road base and road pavement works
 - Integration with existing road pavements (where required)

- Constructing new kerbs, gutters and other drainage
- Erection of directional, wayfinding, regulatory and other signage
- Erection of roadside furniture
- Road paving and pavement marking
- Constructing tie-ins to existing roads
- Installing / modifying traffic lights, induction loops and signage
- Drainage works
- Light rail civil infrastructure and track and stop slabs, including installation of services conduits, placing steel reinforcement and concrete formwork and pouring concrete
- New bridge over the Parramatta River between Camellia and Rydalmere
- New bridge over Silverwater Road between Rydalmere and Ermington
- New bridge in Ken Newman Park connecting to Boronia Street
- Removal of existing bridge on Hill Road in Sydney Olympic Park and construction of a new bridge
- Strengthening of the bridge on the Holker Busway in Sydney Olympic Park
- Provision of active transport links for pedestrians and cyclists
- Urban and architectural design and finishes of the corridor and public domain, including replacement public car parking and construction of a new amenities building
- Landscaping
- Testing and commissioning
- Main alignment construction works for the Macquarie Street turnback
- Supply, operate and maintain system works along the whole alignment between Camellia and Lidcombe and at the Macquarie Street turnback. This will include:
 - Stops
 - Adjustments to Parramatta Light Rail Stage 1 stabling and maintenance facility in Camellia to increase its operational capacity
 - Substations
 - High voltage traction works
 - The Central Control System
 - The light rail signalling system
 - Elements of the road intersection signalling system
 - The communications and passenger information systems
 - The procurement of light rail vehicles
 - Supply of light rail vehicle maintenance vehicles
 - Testing and commissioning.

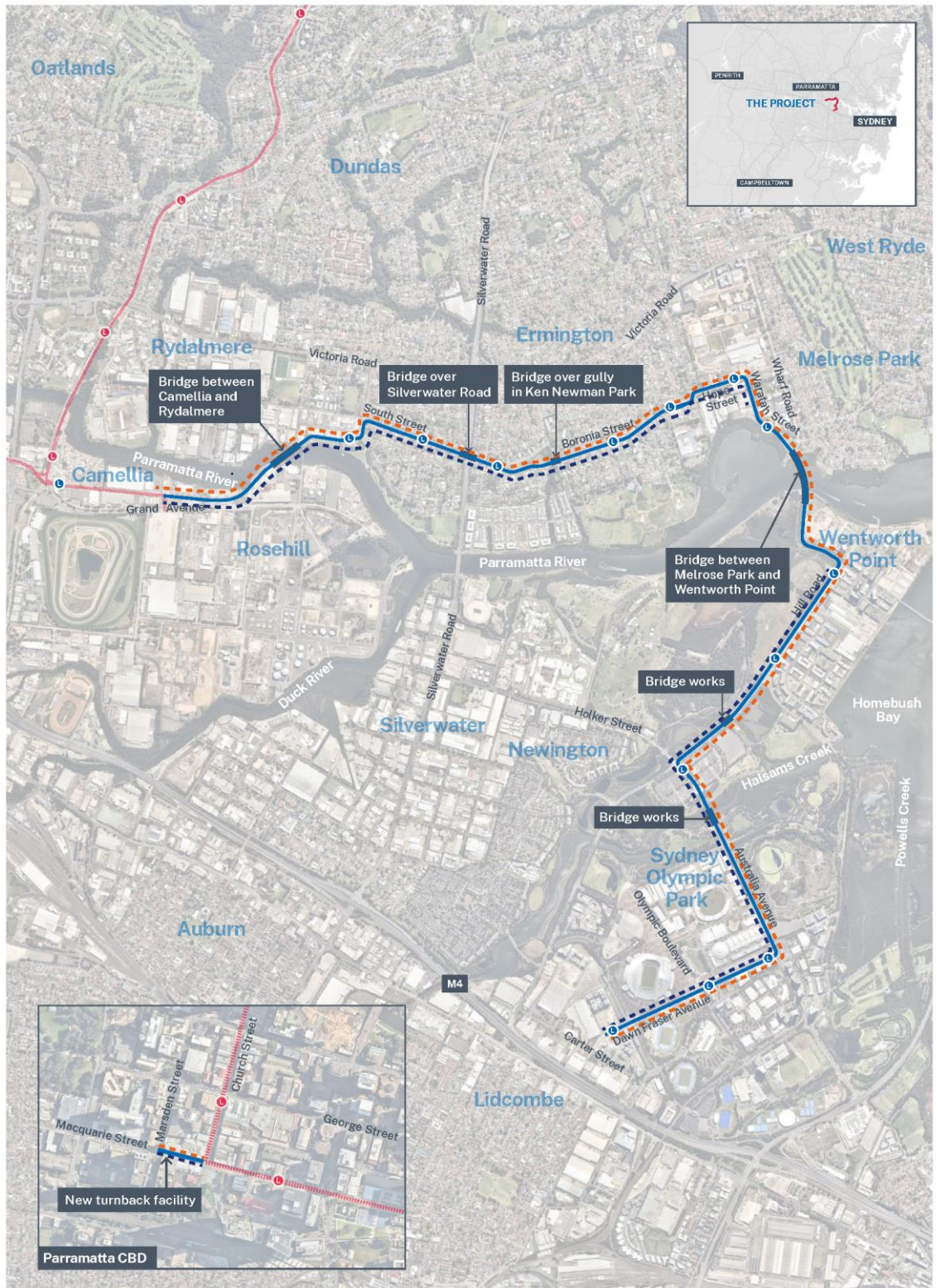


Figure 2-3: Extent of works for Stage B – Main alignment construction works and supply, operate and maintain system works

2.3 Operational staging

Transport is currently not proposing to stage operation of the project. Should Transport elect to stage operation of the project at a later date this Staging Report will be revised, endorsed by the Environmental Representative and submitted to the Department of Planning and Environment prior to the commencement of the stage (refer to section 4).

2.4 Timing

The proposed indicative timing for each stage of the project is outlined in Table 2-1.

Table 2-1: Indicative timing of construction stages

Stage	Substage	Indicative Commencement Date	Estimated Completion Date
Stage A – Bridge between Melrose Park and Wentworth Point	Substage A1 – Pre-construction and site establishment, including heritage investigations	Q4 2024	Q2 2025
	Substage A2 – Utilities relocation	Q1 2025	Q1 2027
	Substage A3 – Temporary works	Q4 2024	Q1 2026
	Substage A4 – Main construction works and testing and commissioning	Q2 2025	Q2 2030
Stage B – Main alignment construction works and supply, operate and maintain system works	Nil	Q4 2025	Q4 2032

2.5 Managing cumulative impacts

The EIS assessed cumulative impacts which may occur during construction of the project, including impacts from concurrent project construction stages and where construction occurs concurrently with other major projects. This included an assessment of cumulative impacts for transport and traffic, noise and vibration, Aboriginal heritage, non-Aboriginal heritage, land use and property, socio-economic, landscape and visual, biodiversity, water, soil and contamination, hazards and risk, air quality, and waste and resource management.

When developing appropriate measures to manage cumulative impacts, it is acknowledged that the extent of cumulative impacts varies with each environmental aspect whether that be for noise, traffic, air quality, amenity, etc. Similarly, the duration of cumulative impact can vary depending on construction works along the linear infrastructure route. For example, the duration of affect will occur from the time a work zone has noticeable effects to “the receiver”, during the peak effect period (where construction impacts occur immediately adjacent to a receiver), before moving away

from the receiver again and decreasing in noticeable effects until the impact of construction has passed.

2.5.1 Other major projects

Projects with the potential for cumulative impacts with Parramatta Light Rail Stage 2 were identified in the EIS. These include the major projects of Parramatta Light Rail Stage 1 and Sydney Metro West, and a number of other development and road projects.

During the construction of the project, Transport will seek to coordinate construction activities both within the project, where concurrent staging applies, and with external construction projects.

Where cumulative impacts result from works by external construction projects in the road reserve this will be coordinated through the Sydney Coordination Office and in consultation with the proponents of the other major projects, to identify potential cumulative impacts and potential strategies to minimise these impacts.

In addition, ongoing consultation with key stakeholders and design integration with adjacent developments will be undertaken regularly. Construction environmental management plans, sub-plans and procedures will incorporate measures, where feasible, to manage cumulative construction impacts.

2.5.2 Project cumulative impacts

The project commits to coordinating work across and between stages to manage cumulative construction impacts while minimising the duration of construction in any one location (area of environmental impact as a result of the project) as far as reasonably practicable. This will be achieved through governance / coordination meetings; reviews of each stage's detailed program; reviews of interface activities, such as shared work spaces, haulage routes and/or transport, traffic and access impacts; and maintaining a register of out-of-hours work (OOHW) applications for the project. This is further detailed in Table 2-2.

In general, representatives from each stage (either Transport or if nominated, the contractor) must attend regular Project Governance Meetings during periods of work or construction to discuss the delivery program and upcoming activities that require consultation with the community and stakeholders.

Each stage contractor's environmental manager is required to attend regular environmental management governance meetings with Transport, the Environment Representative and if nominated, other interface contractors. During these meetings concurrent works will be discussed along with how these works can be best managed to minimise impacts such as coordinating out-of-hours work and respite periods.

In addition, each contractor's environmental manager may be required to attend meetings chaired by Transport with key stakeholders to discuss and resolve environmental issues. Transport will meet with City of Parramatta Council and Sydney Olympic Park Authority on a monthly basis and with other stakeholders as required.

During these interface meetings key milestones of each stage's program will be discussed, and any milestones that could be coordinated to minimise cumulative impacts between project stages or with external construction projects shall be brought to the attention of the Transport Project Director to facilitate demonstrable, improved cumulative outcomes on behalf of the proponent.

Where management of cumulative impacts results in interface requirements between stages, such as shared work spaces, similar haulage routes and/or combined transport, traffic and access impacts, the Project Management team for each stage shall monitor and report on these to the Transport Project Director. Monitoring and reporting shall capture construction progress, community and environmental outcomes and further recommendations of the interface agreement to minimise the duration of construction and its associated impacts in any one location as far as reasonably practicable.

A register of OOHW applications shall be prepared and maintained by the Transport Planning and Environment team to ensure that mitigation measures across all packages can achieve the required noise and vibration outcomes, in particular provision of respite compliant with mitigation measure NV8. Where conflicts arise the competing OOHW applications shall be brought to the attention of the Transport Project Director to facilitate demonstrable, improved cumulative outcomes on behalf of the proponent.

2.5.3 Principles and mechanisms to minimise cumulative impacts

As outlined above the initial step to minimising cumulative impacts is awareness of the projects' construction programs and identification of potential cumulative impacts. Once the potential impacts are identified, the project will implement appropriate management measures including hours of construction, respite and other noise mitigation measures (screening, community consultation regarding alternate work programs etc.).

The suite of mitigation measures best adapted to the impacted zone will be determined through community consultation. The steps to managing cumulative impacts are:

- Transport Place Managers' and the Contactor's Project Managers to identify
 - Suite of mitigation measures to address cumulative impact via liaison with Sydney Coordination Office and Councils, as appropriate
 - External construction projects that will commence construction during the stage's construction period
- Separation of time and place, staging of works to minimise cumulative impacts
- Include cumulative mitigation measures in the construction environmental management plan (CEMP), subplans and other relevant documentation, e.g. construction noise and vibration impact statements and Traffic Management Plans
- Monitor complaints to identify unexpected/emerging cumulative impacts
- Up-date approach in CEMP and specific sub-plans, as needed.

Table 2-2: Cumulative aspects and their management measures

Cumulative Aspect	Mitigation Measure	Accountable Organisation	Accountable Team / Role
Access	Stakeholder meetings (including with Sydney Coordination Office, City of Parramatta Council, Sydney Olympic Park Authority)	Transport / Stakeholder	Transport Project Director
	Governance meetings	Contractor / Transport	Construction Manager / Project Manager
	Property access plans	Contractor	Transport Senior Project Manager / Property
	CEMP implementation (Traffic and Access Management)	Contractor	Construction Manager / Environmental Manager
	Community communication strategy implementation	Contractor / Transport	Construction Manager / Community Engagement Manager
Business disruption	Stakeholder meetings (City of Parramatta Council, Sydney Olympic Park Authority)	Transport / Stakeholder	Transport Project Director
	Governance meetings	Contractor / Transport	Construction Manager / Project Manager
	Business Reference Group Meeting	Transport	Parramatta Light Rail Business Reference Group
	Community communication Strategy implementation	Contractor / Transport	Construction Manager / Community Engagement Manager

Cumulative Aspect	Mitigation Measure	Accountable Organisation	Accountable Team / Role
Noise and vibration	Stakeholder meetings (including with Sydney Coordination Office, City of Parramatta Council)	Transport / Stakeholder	Transport Project Director
	Governance meetings	Contractor / Transport	Construction Manager / Project Manager
	CEMP implementation (Noise and Vibration) and construction noise and vibration impact statements	Contractor	Construction Manager / Environmental Manager
	Community communication strategy implementation	Contractor / Transport	Construction Manager / Community Engagement Manager
OOHW Respite	OOHW Register	Transport	Transport Project Director /Senior Manager Environment
	OOHW Protocol	Contractor / Transport	Transport Project Director /Senior Manager Environment
	Stakeholder meetings (including Sydney Coordination Office, City of Parramatta Council)	Transport / Stakeholder	Transport Project Director
	Governance meetings	Contractor / Transport	Construction Manager / Project Manager
	CEMP implementation (Noise and Vibration) and construction noise and vibration impact statements	Contractor	Construction Manager / Environmental Manager

Cumulative Aspect	Mitigation Measure	Accountable Organisation	Accountable Team / Role
Parking	Parking Management Strategy	Transport / Contractor	Sydney Coordination Office Interface
	Stakeholder meetings (including with Sydney Coordination Office, City of Parramatta Council, Sydney Olympic Park Authority)	Transport / Stakeholder	Transport Project Director
	Community communication strategy implementation	Contractor / Transport	Construction Manager / Community Engagement Manager
Respite periods	Stakeholder meetings (including with Sydney Coordination Office, City of Parramatta Council)	Transport / Stakeholder	Transport Project Director
	Governance meetings	Contractor / Transport	Construction Manager / Project Manager
	CEMP implementation (Noise and Vibration) and construction noise and vibration impact statements	Contractor	Construction Manager / Environmental Manager
	Community communication strategy implementation	Contractor / Transport	Construction Manager / Community Engagement Manager
Traffic	Network Management Strategy	Transport	Sydney Coordination Office Interface
	Stakeholder meetings (including with Sydney Coordination Office, City of Parramatta Council, Sydney Olympic Park Authority)	Transport / Stakeholder	Transport Project Director
	CEMP implementation (Traffic and Access Management)	Contractor	Construction Manager / Environmental Manager

Cumulative Aspect	Mitigation Measure	Accountable Organisation	Accountable Team / Role
	Community communication strategy implementation	Contractor / Transport	Construction Manager / Community Engagement Manager
Visual	Stakeholder meetings (including with Sydney Coordination Office, City of Parramatta Council, Sydney Olympic Park Authority)	Transport / Stakeholder	Transport Project Director
	Governance meetings	Contractor / Transport	Construction Manager / Project Manager
	CEMP implementation	Contractor	Construction Manager / Environmental Manager
	Transport Branding Guidelines	Contractor / Transport	Construction Manager / Community Engagement Manager
	Community communication strategy implementation	Contractor / Transport	Construction Manager / Community Engagement Manager

3 Addressing the mitigation measures

The applicability of the mitigation measures to each stage of the project has been assessed, allocated and confirmed. This assessment and allocation is based on the scope of works (refer to section 2), the geographic location of the works (refer to section 2) and the risk assessment completed within Appendix G (Construction Environmental Management Framework) of the Response to Submissions.

No aspect of the staged approach to construction will affect the ability of the project to comply with the mitigation measures or the conditions of approval. Generally, implementation of the mitigation measures and conditions of approval will be progressively completed as each stage is initiated and the measure / condition is triggered.

3.1 Requirements of the mitigation measures

Many of the mitigation measures require the preparation of and consultation on various plans, protocols and strategies which govern the construction and operation of the project. The development of these documents will largely be the responsibility of Transport's contractors, however some plans, or elements of specific plans will remain the responsibility of Transport.

The mitigation measures will be implemented as appropriate to the scope, risks and timing of each stage. Table 3-1 summarises the mitigation measures applicable to design, pre-construction and construction activities for the project and how they will be delivered for each stage.

The CEMP and sub-plans will outline how the project will implement these mitigation measures, along with other management and monitoring requirements. It will be prepared in accordance with Chapter 23 (Approval to environmental management and mitigation) of the EIS and this document. Appendix G of the Response to Submissions also identifies:

- CEMPs and sub-plans required for each stage of construction
- The consultation and endorsement level for the CEMPs and sub-plans for each construction stage. The endorsement level being one of the following:
 1. Low Risk Stage – to be self-endorsed and consultation with agency and council stakeholders is not mandatory
 2. Medium Risk Stage – to be endorsed by the Environmental Representative and consultation with agency and council stakeholders required
 3. High Risk Stage – to be endorsed by the Department of Planning and Environment and consultation with agency and council stakeholders required.

Should the project be approved, this Staging Report would be updated to assess, allocate and confirm the applicability of each condition of approval to each project stage. The revised Staging Report would be endorsed by the Environmental Representative and submitted to the Department of Planning (refer to section 4).

3.2 Compliance

The mitigation measures detailed in the CEMPs and sub-plans will be monitored during construction to confirm their effectiveness and whether any additional measures are required. Site inspections will be regularly undertaken to check and update measures as necessary. Environmental site monitoring will also be undertaken to confirm project impacts and existing environmental values in accordance with monitoring commitments made in this document.

The CEMPs will provide for an internal compliance monitoring program where each contractor will periodically monitor and report on project performance against relevant statutory and other obligations, including the conditions of approval. It is the role of each contractor to ensure compliance with the mitigation measures and conditions of approval as they relate to their specific package. The Transport Planning and Environment Team's role is to oversee contractors to ensure they maintain compliance with the planning approval at all times.

Contractors will maintain their own internal audit program to ensure they meet the requirements set out in the mitigation measures, the condition of approval and contract. Transport will conduct its own due diligence auditing across all stages with a specific focus on compliance with the conditions of approval. Transport will monitor compliance with the mitigation measures and conditions of approval across all stages through surveillance, environmental inspections, record-keeping and compliance reporting.

Independent external environmental audits will also be carried out in accordance with *Independent Audit Post-Approval Requirements* (Department of Planning, Industry and Environment, 2020) and *AS/NZS ISO 19011:2003 – Guidelines for quality and/or environmental management systems auditing* (Standards Australian, 2003).

An Environmental Representative will be engaged by Transport to undertake an independent compliance monitoring role for the project. Their role will include:

- Undertake regular site inspections with the contractor's environmental managers and Transport representatives
- Review compliance with the mitigation measures and conditions of approval on a periodic basis
- Review management plans and provide advice in relation to the level of risk associated with construction works
- Provide independent advice on matters relating to compliance to the contractors, Transport and Department of Planning and Environment if requested.

Table 3-1: Applicability of the mitigation measures to each stage

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
TT1	The design will continue to be refined to avoid or minimise impacts on the surrounding road and transport network and property accesses as far as reasonably practicable.	Design	Not applicable – stage does not include permanent changes to the road network or access	Not applicable – stage does not include permanent changes to the road network or access	Not applicable – stage does not include permanent changes to the road network or access	Applicable	Applicable
TT2	Input will be sought from relevant stakeholders (including local councils, Sydney Olympic Park Authority, Royal Agricultural Society of NSW, bus and ferry operators) prior to finalising the design of those aspects of the project that affect the operation of road and other transport infrastructure under the management of these stakeholders. This will include confirming ongoing operation and maintenance arrangements.	Design	Not applicable – stage does not include changes to operation of road or other transport infrastructure	Not applicable – stage does not include changes to operation of road or other transport infrastructure	Applicable for changes to the navigation channel	Applicable	Applicable
TT3	Where the project permanently affects access to and from a public road, input will be sought from relevant property owners and occupants regarding alternative access arrangements prior to finalising the design. Where any legal access to a property is permanently affected and a property has no other legal means of access, alternative access to and from a public road will be provided to an equivalent standard, where feasible and reasonable. Where an alternative access is not feasible or reasonable, and a property or part of a property is left with no access to a public road, consideration will be given to acquisition of the property or part of the property in accordance with the provisions of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> (NSW).	Design	Not applicable – stage does not include permanent changes to access	Not applicable – stage does not include permanent changes to access	Not applicable – stage does not include permanent changes to access	Applicable	Applicable
TT4	Road safety audits will be undertaken where changes to the road network are proposed, in accordance with relevant Austroads guidelines, to ensure the safety of all road users is considered during design development.	Design	Not applicable – stage does not include permanent changes to the road network	Not applicable – stage does not include permanent changes to the road network	Not applicable – stage does not include permanent changes to the road network	Applicable	Applicable
TT5	Opportunities to reduce the loss of on and off street parking will be reviewed during design development.	Design	Not applicable – stage does not include permanent changes to parking	Not applicable – stage does not include permanent changes to parking	Not applicable – stage does not include permanent changes to parking	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
TT6	Opportunities to mitigate impacts on parking at Ermington Boat Ramp will be considered during design development.	Design	Not applicable – stage does not include permanent impacts to the Ermington boat ramp or parking	Not applicable – stage does not include permanent impacts to the Ermington boat ramp or parking	Not applicable – stage does not include permanent impacts to the Ermington boat ramp or parking	Applicable	Not applicable – stage does not impact upon the Ermington boat ramp or parking
TT7	<p>A parking management strategy will be prepared to provide an overarching framework for parking management during construction and operation. The strategy will include measures to manage:</p> <ul style="list-style-type: none"> the reduction in on-street parking availability, such as provision of alternative parking arrangements for accessible and service spaces, staged removal, resident parking schemes, and managed staff parking arrangements construction worker parking, such as provision of designated parking areas within the project site, encouraging use of public transport, and shuttle bus arrangements. 	Design	Applicable, where the stage removes on-street parking or where personnel numbers exceed onsite parking availability	Applicable, where the stage removes on-street parking or where personnel numbers exceed onsite parking availability	Applicable, where the stage removes on-street parking or where personnel numbers exceed onsite parking availability	Applicable	Applicable
TT8	<p>A traffic and access management plan will be prepared prior to construction and implemented as part of the CEMP. The plan will detail processes and responsibilities to minimise traffic and access delays and disruptions, and identify and respond to changes to road access and on-street parking arrangements. The plan will include, as appropriate, additional reasonable and feasible measures identified as an outcome of consultation (in accordance with mitigation measure TT12)</p>	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
TT9	The traffic and access management plan will include measures to manage staging of construction works to ensure that satisfactory capacity and minimum levels of service are maintained for all users.	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
TT10	A maritime works and navigation management plan will be prepared prior to construction and implemented as part of the CEMP. The plan will detail processes and responsibilities to manage marine construction vessels and impacts on navigation during construction of the bridges over the Parramatta River. The plan will include, as appropriate, additional reasonable and feasible measures identified as an outcome of consultation (in accordance with mitigation measure TT12).	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
TT11	Opportunities to minimise impacts to recreational use of the Parramatta River will be considered during construction planning, based on a review of the usage of the facilities at Ermington Boat Ramp and at other existing boat ramps in the vicinity of the project site.	Pre-construction	Applicable where the stage requires the closure of the Ermington Boat Ramp	Not applicable	Applicable where the stage requires the closure of the Ermington Boat Ramp	Applicable	Not applicable – stage does not impact upon the Ermington boat ramp or parking
TT12	Consultation with relevant stakeholders will be undertaken regularly to facilitate the efficient delivery of the project and to minimise impacts on road, river and transport infrastructure customers and users. Stakeholders will include the City of Parramatta and City of Ryde councils, Sydney Olympic Park Authority, Royal Agricultural Society of NSW, bus and ferry operators, emergency services, and recreation groups. Additional measures identified as an outcome of consultation will be implemented during construction, where reasonable and feasible. This will include modifying work areas, activities and construction access arrangements to address traffic flow and access issues identified by key stakeholders, where practicable.	Pre-construction, construction	Applicable where the stage results in impacts to road, river and transport infrastructure	Applicable where the stage results in impacts to road, river and transport infrastructure	Applicable where the stage results in impacts to road, river and transport infrastructure	Applicable	Applicable
TT13	The Community Communication Strategy (mitigation measure SE1) will include mechanisms to inform the community of the dates and durations of changes to transport services and access arrangements (including access restrictions for the Parramatta River) and proposed alternative services and access provisions.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
TT14	Access to properties, including residences, businesses and community infrastructure, will be maintained. Where temporary disruption to access cannot be avoided, consultation will be undertaken with the owners, occupants and managers of affected properties and infrastructure, to confirm their access requirements and determine alternative arrangements.	Construction	Applicable where the stage impacts upon access	Applicable	Applicable where the stage impacts upon access	Applicable	Applicable
TT15	Safe pedestrian and cyclist access will be maintained around and/or through work areas. Where disruption to access cannot be avoided, alternative routes that comply with relevant accessibility standards and guidelines will be provided, signposted and communicated. Alternative access arrangements will be established prior to implementing restrictions on existing routes.	Construction	Applicable	Applicable	Applicable where the stage impacts upon pedestrian and cyclist access	Applicable	Applicable
TT16	Modifications to existing bus stops, implementation of new stops and services, and alterations to service patterns, will be undertaken in consultation with relevant key stakeholders, including Customer Journey Management, bus and ferry operators, the City of Parramatta and City of Ryde councils, and Sydney Olympic Park Authority. Advance notification of changes to services will be provided to affected customers.	Construction	Applicable where the stage impacts upon bus services	Applicable where the stage impacts upon bus services	Applicable where the stage impacts upon bus services	Applicable where the stage impacts upon bus services	Applicable
TT17	Traffic management for special events in the Parramatta CBD, at Rosehill Gardens Racecourse and Sydney Olympic Park (including Sydney Showground) will be considered during construction. Where special events require specific traffic and pedestrian management, measures will be developed and implemented in consultation with relevant stakeholders, including event organisers, venue managers, City of Parramatta Council, Australian Turf Club, Sydney Olympic Park Authority and Royal Agricultural Society of NSW.	Construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
TT18	<p>The potential for cumulative construction transport and traffic impacts will be reviewed and coordinated with other projects, in consultation with relevant stakeholders, including Customer Journey Management, Customer Journey Planning, Traffic and Transport Liaison Group, City of Parramatta Council, Sydney Olympic Park Authority and Royal Agricultural Society of NSW. The review will include:</p> <ul style="list-style-type: none"> • other projects with the potential to affect access and capacity • reviews of programs for traffic staging, lane, footpath, cycleway and road closures for all projects • coordinating works and identifying efficient re-routing options as appropriate. 	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
TT19	<p>Pre-construction condition surveys will be completed for local roads, footpaths and other Council assets within 100 metres of the project which could be affected or damaged during construction. Where damage to an asset is caused by the project it will be restored to at least the condition it was pre-works or compensation will be offered to the asset owner. A copy of the pre-construction condition report will be provided to the relevant Council prior to occupation or use of the aforementioned Council assets.</p>	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
TT20	<p>A review of operational network performance will be carried out 12 months and three years from the opening of the project to confirm the operational impacts of the project.</p> <p>Appropriate changes that balance the performance outcomes for light rail and general traffic will be considered to address identified issues along the alignment.</p> <p>For surrounding arterial roads, feasible and reasonable mitigation measures will be identified in consultation with the Department of Planning and Environment and other relevant stakeholders (including relevant council(s) and Sydney Olympic Park Authority) to manage identified traffic performance impacts.</p>	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
TT21	A light rail operations during special events management plan will be prepared and implemented as part of the project's Operational Environmental Management System. The plan will detail processes, responsibilities and measures to manage light operations during special events, including how the project will operate in 'event mode'. The plan will be prepared in consultation with event organisers, venue managers, City of Parramatta Council, Australian Turf Club, Sydney Olympic Park Authority, and Royal Agricultural Society of NSW.	Operation	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
NV1	<p>An operational noise and vibration review of the developed design will be undertaken to review the potential for operational impacts and confirm feasible and reasonable mitigation measures to be incorporated in the design. The review will include:</p> <ul style="list-style-type: none"> reviewing compliance monitoring for Parramatta Light Rail Stage 1 to refine the assumptions used and confirm the effectiveness of the mitigation that has been implemented surveying relevant buildings to determine appropriate façade noise reduction performances a road traffic noise assessment for the reconfiguration of South and Boronia streets conducted in accordance with the <i>Road Noise Criteria Guideline</i> (Transport for NSW, 2022) and the <i>Road Noise Mitigation Guideline</i> (Transport for NSW, 2022) consideration of feedback from, and preferences of, directly affected landowners/landholders. <p>The operational noise and vibration review will be undertaken in consultation with relevant council(s) and the NSW EPA. The review will be developed in accordance with the <i>Rail Infrastructure Noise Guideline</i> (NSW EPA, 2013), the <i>Noise Policy for Industry</i> (NSW EPA, 2017) and the <i>NSW Road Noise Policy</i> (DECCW, 2011).</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
NV2	Public address systems at stops will be designed to comply with the <i>Noise Policy for Industry</i> (NSW EPA, 2017) intrusiveness and sleep disturbance noise trigger levels at all locations.	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
NV3	Traction power substations will be designed to comply with the <i>Noise Policy for Industry</i> (NSW EPA, 2017).	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
NV4	Consideration will be given to implementing operational noise mitigation early in the construction program to reduce the potential for construction noise impacts, where the mitigation will not be impacted by future works	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
NV5	A noise and vibration management plan will be prepared as part of the CEMP and implemented during construction. The plan will detail processes, responsibilities and measures to manage noise and vibration and minimise the potential for impacts during construction, aligned with the results of community consultation and consistent with the management approach and mitigation measures in the <i>Construction Noise and Vibration Strategy</i> (Transport for NSW, 2019). Measures that mitigate potential noise and vibration at the source will be prioritised.	Pre-construction, construction	Not applicable	Applicable	Applicable	Applicable	Applicable
NV6	Location and activity-specific construction noise and vibration impact assessments will be undertaken: <ul style="list-style-type: none"> • prior to works with the potential to generate noise levels above 75 dBA and/or exceed relevant human response and cosmetic damage criteria for vibration • prior to works that need to occur outside the primary project working hours • where any changes to heavy vehicle routes affect local roads not considered by the noise and vibration assessment (Updated Noise and Vibration Report). • where works will likely impact upon threatened and migratory fauna and Green and Golden Bell Frog habitat within Sydney Olympic Park. <p>The assessments will be based on a more detailed understanding of construction methods, including the size and type of construction equipment, duration and timing, and detailed reviews of local receivers, as required.</p> <p>The results of the assessments will be documented in construction noise and vibration impact statements.</p>	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<p>Where potential exceedances are identified, the statements will define feasible and reasonable mitigation and management measures, developed in accordance with the <i>Construction Noise and Vibration Strategy</i> (Transport for NSW, 2019) and measures developed as part of the biodiversity management plan and the Green and Golden Bell Frog management plan in relation to potential noise and vibration impacts (see mitigation measures BD11 and BD12).</p> <p>Potentially impacted receivers will be informed of the nature of works to be carried out, the expected noise levels and duration, and will be provided with details of the complaints management system (mitigation measure SE3).</p> <p>The measures will be implemented for the duration of the specific activity.</p>						
NV7	<p>A minimum of 2.4 metre high solid hoarding will be provided around construction compounds located close to residential areas, where construction noise is predicted to exceed noise management levels during recommended standard hours, including those compounds currently proposed near sensitive receivers on/around:</p> <ul style="list-style-type: none"> • John Street • Broadoaks Park • Ken Newman Park west and east • Hope Street • Wharf Road • Wentworth Point north • Hill Road north • Dawn Fraser Avenue east and west. 	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
NV8	<p>Appropriate respite periods will be identified, in consultation with the community and in accordance with the <i>Construction Noise and Vibration Strategy</i> (Transport for NSW, 2019), for work:</p> <ul style="list-style-type: none"> • with the potential to result in noise levels above 75 dBA and/or • that needs to occur outside the primary project working hours. 	Construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<p>The following will be taken into account when determining appropriate respite:</p> <ul style="list-style-type: none"> the need to efficiently undertake construction the communities' preferred noise and vibration management approach the construction schedules of other major projects in close proximity to the project works. 						
NV9	Where construction activities are predicted to exceed noise management levels at sensitive receivers, no work would be permitted in that area one weekend per month, unless it is otherwise agreed by a substantial majority of the sensitive receivers impacted by the proposed works.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
NV10	The potential for cumulative construction impacts will be reviewed during construction planning in consultation with the proponents of other projects. Where the potential for cumulative impacts is identified, feasible and reasonable mitigation and management measures will be developed and included in the noise and vibration management plan (mitigation measure NV5).	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
NV11	<p>An out-of-hours work protocol will be developed to define the process for considering, approving and managing out-of-hours work that is not subject to an environment protection licence (i.e, works subject to exemptions under the licence, including low noise impact and emergency works). The protocol will include implementing feasible and reasonable measures and communication requirements in accordance with the <i>Construction Noise and Vibration Strategy</i> (Transport for NSW, 2019).</p> <p>Measures will focus on proactive communication and engagement with potentially affected receivers, provision of respite periods and/or alternative accommodation for defined exceedance levels.</p>	Construction	Not applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
NV12	<p>All work outside the recommended standard hours defined by the <i>Interim Construction Noise Guideline</i> (DECC, 2009) will be scheduled using the hierarchy of preferred working hours described by Chapter 7 (Project description – construction) (section 7.5) as far as practicable, and in consultation with the community and key stakeholders (including the NSW EPA).</p> <p>Highly noise and vibration intensive works as defined in the <i>Construction Noise and Vibration Strategy</i> (Transport for NSW, 2019) will be limited to recommended standard hours as far as practicable.</p>	Construction	Not applicable	Applicable	Applicable	Applicable	Applicable
NV13	<p>Where buildings or structures are predicted to exceed the screening criteria for structural damage, a dilapidation survey will be undertaken prior to any construction works. Where required, the vibration management level will be refined based on the type and condition of the building or structure.</p> <p>For heritage buildings and structures, the dilapidation survey will consider the heritage value of the structure in consultation with a structural engineer and heritage specialist.</p>	Pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable
NV14	<p>A survey will be undertaken to identify vibration sensitive receivers (including buildings, structures, utilities, remediation infrastructure, heritage items or sites and equipment) within 200 metres of the project site. Vibration criteria will be identified based on relevant standards or manufacturer’s data. Where vibration criteria are not available, conservative criteria will be used.</p> <p>Appropriate measures will be developed and implemented where potential exceedances of the criteria are identified.</p>	Pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
NV15	<p>Vibration generating activities will be managed to minimise the potential for impacts on vibration sensitive receivers, (identified in accordance with mitigation measure NV14).</p> <p>Prior to the commencement of vibration-intensive works within the minimum working distances for cosmetic damage, the potential for impacts will be assessed. This will include a more detailed assessment of potentially affected receivers to assess the susceptibility to damage from vibration.</p> <p>Where there is potential for damage, alternate methods that generate less vibration will be investigated and substituted where feasible and reasonable.</p> <p>For heritage items or sites, the more detailed assessment will consider the sensitivity of the receiver in consultation with a heritage specialist to ensure susceptible components are adequately monitored and managed.</p> <p>Where residual risks remain, vibration monitoring will be undertaken. Vibration monitors will provide real-time notification of exceedances of levels approaching cosmetic damage.</p> <p>Any identified vibration-related damage to the receivers will be rectified, including as recommended by a heritage specialist for heritage items.</p>	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
NV16	<p>Monitoring of noise and vibration will be undertaken within 12 months of the commencement of operation to compare actual noise and vibration performance against that predicted by the operational noise and vibration review (mitigation measure NV1).</p> <p>The results of monitoring will be documented in an operational noise and vibration compliance report. Additional feasible and reasonable mitigation measures will be considered where any additional receivers are identified as qualifying for consideration of noise mitigation in accordance with the relevant guidelines.</p>	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage
AH1	<p>The design will continue to be refined to avoid direct impacts on identified places of Aboriginal heritage as far as reasonably practicable.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
AH2	Aboriginal consultation will continue to be undertaken through the life of the project in accordance with the <i>Procedure for Aboriginal Cultural Heritage Consultation and Investigation</i> (Roads and Maritime Services, 2012) and the <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> (DECCW, 2010). This includes managing potential impacts on objects/aspects of cultural significance in consultation with registered Aboriginal parties.	Design, pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
AH3	<p>A heritage interpretation strategy will be developed to guide incorporation of appropriate interpretation and integration of Aboriginal and non-Aboriginal heritage in the design.</p> <p>The strategy will be prepared and implemented in accordance with <i>Interpreting Heritage Places and Items: Guidelines</i> (NSW Heritage Office, 2005) and the <i>Heritage Interpretation Policy</i> (NSW Heritage Council, 2005).</p> <p>The strategy will include measures to ensure a meaningful design response to Aboriginal heritage and cultural values. It will be developed in consultation with relevant stakeholders, including registered Aboriginal parties, and will take into account the recommendations of the Cultural Values Assessment Report (Appendix G of the Aboriginal Cultural Heritage Assessment Report).</p> <p>The project will include appropriate interpretation of Aboriginal heritage in accordance with the heritage interpretation strategy.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
AH4	Aboriginal stakeholders will continue to be consulted and involved during design development in accordance with Transport for NSW’s Aboriginal Culture and Heritage Framework, <i>Draft Connecting with Country</i> (Government Architect NSW, 2020) and <i>Designing with Country</i> (Government Architect NSW, 2020) and in consultation with the Design Review Panel.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
AH5	<p>Test excavations will be undertaken to confirm the nature and extent of potential archaeological deposits/shell middens at:</p> <ul style="list-style-type: none"> PAD1 Ermington Boat Ramp PAD3 Rydalmere Wharf PAD6 Ken Newman Park Macquarie Street PAD3 (AHIMS 45-6-2977) Church Street PAD1 (AHIMS 45-6-4015) Ermington SHL01 (AHIMS 45-6-4078) Ermington SHL02 (AHIMS 45-6-4079). <p>The excavations will be undertaken in accordance with a project-specific excavation methodology developed as described in section 12.2 of the Aboriginal Cultural Heritage Assessment Report.</p> <p>The test excavation program will be completed prior to the commencement of construction, and any ground disturbing works in these areas.</p> <p>Where testing confirms that Aboriginal objects are present:</p> <ul style="list-style-type: none"> options to modify the project will be investigated in accordance with mitigation measure AH1 the assessments of significance provided in the Aboriginal Cultural Heritage Assessment Report will be updated. <p>Unavoidable impacts will be managed in consultation with registered Aboriginal parties. Any salvage required will be undertaken in accordance with the salvage methodology (mitigation measure AH6).</p>	Design	Applicable	Applicable	Applicable	Applicable	Applicable
AH6	<p>A detailed salvage methodology will be prepared (if required) following test excavations. The methodology will be prepared by a suitably qualified archaeologist in consultation with registered Aboriginal parties. The salvage methodology will include:</p> <ul style="list-style-type: none"> the process for consultation with Heritage NSW and registered Aboriginal parties in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010), and Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) 	Design, pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<ul style="list-style-type: none"> requirements in relation to the short and long-term management of Aboriginal objects recovered during testing and salvage, including care agreements, where relevant. <p>Where salvage is required, registered Aboriginal parties will be engaged to assist the salvage process, which will be managed by an appropriately qualified archaeologist.</p> <p>Detailed analysis and reporting of cultural material collected will be provided to Heritage NSW in accordance with section 89A of the <i>National Parks and Wildlife Act 1974</i>. This will include recording salvaged objects on the NSW Aboriginal Heritage Information Management System (AHIMS) register and updating site records.</p>						
AH7	<p>An Aboriginal cultural heritage management plan will be prepared prior to construction and implemented as part of the CEMP. The plan will include measures to minimise the potential for impacts and manage Aboriginal heritage, including:</p> <ul style="list-style-type: none"> outcomes of further investigations (mitigation measures AH5) salvage methodology (mitigation measure AH6) requirements for an induction and cultural awareness training for construction workers and supervisors (mitigation measure AH8) unexpected finds procedure (mitigation measure AH9) measures to protect sites from inadvertent impacts from vehicles and equipment. 	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable
AH8	<p>A requirement for cultural and historic heritage awareness training will be included in the Aboriginal cultural heritage management plan. Cultural heritage awareness training will be provided by an Aboriginal representative at the commencement of substantial works for the project.</p>	Pre-construction, construction	Not applicable	Completion of training – applicable Including in management plan – not applicable	Completion of training – applicable Including in management plan – not applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
AH9	Where previously unidentified Aboriginal objects are encountered during construction, this will be managed in accordance with Transport for NSW's <i>Unexpected heritage items procedure (2022)</i> , included in the heritage interpretation strategy (mitigation measure AH3) and Aboriginal cultural heritage management plan (mitigation measure AH7), and recorded on the AHIMS register.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
NAH1	The design will continue to be refined to avoid direct impacts on items/sites of non-Aboriginal heritage significance and archaeological sites of State significance, and to minimise impacts on archaeological sites of local significance, as far as reasonably practicable.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
NAH2	For areas of archaeological significance where harm cannot be avoided, the Research Design and Excavation Methodology will be implemented to ensure there is appropriate management informed by significance and relevant research questions. A management rating system will be adopted based on the approach provided in the Updated Historical Archaeological Assessment, which will be further refined following the outcomes of test excavations and site-specific research.	Design	Applicable	Applicable	Applicable	Applicable	Applicable
NAH3	Test excavations will be undertaken, prior to construction, to clarify significance, extent and integrity of deposits in accordance with the Research Design and Excavation Methodology (see Appendix B of the Updated Historical Archaeological Assessment). Where testing confirms that archaeological resources are present, additional site-specific research will be undertaken to refine the understanding of significance to ensure future management is in line with research values.	Design	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
NAH4	<p>The design will be prepared in accordance with the urban design requirements and recommendations in the Updated Statement of Heritage Impact.</p> <p>The design will minimise the potential for visual impacts on heritage items by incorporating sympathetic form, fabric and colour, where feasible.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
NAH5	<p>Design refinement will be undertaken to minimise potential impacts on Bulla Cream Dairy (Willowmere) (Parramatta LEP Item No. I64) as far as practicable. This will include minimising encroachment of the curtilage, retaining significant heritage fabric (i.e. Billiards Room in addition to the Main House), and retaining or relocating significant tree plantings where practicable.</p> <p>Adaptive reuse options for Bulla Cream Dairy (Willowmere) will be investigated and implemented in accordance with <i>New Uses for Heritage Places: Guidelines for the Adaptation of Historic Buildings and Sites</i> (Heritage Council of NSW and Royal Australian Institute of Architects NSW Chapter, 2008). This will be undertaken in consultation with the property owner and the City of Parramatta Council.</p>	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
NAH6	<p>A heritage interpretation strategy will be developed to guide incorporating appropriate interpretation and integration of heritage in the design. The strategy will include interpretation requirements for specific parts of the project, particularly where heritage items will be impacted, or archaeological sites are proposed to be excavated.</p> <p>The strategy will be prepared and implemented in accordance with <i>Interpreting Heritage Places and Items: Guidelines</i> (NSW Heritage Office, 2005) and the <i>Heritage Interpretation Policy</i> (NSW Heritage Council, 2005) and developed in consultation with relevant stakeholders, including City of Paramatta Council and City of Ryde Council, and Sydney Olympic Park Authority.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<p>The strategy will provide a framework for interpreting the heritage items impacted by the project, set out the key interpretative themes and identify communication strategies, and the location and form of interpretation. These may include approaches such as interpretative signage, historical/artefact displays at local museums or visitor centres, and online media about heritage items and the history of surrounding suburbs.</p> <p>The design will include appropriate interpretation of non-Aboriginal heritage in accordance with the heritage interpretation strategy.</p>						
NAH7	<p>Photographic archival recording will be carried out for affected sections of the following items:</p> <ul style="list-style-type: none"> • Bulla Cream Dairy (Willowmere) (Parramatta LEP Item No. I64) • House at 46 John Street, Rydalmere (unlisted). <p>Photographic archival recording will be carried out prior to works commencing in the vicinity of the item, and in accordance with <i>How to Prepare Archival Records of Heritage Items</i> (Heritage Office, 1998) and <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (Heritage Office, 2006).</p> <p>Once complete, a report will be prepared detailing the history and significance of the item, relevant findings from the archival recording and an overview of the project.</p>	Pre-construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
NAH8	<p>A heritage management plan will be prepared and implemented as part of the CEMP. The plan will include measures to manage non-Aboriginal heritage and minimise the potential for impacts during construction.</p> <p>The plan will be prepared in consultation with relevant heritage agencies (Heritage NSW, Sydney Olympic Park Authority, City of Parramatta Council and City of Ryde Council) and take into account the outcomes of further investigations, including test excavations and the Research Design and Excavation Methodology.</p>	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	The heritage management plan will define a requirement for non-Aboriginal historical heritage awareness training for site workers prior to commencement of construction works. The awareness training will promote an understanding of heritage items that may be impacted during the works.						
NAH9	An unexpected finds procedure for land and maritime based archaeological resources will be developed as part of the heritage management plan, consistent with Transport for NSW's <i>Unexpected heritage items procedure (2022)</i> and <i>Skeletal remains: guidelines for the management of human skeletal remains under the Heritage Act 1977</i> (Heritage Office, 1998).	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
NAH10	Significant heritage fabric at the Bulla Cream Dairy (Willowmere) that is proposed to be retained and the fenced preservation area of Ermington Wharf/Wharf/Former Pennant Hills Wharf (and visible remnants) will be fenced and marked on site plans within the CEMP and heritage management plan as areas to be avoided/protected during construction.	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
NAH11	Potential vibration impacts on items of heritage significance will be managed in accordance with the <i>Construction Noise and Vibration Strategy</i> (Transport for NSW, 2019) and mitigation measures NV13 to NV15.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
LP1	The design will continue to be refined to minimise land requirements and potential impacts on land uses and properties as far as reasonably practicable. Consultation with landowners/landholders will be ongoing to confirm feasible and reasonable measures to minimise impacts on their operations/properties.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
LP2	<p>Consultation with key stakeholders (including City of Parramatta Council, Sydney Olympic Park Authority, the Department of Planning and Environment, Royal Agricultural Society of NSW, and relevant developers) will be ongoing to ensure that the design of the project is integrated as far as practicable with adjoining developments, proposed developments and urban renewal areas (including those subject to the <i>Camellia-Rosehill Place Strategy</i> (DPE, 2022), structure planning for Melrose Park North and Melrose Park South, the <i>Parklands Plan of Management 2010</i> (Sydney Olympic Park Authority, 2010), the <i>Sydney Olympic Park Master Plan 2030</i> (Sydney Olympic Park Authority, 2018) (including the <i>Sydney Olympic Park Master Plan 2030 Interim Metro Review</i> (Sydney Olympic Park Authority, 2022)), the <i>Sydney Olympic Park Vision and Strategy 2050</i> (Sydney Olympic Park Authority, 2022), and the <i>Carter Street Precinct Development Framework</i> (DPIE, 2020)). This will include identifying measures and design responses to manage the interface between the project and adjoining land uses and properties as far as reasonably practicable.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
LP3	<p>The location of the turnback facility in Parramatta CBD will be further refined in consultation with City of Parramatta Council. This will include identifying measures and design responses to maximise customer experience and manage the interface between the turnback facility and adjoining land uses.</p>	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
LP4	<p>A residual land management plan will be prepared to define the proposed approach to managing residual land, including consulting on proposed future uses with key stakeholders, and required actions in relation to the identified land.</p>	Design	Not applicable	Not applicable	Not applicable	Applicable where the stage results in residual land	Applicable
LP5	<p>Construction planning will minimise the duration that land is required to the shortest possible duration, particularly where the land requirements affect recreation/open space areas.</p>	Pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
LP6	All property acquisitions will be undertaken in accordance with the requirements of the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> , the land acquisition reforms announced by the NSW Government in 2016, and the recommendations of the Auditor General's 2021 review of Transport for NSW's acquisition practices.	Pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable
LP7	Transport for NSW will appoint Personal Relationship Manager(s) to assist residential landowners and tenants who may be affected by acquisition. The Personal Relationship Manager(s) will maintain regular contact with these individuals to provide assistance with the acquisition process, including updates on the project, and respond to queries. The Personal Relationship Manager(s) will work with the landowners and tenants to offer assistance and support throughout the acquisition process.	Pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable
LP8	Transport for NSW will seek to secure agreements with affected landowners/landholders, to guide property-level design requirements and the management of construction on, or immediately adjacent to, private properties. Property adjustment plans will be prepared in consultation with impacted landowners/landholders. The plans will define the works required to properties affected by acquisition and those requiring adjustments as a result of the project. Works will include, but not be limited to, adjustments to driveways, fences, trees and landscaping.	Pre-construction	Applicable where stage directly affects private property	Applicable where stage directly affects private property	Applicable where stage directly affects private property	Applicable	Applicable
LP9	The location of all utilities and services, and requirements for access to, diversion, protection and/or support, will be confirmed prior to construction. This will include (as required) undertaking utilities investigations, including intrusive investigations, and consultation and agreement with service providers.	Pre-construction	Applicable	Applicable	Not applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
LP10	<p>A rehabilitation strategy will be prepared to guide rehabilitation planning, implementation, monitoring and maintenance of disturbed areas outside the operational footprint following the completion of construction. The strategy will have regard to Appendix G (Rehabilitation recommendations) of <i>Managing Urban Stormwater – Soils and Construction – Volume 1</i> (Landcom, 2004).</p> <p>The strategy will be consistent with the residual land management plan for land owned by Transport for NSW.</p>	Pre-construction	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
LP11	<p>Land subject to temporary use will be rehabilitated as soon as practicable to the pre-construction condition (or as agreed with the landowner/landholder), taking into consideration the existing condition, location and land use characteristics.</p> <p>Rehabilitation will be undertaken in consultation with the relevant landowner/landholder, and in accordance with the rehabilitation strategy.</p>	Construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable
SE1	<p>Transport for NSW will implement the Parramatta Light Rail Stage 2 Community Communication Strategy to guide the management and delivery of community and stakeholder engagement in the lead up to and during construction, and ensure that:</p> <ul style="list-style-type: none"> accurate and accessible information about the project is provided feedback from the community is encouraged opportunities for input to design development are provided, where relevant community members and stakeholders with the potential to be affected by construction activities are notified in a timely manner about the timing of activities and potential for impacts enquiries and complaints are managed (see mitigation measure SE3), and a timely response is provided for concerns raised. 	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<p>In relation to the potential for socio-economic impacts, this will include implementing approaches and protocols to:</p> <ul style="list-style-type: none"> communicate with potentially affected residents, other community members, businesses and other key stakeholders to provide information about the project, and the likely nature, extent and duration of changes during construction identify and engage with vulnerable persons that might be affected by the project communicate information about potential access changes and delays (including changes to public and active transport facilities) engage with owners and tenants of properties that will be impacted by acquisition. <p>Engagement plans will be developed and implemented to define the specific requirements for engagement consistent with the Community Communication Strategy. The engagement plans will define tools and activities, timing and responsibilities, and monitoring requirements.</p>						
SE2	<p>Dedicated place managers will be available in the lead up to, and during, construction to listen to concerns and answer questions from the community and businesses. Place managers will provide a single point of contact for people (including business owners/operators) wanting to find out more about the project, including the impacts of construction, and the measures that will be implemented to minimise these impacts as far as possible.</p>	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
SE3	<p>Enquiries and complaints management systems will be developed, outlined in the Community Communication Strategy, and implemented before and during construction.</p> <p>The complaints management systems will be maintained throughout the construction period and for a minimum of 12 months after construction finishes.</p>	Construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
SE4	A social impact management plan (SIMP) will be prepared, in accordance with Section 5.2 of the <i>Social Impact Assessment Guideline for State Significant Projects</i> (DPIE, 2021), to manage the implementation of the proposed socio-economic mitigation measures, and detail the specific management actions and targets that will be developed in response to these measures. The SIMP will define specific actions, roles and responsibilities, and a monitoring, reporting and adaptive management framework for construction.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
SE5	Access to community facilities and infrastructure will be maintained during construction as far as practicable. Where alternate access arrangements need to be made, including changes to access for public and active transport facilities, these will be developed in consultation with relevant stakeholders and service providers, and communicated to users in accordance with the engagement plan. Changes to access arrangements will be managed in accordance with the traffic and access management plan (mitigation measure TT8).	Construction	Applicable where stage impacts access to community facilities and infrastructure	Applicable where stage impacts access to community facilities and infrastructure	Applicable where stage impacts access to community facilities and infrastructure	Applicable where stage impacts access to community facilities and infrastructure	Applicable
SE6	Transport for NSW will continue to consult with relevant key stakeholders (including facility managers) in relation to community infrastructure with the potential to be directly affected (by the project's land requirements) and/or indirectly affected (for example, as a result of amenity impacts or access changes). Consultation will be undertaken in accordance with the engagement plan (mitigation measure SE1) and will assist with identifying measures to minimise the potential impacts of the project on community infrastructure as far as possible. Stakeholders to be consulted will include, but not be limited to, City of Parramatta Council, City of Ryde Council, NSW Maritime, Melrose Park Public School and the Department of Education, and Sydney Olympic Park Authority.	Pre-construction, construction	Applicable where stage impacts community infrastructure	Applicable where stage impacts community infrastructure	Applicable where stage impacts community infrastructure	Applicable where stage impacts community infrastructure	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
SE7	Transport for NSW will continue to consult with relevant councils and Sydney Olympic Park Authority to offset the direct impacts of the project's land requirements on open space (parks and reserves) through the provision of a net increase in open space, including active transport infrastructure and improved open spaces and recreation facilities.	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
SE8	A project-specific social procurement and workforce development strategy will be developed and implemented to <ul style="list-style-type: none"> • nominate workforce development and social procurement targets and outcomes • define approaches to achieve nominated targets and outcomes • support job creation and skill development opportunities for the project. 	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
SE9	A business management and activation plan will be prepared and implemented for businesses with the potential to be affected by the project, including those located on roads impacted by construction. The plan will identify businesses with the potential to be impacted by the project. It will detail feasible and reasonable measures, developed in consultation with affected business owners/operators to: <ul style="list-style-type: none"> • minimise disruption for customers and deliveries as far as possible • maintain vehicular and pedestrian access during business hours, including alternative arrangements for times when access cannot be maintained • maintain visibility of the business to potential customers during construction, including alternative arrangements for times when visibility cannot be maintained • respond to other identified impacts as far as possible, including specific measures to assist small businesses with the potential to be adversely affected during construction. 	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<p>The plan will also include:</p> <ul style="list-style-type: none"> measures identified as an outcome of the small business support program (measure SE11) maintaining a phone hotline that enables businesses to find out about the project or register any issues establishment of business reference groups to provide information on the project and assist with the development of management measures a feedback and monitoring mechanism to assess the effectiveness of measures. 						
SE10	<p>Alternative arrangements, including for pedestrian and vehicular access, will be developed in consultation with affected businesses and implemented before any changes are made to existing access.</p> <p>Adequate wayfinding to businesses will be provided before, and for the duration of, any disruption. Wayfinding will be provided in consultation with the City of Parramatta Council, City of Ryde Council, Sydney Olympic Park Authority, Royal Agricultural Society of NSW and/or relevant road authority, and as outlined in the business management and activation plan (mitigation measure SE9).</p>	Pre-construction, construction	Applicable where stage impacts upon access to businesses	Applicable where stage impacts upon access to businesses	Applicable where stage impacts upon access to businesses	Applicable where stage impacts upon access to businesses	Applicable
SE11	<p>A small business support program will be established to provide assistance to small business owners with the potential to be impacted by construction. The program will assist local businesses develop proactive business strategies, including:</p> <ul style="list-style-type: none"> marketing and promotion business diversification and business planning engagement of specialists to provide training. 	Pre-construction, construction	Applicable where stage impacts upon small businesses	Applicable where stage impacts upon small businesses	Applicable where stage impacts upon small businesses	Applicable where stage impacts upon small businesses	Applicable
SE12	<p>An Aboriginal community and stakeholder engagement strategy and action plan will be prepared to define the strategies that will be implemented to minimise impacts on cultural values and ensure that:</p> <ul style="list-style-type: none"> information about the project is shared with Aboriginal stakeholders and communities in a timely manner local Aboriginal cultural and community values are identified and understood 	Design, pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
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	<ul style="list-style-type: none"> opportunities to reflect Aboriginal community and cultural values are identified and implemented. 						
LV1	<p>The urban design requirements will be finalised in accordance with the vision, principles and outcomes defined in Technical Paper 1 (Design, Place and Movement) and the Supplementary Design, Place and Movement Report, to provide detailed urban design guidelines and key requirements for the project, including individual design elements.</p> <p>The urban design requirements will be finalised in consultation with key stakeholders, the operator, the rail regulator, and the Design Review Panel.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
LV2	Design development will be undertaken in accordance with the urban design requirements and with advice from the Design Review Panel.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
LV3	Opportunities to incorporate additional wire-free sections will be investigated in consultation with relevant stakeholders, including in visually sensitive environments, areas where existing above-ground infrastructure and significant street trees need to be retained and areas adjoining significant habitat in accordance with mitigation measure BD4.	Design, construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
LV4	<p>A tree register will be prepared by a qualified arborist to identify all trees with the potential to be impacted by the project, and the proposed impacts to trees, including:</p> <ul style="list-style-type: none"> definitions of tree and canopy definition of what constitutes an impact (generally more than minor crown or root pruning of more than 10 per cent) location of each tree tree condition and values, including ecological screening functions where a tree requires removal, whether, in the opinion of the arborist, it can be successfully transplanted the extent of the proposed impact (complete removal or extent of pruning). 	Design	Applicable	Applicable	Not applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
LV5	<p>The design will continue to be refined to avoid or minimise impacts on trees. Any tree within the project site boundary, that will not be directly impacted by infrastructure or utility works, will be assessed for retention through careful consideration of design and construction methods. This will include consideration of the following options:</p> <ul style="list-style-type: none"> operational requirements in relation to tree locations adjustments to the design to avoid impacting trees (such as opportunities for localised narrowing of footpaths, use of porous pavement) reduction in the standard offset distances required for underground services consideration of the health of each tree, including its vigour and likely ability to survive in-situ pruning or transplanting. 	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
LV6	<p>A tree offset strategy will be developed to offset the loss of trees and achieve a net increase in tree number and canopy. The strategy will be prepared in accordance with the <i>Biodiversity Policy</i> (Transport for NSW, 2022) and the <i>Tree and hollow replacement guidelines</i> (Transport for NSW, 2022) to define and identify:</p> <ul style="list-style-type: none"> how impacts on trees will be offset the tree replacement ratios that would apply to offset the removal of trees locations for replacement trees species and trees sizes to ensure a mix of species and a range of mature heights to provide visual diversity as appropriate to proposed planting locations requirements for monitoring and maintenance. <p>The strategy will also demonstrate how lessons learned from the preparation and implementation of the tree offset strategy for Parramatta Light Rail Stage 1 have been incorporated.</p> <p>The strategy will be developed, and locations of replacement trees confirmed, in consultation and/or partnership with City of Parramatta Council, City of Ryde Council and Sydney Olympic Park Authority.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
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LV7	Lighting will be designed and sited to minimise glare and light spill into adjoining areas in accordance with Australian/New Zealand Standard AS/NZS 4282:2019 <i>Control of the obtrusive effects of outdoor lighting</i> and relevant standards in the series AS/NZS 1158:2005 <i>Lighting for roads and public spaces</i> .	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
LV8	Opportunities to mitigate the high-moderate and high visual impacts to residential properties on Wharf Road south of Andrew Street (such as planting to provide screening of views to the bridge) would be investigated in consultation with property owners.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Not applicable
LV9	Construction planning will demonstrate consideration of all practicable options to avoid or minimise impacts on trees, including: <ul style="list-style-type: none"> review of the construction methodology and layout of work sites, compounds, access, ancillary infrastructure and fencing consideration of alternative construction methods and equipment. Trees to be retained will be protected prior to the commencement of construction in accordance with Australian Standard AS 4970–2009 <i>Protection of trees on development sites</i> .	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
LV10	Any tree pruning that is more than minor will be undertaken by a qualified arborist in accordance with AS 4373–2007 <i>Pruning of amenity trees</i> .	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
LV11	Construction site hoarding and fencing will be designed, erected and maintained to minimise visual impacts. This will include: <ul style="list-style-type: none"> erecting hoarding/fencing as early as possible in the site establishment phase to provide visual screening using high quality materials suitable for parks and public spaces where sites are located close to sensitive receivers and public open space featuring graphics, artwork or project information at appropriate locations in consultation with Transport for NSW maintaining hoarding/fencing regularly, including the prompt removal of graffiti. 	Construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
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LV12	Lighting of work areas, compounds, and work sites will be oriented to minimise glare and light spill impact on adjacent receivers.	Construction	Not applicable	Applicable	Applicable	Applicable	Applicable
LV13	Following completion of construction, site restoration will be undertaken in accordance with the rehabilitation strategy (mitigation measure LP10). Temporary impacts on public open space will be rehabilitated in consultation with the relevant local council or Sydney Olympic Park Authority.	Construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable
LV14	Early planting and revegetation works will be undertaken where practicable to provide a screening buffer that has time to mature before the project is operational.	Construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable
LV15	Construction programming will provide for the progressive rehabilitation of disturbed areas as far as practicable, to minimise the duration and extent of temporary visual and landscape character impacts.	Construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable
BD1	Vegetation clearing will be limited to the minimum necessary to construct the project. The design and location of infrastructure will be further refined during each design phase to minimise or avoid impacts on native vegetation, fauna movement and habitat as far as practicable.	Design	Applicable	Applicable	Applicable	Applicable	Applicable
BD2	Biodiversity offsets will be finalised in accordance with the NSW Biodiversity Offsets Scheme and the NSW Assessment Bilateral Agreement under the EPBC Act, in consultation with the NSW Department of Planning and Environment (Environment, Energy and Science Directorate). Offsets required under the <i>Fisheries Management Act 1994</i> will be finalised in consultation with DPI Fisheries.	Design	Applicable	Applicable	Applicable	Applicable	Applicable
BD3	Design development in Sydney Olympic Park and the Millennium Parklands will ensure that habitat connectivity and quality for the Green and Golden Bell Frog is maintained in consultation with Sydney Olympic Park Authority and a suitably qualified and experienced ecologist.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
BD4	The use of overhead wiring will be minimised as far as practicable in areas adjoining Grey-headed Flying-fox foraging habitat and the flight paths of the White-bellied Sea-eagle and migratory waders, particularly on the bridges over the Parramatta River, adjacent to Newington Nature Reserve and Narawang Wetland, and the Holker Busway.	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
BD5	The planting of feed trees for the Grey-headed Flying-fox will be considered to improve habitat values, with a particular focus on locally indigenous winter-flowering species, such as Forest Red Gum (<i>Eucalyptus tereticornis</i>), Spotted Gum (<i>Corymbia maculata</i>) and Broad-leaved Paperbark (<i>Melaleuca quinquenervia</i>).	Design	Not applicable	Not applicable	Not applicable	Applicable	Applicable
BD6	Landscaping will use locally indigenous species to buffer the light rail alignment adjacent to vegetated areas, including Newington Nature Reserve, and along Hill Road and the Holker Busway, determined in consultation with Sydney Olympic Park Authority.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
BD7	Opportunities to minimise light and noise pollution to ecologically sensitive areas, particularly the Parramatta River, Newington Nature Reserve and the Millennium Parklands will be investigated and implemented, with regard to the <i>National Light Pollution Guidelines for Wildlife</i> (Department of the Environment and Energy, 2020), and in consultation with Sydney Olympic Park Authority.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
BD8	The design of the proposed bridges over the Parramatta River, and works to bridges in Sydney Olympic Park, will include provision for microbat-friendly roost features. The use of nest boxes appropriate for use by microbats and other small fauna will also be investigated and installed at other locations, in consultation with Sydney Olympic Park Authority and NSW National Parks and Wildlife Service.	Design	Not applicable	Not applicable	Not applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
BD9	<p>Construction measures to avoid impacts on breeding of fauna, including threatened and migratory fauna such as the White-bellied Sea-eagle, Southern Myotis and migratory waders, will be implemented. Such measures, including timing of construction, quieter construction methods, appropriate siting of lighting and/or the use of temporary noise barriers, will be implemented for works at:</p> <ul style="list-style-type: none"> • Holker Busway (to minimise impacts on the breeding of the Southern Myotis during October to April) • Hill Road near the White-bellied Sea-eagle nest (breeding season from July to January) • Hill Road adjacent to Narawang Wetland, Newington Nature Reserve Wetland and Kronos Hill (to minimise impacts on migratory waders and the Green and Golden Bell Frog during spring and summer). 	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
BD10	<p>Impacts on estuarine mangrove vegetation at Haslams Creek will to be avoided or minimised as far as practicable.</p> <p>Works on the Holker Busway bridge will be undertaken via scaffolding attached to the bridge where practicable, rather than from the ground, to minimise impacts on estuarine mangrove vegetation.</p>	Construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
BD11	<p>A biodiversity management plan will be prepared prior to construction and implemented as part of the CEMP. The plan will include measures to protect biodiversity and minimise the potential for impacts during construction. The plan will include but not be limited to:</p> <ul style="list-style-type: none"> • measures to manage potential impacts on the Green and Golden Bell Frog (see mitigation measure BD12) • measures to manage potential light, noise and vibration impacts on threatened and migratory fauna, such as the Green and Golden Bell Frog, within Sydney Olympic Park • measures to manage biosecurity risks (including pathogens and weeds) in accordance with the <i>Biosecurity Act 2015 (NSW)</i> 	Construction	Not applicable	Not applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<ul style="list-style-type: none"> locations and requirements for pre-clearing surveys, including where clearing is required within Sydney Olympic Park and areas of mangrove, saltmarsh or other riparian vegetation (see mitigation measure BD13) an unexpected finds procedure hygiene controls in relation to chytrid fungus, cinnamon fungus (<i>Phytophthora cinnamomi</i>) and myrtle rust (<i>Pucciniales fungi</i>) locations and procedures for monitoring (see mitigation measures BD15, BD16 and BD18). <p>The plan will be developed in accordance with the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (Roads and Traffic Authority (RTA), 2011) and the <i>Policy and guidelines for fish habitat conservation and management (update 2013)</i> (DPI, 2013).</p> <p>Management measures, including changes to measures to respond to monitoring outcomes, for works within Sydney Olympic Park and the Millennium Parklands will be developed in consultation with Sydney Olympic Park Authority.</p>						
BD12	<p>A Green and Golden Bell Frog management plan will be implemented as part of the biodiversity management plan by a qualified herpetologist, in consultation with Sydney Olympic Park Authority ecologists. The plan will define measures to:</p> <ul style="list-style-type: none"> ensure that habitat connectivity and quality is maintained during construction minimise direct impacts during construction (such as from noise and lighting). <p>The plan will include requirements for:</p> <ul style="list-style-type: none"> temporary frog-proof fencing to be installed around work areas in Sydney Olympic Park where existing frog-proof fencing is impacted permanent frog-proof fencing to be reinstated following construction temporary noise barriers to be installed near Newington Nature Reserve wetland, Narawang Wetland, and Kronos Hill during construction. 	Construction	Not applicable	Not applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
BD13	<p>Pre-clearing surveys will be completed prior to any works (including minor works) within sensitive areas, including at the following locations:</p> <ul style="list-style-type: none"> • vegetated land within Sydney Olympic Park • areas of mangrove, saltmarsh or other riparian vegetation. • areas identified by the project ecologist as supporting known or potential habitat, for ground-dwelling and arboreal species • buildings/structures to be removed (for roosting microbats). <p>Pre-clearing surveys and relocation of native fauna will be undertaken in accordance with Guide 1 (Pre-clearing process) and Guide 9 (Fauna handling) of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011).</p> <p>Pre-clearing surveys of vegetated land within Sydney Olympic Park will be conducted in accordance with the <i>Sydney Olympic Park Biodiversity Strategy and Management Plan</i> (SOPA, 2022), in particular Section 3 (Frog habitat clearance) of Environmental Procedure 3 (Works in and near habitats).</p>	Pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable
BD14	<p>A habitat restoration and revegetation plan will be prepared as a key part of the rehabilitation strategy (mitigation measure LP10) in consultation with relevant stakeholders, including City of Parramatta Council, Sydney Olympic Park Authority and landowners and implemented.</p> <p>The habitat restoration and revegetation plan will be prepared by a habitat restoration specialist and will include:</p> <ul style="list-style-type: none"> • clear objectives for rehabilitation and re-establishment of native vegetation of local provenance in temporary disturbance areas, in accordance with Guide 3 (Re-establishment of native vegetation) of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA, 2011) • active revegetation of mangroves at the proposed bridges over the Parramatta River, taking into account future shading impacts 	Construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<ul style="list-style-type: none"> reuse of removed trees would be considered, in consultation with Sydney Olympic Park Authority ecologists and the NSW National Parks and Wildlife Service requirements for ongoing monitoring. 						
BD15	<p>A fauna monitoring program, including monitoring locations, methods and timing, will be developed and implemented in consultation with the Environment and Heritage Group, Sydney Olympic Park Authority ecologists and Birdlife Australia, using available baseline data. The program will include monitoring during construction of:</p> <ul style="list-style-type: none"> frog fencing microbat roosts (for any works along the Holker Busway during the microbat breeding season, and any roosts identified in buildings/structures to be removed) the response of the White-bellied Sea-eagle and Green and Golden Bell Frog to construction noise. 	Construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
BD16	<p>Monitoring of indirect impacts on mangroves, saltmarsh and the Narrow-leafed <i>Wilsonia</i> (<i>Wilsonia backhousei</i>) population will be undertaken during and following construction.</p> <p>If an incident occurs in these areas, monitoring by a suitably qualified expert is required to determine the severity and potential need for additional offsets under the <i>Biodiversity Assessment Method</i> (DPIE, 2020).</p>	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
BD17	<p>The operational environmental management system will define measures to manage potential operational risks to biodiversity in the Millennium Parklands (including maintenance, cleaning, herbicide and other chemical use and lighting considerate of the protection of the Green and Golden Bell Frog populations) in consultation with Sydney Olympic Park Authority.</p>	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
BD18	<p>The behavioural response of the White-bellied Sea-eagle and Green and Golden Bell Frog to operations will be monitored by a suitably qualified ecologist specialising in the subject species in consultation with the Environment and Heritage Group, Sydney Olympic Park Authority ecologists, NSW National Parks and Wildlife Service and/or Birdlife Australia during the first two years of operation, with an option to extend for a further three years, based on advice from the ecologist, as to whether sufficient data has been obtained.</p> <p>The monitoring methods (including the need for baseline data), reporting requirements, and adaptive management will be set out in the biodiversity management plan (BD11).</p>	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage
W1	<p>A flood management strategy will be prepared, building on the results of the assessment presented in Technical Paper 10 (Hydrology, Flooding and Water Quality) to inform further design development and demonstrate how:</p> <ul style="list-style-type: none"> the project will achieve the Flood Management Objectives and Flood Immunity Standards the risk of flooding to the project will be minimised the potential impacts of the project on flood behaviour (under pre-project conditions) will be managed such that flooding characteristics will not be adversely impacted. <p>The flood management strategy will:</p> <ul style="list-style-type: none"> be based on revised flood modelling taking into account further design development and construction planning confirm the project's level of flood immunity confirm the impacts of the project on flood behaviour in accordance with the <i>NSW Floodplain Development Manual</i> (DIPNR, 2005) identify design responses and management measures in consultation with affected landowners/landholders to minimise: <ul style="list-style-type: none"> – flooding impacts above the one per cent AEP by adopting climate change adaptation measures 	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	<ul style="list-style-type: none"> - flooding impacts to flood sensitive areas and infrastructure within Sydney Olympic Park, including the Narawang Wetland, the Brick Pit and the existing leachate system - address potential impacts to the flood capacity and potential for scour as a result of the bridge piers. <p>The strategy will be prepared by a suitably qualified and experienced specialist in consultation with City of Parramatta Council, City of Ryde Council, Sydney Olympic Park Authority, NSW State Emergency Service and the Department of Planning and Environment.</p>						
W2	Drainage and flood management infrastructure will be designed with regard to relevant drainage design requirements and guidelines, including the <i>Development Engineering Design Guidelines</i> (City of Parramatta Council, 2018) and <i>Sydney Olympic Park Authority Policy – Stormwater Management and Water Sensitive Urban Design</i> (Sydney Olympic Park Authority, 2016).	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
W3	The location and specification of water quality treatment measures will be determined with reference to the NSW and project-specific water quality objectives and existing water quality.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
W4	Further investigations and consultation with the owner of groundwater bore GW107659 will be undertaken to identify the potential for the project to affect existing water extraction and to identify appropriate management measures in accordance with the <i>NSW Aquifer Interference Policy</i> (Department of Primary Industries, 2012).	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
W5	Further investigations and consultation with the owner of groundwater bore GW063660 will be undertaken to identify if the bore can be retained. Any decommissioning required will be undertaken in accordance with the <i>Minimum Construction Requirements for Water Bores in Australia</i> (National Uniform Drillers Licensing Committee, 2012). Decommissioning will be developed in consultation and agreement with the bore owner.	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
W6	Construction planning and the layout of construction work sites and compounds will be undertaken with consideration of overland flow paths and flood risk, avoiding flood liable land as far as practicable.	Pre-construction	Applicable	Not applicable	Not applicable	Applicable	Applicable
W7	A flood and emergency response plan will be prepared and implemented. The plan will include measures, process and responsibilities to minimise the potential impacts of construction activities on flood behaviour as far as practicable. It will also include measures to manage flood risks and address flood recovery during construction.	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
W8	Ongoing consultation will occur with the NSW State Emergency Service and relevant councils in relation to potential impacts to existing community emergency management arrangements for flooding.	Design, pre-construction, construction operation	Applicable	Applicable	Applicable	Applicable	Applicable
W9	A soil and water management plan will be prepared as part of the CEMP and implemented during construction. The plan will detail processes, responsibilities and measures to manage potential soil and water quality impacts during construction, including measures to minimise the potential for pollutants to enter surface water and groundwater. The plan will be prepared in accordance with relevant guidelines and standards, including <i>Managing Urban Stormwater – Soils and Construction - Volume 1</i> (Landcom, 2004) and Volume 2D <i>Main Road Construction</i> (DECC, 2008) (the Blue Book), <i>Best Practice Erosion and Sediment Control</i> (International Erosion Control Association (Australasia), 2008), and <i>Sydney Olympic Park Authority Policy - Stormwater Management and Water Sensitive Urban Design</i>	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	(Sydney Olympic Park Authority, 2016) (for works in Sydney Olympic Park).						
W10	Discharge to surface water will be undertaken in accordance with <i>Water Discharge and Reuse Guideline DMS-SD-024 version 4.1</i> (Transport for NSW, 2019), and project specific objectives.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
W11	<p>A water quality monitoring program will be developed and implemented as part of the soil and water management plan to monitor potential surface water quality impacts. The program will define:</p> <ul style="list-style-type: none"> • monitoring parameters • monitoring locations • frequency and duration of monitoring. <p>The monitoring program will include monitoring prior to the commencement of construction to validate the baseline water quality of potential receiving waters and confirm project-specific water quality criteria.</p> <p>Water quality monitoring will continue for a minimum of 12 months following the completion of construction, or until affected watercourses are rehabilitated to an acceptable condition (or as otherwise required by any project conditions of approval).</p> <p>The monitoring program will assess compliance with the project-specific water quality objectives and the efficacy of the mitigation measures and will include a trigger response action plan. It will be developed in consultation with the NSW EPA, City of Parramatta Council and Sydney Olympic Park Authority.</p>	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
W12	Hydrodynamic modelling will be undertaken to inform the final bridge construction methodology and features of the temporary jetties to minimise the risk of river bank destabilisation or additional flooding to nearby areas. The modelling will also identify if additional measures, such as scour protection are required.	Pre-construction	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
W13	The soil and water management plan will detail measures to manage potential changes to hydrodynamic processes within the Parramatta River and ensure appropriate mitigation measures are implemented to minimise erosion, scour and destabilisation of the river banks.	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
W14	Works within or near watercourses will be undertaken with consideration of the <i>Guidelines for watercourse crossings on waterfront land</i> (DPI, 2012) and <i>Guidelines for controlled activities on waterfront land – Riparian corridors</i> (DPE, 2022).	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
W15	Impacts on groundwater during construction will be minimised as far as practicable by: <ul style="list-style-type: none"> avoiding the need to extract groundwater minimising groundwater inflows and volumes into excavations. 	Construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
W16	A dewatering management strategy will be prepared as part of the soil and water management plan and implemented during construction. The plan will detail measures for the appropriate management of extracted groundwater, including leachate.	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
W17	Emergency management arrangements will be developed to manage flood risks to people and vehicles accessing stops and facilities.	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage
CS1	Additional investigations will be undertaken to inform the design, construction planning, and preparation of remediation action plan(s) (RAP(s)) (if required). The investigations will include targeted investigation in the north of Wentworth Point. The results of site investigations will be assessed against the criteria contained with the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i> (NEPC, 2013) to determine the need for any remediation.	Design	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
	An independent site auditor accredited under the site auditor scheme under the CLM Act will review the scope and results of the further investigation, including any recommendations for further assessment, and provide a written opinion on the contamination risk and the appropriateness of the reports and any proposed recommendations.						
CS2	<p>The location, layout and functioning of the asbestos containment cells at 13A Grand Avenue, Camellia and the former Sandown Line will be confirmed.</p> <p>Where the project has the potential to affect the remediation systems in the stabling and maintenance facility, and the asbestos containment cells at 13A Grand Avenue and the former Sandown Line, the controls and protocols outlined in the existing long-term environmental management plan will be implemented such that the systems continue to operate effectively.</p>	Design	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
CS3	<p>The location, layout and functioning of the leachate management systems in Sydney Olympic Park will be confirmed.</p> <p>Where the project has the potential to affect the leachate management systems in Sydney Olympic Park, negotiation will be undertaken with Sydney Olympic Park Authority to understand the extent of the potential interaction. The controls and protocols outlined in the existing management plan will be implemented such that the systems continue to operate effectively.</p>	Design	Applicable where the stage affects the leachate management system	Not applicable	Applicable where the stage affects the leachate management system	Applicable where the stage affects the leachate management system	Applicable
CS4	Where the potential for disturbance of existing remediation systems in Camellia and Sydney Olympic Park is not consistent with the existing management plans, a remediation action plan(s) will be prepared in consultation with the landowners and NSW EPA. The plan(s) will describe how these systems will be managed during construction, and/or how these systems will be reinstated such that they continue to operate effectively after construction is complete.	Design	Applicable where the stage is not consistent with the existing management plans	Not applicable	Applicable where the stage is not consistent with the existing management plans	Applicable where the stage is not consistent with the existing management plans	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
CS5	Where a remediation action plan(s) is/are determined to be required following further investigation it will be prepared and implemented in accordance with the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i> . The remediation action plan(s) will be prepared in consultation with landowner/s and reviewed by an independent site auditor (accredited under the site auditor scheme under the CLM Act), to certify the appropriateness of the plan(s) and that the site can be made suitable for the proposed use.	Design	Applicable where a remediation plan is required	Applicable where a remediation plan is required	Applicable where a remediation plan is required	Applicable where a remediation plan is required	Applicable
CS6	Hazardous materials surveys will be undertaken to inform construction planning.	Pre-construction	Applicable	Applicable	Not applicable	Not applicable	Applicable
CS7	The soil and water management plan (mitigation measure W9) will detail processes, responsibilities and measures to manage potential soil impacts during construction, including potential impacts associated with the presence of existing contamination, stockpile management, saline soils and acid sulfate soils.	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
CS8	Physical controls (such as sediment curtains) will be implemented during works within the Parramatta River to minimise the disturbance and migration of contaminated sediments.	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
CS9	The preferred methods to manage and dispose of contaminated materials and groundwater will be confirmed following further geotechnical and contamination investigations and incorporated into the waste and resource management plan (mitigation measure WR3).	Pre-construction	Applicable	Applicable	Applicable	Applicable	Applicable
CS10	Protocols to address and manage the potential for landfill gases along Hill Road and in Sydney Olympic Park will be developed as part of the air quality management plan (mitigation measure AQ1) and implemented during construction. The protocols will consider confined and/or enclosed spaces and appropriate controls as required (e.g. forced ventilation) and will include appropriate occupational monitoring.	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
CS11	<p>An acid sulfate soils management plan will be prepared as part of the soil and water management plan in accordance with the <i>Acid Sulfate Soils Assessment Guidelines</i> (ASSMAC, 1998).</p> <p>The plan will define the process and measures to manage actual and potential acid sulfate soil and sediment disturbed during construction. The plan will include a summary of available acid sulfate soil information relevant to the project site and identify any further soil/water analysis required as a precursor to implementing the management plan.</p> <p>Acid sulfate soils will be disposed off-site (where required) in accordance with the <i>Waste Classification Guidelines – Part 1: Classifying waste</i> (NSW EPA, 2014) and <i>Part 4: Acid sulfate soils</i> (NSW EPA, 2014).</p>	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
CS12	<p>Temporary storage and containment systems for the stockpiling of contaminated material during construction will be designed to be impervious to the materials stored, resistant to fire (where required), prevent cross contamination of clean fill, covered to prevent contact with rainfall (when required), and managed and maintained to prevent any release of liquids and contaminated run-off to stormwater drains, waters and land.</p>	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
CS13	<p>The discovery of previously unidentified contaminated material will be managed in accordance with an unexpected contaminated finds procedure, which will be included in the soil and water management plan.</p>	Pre-construction, construction	Applicable	Applicable	Applicable	Applicable	Applicable
CS14	<p>Spills and leaks of vehicles or maintenance plant and equipment will be managed in accordance with Transport for NSW's standard operating procedures.</p>	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage
CS15	<p>Ongoing management and monitoring measures will be implemented for any areas where minor, residual contamination remains following construction.</p>	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
HR1	The project will be designed in accordance with <i>Non-Ionising Radiation Protection Guidelines for Limiting Exposure to Time Varying Electric and Magnetic Fields</i> (ICNIRP, 2010) and Australian Standard AS 2067:2016 <i>Substations and high voltage installations exceeding 1 kV</i> to minimise the risk associated with electro-magnetic field exposure. Wiring, tracks and other infrastructure will be designed to mitigate risks associated with high voltage cabling and potential earth leakage.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
HR2	Ongoing design development will be subject to detailed safety reviews through the Safety in Design process, to identify measures to mitigate, manage and reduce the risk of incidents arising from collisions during operation.	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
HR3	The CEMP will detail incident management and emergency response processes, responsibilities and measures to manage hazards, and incident and emergency situations during construction.	Pre-construction, construction	Not applicable	Applicable	Applicable	Applicable	Applicable
HR4	The soil and water management plan will include a spill response procedure. The procedure will detail measures to manage hazardous substances and dangerous goods, including storage, handling and spill response, in accordance with legislative requirements.	Pre-construction, construction	Not applicable	Not applicable	Applicable	Applicable	Applicable
HR5	Valve shut downs on the Sydney Water drinking water trunk mains will be undertaken to confirm the condition and functionality of the nearest valves to the project site and whether any repairs or rectification works are required to the existing assets.	Pre-construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
HR6	An incident and emergency response plan will be prepared to include the process to be followed in the event of an incident involving critical utilities such as the Sydney Water drinking water trunk mains, Jemena high pressure gas pipelines and fuel pipelines. The plan will be developed in consultation with the service providers and incorporate the findings from the utility investigations, the condition assessment of the Sydney Water drinking water trunk mains, and the safety management study (mitigation measure HR7).	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Not applicable	Applicable
HR7	A safety management study will be undertaken to identify potential risks, including those associated with proposed alterations, to the gas and fuel pipelines in accordance with Australian and New Zealand Standard AS/NZS 2885.6:2018 <i>Pipelines – Gas and liquid petroleum, Part 6: Pipeline safety management</i> . The outcomes of the safety management study will be incorporated in construction planning and design development.	Design, pre-construction,	Not applicable	Applicable	Not applicable	Applicable	Applicable
HR8	The transport of dangerous goods will be undertaken in accordance with the Dangerous Goods (Road and Rail Transport) Regulation 2009 and the Australian Code for the <i>Transport of Dangerous Goods by Road and Rail</i> (National Transport Commission, 2017).	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
HR9	Targeted safety campaigns to raise awareness about the operation of light rail vehicles will be undertaken in the lead up to the opening of the project and during operation to promote safe operation. This will focus on raising awareness and promoting safe behaviours around light rail vehicles.	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage
GHG1	An energy and greenhouse gas strategy will be prepared to document the greenhouse reduction targets for the construction and operational stages of the project. The strategy will: <ul style="list-style-type: none"> be prepared in accordance with Infrastructure Sustainability Council and NSW Government Resource Efficiency Policy (OEH, 2014) requirements identify the key initiatives that will be explored further to meet these targets in accordance with the carbon emissions management hierarchy 	Design, construction, operation	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
GHG2	<ul style="list-style-type: none"> be reviewed throughout the project lifecycle. <p>Opportunities to reduce construction and operational greenhouse gas emissions will be investigated including, but not limited to:</p> <ul style="list-style-type: none"> purchasing electricity derived from a renewable energy source the use of biodiesel in plant and equipment connecting compound sites to grid electricity, where available the use of low embodied energy and recycled materials promoting the selection of energy efficient rolling stock, electrical equipment and maintenance vehicles. <p>Preferred measures will be defined in the energy and greenhouse gas strategy.</p>	Design	Applicable	Applicable	Applicable	Applicable	Applicable
AQ1	<p>An air quality management plan will be prepared as part of the CEMP and implemented during construction. The plan will detail processes, responsibilities and measures to manage air quality, odour and landfill gas and minimise the potential for impacts during construction.</p> <p>The plan will include an air quality, odour and landfill gas monitoring program, which will be undertaken for the duration of construction.</p>	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable
AQ2	<p>An odour management strategy will be developed prior to construction and implemented for the duration of works involving ground disturbance and the potential generation of landfill gases in Camellia, near the Parramatta River and in Sydney Olympic Park. The strategy will include:</p> <ul style="list-style-type: none"> proposed work methods and mitigation measures that aim to limit odour at sensitive receivers routine observation of weather conditions regular odour surveys at receptor locations by appropriately qualified professionals (mitigation measure AQ3) measures to minimise the generation of odour at the end of each work day/shift 	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
AQ3	<ul style="list-style-type: none"> mechanisms for investigating odour complaints, including conduct of additional odour surveys (mitigation measure AQ3) contingency and rectification measures should significant odour issues occur at sensitive receivers in the vicinity of the project site. <p>Odour surveys will be undertaken at downwind receivers during works involving ground disturbance in Camellia, near Parramatta River and in Sydney Olympic Park in accordance with <i>Determination of odorants in ambient air by field inspection</i> (VDI 3940, 1993).</p> <p>The odour surveys will be undertaken:</p> <ul style="list-style-type: none"> daily, for one hour when works commence, and prior to works completing if wind conditions drop below three metres per second if an odour complaint is received. <p>If significant odour issues are observed in the vicinity of sensitive receivers, the contingency and rectification measures defined by the odour management strategy will be implemented (see AQ2).</p>	Construction	Applicable	Applicable	Applicable where the stage requires ground disturbance near Parramatta River or Sydney Olympic Park	Applicable	Applicable
CC1	<p>The climate change risk assessment will continue to be refined in accordance with Australian Standard AS 5334-2013 <i>Climate change adaptation for settlements and infrastructure – A risk based approach</i> and the <i>Transport for NSW Climate Risk Assessment Guidelines</i> (Transport for NSW, 2021).</p> <p>Adaptation measures will be confirmed, and actions implemented, to address very high, high and medium risks where reasonable and feasible.</p>	Design	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Not applicable – stage does not include permanent works	Applicable	Applicable
CC2	Operational procedures for emergency planning and management will be prepared and implemented to consider the increased risk of flooding, storm surges and heatwaves.	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage
CC3	Operational procedures will be developed and implemented to appropriately respond to extreme climate events (temperature, winds or rainfall), as identified in the updated climate change risk assessment.	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
WR1	Measures to minimise spoil generation will be confirmed during design development. This will include a focus on optimising the design to minimise spoil volumes, and the reuse of material on site.	Design	Applicable	Applicable	Not applicable	Applicable	Applicable
WR2	Material procurement and resource use planning will be undertaken in accordance with the <i>Sustainable Design Guidelines</i> (Transport for NSW, 2020).	Design	Applicable	Applicable	Applicable	Applicable	Applicable
WR3	A waste and resource management plan will be prepared as part of the CEMP and implemented during construction. The plan will adopt the circular economy principles and the waste hierarchy contained in the <i>Waste Avoidance and Resource Recovery Act 2001</i> and the <i>Infrastructure Sustainability Rating Scheme Technical Manual</i> (Infrastructure Sustainability Council, 2021). It will detail processes, responsibilities and measures to manage waste and resource use, and minimise the potential for impacts during construction. The plan will include strategies to manage spoil, including preferred reuse options.	Pre-construction, construction	Not applicable	Not applicable	Not applicable	Applicable	Applicable
WR4	All waste will be classified in accordance with the <i>Waste Classification Guidelines</i> (NSW EPA, 2014) and managed in accordance with the POEO Act and associated regulations.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
WR5	The disturbance, movement and disposal of special waste, including hazardous building materials such as asbestos containing materials, will be carried out in accordance with the Work Health and Safety Regulation 2011 and relevant guidelines.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable
WR6	Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Such areas will be hardstand or lined, appropriately stabilised and bunded, with sufficient space for stockpile storage.	Construction	Applicable	Applicable	Applicable	Applicable	Applicable

New ID	Mitigation measure	Timing	Stage A – Bridge between Melrose Park and Wentworth Point				Stage B – Main alignment construction works and supply, operate and maintain system works
			Substage A1 – Pre-construction and site establishment	Substage A2 – Utilities relocation	Substage A3 – Temporary works	Substage A4 – Main construction works	
WR7	Operational waste, including general litter clean up, will be managed consistent with the Parramatta Light Rail Stage 1 Operations Environmental Management Plan and the waste hierarchy principles contained in the <i>Waste Avoidance and Resource Recovery Act 2001</i> .	Operation	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage	Not applicable to this construction stage

4 Review

4.1 Changes to delivery strategy

This Staging Report details the staging of construction of the project, reflecting the current delivery strategy. As the project progresses the delivery strategy may change which may also result in changes to the stages outlined in this report. Where this occurs, Transport will undertake a reallocation exercise to confirm how the mitigation measures apply to the new or modified stages and subsequently update this Staging Report.

If changes are proposed to the staging of construction or operation, the revised Staging Report will be endorsed by the Environmental Representative and submitted to the Department of Planning and Environment before the commencement of changes to the stage of construction or the stage of operation.

4.2 Project determination and changes to the planning approval

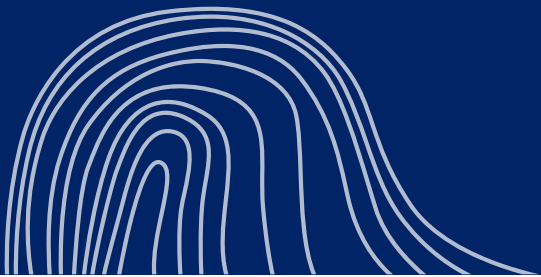
This Staging Report confirms mitigation measures which are appropriate to the scope, risks and timing of each construction stage. Should the project be approved this Staging Report would be updated to assess, allocate and confirm the applicability of each condition of approval to each project stage.

During the project there may be changes to the planning approval, following the approval of a project modification. Following the determination of a modification, the approved project modification and associated construction activities would be reviewed, and if necessary, new or modified conditions of approval would be subject to the applicability and allocation processes described in earlier sections of this report.

Following updates to the revised Staging Report, it would be endorsed by the Environmental Representative and submitted to the Department of Planning and Environment.

5 References

- Department of Environment and Climate Change (2009), *Interim Construction Noise Guideline*, July 2009. Available at: [Interim Construction Noise Guideline \(nsw.gov.au\)](https://www.nsw.gov.au/interim-construction-noise-guideline)
- Department of Environment, Climate Change and Water (DEECW) (2010), *Code of practice for archaeological investigation of Aboriginal objects in NSW*, September 2010. Available at: [Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW | NSW Environment and Heritage](#)
- Department of Environment and Conservation (DEC) (2006), *Assessing Vibration: a technical guideline*, February 2006. Available at: [Assessing Vibration: a technical guideline](#)
- Department of Planning and Environment (2022), *State Significant Infrastructure Template Conditions of Approval (Linear Infrastructure)*, February 2022. Available at: [State Significant Infrastructure Template Conditions of Approval \(Linear Infrastructure\)](#)
- Department of Planning, Industry and Environment (2020), *Independent Audit Post-Approval Requirements*, May 2020. Available at: [Independent Audit](#)
- Standards Australia (2019), *AS/NZS ISO 19011:2019 – Guidelines auditing management systems*. Available at: [AS/NZS ISO 19011:2019](#)
- Transport for NSW (2022), *Parramatta Light Rail Stage 2 Environmental Impact Statement*, November 2022. Available at: [Parramatta Light Rail Stage 2 Environmental Impact Statement](#)



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