

# **Memorial Avenue Upgrade**

**Addendum Review of Environmental Factors**

**Transport for NSW**

April | 2021

# Memorial Avenue Upgrade

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Transport for NSW | April 2021

Prepared by Beca Pty Ltd and Transport for NSW

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# Document controls

## Approval and authorisation

<b>Title</b>	Memorial Avenue Upgrade Addendum Review of Environmental Factors
<b>Accepted on behalf of Transport for NSW by:</b>	Mark Jajou Project Contract Manager
<b>Signed:</b>	
<b>Dated:</b>	06 May 2021

## Document status

Document status	Date	Prepared by	Reviewed by
<b>First Draft</b>	29 January 2021	Manasi Chonkar (Beca)	Matt Brookes (Beca)
<b>Second Draft</b>	26 February 2021	Fran Soler (Beca)	Matt Brookes (Beca)
<b>Third Draft</b>	15 March 2021	Fran Soler (Beca)	Matt Brookes (Beca)
<b>Final</b>	29 April 2021	Fran Soler (Beca)	Matt Brookes (Beca)

# Executive summary

## The proposed modification

It is proposed that the Memorial Avenue Upgrade, between Windsor Road and Old Windsor Road, Kellyville be modified to include additional utility work, property adjustments and pavement work at various locations. Key features of the proposed modification would include:

- Utility works involving earthworks and trenching within Sydney Water land and along:
  - Old Windsor Road
  - Thomas Boulton Circuit
  - Rutherford Avenue
  - Arnold Avenue
  - Memorial Avenue
  - Windsor Road.
- Line marking works including asphalt re-sheeting along Windsor Road, Old Windsor Road, Arnold Avenue and Severn Vale Drive.
- Additional haulage routes during construction potentially using local roads which may lead to minor pavement works.
- Additional ancillary site access.
- Additional access to various locations throughout the construction site.
- Road widening along Windsor Road for turn lanes.
- Driveway connections to new housing development which were not developed at the time the Project REF was determined.
- Property adjustment works along Memorial Ave between Old Windsor Road and Windsor Road, including stormwater drainage installation and connections outside the road reserve at 27 Memorial Avenue, 40 Memorial Avenue and 43 Memorial Avenue.

## Background

A Review of Environmental Factors (REF) was prepared in 2014 (the Project REF). The Project REF was placed on public display between 17 November 2014 and 12 December 2014 for community and stakeholder comments. A submissions report dated May 2015 was prepared to respond to issues raised. In addition, an Addendum REF for the Memorial Avenue Upgrade was prepared in July 2019 and a Consistency Review in November 2019.

This Addendum REF has now been prepared as a result of further detailed design changes and changes to utilities services in the area.

## Proposal objectives

The objectives of the proposal are to:

- Improve road safety in line with the NSW Road Safety Strategy 2012-2021
- Improve liveability and sustainability, support economic growth and productivity
- by providing road capacity for projected traffic volumes
- Improve travel times
- Improve quality of service, sustainability and liveability by providing facilities for walking and cycling and future public transport needs
- Improve urban design and visual quality
- Improve the drainage system.

## Statutory and planning framework

The Memorial Avenue Upgrade project was approved under Division 5.1 of the *Environment*

*Planning and Assessment Act 1979* (EP&A Act) in 2014. Transport for NSW is the proponent and determining authority for the proposed works. Clause 94 of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by, or on behalf of a public authority without consent. As the proposed modification is for a road and is to be carried out on behalf of Transport for NSW, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

### **Community and stakeholder consultation**

A comprehensive consultation strategy was implemented for the Project REF. No submissions were received opposing the initial proposal and several requested priority timing for the delivery of the project. No additional community consultation has been undertaken for the proposed modification.

### **Environmental impacts**

The main environmental impacts for the proposed modification are as below:

#### **Biodiversity**

Additional areas of vegetation are required to be removed as a result of the proposed changes. The modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats.

As a result of the proposed additional stormwater connections, it is likely that there would be some short term and long-term aquatic impacts to Strangers Creek. Adherence to the *Sydney Water Guide for Stormwater* is recommended which would require revegetation and design considerations which are considered likely to result in local improvements in the value of these aquatic habitats and also in the resilience of these aquatic communities.

#### **Socio-economic and Property**

During construction and operation the proposed modification would likely result in the following:

- Impacts to property and land use as a result of property adjustment work.
- Partial acquisition of property at 6 Windsor Road to allow for manoeuvring around the adjacent bus stop for DDA compliance.
- Additional impacts to traffic and transport during construction which may result in minor traffic delays, temporary changes to access and increased travel times.
- Amenity impacts, including noise and vibration and landscape and visual quality.
- Utility adjustments may temporarily disrupt services such as power, water, sewer, gas and telecommunications.

Access to Kellyville Memorial Park would not be affected by the proposed modification.

#### **Cumulative**

As the project forms part of a series of planned road upgrades and under-construction upgrades in Sydney's north-west, there are potential cumulative impacts associated with:

- Traffic delays and access
- Construction noise & vibration
- Visual amenity
- Biodiversity

There would be cumulative traffic delays as a result of the road widening project due to additional works and time required. The cumulative impacts of construction noise, vibration, and visual amenity should be largely the same as those listed in the Project REF and Addendum REF. While there is some additional vegetation proposed to be removed, the potential cumulative impacts are considered negligible.

Despite minor additional environmental impacts having been identified, no additional specific safeguards and management measures have been included in this Addendum REF beyond those considered in the Project REF and Addendum REF (2019).

### **Justification and conclusion**

This Addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

The proposed modification is necessary as part of the Memorial Avenue Upgrade project. Minor additional environmental impacts have been identified as a result of the proposed modification. The safeguards and mitigation measures documented in the Project REF and Addendum REF (2019) are considered satisfactory to minimise the expected impacts.

The environmental impacts of the proposed modification are not likely to be significant and therefore, it is not necessary for an environmental impact statement to be prepared and approval for the proposed modification to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.

The proposed modification is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth Land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of Agriculture, Water and the Environment is not required.

On balance, the proposed modification to the original proposal is considered justified.

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Appendix A Proposed Modification Maps

Appendix B Consideration of clause 228(2) factors and matters of National Environmental Significance and Commonwealth land

Appendix C Statutory Consultation Checklists

Appendix D Updated Addendum Biodiversity Assessment



# 1 Introduction

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## 1.1 Proposed modification overview

Transport for NSW proposes to modify the Memorial Avenue Upgrade project to include additional works resulting from refinements to the approved design (proposed modification). Key features of the proposed modification would include:

- Utility works involving earthworks and trenching within Sydney Water land and along:
  - Old Windsor Road
  - Thomas Boulton Circuit
  - Rutherford Avenue
  - Arnold Avenue
  - Memorial Avenue
  - Windsor Road
- Line marking works including asphalt re-sheeting along Windsor Road, Old Windsor Road, Arnold Avenue and Severn Vale Drive
- Additional haulage routes during construction potentially using local roads which may lead to minor pavement works
- Additional ancillary site access
- Additional access to various locations throughout the construction site
- Road widening along Windsor Road for turn lanes
- Driveway connections to new housing development which were not developed at the time the Project REF was determined
- Property adjustment works along Memorial Ave between Old Windsor Road and Windsor Road, including stormwater drainage installation and connections outside the road reserve at 27 Memorial Avenue, 40 Memorial Avenue and 43 Memorial Avenue.

The location of the proposed modification is shown in **Figure 1-1** and a map of the proposed boundary modification is shown in **Figure 1-2**. Refer to Appendix A for a more detailed map. Chapter 3 describes the proposed modification in more detail.

A Review of Environmental Factors (REF) was prepared in 2014 (the Project REF). The Project REF was placed on public display between 17 November 2014 and 12 December 2014 for community and stakeholder comments. A submissions report dated May 2015 was prepared to respond to issues raised.

In addition, an Addendum REF for the Memorial Avenue Upgrade was prepared in July 2019 and a Consistency Review in November 2019.

## 1.2 Purpose of the report

This Addendum REF has been prepared by Beca Pty Ltd on behalf of Transport for NSW. For the purposes of these works, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Addendum REF is to be read in conjunction with the Project REF, Submissions Report, Addendum REF (2019) and Consistency Review (2019). The purpose of this Addendum REF is to describe the proposed modifications, to document and assess the likely impacts of the proposed modifications on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in context of clause 228 of the Environmental Planning and Assessment Regulation 2000, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS Required? guidelines) (DUAP, 1995/1996), Roads

and Road Related Facilities EIS Guideline (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the update to addendum REF helps to fulfil the requirements of:

- Section 5.5 of the EP&A Act including that Transport for NSW examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the update to addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report.
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of Agriculture, Water and the Environment for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

**Figure 1-1: Location Map**

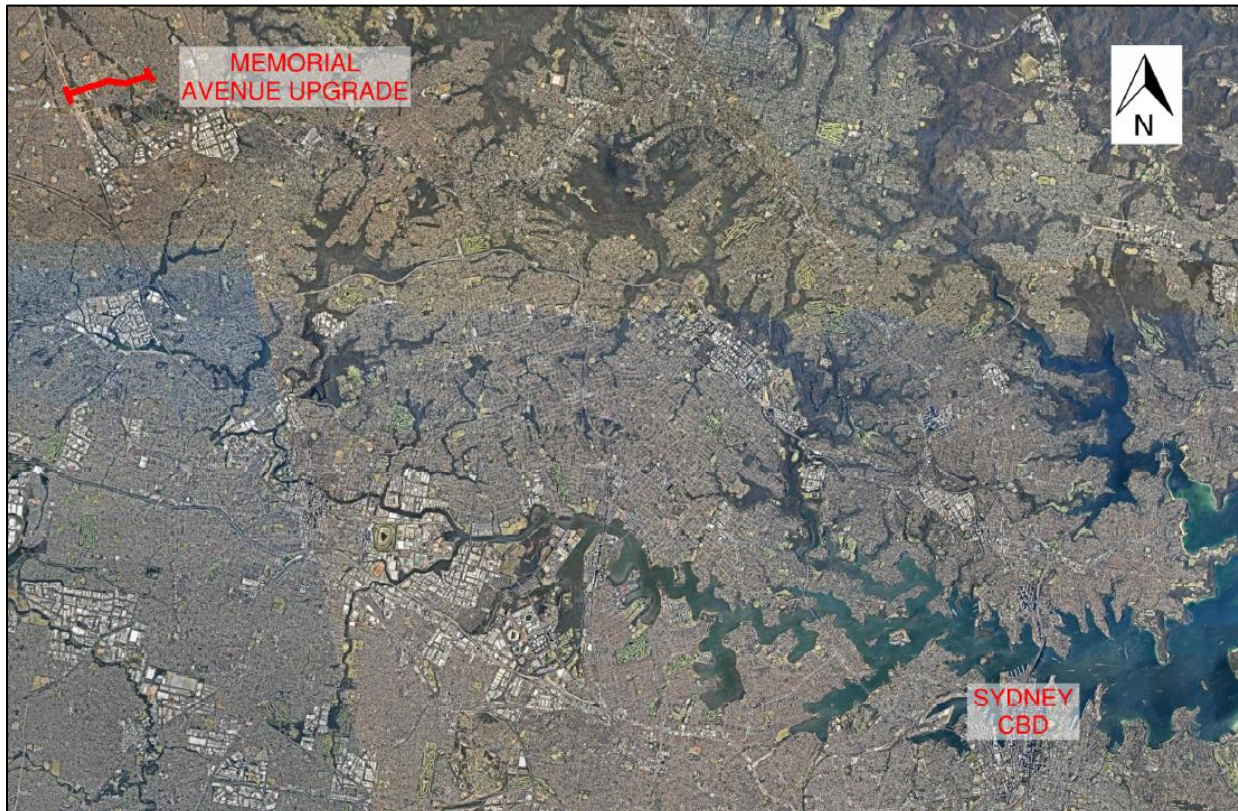
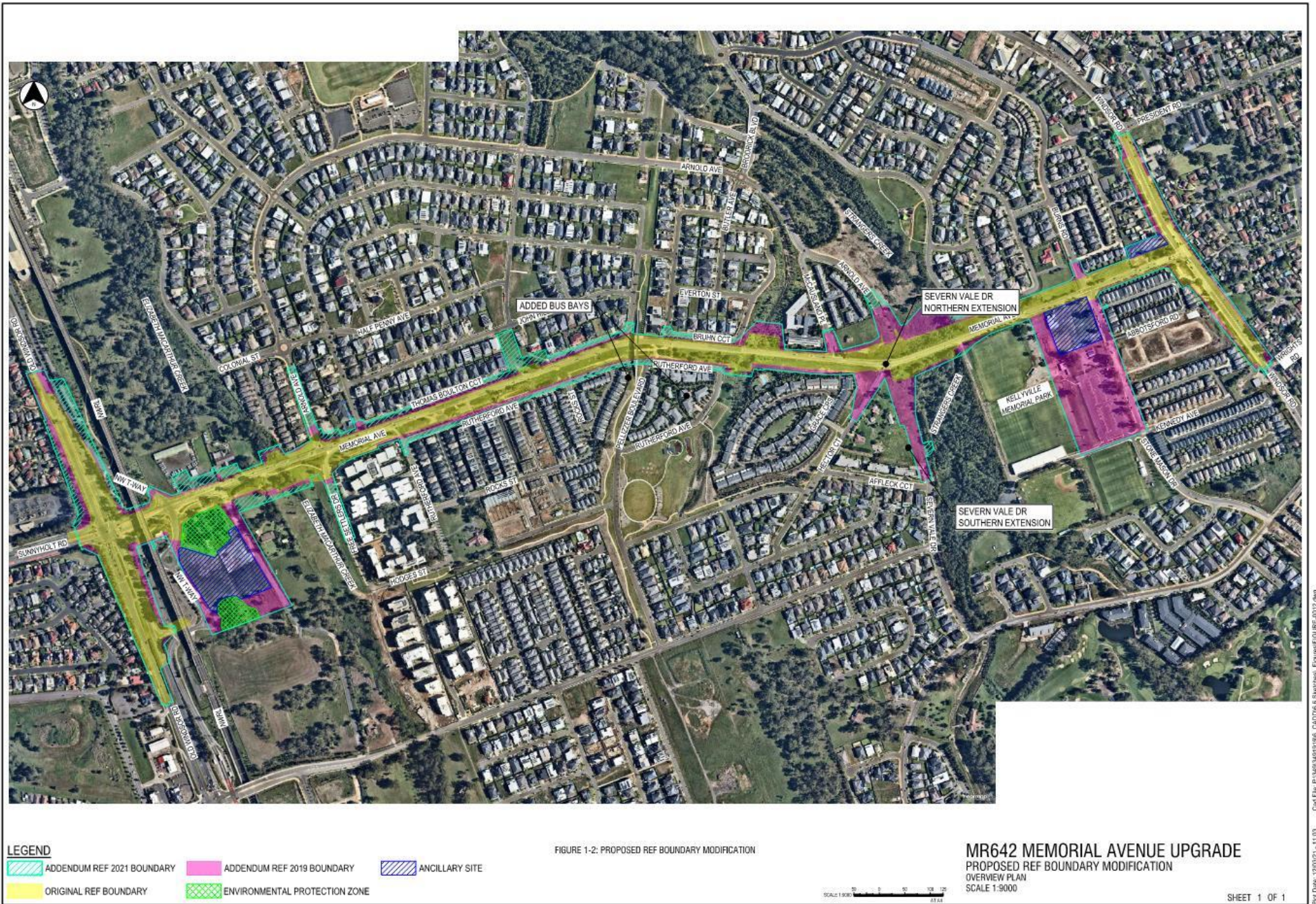


Figure 1-2: Proposed REF Boundary Modification



## **2 Need and options considered**

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### **2.1 Strategic need for the proposed modification**

Chapter 2 of the Project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this Addendum REF is consistent with the strategic need for the project.

The proposed modification is needed to conduct utility works, ancillary works and to fully consider the impacts on properties due to utility changes in areas along the project footprint that were not considered under the Project REF and the Addendum REF.

#### **2.1.1 Utility works**

The proposed modification would involve public utility adjustments located within or adjacent to the road corridor. The proposed changes would have a minor impact for the public utility adjustment however they are necessary to ensure the ongoing service of the utility and to avoid conflict with the road upgrade.

In line with the design intent of the previously proposed utility adjustments, impacted utilities would be adjusted locally at the location of the proposed changes, where required.

Public utilities that do not require adjustment will be protected by the construction contractor during the upgrade works.

#### **2.1.2 Other Works**

The other proposed works are strategically necessary to support construction activities of road upgrade. These other works are necessary to complete upgrade works in order to realise the project objectives.

The proposed other works include:

- Site Access;
- Line marking including asphalt re-sheeting;
- Local Road Access;
- Road widening;
- Driveway connections to new developments; and
- Drainage connections.

These works are considered minor relative to the main road upgrade, however, are necessary to the ongoing operation of the Memorial Avenue and surrounding road network following construction. The strategic need for these changes relates directly to the original project objectives, such as improving travel times.

### **2.2 Proposal objectives and development criteria**

The objectives of this proposal are consistent with the objectives of the proposal outlined in the Project REF and listed below:

- Improve road safety in line with the NSW Road Safety Strategy 2012–2021 'Safe System Directions' and 'Safer Road' key focus
- Improve liveability and sustainability, support economic growth and productivity by providing road capacity for projected traffic volumes
- Improve travel times

- Improve quality of service, sustainability and liveability by providing facilities for walking and cycling and future public transport needs
- Improve urban design and visual quality
- Improve the drainage system.

## **2.3 Alternatives and options considered**

A number of proposed design refinements have emerged as a consequence of detailed design development and constructability of some approved works.

### **2.3.1 Methodology for selection of the preferred option**

The proposal involves several changes that have arisen during detailed design and did not require consideration of other options. In this context, the process of option evaluation had two broad stages:

- A consideration of whether the proposal in any configuration could be justified. This is an evaluation of the 'do nothing' option.
- An evaluation of other options by reference to the respective impacts and benefits.

### **2.3.2 Identified options**

#### **Utility Works**

##### **Option 1: Do nothing**

This option would involve not adjusting the utility services near the construction works.

##### **Option 2: Utility works**

This option involves public utility adjustments located within or adjacent to the road corridor to ensure the ongoing service of the utility and to avoid conflict with the road upgrade.

#### **Other Works**

##### **Option 1: Do nothing**

This option would involve not undertaking the other works in relation to the proposed road upgrade.

##### **Option 2: Other works**

This option involves completing necessary supplementary works to support construction activities of road upgrade.

### **2.3.3 Analysis of options**

#### **Utility Works**

Adjustments to the public utility infrastructure near the construction footprint was selected as the preferred option. The adjustments would ensure the ongoing operation of critical public utility infrastructure to residents and businesses in the area.

To do nothing and not adjust the utility services may result in damage to that infrastructure which may become unusable.

#### **Other Works**

Undertaking supplementary works to support construction activities of road upgrade was selected as the preferred option. These works would ensure the ultimate functional use of the road once upgraded and would allow of safe use of the surrounding roads for road users and pedestrians.

To do nothing would result in an unsafe road environment, as well as limiting or providing no vehicle access to new developments and properties. Impacts to drainage networks and water flow would also be expected if the do nothing option was preferred.

## **2.4 Preferred option**

Assessment of the options determined the following preferred options:

- Public utility adjustments located within or adjacent to the road corridor to ensure the ongoing service of the utility and to avoid conflict with the road upgrade.
- Completing necessary supplementary works to support construction activities of road upgrade including additional site access, line marking including asphalt re-sheeting, local road access, road widening, driveway connections to new developments, and drainage connections

## 3 Description of the Proposed Modification

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### 3.1 The proposed modification

Transport for NSW proposes to modify the Memorial Avenue Upgrade project to include additional works resulting from refinements to the approved design. The proposed modification is shown in Figure 1-2. Refer to **Figure 3-1** in Appendix A which shows the key features of the proposed modification in further detail.

Key features of the proposed modification would include:

- Utility works involving earthworks and trenching within Sydney Water land and along:
  - Old Windsor Road
  - Thomas Boulton Circuit
  - Rutherford Avenue
  - Arnold Avenue
  - Memorial Avenue
  - Windsor Road
- Line marking works including asphalt re-sheeting along Windsor Road, Old Windsor Road, Arnold Avenue and Severn Vale Drive
- Additional haulage routes during construction potentially using local roads which may lead to minor pavement works
- Additional ancillary site access
- Additional access to various locations throughout the construction site
- Road widening along Windsor Road for turn lanes
- Driveway connections to new housing development which were not developed at the time the Project REF was determined
- Property adjustment works along Memorial Ave between Old Windsor Road and Windsor Road, including stormwater drainage installation and connections outside the road reserve at 27 Memorial Avenue, 40 Memorial Avenue and 43 Memorial Avenue.

### 3.2 Design

#### 3.2.1 Design criteria

The key design criteria to enhance this project include:

- Improve road safety in line with the NSW Road Safety Strategy 2012–2021 'Safe System Directions' and 'Safer Road' key focus
- Improve liveability and sustainability, support economic growth and productivity by providing road capacity for projected traffic volumes
- Improve travel times through the road network
- Improve access to adjacent developments
- Improve level of service at intersections and allow for movement of larger service vehicles.
- Provide facilities for walking and cycling and future public transport needs
- Improve urban design and visual quality
- Improve the drainage system and make provision for flood management on the road network.

#### 3.2.2 Engineering constraints

The relevant design standards and design criteria are outlined in the Project REF and the Addendum REF (2019).

Details relating to design standards and engineering constraints are outlined in the Final Design Report rev 0.8 dated 23 March 2020.

### **3.2.3 Main features of the modification**

#### **Utility Works**

Utility reconstruction throughout the study area along Old Windsor Road, Thomas Boulton Circuit, Rutherford Avenue, Bruhn Circuit, Arnold Avenue, Severn Vale Drive, Andrews Grove, and Windsor Road for electrical and water utility works. There are also electrical and ITS utility works occurring along Old Windsor Road with gas and communications works occurring just north of the Memorial Avenue and Old Windsor Road intersection. This work would involve earthworks for trench construction and backfill.

#### **Site Access**

Additional access points to ancillary facilities to be used for site offices, stockpiling and storage of materials required for construction. The use of these sites is now better understood as a more detailed construction program has been developed.

#### **Line-Marking**

At several minor road intersections, line marking changes would require re-sheeting of the surface asphalt to ensure old markings are removed and new markings are clear for all drivers. This may require additional works out of hours to provide for traffic management.

#### **Local Road Access**

Access along local roads for construction traffic has been included in this addendum. While this would be limited access it is necessary as some of the construction is close to the road boundary and needs to be interfaced with council's roads.

#### **Road Widening**

The left turn lane from Windsor Road has been extended and widened to provide for improved traffic flow at the intersection. This work would require widening into the existing road reserve and modification of the footpath alignment.

#### **Driveway Connections**

Since the Project REF was determined several residential developments have been completed adjacent to Memorial Ave. These developments have changed access locations for driveways that would require minor modifications to Memorial Ave to facilitate access.

#### **Drainage**

Extension of drainage outside road boundary to connect through a proposed development at 27 Memorial Ave. The road drainage previously discharged to an open channel. To co-ordinate with a proposed downstream residential development an extension of the pipe drainage from the road is included in the project.

#### **Property Adjustments**

Property adjustments are included at locations along Memorial Avenue between Old Windsor Road and Windsor Road, including stormwater drainage installation and connections outside the road reserve at 27 Memorial Avenue, 40 Memorial Avenue and 43 Memorial Avenue. These adjustments would include landscaping and fencing works which were agreed upon with landowners during property consultations. Property adjustments may also extend beyond the current REF boundary and have been considered as part of this Assessment. Such extensions may apply to the following properties:

7 Arnold Avenue

4 to 28 Windsor Road

27, 40, 41, 43 Memorial Avenue

1 McCausland Place



### **3.3 Construction activities**

#### **3.3.1 Work methodology**

The work methodology described in Section 3.4.1 of the Project REF is applicable to the modifications detailed in this Addendum REF. Construction activities would be guided by a Construction Environmental Management Plan (CEMP) to facilitate work being carried out within the specified work area and to incorporate all safeguards and management measures contained in this Addendum REF.

#### **3.3.2 Construction hours and duration**

The proposed daily hours and duration of all construction activities and the use of ancillary facilities would be aligned with those prescribed within Section 3.4.2 of the Project REF and Section 3.3.2 of the Addendum REF, which are:

- Monday to Friday 7am to 6pm
- Saturday 8am to 1pm
- Sunday and Public Holidays, no work.

Work outside these standard work hours would occasionally be necessary for construction activities including but not limited to utility adjustment and tie-in works. This is in order to avoid major delays to commuter traffic and to maintain the safety of the workforce. Night work (between 8pm to 7am) may be required.

#### **3.3.3 Plant and equipment**

Plant and equipment would be as per section 3.4.3 of the Project REF.

#### **3.3.4 Earthworks**

Estimated earthwork volumes are generally consistent with those detailed in Section 3.4.4 of the Project REF and Section 3.3.4 of the Addendum REF.

#### **3.3.5 Source and quantity of materials**

Source and quantity of materials would be generally consistent with volumes estimated within Section 3.4.5 of the Project REF.

#### **3.3.6 Traffic management and access**

Traffic and access management will be carried out in accordance with Section 3.4.6 of the Project REF and Section 3.3.6 of the Addendum REF. Traffic and access management will also be carried out for the additional access proposed as part of this modification under the same conditions and safeguards as determined in the Project REF and Addendum REF.

### **3.4 Ancillary facilities**

All ancillary facilities that form a part of the project work and footprint have been covered in the Project REF and the Addendum REF. No additional ancillary facilities have been identified in this Update to Addendum REF.

### **3.5 Public utility adjustment**

Public utility adjustments would largely be similar to those already noted in the Project REF and Addendum REF. There would be minor additional public utility works impacting properties along Old Windsor Road, Thomas Boulton Circuit, Rutherford Avenue, Bruhn Circuit, Arnold Avenue,

Severn Vale Drive, Andrews Grove, and Windsor Road, lying to the north of the Memorial Avenue intersection. The public utility adjustments within these properties would involve rerouting of the current Sydney Water mains into the properties. The new water supply mains would enter the properties from Andrews Grove. Minor earthworks including trenching and excavation works would be required to complete the public utility adjustment, however, impacts to properties and residents would be minimal.

### **3.6 Property acquisition**

Properties to be acquired for the Memorial Avenue Upgrade have been identified and listed in the Section 3.7 of the Project REF and Section 3.5 of the Addendum REF (2019). Additional partial property acquisition as part of this Addendum REF would be required at 6 Windsor Road to allow manoeuvring area around the adjacent bus stop for DDA compliance.

Consultation with the owner of 6 Windsor Road has been undertaken and an agreement reached regarding land acquisition to enable the shared path to be widened to 3.0m at this location.

## 4 Statutory and planning framework

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Chapter 4 of the Project REF and Chapter 4 of the Addendum REF (2019) provided the statutory and planning framework for the Memorial Avenue Upgrade and considered provisions of the relevant State Environmental Planning Policies (SEPPs), Local Environmental Plans (LEPs) and other NSW legislation. A review of the relevant legislation assessed in the Project REF and Addendum REF (2019) has been undertaken in consideration of the proposed modification.

### 4.1 Environmental Planning and Assessment Act 1979

#### 4.1.1 State Environmental Planning Policies

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

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and road infrastructure facilities and is to be carried out by Transport for NSW and/or on behalf of Transport for NSW, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under State Environmental Planning Policy (Coastal Management) 2018, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

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

Consultation, including consultation as required by ISEPP (where applicable), is discussed in chapter 5 of this Addendum REF.

##### Sydney Regional Environmental Plan No 19 – Rouse Hill Development Area

Sydney Regional Environmental Plan No 19 – Rouse Hill Development Area (SREP 19) generally aims to accommodate part of the long-term growth of the Sydney Region by providing a mechanism for identifying land suitable for urban purposes and by providing for the orderly and economic development of that land suitable for urban purposes, and by providing for the orderly and economic development of that land.

The proposal area falls within the Balmoral Road Release Area and would improve network efficiencies at this location. The Hills Local Environmental Plan 2012 provides local environmental planning provisions for land in the Balmoral Road Release Area to guide orderly and sustainable development. Section 4.1.2 of this Addendum REF describes the relevance of The Hills Local Environmental Plan 2012 to the project. The outcomes for the proposed modifications under this Addendum REF are consistent with the Addendum REF (2019) and the Project REF.

##### Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River

Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River (SREP 20) aims to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context. Clause 4(1)(b) states that a public authority proposing to carry out development which does not require development consent must consider:

- The general planning considerations set out in Clause 5
- Specific planning policies and recommended strategies set out in Clause 6.

The matters outlined in Clause 5 and Clause 6 of the SREP 20 have been considered in the Project REF and the outcomes for the proposed modifications are consistent.

#### 4.1.2 Local Environmental Plans

As outlined in Section 4.1.1, ISEPP removes the requirement for development consent from councils. The upgrade is to be assessed under Division 5.1 of the EP&A Act. Nevertheless, an evaluation is provided below of the proposed modification in relation to the objectives of land use zones within which it is located. The implications of zoning on modifications proposed in this Addendum REF remain consistent with those outlined in section 4.1.2 of the Addendum REF (2019).

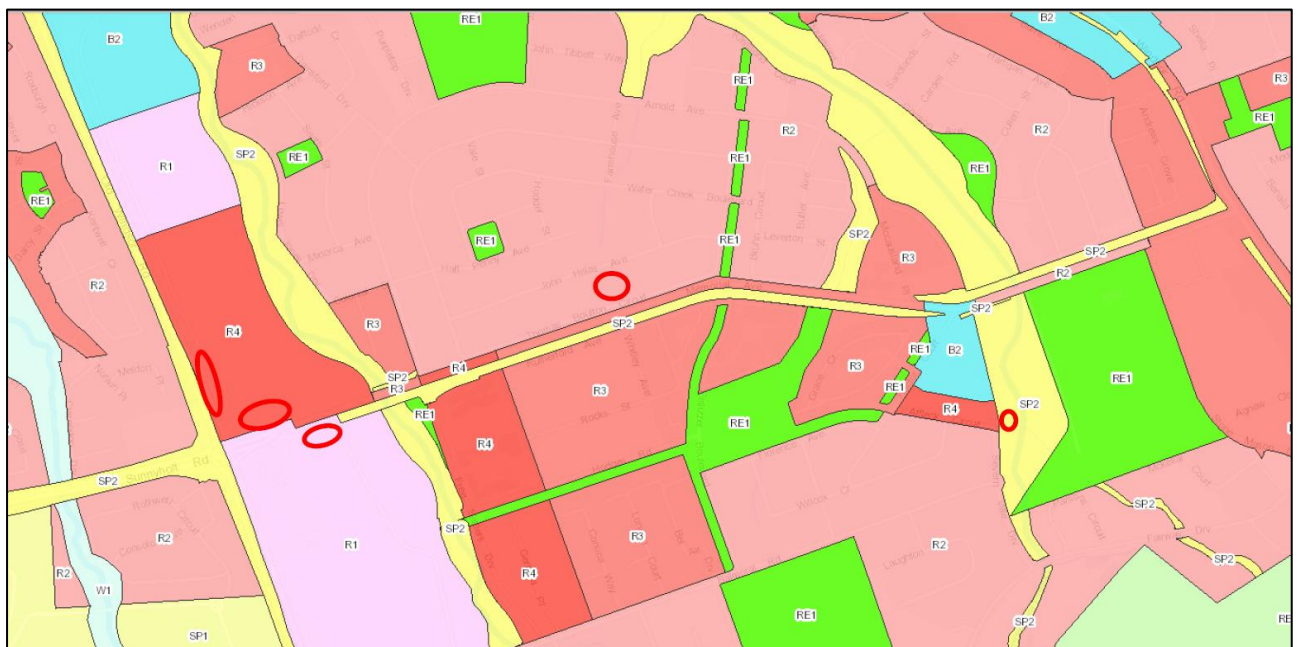
##### The Hills Local Environmental Plan 2019

The proposed modifications, excluding those that are proposed in road reserves, are proposed on land zoned under The Hills Local Environmental Plan 2019 as follows:

- Lot 141, DP1121172 – R4 High Density Residential
- Lot 1, DP1244606 – R2 Low Density Residential
- Lot 20, DP844963 – R4 High Density Residential
- Lot 112, DP1250875 – R1 General Residential
- Lot 1, DP1124315 – SP2 Infrastructure (Stormwater Management System)

The land zoning within and surrounding the proposal area is presented in **Figure 4-1** below. **Table 4-1** outlines the current zoning objectives for each of the impacted zones and the consistency of the proposal against these objectives.

**Figure 4-1:** Existing land use zones covering the impacted sites of the proposed modifications (circled in red).



**Table 4-1** – Consistency of the proposed modifications with zoning objectives in The Hills Local Environmental Plan 2019

Zone	Objectives	Consistency of proposal with objectives and permissibility
R1 (General Residential)	<p>To provide for the housing needs of the community.</p> <p>To provide for a variety of housing types and densities.</p> <p>To enable other land uses that provide facilities or services to meet the day to day needs of residents.</p> <p>To enable other land uses that support the adjoining or nearby commercial centres and protect the amenity of the adjoining or nearby residential areas.</p>	<p>Council consent is not required in accordance with Clause 94 of ISEPP.</p> <p>Although the proposed modification does not meet any of these objectives, the temporary use of this land represents a best-case scenario in terms of the potential impact on the local community.</p>
R2 (Low Density Residential)	<p>To provide for the housing needs of the community within a low-density residential environment.</p> <p>To enable other land uses that provide facilities or services to meet the day to day needs of residents.</p> <p>To maintain the existing low-density residential character of the area.</p>	<p>Council consent is not required in accordance with Clause 94 of ISEPP.</p> <p>Although the proposed modification does not meet any of these objectives, the temporary use of this land represents a best-case scenario in terms of the potential impact on the local community.</p>
R3 (Medium Density Residential)	<p>To provide for the housing needs of the community within a medium density residential environment.</p> <p>To provide a variety of housing types within a medium density residential environment.</p> <p>To enable other land uses that provide facilities or services to meet the day to day needs of residents.</p> <p>To encourage medium density residential development in locations that are close to population centres and public transport routes.</p>	<p>Council consent is not required in accordance with Clause 94 of ISEPP.</p> <p>Although the proposed modification does not meet any of these objectives, the temporary use of this land represents a best-case scenario in terms of the potential impact on the local community.</p>
<b>R4 (High Density Residential)</b>	<p>To provide for the housing needs of the community within a high-density residential environment.</p> <p>To provide a variety of housing types within a high-density residential environment.</p>	<p>Council consent is not required in accordance with Clause 94 of ISEPP.</p> <p>Although the proposed modification does not meet any of</p>

	<p>To enable other land uses that provide facilities or services to meet the day to day needs of residents.</p> <p>To encourage high density residential development in locations that are close to population centres and public transport routes.</p>	<p>these objectives, the temporary use of this land represents a best-case scenario in terms of the potential impact on the local community.</p>
SP2 (Infrastructure)	<p>To provide for infrastructure and related uses.</p> <p>To prevent development that is not compatible with or that may detract from the provision of infrastructure.</p>	<p>Council consent is not required in accordance with Clause 94 of ISEPP. The proposed modification is consistent with both of these objectives.</p>

## 4.2 Other relevant NSW legislation

### 4.2.1 Protection of the Environment Operations Act 1997

Both the Project REF and Addendum REF (2019) identified the requirement under the *Protection of the Environment Operations Act 1997* (POEO) for an Environmental Protection Licence (EPL) to undertake work, based on the estimate that the project incorporated additional traffic lanes exceeding 3 kilometres in length, pursuant to clause 35(b)(ii). However, a consistency review undertaken in 2019 identified that the total distance of new traffic lanes constructed as part of the Memorial Avenue Upgrade and classified as a “Main Road” for the purposes of clause 35(b)(ii), does not exceed 3 kilometres in length as originally estimated in the Project REF and Addendum REF (2019). The total length of new traffic lanes constructed is 2,970 metres for the purposes of clause 35(b)(ii). As this is less than 3 kilometres, an EPL is not required.

The construction length assessment as a result of the latest modification assessed in this Addendum REF has determined that the road length has not increased for the purpose of clause 35(b)(ii) of the POEO Act and therefore the requirement for an EPL is not triggered.

### 4.2.2 Fisheries Management Act 1994

The *Fisheries Management Act 1994* provides for the identification, conservation and recovery of threatened fish, aquatic invertebrates and marine vegetation. The Act also covers the identification and management of key threatening processes affecting threatened species or causing other species to become threatened. Section 220 of the *Fisheries Management Act 1994* requires the Minister to issue a permit for causing a barrier to fish passage.

The proposed modification in this Addendum REF do not alter the passage of fish. The statement within the Project REF remains applicable in that fish passage will be maintained, specifically with the removal of the culverts at Strangers Creek and replacement of culverts at the other waterways during construction. Should it be determined that this is not feasible appropriate permits would be sought.

### 4.2.3 Heritage Act 1977

The *Heritage Act 1977* protects items of environmental heritage (natural and cultural) in NSW. State significant items listed on the NSW State Heritage Register (SHR) are protected under the *Heritage Act 1977* against any activities that may damage an item or affect its heritage significance.

The *Heritage Act 1977* also protects ‘relics’, which can include archaeological material, features and deposits.

A search of the Transport for NSW Section 170 register does not return any results for items located within the Addendum REF project boundary. No further requirements are necessary under this Act.

#### **4.2.4 National Parks and Wildlife Act 1974**

The *National Parks and Wildlife Act 1974* is administered by the National Parks and Wildlife Service. It provides statutory protection for all Aboriginal 'objects' (Section 90) and 'places' (Section 84).

The proposed modifications would not impact any known Aboriginal sites. Transport for NSW will not need to obtain an Aboriginal Heritage Impact Permit (AHIP).

#### **4.2.5 Biodiversity Conservation Act 2016**

The *Biodiversity Conservation Act 2016* (BC Act) protects threatened species, populations and ecological communities and their habitats in NSW. Part 7 of the BC Act requires preparation of a Test of Significance (ToS) for assessment of impacts to threatened species, populations or ecological communities. Where a significant impact is likely to occur a species impact assessment (SIS) must be prepared.

Three threatened ecological communities (TECs) listed under the BC Act were identified within the proposal area by the Addendum REF, namely:

- River-Flat Eucalypt Forest
- Cumberland Plain Woodland
- Swamp Oak Floodplain Forest

The proposed modification increases the REF boundary in several locations and would result in minor additional clearing of native vegetation and minor additional disturbance to waterways. No additional threatened flora or fauna species or high-quality habitat were identified as impacted by the proposed clearing, beyond those considered in the Project REF and the Addendum REF (2019).

As none of the three TECs nor any threatened species under the BC Act are considered likely to be significantly impacted by the proposed works, an SIS is not required.

### **4.3 Commonwealth legislation**

#### **4.3.1 Environment Protection and Biodiversity Conservation Act 1999**

Under the *EPBC Act* a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Appendix A and chapter 6 of this Addendum REF.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the *EPBC Act* by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of chapter 6 of this Addendum REF and Appendix A.

#### **Findings – matters of national environmental significance (other than biodiversity matters)**

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A

referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

#### **4.4 Confirmation of statutory position**

The proposed modification is categorised as development for the purpose of *road and/or road infrastructure facilities* and is being carried out by or on behalf of a public authority. Under clause 94 of ISEPP the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the *EP&A Act*. Consent from Council is not required.



## 5 Consultation

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### 5.1 Consultation strategy

A comprehensive consultation strategy was implemented as part of the Project REF. It is deemed unnecessary to repeat for this Addendum REF the original extensive stakeholder and community consultation strategy implemented, since additional impacts are considered minimal compared to the original proposal. During the initial project consultation period there were no submissions received opposing the proposal.

The Project REF was publicly displayed between 17 November 2014 and 12 December 2014 at The Hills Shire Council and Castle Hill Library. The documents were also available on the Roads and Maritime website. In addition to this, two community information sessions were held at the Wrights Road Community Centre and Sherwood Ridge Public School during this public display period. Submissions were accepted until the 30 January 2015.

Forty-four (44) submissions were received in response to the exhibition of the original environmental assessment, identifying the following topics for consideration:

- Safety
- Local traffic access
- Bus facilities
- Noise impacts on local residents
- Increased traffic.

Following the display period, a Submissions Report (April 2015) was prepared to document the issues raised, outline the Roads and Maritime response to those issues and to provide a revised list of safeguards and mitigation measures. Mitigation and management strategies were proposed against each of these issues, as well as other possible environmental impacts identified in the Project REF.

### 5.2 Consultation outcomes

#### 5.2.1 Council Consultation

Ongoing consultation with The Hills Shire Council has continued during detailed design including the proposed modifications pursuant to this Addendum REF. Council did not raise any issues.

#### 5.2.2 Community Consultation

Consultation with the developer of 27 Memorial Avenue has been undertaken in relation to the drainage interactions and connections. They have been informed of the proposed works with no immediate issues raised.

#### 5.2.3 Stakeholder Consultation

Land within the project boundary, directly adjacent to existing waterways, is owned by Sydney Water. Due to the proposed expansion of the project boundary it would be necessary that some of this land is partially acquired or leased to facilitate the construction of the Memorial Avenue Upgrade. Consultation with Sydney Water has continued, to date, throughout detailed design.

The impacts of the proposed modification pursuant to this Addendum REF on watercourse have been addressed against the original flood study with no additional impacts.

Therefore, there are no permanent adverse impacts, or changes impacting Sydney Water land, and as a result, no further consultation has been undertaken.

#### **5.2.4 ISEPP Consultation**

Consultation requirements under Clauses 13-16 of the *State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)* have been considered and it has been determined that no additional consultation to that already undertaken as part of the original REF or previous Addendum REF, is required.

#### **5.3 Ongoing or future consultation**

No ongoing or future consultation has been currently identified.

## 6 Environmental assessment

This section of the Addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the Memorial Avenue Upgrade. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of the factors specified in the guidelines *Roads and Related Facilities EIS Guideline* (DUAP, 1996) and *Is an EIS required?* (DUAP, 1999) as required under clause 228(1) of the *Environmental Planning and Assessment Regulation 2000*. The factors specified in clause 228(2) of the *Environmental Planning and Assessment Regulation 2000* are also considered in the Project REF.

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

### 6.1 Issue Identification

The project inclusive of the proposed change as covered by this Addendum REF is generally consistent with that considered in the Project REF and subsequent Submissions Report and the Addendum REF (2019). The proposed change has been reviewed in the context of the receiving environment to identify any new issues for assessment. The review is documented below in Table 6-1. The aspects reviewed in general correspond with those presented in Chapter 6 of the project REF and subsequent Submissions Report and the Addendum REF.

Table 6-1 – Aspect / Impact Summary

Aspect / Impact	Further Assessment?	Comment
<b>Noise and vibration</b>	No	Extensive noise monitoring and assessment has been undertaken as part of the Project REF process and to support the Addendum REF. Previously completed Noise and Vibration Assessments for the project footprint are envisaged to adequately cover the impacts from additional works proposed in this Addendum REF including pavement works and haulage on local streets.
<b>Landform, geology and soils</b>	No	Existing sub-surface conditions are expected to be similar to those described in the Project REF. Impacts would be similar to those described in the Project REF.
<b>Hydrology and water quality</b>	No	Impacts are envisaged to be similar to the Project REF and Addendum REF (2019). Additional works within the surrounding creeks or surface waterways are proposed as part of this Addendum REF. These works are temporary and include construction of temporary sediment basins for water quality control during construction therefore additional impact assessment is not deemed necessary.
<b>Biodiversity</b>	Yes	An Addendum biodiversity assessment has been prepared to assess any additional impacts.
<b>Non-Aboriginal Heritage</b>	No	A previous desktop search of the Transport for NSW Section 170 register conducted for the Project and Addendum REF (2019) studies did not return any results for items located within the proposal area. As

		work is occurring on heavily disturbed sites or within road corridors, no further non-Aboriginal heritage investigation is required.
<b>Aboriginal Heritage</b>	No	The initial study area covered the extent of the proposed works and resulting extensions to the REF boundary. Therefore, it is considered that the initial ground-truthing, completed as part of the Project REF, and an extensive AHIMS search, is sufficient to understand potential impacts for this proposed modification.
<b>Traffic and access</b>	No	Impacts to traffic and access are envisaged to be adequately covered by the Project REF and Addendum REF (2019). The safeguards and mitigation measures detailed in the Project REF, including the construction traffic management plan will apply to the additional areas included in this Addendum REF. This access will be temporary and will utilise existing local roads. The impact on local roads will be managed through the contractor's traffic management plans. This is consistent with previous agreed plans for the work.
<b>Visual amenity and urban design</b>	No	The impacts are consistent with the Project REF. The safeguards and mitigation measures detailed in the Project REF are sufficient and will be applied to address visual amenity.
<b>Socio-economic and Property</b>	Yes	Impacts would be largely similar to those described in the Project REF.  However, to consider the impacts on property owners from utility adjustment works, a socio-economic impact assessment note has been included in this Addendum REF.
<b>Air Quality</b>	No	Impacts would be similar to those described in the Project REF.
<b>Climate change and greenhouse gases</b>	No	Impacts would be similar to those described in the Project REF.
<b>Waste management</b>	No	Impacts would be similar to those described in the Project REF.
<b>Resource use</b>	No	Impacts would be similar to those described in the Project REF.
<b>Hazards and risks</b>	No	Impacts would be similar to those described in the Project REF.
<b>Cumulative impacts</b>	Yes	Any changes to cumulative impacts due to additional works have been considered, however it is envisaged that the cumulative impacts would largely be the same

		as those described in the Project REF and Addendum REF (2019).
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## 6.2 Biodiversity

Biosis were engaged to assess the potential impacts of proposed modifications that were not assessed as part of the Project REF and Addendum REF (2019). An Addendum REF Biodiversity Assessment dated 29 November 2016 was prepared by Biosis and was further updated in April 2019. This Addendum REF Biodiversity Assessment (January 2021) is provided as Appendix A and the findings summarised below.

### 6.2.1 Existing environment

The current assessment for this Addendum REF has updated the findings of the Project REF (2014) the Addendum REF (2019) and the findings of the field investigation undertaken for the 2019 Addendum REF. This accounts for changes in the existing environment since the original 2014 assessment and includes a broader study area (outside the area to be directly impacted) in places to ensure the assessment of biodiversity values is accurate and in accordance with the *BC Act*, *FM Act* and *EPBC Act*. The revised proposal boundary is shown in Error! Reference source not found..

### 6.2.2 Potential impacts

The potential impacts associated with the construction and operation of the Memorial Avenue Upgrade have been assessed and no additional threatened flora or fauna species or high quality habitat were identified within the study area, other than those considered in the Addendum REF (2019). Areas of additional vegetation clearance, stormwater connections and additional weed species are identified below:

#### 6.2.2.1 Construction Impacts

##### Removal of native vegetation

Additional areas of vegetation are required to be removed due to the increase of the REF boundary; these have been assessed as detailed below. Tests of Significance (ToS) under the BC Act were prepared by Biosis to assess the level of impact to state listed River-flat Eucalypt Forest, Cumberland Plain Woodland, and Swamp Oak Riparian Forest. A Significant Impact Criteria (SIC) assessment under the EPBC Act was also prepared for the impacts on the River-flat Eucalypt Forest.

The assessments for River-flat Eucalypt Forest and Swamp Oak Riparian Forest concluded that a significant impact was unlikely due to the majority of the local occurrence of the Threatened Ecological Community not being directly or indirectly impacted by the proposal. The SIC assessment for River-flat Eucalypt also concluded that a great majority of the connected patch of vegetation would not be directly or indirectly impacted by the proposed works. The assessment for Cumberland Plain Woodland concluded that a significant impact was unlikely to occur as the proposal would avoid impacts to the largest part of the Threatened Ecological Community within the study area.

**Figure 6-2** demonstrates the Threatened Ecological Communities (TEC) within the project area and **Table 6-2** provides a summary of impacts on the TEC.

Figure 6-1: Study Area



**Figure 6-2: Threatened Ecological Communities Map**



**Table 6-2:** Summary of Impacts on TECs

Threatened Ecological Community (TEC) Impacted	Plant Community Type	Nature of Impact of Proposed Modifications	Extent of Impact	Duration of Impact
River-flat Eucalypt Forest ( <i>EPBC Act</i> )	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin	Direct loss of 0.59ha	Local	Long term
Cumberland Plain Woodland ( <i>BC Act</i> )	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin	Direct loss of 0.22ha	Local	Long term
Swamp Oak Riparian Forest ( <i>BC Act</i> )	Cumberland Swamp Oak Riparian Forest	Direct loss of 0.25ha	Local	Long term
River-flat Eucalypt Forest ( <i>BC Act</i> )	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin	Direct loss of 0.59ha	Local	Long term

### Removal of threatened fauna habitat

Threatened fauna habitat to be removed in the proposal area comprises low to moderate quality forage habitat for highlight mobile species. The Project REF found that impacts to threatened fauna species would not be significant.

As potential impacts associated with the proposed modifications are of a similar scale to 2014, and the condition of the habitats has remained consistent since that assessment, the conclusions made in the Project REF are supported and no additional impact assessment is considered necessary.

### Removal of threatened flora

The potential impacts to threatened flora are considered to be negligible. No threatened flora species have been identified in the modified proposal area. Potential habitat was found to be of low quality for species considered to have some potential to occur.



## Aquatic impacts

In addition to the aquatic impacts identified in the Project REF, three additional storm water connections from Memorial Avenue are proposed with the potential impacts considered to be both short and long term in nature.

Short term impacts are considered likely to affect Strangers Creek, with localised increases in turbidity, displacement of habitat and noise/vibration associated with civil works. The highly disturbed nature of the Strangers Creek and the prevalence of noxious species indicates these short-term impacts are unlikely to have any residual effects on the existing aquatic ecological community. Long term impacts to Strangers Creek and its tributary are associated with alterations to the existing hydrological and hydraulic characteristics of these waterways. Increased stream flow as a result of stormwater influence would result in the higher flow velocities and volumes during rainfall events

Adherence to the *Sydney Water Guide for Stormwater* is recommended which will require revegetation and design considerations which are considered likely to result in local improvements in the value of these aquatic habitats and also in the resilience of these aquatic communities.

### 6.2.2.2 Operational Impacts

#### Injury and mortality of fauna

The potential for this impact to occur is considered to be low as there was no substantial fauna habitat that was identified during surveys. However, smaller fauna species including reptiles and frogs could potentially be injured during the clearance of vegetation due to their reduced capacity to avoid machinery and plant.

#### Wildlife connectivity and habitat fragmentation

The study area occurs within a highly disturbed and modified urban environment with some remnant isolated patches of native vegetation. However, it is not considered likely that the proposal would result in a further reduction in the connectivity of fauna habitats throughout the landscape.

#### Invasion and spread of weeds

Within the study area there were four Weeds of National Significance (WoNS) the study area and include:

- Blackberry *Rubus fruticosus* sp. aggregate
- Bridal Creeper *Asparagus asparagoides*
- Ground Asparagus *aethiopicus*
- Willows *Salix* sp.

A further five priority weed species within Sydney Metropolitan Local Land Services Area and Hills Shire LGA (DPI 2019) were recorded within the study area and include:

- African Olive *Olea europaea* subsp. *cuspidata*
- Fireweed *Senecio madagascariensis*
- Giant Reed *Arundo donax*
- Green *Cestrum parquii*
- Prickly Pear – common pear *Opuntia stricta*
- Scotch Broom *Cytisus scoparius* subsp. *scoparius*.

The weeds were mainly found dispersed along the roadside corridor, remnant vegetation and others areas not managed via regular slashing. Management requirements for each of these

species varies and the construction contractor is responsible for undertaking works in a manner that will not enable priority weeds to spread from the work area. Recommendations for dealing with these weeds are provided in Section 6.2.3

### **6.2.2.3 Conclusion on significance of impacts**

The modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the *BC Act* or *FM Act* and therefore a Species Impact Statement is not required.

The modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the *EPBC Act*.

### **6.2.3 Safeguards and management measures**

This Addendum REF Biodiversity Assessment has concluded that there are requirements for clearing vegetation, and likely trimming of shrubs and minor clearing of native ground cover species. However, there are no additional safeguards and management measures for biodiversity that are considered to be required, beyond those identified in the Project REF and Addendum REF (2019).

### **6.2.4 Biodiversity offsets**

The Project has been assessed as unlikely to result in a significant impact to threatened species or ecological communities listed under the *BC Act* or *EPBC Act*. However, as outlined in Table 1 of Guidelines for Biodiversity Offsets (Roads and Maritime 2016), biodiversity impacts assessed by a REF are required to consider offsets where there is any clearing of a Critically Endangered Ecological Community (CEEC) in moderate to good condition.

Cumberland Plain Woodland – *BC Act* and River-flat Eucalypt Forest – *EPBC Act* are both present within the study area in condition states that meet the FBA definition for vegetation in moderate to good condition, and therefore offsets are to be considered. Impacts as a result if the project include:

- 0.22 hectares of impact to Cumberland Plain Woodland – *BC Act*
- 0.59 hectares of impact to River-flat Eucalypt Forest – *EPBC Act*

It should be noted that there is no overlap in these two areas.

## **6.3 Socio-economic and Property Impacts**

The socio-economic impacts of the proposed modifications would be similar to those described in the Project REF. Minor impacts would occur to residents where additional property adjustments works have been proposed along Memorial Avenue. Access to the Kellyville Memorial Park for patrons would not be affected by the proposed modification. During construction and operation, the proposal would have the following impacts on the local community and socio-economic profile of the area:

- Impact on property and land use, including acquisition
- Impact on traffic and safety
- Impact on amenity, including noise and vibration, and landscape and visual quality.

### **6.3.1 Property Acquisition**

Additional partial property acquisition as part of this Addendum REF would be required at 6 Windsor Road (Lot 404 on DP 1240786) to allow for a wider shared path around the adjacent bus stop for DDA compliance.

Property adjustments could have the following socio-economic impact on affected landholders:

- Some residents whose properties fall within the proposal area may experience an impact on health and wellbeing associated with the uncertainty of knowing how their property would be affected, and the timeframes over which the impact would occur. TfNSW would minimise uncertainty by ongoing consultation with potentially affected landowners and by providing information on the process of acquisition.

### **6.3.2 Property Adjustments**

Property adjustments could have the following socio-economic impact on affected landholders:

- This may include use of a temporary access road to provide access to a number of properties on Memorial Avenue and Windsor Road during construction. These adjustments would take place before or during roadwork. On sites where property adjustments have been identified in this Addendum REF, landscaping and fencing works have been agreed upon with landowners during property consultations.

### **6.3.3 Utility Adjustments**

Utility adjustments could have the following socio-economic impact on affected users:

- The relocation of utilities may temporarily disrupt services such as power, water, sewer, gas and telecommunications, which may impact properties within and around the proposal area. This impact would be minimal as the disruptions would be short-term and all property owners would be notified in advance of the disruption.

### **6.3.4 Traffic and Transport**

The following potential socio-economic impacts have been identified:

- Vehicle Access: As the Addendum REF boundary has increased to allow for utility works, additional areas on local roads and along on Memorial Avenue are impacted. However, access to all local roads and properties within the proposal area would be maintained wherever possible, though road users may experience some minor traffic delays, access restrictions, or increased travel times.
- Pedestrian Access: Existing cyclist and pedestrian facilities along impacted local roads would be maintained, though there may be slight detours or alterations to ensure safety.

### **6.3.5 Amenity**

During construction, there would be a temporary increase in traffic, noise and dust. The minor additional clearance of vegetation and utility works including earthworks would impacts on the visual amenity of the area. There may also be service disruptions associated with the relocation of utilities such as overhead electrical wires and underground gas mains.

Construction may also involve some night work, which would adversely affect nearby properties in terms of noise and light spill. These reductions in amenity could temporarily affect sensitive receivers close to the proposal area, including Kellyville Chiropractic, The Hills Clinic, Gracelands Early Education Childcare Centre, Baptist Community Services Retirement Facility, and adjacent residences. Some people may also experience anxiety associated with disruption to daily activities.

### **6.3.6 Safeguards and management measures**

The safeguards and management measures for socio-economic impacts provided in the Project REF and Addendum (2019) are appropriate to the proposed modification, therefore no additional measures are required.

## **6.4 Cumulative impacts**

The interaction of individual elements of the proposal and the impact of the proposal being delivered concurrently with other projects in the region may result in cumulative impact on the surrounding environment.

### **6.4.1 Potential impacts**

The project forms part of a series of planned road upgrades and under-construction upgrades in Sydney's north-west. The concurrent development of the proposal may result in adverse cumulative impact associated with:

- Traffic delays and access
- Construction noise & vibration
- Visual amenity
- Biodiversity

#### **Traffic Delays and Access**

The construction of the proposed new bus bays, and the tie-in works may also give rise to cumulative traffic delays with the road widening project due to additional works and time required.

#### **Construction Noise, Vibration and Visual Amenity**

Changes to cumulative impacts of construction noise, vibration and amenity have been considered, however it is envisaged that the cumulative impacts would largely be the same as those listed in the Project REF and Addendum REF. The previously completed Noise and Vibration Assessments for the project area should sufficiently cover the impacts of the additional works proposed in this Addendum REF.

#### **Biodiversity**

In terms of the potential cumulative impacts, this Addendum REF Biodiversity Assessment has concluded that the potential impacts to threatened fauna habitat associated with the proposed modifications are of a similar scale to the Project REF. The condition of the habitats has remained consistent since that assessment such that no additional impact assessment is considered necessary.

The potential for cumulative impacts on biodiversity within the project area are considered to be negligible. It has been identified that no additional threatened flora or fauna species or high-quality habitat were identified within the modified proposal area, other than those considered in the Project REF.

While some addition vegetation would be removed, this is not anticipated to result in significant cumulative impacts over and above those associated with the Project REF.

#### **6.4.2 Safeguards and management measures**

Several measures can be considered to manage the potential cumulative impacts. These are outlined in *Table 6-50: Safeguards and management measures for cumulative impact* of the project REF and would remain constant after considering the proposed modification outlined in this Addendum REF. Once the road upgrades, tie-in works, and new bus bays are operational, there would be a positive cumulative impact on road safety and travel times.

## **7 Environmental management**

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### **7.1 Environmental Management Plans**

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Project Environmental Management Plan (PEMP) and Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

## 7.2 Summary of safeguards and management measures

Environmental safeguards and management measures for the Memorial Avenue Upgrade are summarised in Table 7-1. The safeguards and management measures will be incorporated into the detailed design phase of the proposed modification, the CEMP and the PEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
<b>GEN1</b>	Early works noise & vibration	<ul style="list-style-type: none"> <li>The Transport for NSW Construction Noise and Vibration Guideline (April 2016) 'standard mitigation measures' will be adopted for all proposed construction works.</li> <li>Work activities and heavy vehicle movement will be scheduled for standard hours as much as possible to minimise sleep disturbance.</li> <li>Out of hours works will not be scheduled for more than two consecutive nights to allow respite to nearby residences.</li> <li>Additional noise mitigation measures will be applied where there are still exceedances of the NMLs after the 'standard mitigation measures' have been applied. These will be implemented in accordance with the flowchart outlined in Figure 2 and Appendix E of the Early Works Acoustic Assessment of Addendum REF.</li> </ul>	Contractor	Preconstruction and construction	Project REF and Addendum REF (2019)

<p><b>GEN2</b></p>	<p>Constructi on noise and vibration</p>	<ul style="list-style-type: none"> <li>• The Transport for NSW Construction Noise and Vibration Guideline (April 2016) 'standard mitigation measures' will be adopted for all proposed construction works.</li> <li>• Additional noise mitigation measures will be implemented in accordance with Figure 4 and Appendix I of the Acoustic Addendum Report if there are still exceedances of the NMLs after application of the standard mitigation measures.</li> <li>• Prior to the commencement of site establishment all potentially impacted receivers identified in Appendix I of the Acoustic Addendum Report will be notified to advise that noise from the works may at times be audible.</li> <li>• Attended vibration monitoring will be undertaken to determine site specific minimum working distances for structural damage and human response.</li> <li>• Further attended vibration monitoring will be conducted whenever significant vibration generating plant items are operating close to or within the determined minimum working distances. Locations for vibration monitoring during particular works will be determined by the construction contractor.</li> <li>• The additional vibration mitigation measures outlined in Table 27 of the Acoustic Addendum Report will be applied when predicted vibration levels at receivers exceed the criteria for human comfort after the appropriate standard mitigation measures have been applied.</li> <li>• Where vibration is found to exceed project criteria, management measures would be implemented to control vibration. In terms of human comfort criteria, measures would include modifications of construction methods and respite periods. For potential structural damage impacts, modification of construction methods or equipment would be necessary.</li> <li>• All receivers within 100m of works will be notified of potential vibration impacts. Prior to the commencement of work, receivers around the site will also be notified to advise that vibration from the works may be perceptible.</li> <li>• All potentially impacted noise and vibration receivers will be kept informed of the nature of the works to be carried out, the expected</li> </ul>			<p>Project REF and Addendum REF (2019)</p>
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		<p>noise and vibration levels and duration and well as being given appropriate enquiries and complaints contact details.</p> <ul style="list-style-type: none"> <li>• A management procedure will be put in place to deal with noise and vibration complaints that may arise from construction works. Each complaint will be investigated, and appropriate noise and/or vibration amelioration measures be put in place to mitigate further occurrences, where the noise and/or vibration in question exceeds allowable limits.</li> <li>• A Construction Noise and Vibration Management Plan (CNVMP) in accordance with OEH/EPA's Interim Construction Noise Guideline (DECCW 2009) would be prepared as part of the Construction Environmental Management Plan (CEMP) This plan would detail the mitigation, monitoring and community liaison measures and would include but not be limited to: <ul style="list-style-type: none"> <li>- Identification of potentially affected properties and residences (including a detailed map)</li> <li>- A map indicating the locations of likely potential impacts</li> <li>- A risk assessment to determine potential risk for activities likely to affect residents</li> <li>- Mitigation measures to reduce excessive noise during construction activities including those associated with truck movements</li> <li>- A process for assessing the performance of the implemented mitigation measures</li> <li>- A process for identifying management measures for highly noise affected receivers including consultation with affected residences</li> <li>- A process for resolving issues and complaints.</li> </ul> </li> <li>• The CNVMP would include an assessment of the structures such as buildings that need building condition surveys.</li> <li>• A vibration assessment is to be prepared and included in the NVMP. The vibration assessment is to include (as a minimum): <ul style="list-style-type: none"> <li>- Identification of potentially affected properties/receivers</li> <li>- A risk assessment to determine the potential for discrete work</li> </ul> </li> </ul>			
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		<p>activities to affect receivers</p> <ul style="list-style-type: none"> <li>- A map indicating the locations considered likely to be impacted and those requiring building condition surveys</li> <li>- Outline a monitoring program</li> <li>- A process for assessing the performance of the implemented mitigation measures</li> </ul> <ul style="list-style-type: none"> <li>- A process for resolving issues and conflicts. <ul style="list-style-type: none"> <li>• Potentially affected receivers would be notified of any start of work via a letterbox drop. The notification would include details of the proposed work, location, type of work, days and dates of work and hours involved. A contact phone number would be provided to manage complaints.</li> <li>• Work hours will be generally carried out during standard construction hours (i.e. 7.00am to 6.00pm Monday – Friday; 8.00am to 1.00pm on Saturdays; no work to be carried out during Sundays or public holidays) where it is possible to carry out work without major impacts on the local road network. Any work that is performed outside normal working hours or on Sundays and public holiday, will be carried out in accordance with Practice Note 7 in the Roads and Maritime’s Environmental Noise Management Manual (RTA, 2001) and Roads and Maritime’s Environmental Fact Sheet No. 2 – Noise Management and Night Work (RTA, undated)</li> <li>• Where predicted and/or measured construction noise levels exceed the Noise Management Level (NML), all feasible and reasonable work practices will be applied to meet the management levels.</li> <li>• Carrying out the noisiest activities during standard construction hours.</li> <li>• Allowing adequate respite periods during noise intensive work.</li> <li>• Using alternatives to reversing alarms, such as ambient noise sensitive or ‘quacker’ type reversing alarms.</li> <li>• Turning off equipment when not in use.</li> <li>• Ensuring equipment is regularly maintained and repair/replace equipment that becomes noisy.</li> <li>• Throughout each construction activity, locating stationary plant items as far from receivers as possible.</li> </ul> </li> </ul>			
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		<ul style="list-style-type: none"> <li>• Choosing mobile equipment that includes exhaust silencers or residential class mufflers.</li> <li>• Communicating with construction workers via toolbox talks about minimising noise, including the use of equipment, avoidance of shouting, loud talking and door slamming.</li> <li>• Where feasible, and particularly in areas in close proximity to sensitive receivers, noise and vibration generating activities with impulsive, tonal or low frequency characteristics (such as jack hammering, rock breaking, rock hammering, vibratory rolling) would only be carried out: <ul style="list-style-type: none"> <li>- in continuous blocks, up to but not exceeding 3 hours each; and</li> <li>- with a minimum respite period of one hour between each block</li> <li>- Simultaneous operation of noisy plant within the discernible range of a sensitive receiver would be limited/ avoided where possible.</li> </ul> </li> <li>• Noise-emitting plant would be directed away from sensitive receivers where possible.</li> <li>• Non-tonal reversing beepers (or an equivalent mechanism) would be fitted and used on all construction vehicles and mobile plant regularly used on site for periods of over two months.</li> <li>• Vibration testing of actual equipment on site would be carried out prior to their commencement of operation to determine acceptable buffer distances to the nearest affected receiver locations.</li> <li>• Building condition surveys would be undertaken for buildings identified in the NVMP. A copy of the report would be sent to the landholder.</li> <li>• All employees, contractors and subcontractors would receive a project induction which would include: <ul style="list-style-type: none"> <li>- all relevant project specific and standard noise and vibration mitigation measures;</li> <li>- relevant license and approval conditions;</li> <li>- permissible hours of work;</li> <li>- any limitations on high noise generating activities; location of nearest sensitive receivers; construction employee parking</li> </ul> </li> </ul>			
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		<p>areas;</p> <ul style="list-style-type: none"> <li>- designated loading/unloading areas and procedures; site opening/closing times (including deliveries); and environmental incident procedures.</li> </ul>			
<b>GEN3</b>	Operation noise and vibration	<ul style="list-style-type: none"> <li>• During the detailed design stage of the proposal, further investigations of all feasible and reasonable mitigation options would be undertaken for affected receivers in accordance with the Road Noise Policy (DECCW 2011) and RTA's Environmental Noise Management Manual Practice Note 4 (RTA 2001).</li> <li>• A post-construction noise monitoring program (including simultaneous traffic counts) would be undertaken in accordance with the RMS Environmental Noise Management Manual within 6 to 12 months of opening once traffic flows have stabilised in order to verify the noise assessment.</li> <li>• Acoustic property treatments, as outlined in Section 6.2.6.</li> </ul>	Transport for NSW	Pre-operation, detailed design and post-construction	Project REF and Addendum REF (2019)
<b>GEN4</b>	Terrestrial and Aquatic Biodiversity	<ul style="list-style-type: none"> <li>• Disturbance to native vegetation within and/or adjacent to the study area will be minimised to the greatest extent practicable.</li> <li>• Exclusion fencing will be established outside the tree protection zones and appropriate signage will identify the area as an 'Environmental No Go Area'.</li> <li>• Areas adjacent to the CEEC and EECs will be revegetated to provide a vegetated buffer between the development and the TECs.</li> </ul>	Construction contractor	Preconstruction and construction	Project REF and Addendum REF (2019)

		<ul style="list-style-type: none"> <li>• Topsoil transportation within, into or out of the study area will be minimised to reduce the spread of weeds.</li> <li>• Appropriate measures will be implemented to minimise the spread of four weeds of national significance and five priority weeds identified in the study area.</li> <li>• The Sydney Water Policy Stormwater connections to natural waterways will be implemented and adhered to when connecting to Sydney water assets to minimise impacts to aquatic ecological values and water infrastructure.</li> <li>• Stockpiling or storage of construction materials will occur in areas already cleared (such as the footpath) where possible.</li> <li>• Appropriate erosion and sediment control measures will be installed at all sites to avoid sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values.</li> <li>• The removal of any substantial fallen hollow logs, if encountered, would not be permitted without pre-clearance checks by a qualified ecologist. Alternatives to avoid their removal would be promoted in the first instance, which may include relocating the excavations where possible.</li> </ul>			
<b>GEN5</b>	Impacts on threatened species	<ul style="list-style-type: none"> <li>• A Biodiversity Management Plan would be prepared and included within the CEMP. The BMP would include but not be limited to the following: <ul style="list-style-type: none"> <li>- A map clearly showing vegetation clearing boundaries and no-go zones</li> <li>- A site walk-over with the site personnel including RMS representatives to confirm clearing boundaries before the start of work</li> <li>- Identification (marking) of the clearing boundary and identification (marking) of habitat features to be protected. E.g. — use of flagging tape</li> <li>- A procedure for a suitably qualified ecologist to undertake pre-clearing surveys immediately before vegetation removal. Target species would include threatened microbats</li> </ul> </li> </ul>	Construction contractor	Preconstruction and construction	Project REF and Addendum REF (2019)

		<ul style="list-style-type: none"> <li>- Management measures identified as a result of the pre-clearing survey report, with actions to respond to the recommendations made</li> <li>- Incorporation of management measures identified as a result of the pre-clearing survey report, completed by an ecologist, (G40, section 2.4) and nomination of actions to respond to the recommendations made. This should include details of measures to be implemented to protect clearing limits and no-go areas</li> <li>- A detailed clearing process in accordance with RMS Biodiversity Guidelines (2011) including requirements of Guide 1,2, 4 &amp; 9.</li> <li>- Identify in toolbox talks where biodiversity would be included such as vegetation clearing or works in or adjacent to sensitive locations</li> <li>- Identify control/mitigations measures to prevent impacts on sensitive locations or no-go zones</li> <li>- A stop works procedure in the event of identification of</li> <li>- unidentified species, habitats or populations</li> <li>- A requirement that culverts be checked for roosting microbats by a suitably qualified ecologist with experience in microbat survey prior to construction. In the event microbats are found, a microbat management plan would be developed</li> <li>- A requirement that culvert work and vegetation removal be carried out outside of summer, if possible (the breeding season of most threatened microbats that could be roosting on site)</li> <li>- A procedure for clearing potential habitat, including hollow-bearing trees in accordance with TfNSW' Specification G40. An experienced, licensed wildlife carer or ecologist would be present to supervise vegetation clearing and capture then relocate fauna if required. Fauna handling and vegetation removal would be in accordance with Roads and Maritime'</li> </ul>			
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		<p>Biodiversity Guidelines 2011. An experienced, licensed wildlife carer or ecologist would be notified or be on call to supervise vegetation clearing and capture then relocate fauna if required. Fauna handling would be in accordance with Roads and Maritime' Biodiversity Guidelines 2011 — Guide 9.</p> <ul style="list-style-type: none"> <li>- Protocols to prevent the introduction or spread of pathogens (e.g. chytrid fungus and Phytophthora) in accordance with Roads and Maritime' Biodiversity Guidelines 2011 — Guide 7.</li> <li>- Provision of education to all personnel taking part in construction activities with regards to the importance of clearing limits, land uses and threatened species and communities and their legislative responsibilities.</li> </ul> <ul style="list-style-type: none"> <li>• The design would be reviewed during the detailed design stage to determine whether it is possible to retain the hollow-bearing tree near the unnamed drainage line.</li> <li>• Minimise to the fullest extent practicable disturbance to native vegetation within and/or adjacent to the study area.</li> <li>• Establish exclusion fencing in areas containing critically endangered and endangered ecological communities, particularly the area adjacent to Strangers Creek south of Memorial Avenue and display appropriate signage for 'Environmental Protection Zones' where identified on Figure 3-1 to 3-4 of the Biodiversity Assessment (Appendix F).</li> <li>• Revegetation of areas adjacent to Critically Endangered Ecological Communities (CEECs) and Endangered Ecological Communities (EECs), namely the area adjacent to Strangers Creek south of Memorial Avenue, to provide a vegetated buffer between development and Threatened Ecological Communities (TECs).</li> <li>• Minimise top soil transportation within, into or out of the study area to reduce the spread of weeds.</li> <li>• Adherence to the Sydney Water Policy Stormwater connections to natural waterways, which provides guidance and management measures to be implemented when connecting to Sydney Water</li> </ul>			
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		<p>assets to minimise impacts to aquatic ecological values and water infrastructure.</p> <ul style="list-style-type: none"> <li>• Where possible, stockpiling or storage of construction materials should occur in areas already cleared, such as the footpath, to avoid unnecessary ground disturbance.</li> <li>• Appropriate erosion and sediment control measures should be installed at all sites to minimise sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values.</li> <li>• If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the TfNSW's Unexpected Threatened Species Find Procedure in the Biodiversity Guidelines 2011 - Guide I (Pre-clearing process) (RTA, 2011). Personnel performing work would be informed of the requirements of the Transport for NSW's Vegetation Trimming and Removal Procedure.</li> <li>• The removal of any substantial fallen hollow logs, if encountered, would not be permitted without pre-clearance checks by a qualified ecologist. Alternatives to avoid their removal would be promoted in the first instance, which may include relocating the excavations where possible.</li> </ul>			
	Impacts to riparian areas	<ul style="list-style-type: none"> <li>• Riparian areas disturbed by the proposal would be rehabilitated as soon as practicable <ul style="list-style-type: none"> <li>- Where vegetation would be planted in disturbed riparian areas, only native species indigenous to the region would be used.</li> </ul> </li> </ul>	TfNSW and construction contractor	Preconstruction	Project REF
	Impacts on the aquatic environment	<ul style="list-style-type: none"> <li>• Creek bank stabilisation would be installed before and during the creek realignment work to minimise bank erosion, topsoil loss and sedimentation of the waterway.</li> <li>• Appropriate erosion and sediment controls would be established throughout the proposal site, including at creek crossings, and water quality monitoring would occur throughout construction.</li> <li>• Fish passage would be maintained at all times. If required, water would be pumped to maintain flow at all times in the event of low flow ponding during creek works.</li> <li>• Temporary waterway diversions would be scheduled during periods of predicted low flow to minimise impacts.</li> </ul>	TfNSW and construction contractor	Preconstruction and construction	Project REF



		<ul style="list-style-type: none"> <li>DPI (Fisheries) would be notified of reclamation/dredging work prior to construction. Consideration would be given to any response within 28 days of notification.</li> </ul>			
	Weeds and Pathogens	<ul style="list-style-type: none"> <li>Actions for weed management would be developed as part of the Vegetation Management Plan in accordance with the requirements of Roads and Maritime' Specification G36 and Specification G40. The plan would include, but not be limited to the following measures: <ul style="list-style-type: none"> <li>The identification of the type and location of weeds of concern (including noxious weeds) within the proposal area</li> <li>The identification of sensitive receivers (such as native vegetation and waterways) within or near the proposal area</li> <li>Measures to prevent the spread of weeds and fungi, including hygiene procedures for equipment, footwear and clothing</li> <li>A requirement that weeds (including Declared noxious weeds) be managed and disposed of in accordance with requirements of the Noxious Weeds Act 1993 and Roads and Maritime' Biodiversity Guidelines 2011 — Guide 6</li> <li>Communication strategies to improve contractor awareness of weeds and weed management.</li> </ul> </li> <li>Any application of herbicide for weed management would be carried out in accordance with the requirements of the Pesticides Act 1999 and herbicide that is appropriate to the sensitivity of the area would be used. Approval by RMS' Regional Environmental Officer would be obtained prior to use.</li> </ul>	TfNSW and construction contractor	Preconstruction and construction	Project REF
<b>GEN6</b>	Impacts to known Aboriginal heritage sites	<ul style="list-style-type: none"> <li>Aboriginal Heritage Management procedures would be included in the CEMP. These would include but not be limited to the following measures: <ul style="list-style-type: none"> <li>The location of all Aboriginal sites within and adjacent to proposal area. These would be marked on relevant site plans</li> <li>An environmental risk assessment to determine potential risks for discrete work elements or activities that could affect Aboriginal heritage items</li> <li>Specific mitigation measures to avoid risk of harm or protect</li> </ul> </li> </ul>	Construction contractor	Preconstruction and construction	Project REF and Addendum REF (2019)

		<p>Aboriginal heritage</p> <ul style="list-style-type: none"> <li>- Provisions for seeking further advice from an archaeologist should the proposed road design be altered in a manner that could impact the intact portion of site 45- 5-2652</li> <li>- If intact AHIMS sites are within 25 m of the proposal area, these would be identified on construction plans and exclusion fencing and signage would be placed at the boundary of the proposal area at this location to prevent indirect or inadvertent impacts to the site</li> <li>- A stop work procedure in the event of actual or suspected potential harm to a heritage feature/place</li> <li>- Aboriginal heritage induction for workers so they are made aware of the location of sites and their responsibilities under the National Parks and Wildlife Act and any relevant permits. Induction would occur before work begins.</li> <li>• In the event of an unexpected find of an Aboriginal heritage item (or suspected item), work would cease in the affected area and TfNSW's Environmental Officer, Sydney Region and the Roads and Maritime Senior Environmental Specialist for Aboriginal Heritage would be contacted on advice on how to proceed. The Unexpected Archaeological Finds Procedure (Roads and Maritime, 2012) would be followed in the event of the uncovering of a potential item.</li> <li>• No work would be permitted within environmental no-go zones. This would include vehicle access.</li> <li>• All staff would be made aware of the no-go zones and their requirements and their legislative obligations.</li> <li>• A site induction register would be maintained with the areas demarked in the field.</li> <li>• The site induction is to include the requirements of TfNSW's unexpected finds procedure.</li> </ul>			
	Possible disturbance to unknown	<ul style="list-style-type: none"> <li>• In the event of an unexpected find of an Aboriginal heritage item (or suspected item), work would cease in the affected area and RMS' Regional Environmental Officer and Senior Environmental Specialist (Aboriginal heritage) would be contacted for advice on how to</li> </ul>	Construction contractor	Construction	Project REF

	Aboriginal heritage due to construction activities	proceed. The <i>RMS Unexpected Archaeological Finds Procedure</i> (2011) would be implemented.			
	Impacts to known non-Aboriginal heritage items	<ul style="list-style-type: none"> <li>• Detailed design should seek to minimise changes to the form and alignment of Windsor Road and Old Windsor Road.</li> <li>• Subsurface impacts to the fabric of Old Windsor Road would be avoided by the proposal. If sub-surface impacts are unavoidable, a section 139(4) exception notification would be required.</li> <li>• The curtilage of the House at 9-11 Windsor Road would be avoided and the vibration management plan would be followed in relation to any potential vibration impacts to this property.</li> </ul>	TfNSW and construction contractor	Preconstruction and construction	Project REF
	Possible disturbance to unknown non-Aboriginal heritage due to construction activities	<ul style="list-style-type: none"> <li>• If potential archaeological relics or works associated with Old Windsor Road and Windsor Road are identified, the Roads and Maritime Services 'Unexpected Archaeological Finds Procedure 2012' would be implemented.</li> </ul>	Construction contractor	Construction	Project REF
	Water Quality	<ul style="list-style-type: none"> <li>• A Soil and Water Management Plan (SWMP) would be prepared as part of the CEMP in accordance with the requirements of Roads and Maritime contract specification G38 before construction begins. The SWMP would address: <ul style="list-style-type: none"> <li>- TfNSW Code of Practice for Water Management</li> <li>- The Roads and Maritime Erosion and Sedimentation Procedure (RTA 2008)</li> <li>- The Blue Book</li> <li>- TfNSW Technical Guidelines — Temporary Stormwater Drainage for Road Construction (Roads and Maritime 2011).</li> </ul> </li> </ul>	Construction Contractor and TfNSW	Pre-construction and detailed design	Project REF

		<p>The SWMP would also include and address:</p> <ul style="list-style-type: none"> <li>- The identification of catchment areas and the direction of on-site and off-site water flow.</li> <li>- The likely runoff from each road subcatchment Dust suppression mechanisms.</li> <li>- Separation of on-site and off-site water.</li> <li>- The direction of runoff and drainage points during each stage of construction.</li> <li>- The locations and sizing of sediment traps such as sumps or basins.</li> <li>- The locations of other erosion and sediment control measures (eg rock check dams, swales, scour protection and sediment fences).</li> <li>- The staging plans, location, sizing and details of creek alignment and realignment controls for scour protection and bank and bed stabilisation including those used during construction and long term.</li> <li>- Progressive site-specific Erosion and Sedimentation Control Plans (ESCPs). The ESCPs would be updated at least fortnightly.</li> <li>- A process for monitoring and preparing for wet weather.</li> </ul> <ul style="list-style-type: none"> <li>• Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls.</li> <li>• The SWMP would be reviewed by a soil conservationist and updated to address their comments and recommendations.</li> <li>• Detailed design to further investigate the provision of additional water quality treatment near Strangers Creek and Elizabeth Macarthur Creek.</li> </ul>			
	Drainage lines and flow paths	<ul style="list-style-type: none"> <li>• Channel bank and bed stabilisation measures would be maintained until riparian vegetation is completely re- established.</li> </ul>	Construction Contractor	Construction	Project REF

	causing scouring				
	Spills	<ul style="list-style-type: none"> <li>• Emergency wet and dry spill kits would be kept on site at all times. All staff would be made aware of the location of the spill kits and trained in their use.</li> <li>• All fuels, chemicals and liquids would be stored in an impervious bunded area within the construction compound, a minimum of 50 metres away from: <ul style="list-style-type: none"> <li>- Rivers, creeks or any areas of concentrated water flow</li> <li>Flooded areas.</li> <li>- Slopes above 10%.</li> </ul> </li> <li>• Refuelling would be done in a similarly contained area.</li> </ul>	Construction contractor	Construction	Project REF
	Flooding due to increases in peak flow velocities	<ul style="list-style-type: none"> <li>• Further flood modelling, including a detailed afflux assessment, would be carried out during detailed design to confirm impacts on surrounding land uses.</li> </ul>	Construction Contractor	Construction	Project REF
	Groundwater	<ul style="list-style-type: none"> <li>• Further investigations would be carried out during detailed design to confirm levels of soil salinity and potential impacts on groundwater</li> </ul>	TfNSW	Detailed Design	Project REF
	Erosion and sediment control	<ul style="list-style-type: none"> <li>• During detailed design an Erosion and Sedimentation Management Report is to be prepared. The report is to include (as a minimum): <ul style="list-style-type: none"> <li>- Identify site catchment and sub-catchments, high risk areas and sensitive areas.</li> <li>- Sizing of each of the above areas and catchments.</li> <li>- Proposed staging plans for the project to ensure appropriate erosion and sediment controls measures are possible.</li> <li>- The likely volume of run-off from each catchment and sub-catchment in accordance with the Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 (Landcom, 2004).</li> </ul> </li> </ul>	Construction Contractor	Pre-construction and construction	Project REF

		<ul style="list-style-type: none"> <li>- Direction of water flow, both off and on site.</li> <li>- Diversion of off-site water around or through the site or details of separation of on-site and off-site water.</li> <li>- The direction of runoff and drainage points during each stage of construction.</li> <li>- The locations and sizing of sediment basins / sumps as well as associated drainage to direct site water to the basin or sumps.</li> <li>- A mapped plan identifying the above at all major construction stages.</li> <li>- A review process by a soil conservationist and a process for updating the report to address any recommendations.</li> <li>• A soil conservationist from the TfNSW Erosion, Sedimentation and Soil Conservation Consultancy Services Register would be engaged to review the Erosion and Sedimentation Management Report.</li> <li>• An Erosion and Sedimentation Control Plan (ESCP) would be prepared prior to construction and is to include as a minimum: <ul style="list-style-type: none"> <li>- Identify site catchment and sub-catchments, high risk areas and sensitive areas.</li> <li>- Sizing of each of the above areas and catchments. The likely run-off from each sub-catchment. Separation of on-site and off-site water.</li> <li>- The direction of run-off and drainage points during each stage of construction.</li> <li>- Direction of flow of on-site and off-site water.</li> <li>- The locations and sizing of sediment basins or sumps and associated catch drains and/or bunds.</li> <li>- The locations of other erosion and sediment control measures (e.g. rock check dams, swales and sediment fences).</li> <li>- Controls/measures to be implemented on wet weather events.</li> <li>- A mapped plan identifying the above.</li> <li>- A dewatering procedure for onsite water and basins.</li> </ul> </li> </ul>			
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		<ul style="list-style-type: none"> <li>- A process for reviewing and updating the plan on a fortnightly basis and/or when works alter.</li> <li>• Wet weather plans for a rain event would be included and shown on the ESCPs outlining the controls to be implemented in preparation for a rain event.</li> <li>• Environmental Work Method Statements (EWMS) would be prepared for high-risk activities such as: <ul style="list-style-type: none"> <li>- Clearing and grubbing Earthwork.</li> <li>- Temporary creek diversions.</li> <li>- Work around the bridge and culverts Drainage work.</li> <li>- Utilities relocations.</li> <li>- Bridge and culvert construction.</li> </ul> </li> </ul> <p>Environmental Work Method Statements (EWMS) would include:</p> <ul style="list-style-type: none"> <li>- Description of the work/activities and machinery.</li> <li>- Outline of the sequence of the work/activities, including interfaces with other construction activities.</li> <li>- Identification of potential environmental risks/impacts due to the work/activities and associated with wet weather events.</li> <li>- Evaluation of methods to eliminate/reduce the environmental risk.</li> <li>- Mitigation measures to reduce environmental risk.</li> <li>- Any safeguards resulting from consultation with public authorities and other stakeholders, where appropriate.</li> <li>- A map indicating sensitive locations, likely potential environmental impacts, and work areas.</li> <li>- Identification of work areas and exclusion areas.</li> <li>- Operational and monitoring measures to reduce environmental impact.</li> <li>- A process for assessing and reporting the performance of the implemented environmental control measures.</li> </ul>			
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		<ul style="list-style-type: none"> <li>- A process for resolving environmental issues or conflicts and reporting outcomes.</li> <li>• A Stabilisation Plan is to be prepared and included in the SWMP. The stabilisation plan is to include but not be limited to the following: <ul style="list-style-type: none"> <li>- Identification and methodology of techniques for stabilisation of site.</li> <li>- Identification of area on site for progressive stabilisation.</li> <li>- Stabilisation is to be undertaken of areas, including stockpiles and batters, exposed for a duration of 2 weeks or greater. For example, covering with geotextile fabric, stabilised mulch, soil binder or spray grass.</li> <li>- Identification of areas on site for progressive permanent stabilisation such as implementation of landscaping.</li> </ul> </li> <li>• Localised erosion and sediment control measures would also be implemented to minimise erosion and the volume of sediment transported from disturbed areas. Measures would include use of the following elements: <ul style="list-style-type: none"> <li>- Temporary revegetation /rehabilitation work to reduce the extent of disturbed surfaces.</li> <li>- Application of temporary surface treatments or blanketing on exposed earth surfaces.</li> <li>- Sediment barriers and sumps, in series where necessary</li> <li>- Vegetated buffer strips.</li> </ul> </li> <li>• Control measures would be implemented at egress points to minimise dirt and mud tracking.</li> <li>• All stockpiles would be designed, established, operated and decommissioned in accordance with <i>Roads and Maritime Stockpile Management Procedures (RTA 2011a)</i>. Stockpile sites would be located: <ul style="list-style-type: none"> <li>- At least 50 metres from the nearest waterway</li> <li>- In an area of low ecological and heritage conservation significance.</li> </ul> </li> </ul>			
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		<ul style="list-style-type: none"> <li>- On relatively level ground.</li> <li>- Outside the 1 in 10-year ARI floodplain.</li> <li>• Topsoil would be stockpiled separately for possible reuse in landscaping and rehabilitation.</li> <li>• An accredited soil conservationist would be engaged to regularly inspect work throughout the construction phase.</li> <li>• Any material transported onto road surfaces would be swept and removed at the end of each working day and before rainfall.</li> </ul>			
	Contamination	<ul style="list-style-type: none"> <li>• A Stage 2 — Detailed site investigation in accordance with NSW EPA guidelines would be prepared and would include preparation of a sampling, analysis and quality plan in accordance with the Roads and Maritime Contaminated Land Management Guidelines. This plan would include site specific sampling and analysis of soil at the site on the corner of Old Windsor Road and Memorial Avenue.</li> <li>• Following the Stage 2 — Detailed site investigation, a Contaminated Land Management Plan would be prepared in accordance with the Contaminated Land Act 1997 and relevant EPA Guidelines as part of the CEMP and would include: <ul style="list-style-type: none"> <li>- Outline of occupational health and safety measures</li> <li>- Contamination management measures.</li> <li>- Incident reporting in according with the RMS Environmental Incident Management Procedure.</li> <li>- Identification of rehabilitation requirements, classification, transport and disposal requirements of any contaminated land within the construction footprint.</li> <li>- In the event that indications of contamination are encountered (known and unexpected, such as odorous or visually contaminated materials), work in the area would cease until an contamination assessment can be prepared to advise on the need for remediation or other action, as deemed appropriate.</li> </ul> </li> </ul>	TfNSW	Detailed Design	Project REF

	Constructi on traffic impacts	<ul style="list-style-type: none"> <li>• A Traffic Management Plan (TMP) would be prepared as part of the CEMP. The TMP would be prepared in accordance with <i>Traffic Control at Worksites</i> (Roads and Maritime 2010), <i>Australian Standard AS1742</i> and the worksite manual <i>Roads and Maritime Specification G10</i>. The TMP would outline: <ul style="list-style-type: none"> <li>- Traffic controls to manage and regulate traffic movements, including minimising traffic switching.</li> <li>- Maintenance of continuous, safe and efficient movement of traffic for both the public and construction workers.</li> <li>- Haulage routes/access arrangements to minimise impacts on local routes.</li> <li>- Temporary speed restrictions to ensure a safe driving environment around work zones.</li> <li>- Access provisions for local roads and properties, including the use of temporary turn-around bays.</li> <li>- Maintenance of pedestrian and cyclist access.</li> <li>- Provision of appropriate warning and advisory signposting.</li> <li>- Requirements and methods to consult and inform the local community of impacts on the local road network and traffic.</li> <li>- Measures to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic caused by other developments.</li> </ul> </li> </ul>	Construction Contractor	Pre-Construction	Project REF
	Access	<ul style="list-style-type: none"> <li>• Vehicular property access would be maintained where possible including pre-schools, places of worship and commercial premises. If driveway access cannot be maintained the resident would be consulted.</li> <li>• Road users, pedestrians and cyclists would be informed of changed conditions, including likely disruptions to access during construction.</li> </ul>	Construction Contractor	Construction	Project REF
	Temporary impacts on bus services	<ul style="list-style-type: none"> <li>• Access to bus stops and safe stopping locations would be maintained during construction in consultation with bus operators.</li> </ul>	TfNSW	Construction	Project REF

		<ul style="list-style-type: none"> <li>• Ongoing updates on locations and access to bus stops would be provided to the community during the construction period to minimise disruption.</li> </ul>			
Dust and odour	<ul style="list-style-type: none"> <li>• An Air Quality Management plan (AQMP) would be prepared as part of the CEMP. The plan would include but not be limited to: <ul style="list-style-type: none"> <li>- A map identifying locations of sensitive receivers.</li> <li>- Identification of potential risks/impacts due to the work/activities as dust generation activities.</li> <li>- Management measures to minimise risk including a progressive stabilisation plan.</li> <li>- A process for monitoring dust on site and weather conditions.</li> <li>- A process for altering management measures as required.</li> </ul> </li> <li>• To minimise or prevent air pollution and dust, loads that may produce dust or odour would be covered, and water would be sprayed on unseated access roads and open areas during conditions conducive to dust generation.</li> </ul>	Construction contractor	Preconstruction and construction	Project REF	
Exhaust emissions	<ul style="list-style-type: none"> <li>• Construction equipment (including all internal combustion engines) would be properly maintained and running efficiently to ensure exhaust emissions are minimised, where practicable, and comply with the <i>Protection of Environment Operations Act 1997</i>.</li> <li>• Machinery would be turned off when not in use.</li> </ul>	Construction contractor	Construction	Project REF	
Impact on businesses and the community	<ul style="list-style-type: none"> <li>• A complaints handling register would be included in the CEMP.</li> <li>• Access would be maintained wherever possible. Prior to any temporary unavoidable disruption to access, consultation would be undertaken with the affected property owner/s.</li> <li>• Safe access to bus stops would be maintained at all times and bus companies would be advised before changes to traffic conditions.</li> <li>• Existing cyclist and pedestrian access along Windsor and Old Windsor Road would be maintained but may need to be altered during construction to ensure safety. Road users, pedestrians and cyclists would be informed of changed conditions, including likely disruptions to access during construction.</li> </ul>				

		<ul style="list-style-type: none"> <li>Residents would be informed before any interruptions to utility services that may occur during the relocation of utilities.</li> <li>Community consultation would be carried out in accordance with Roads and Maritime's <i>Community Involvement Practice Notes and Resource Manual</i> (2012)</li> <li>Temporary signage would be provided during construction to inform traffic of alternative access to the businesses along Windsor Road and Memorial Avenue.</li> <li>Property acquisition would be managed in accordance with the provisions of Department of Transport's <i>Land Acquisition Policy</i> and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i>.</li> </ul>			
	Landscape character and visual impacts	<ul style="list-style-type: none"> <li>The following would be considered during detailed design:</li> <li>The design of and materials to be used for retaining walls. For walls in fill situations, walls should be appropriate to future adjoining land uses. For example, in residential areas, walls would be a combination of split-faced and smooth-faced blockwork in a recessive colour. Gabion walls should be considered for rural or open space areas.</li> <li>It is proposed to plant low shrub and groundcover planting to the base of the walls to reduce the walls visibility when viewed from the surrounding landscape</li> <li>Roadside elements such as safety barriers, fencing, bus stops, street lighting, etc, are to be consistent with those used in other road upgrade projects within the North West Growth Centre</li> <li>The design and location of the new bridge over Strangers Creek and associated earthworks should be designed to minimise impacts on the creek bed, banks and vegetation</li> <li>The number and location of existing trees to be retained within verge areas and median would be confirmed following a detailed survey of the study area</li> <li>Investigate alternative types and colours of paved surfaces to minimise visual impact.</li> <li>The landscape and urban design strategy for the proposal would be finalised during detailed design in consideration of design principles</li> </ul>	TfNSW	Detailed design	Project REF

		<p>and objectives as described in Section 3.2 of the REF and Appendix J.</p> <ul style="list-style-type: none"> <li>• During detailed design, the design including landscape plans are to incorporate the design principles outlined in the Landscape Character, Visual Impact Assessment and Urban Design Report. These include: <ul style="list-style-type: none"> <li>- To ensure that the design reinforces the identity and functionality of a transit boulevard road type.</li> <li>- To ensure that existing land uses is considered and integrated into the design of the road alignment.</li> <li>- To contribute to the future urban planning of the adjoining development precincts including its transport and access needs.</li> <li>- To respond to natural patterns including creek lines and drainage corridors and vegetation communities. This includes the use of local plants consistent with the existing communities either side of the alignment in order to unify the crossing with the existing corridor, and, use of advance stock to escalate the re-vegetation where appropriate.</li> <li>- To provide a unified and consistent approach to the design of bridges along the corridor.</li> <li>- The consideration of landscaping treatment to reduce the incidence of graffiti.</li> <li>- To achieve an integrated, safe and minimal maintenance design.</li> </ul> </li> <li>• During detailed design, the landscape design principles and streetscape (planting) would be reviewed to ensure that they are consistent with the outcomes of the biodiversity assessment. This would be done in consultation with RMS environment staff.</li> <li>• If cut-off drains or swales are required as a permanent fixture, their location, size and treatment would be finalised during detailed design so that they blend into the landform and landscape character.</li> </ul>			
	Climate change	<ul style="list-style-type: none"> <li>• Design would consider the potential effects of climate change on the proposal, including drainage requirements.</li> </ul>	TfNSW	Detailed design	Project REF

	Energy efficiency	<ul style="list-style-type: none"> <li>• The selection process for vehicle and plant would consider energy efficiency and related carbon emissions.</li> <li>• Equipment would be serviced frequently to ensure it is operating efficiently.</li> <li>• Machinery would be operated efficiently to ensure optimal performance, minimise down time and improve fuel efficiency.</li> </ul>	Construction contractor	Preconstruction and construction	Project REF
	Increases in production of waste materials	<ul style="list-style-type: none"> <li>• A Resource and Waste Management Plan (RWPM) would be developed as a component of the CEMP, which would include: <ul style="list-style-type: none"> <li>- The type and volume of all materials.</li> <li>- Destinations for each resource/waste type either for on- site reuse or recycling, off-site reuse or recycling, or disposal at a licensed waste facility.</li> <li>- Quantity and classification of excavated material generated as a result of the proposal.</li> <li>- Disposal strategies for each type of material.</li> <li>- Details of how waste would be stored and treated on site.</li> <li>- identification of all non-recyclable waste.</li> <li>- Identification of strategies to 'avoid', 'reduce', 're-use', and 'recycle'.</li> <li>- Identification of available recycling facilities on and off site.</li> <li>- Identification of suitable methods and routes to transport waste.</li> <li>- Procedures and disposal arrangements for unsuitable excavated material or contaminated material.</li> <li>- Site clean-up for each stage.</li> </ul> </li> <li>• Waste management measures developed in accordance with the waste hierarchy established under the WARR Act for the proposal would be included in the CEMP.</li> <li>• Training in waste management principles would be included in site inductions for the workforce.</li> <li>• Types of waste collected, amounts, date/time and details of disposal shall be recorded in a waste register.</li> </ul>	Construction contractor	Preconstruction and construction	Project REF
	Sourcing of recycled materials	<ul style="list-style-type: none"> <li>• Roads and Maritime contractors would be required to propose recycled-content materials where they are cost and performance competitive.</li> </ul>	Construction contractor	Construction	Project REF

Reuse and recycling of materials	<ul style="list-style-type: none"> <li>Workspaces would be maintained, kept free of rubbish and cleaned up at the end of each working day.</li> </ul>	Construction contractor	Construction	Project REF
Waste disposal	<ul style="list-style-type: none"> <li>Solid and liquid wastes, as well as fuels, lubricants and chemical containers would be disposed of in accordance with OEH requirements.</li> <li>Suitable waste disposal locations would be identified and used to dispose of litter and other wastes on-site. Suitable containers would be provided for waste collection.</li> <li>Material identified for recycling would be stockpiled in an adequately bunded area (in accordance with the <i>Roads and Maritime Stockpile Site Management Guidelines, 2011</i>).</li> <li>Fuel and chemical storage areas would be appropriately sized and imperviously bunded.</li> </ul>			
Waste Management	<ul style="list-style-type: none"> <li>All wastes would be managed in accordance with the <i>Protection of the Environment Operations Act 1997</i></li> <li>A dedicated concrete washout facility would be provided during construction so that runoff from the washing of concrete machinery and equipment could be collected and disposed of at an appropriate waste facility.</li> </ul>	Construction contractor	Construction	Project REF
Cumulative impact during construction	<ul style="list-style-type: none"> <li>Cumulative impact would be considered in the CEMP, addressing any cumulative traffic, noise and vibration and air quality impact as required.</li> <li>Work would be staged to minimise impact along the entire length of the proposal area, where possible.</li> <li>Cumulative impact management measures within the CEMP would be reviewed in response to any complaints received.</li> </ul>	Contractor	Preconstruction and construction	

### **7.3 Licensing and approvals**

All relevant licenses, permits, notifications and approvals needed for the Memorial Avenue Upgrade project have been considered and addressed in the Project REF, Submission Report, Addendum REF (2019) and Consistency Review (2019).

The Consistency Review (2019) provided that the length of the project is 2,970 metres for the purposes of clause 35(b)(ii). As this is less than 3 kilometres, an EPL for this project under the POEO Act is not required.

The construction length assessment as a result of the latest modifications assessed in this Addendum REF have determined that the road length has not increased for the purpose of clause 35(b)(ii) of the POEO Act and therefore a requirement for an EPL is still not triggered.



## 8 Conclusion

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### 8.1 Justification

The proposed modification assessed in this Addendum REF are necessary as part of the Memorial Avenue Upgrade project. The potential impact of the modification on the environment and the surrounding sensitive receivers have been considered throughout the detailed design process.

Potential environmental impacts have been identified and the safeguards and mitigation measures documented in the Project REF, Addendum REF (2019) and this Addendum REF are considered satisfactory in addressing any potential environmental impacts.

In this context, the proposed modifications to the original proposal are considered justified.

#### 8.1.1 Economic factors

The proposal would have a positive long-term impact for businesses in the region as it would reduce congestion and improve connectivity between Windsor Road and Old Windsor Road as development of the Balmoral Road Release Area generates additional pressure on the road network. If the upgrade were not developed, motorists would experience longer travel times and congestion, which can have a significant impact on business activities and economic growth both locally and regionally (CRWG 2006).

#### 8.1.2 Public interest

When completed, the proposal, as well as other current road projects and the completed North West Rail Link (NWRL), would result in cumulative benefits for the Balmoral Road Release Area and nearby established communities in terms of enhanced accessibility, road safety, improved flow of traffic, and improved pedestrian and cyclist facilities. The proposed shared path along both sides of Memorial Avenue would improve opportunities for safe cyclist and pedestrian movement within the proposal area. The new shared paths would connect to existing cyclist and pedestrian facilities along Windsor Road and Old Windsor Road which would be maintained.

#### 8.1.3 Other benefits

The proposal is expected to result in other benefits including:

- Improving safety by offering a new road design and intersection upgrades that is compliant with current safety standards for arterial roads
- Providing an opportunity to enhance urban design and visual aspect within the proposal area, to complement the changing landscape of the Balmoral Road Release Area
- Improving the drainage system, particularly at identified low points along Memorial Avenue so that the road is serviceable during 100-year floods
- Providing capacity for projected traffic volumes on Memorial Avenue between Windsor Road and Old Windsor Road, including at the intersections of these arterial roads

## 8.2 Objects of the EP&A Act

Object	Comment
<p><b>1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.</b></p>	<p>The proposed modifications would contribute to the continued management of traffic and facilitation of development of the Balmoral Road Release Area, and other local developments, by ensuring that Memorial Avenue and connections to Old Windsor Road and Windsor Road provide an acceptable level of service.</p>
<p><b>1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.</b></p>	<p>Ecologically sustainable development is considered in Sections 8.3 below.</p>
<p><b>1.3(c) To promote the orderly and economic use and development of land.</b></p>	<p>Not relevant to the proposed modifications.</p>
<p><b>1.3(d) To promote the delivery and maintenance of affordable housing.</b></p>	<p>Not relevant to the proposed modifications.</p>
<p><b>1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.</b></p>	<p>The proposed modifications have been assessed against relevant environmental legislation that protects and conserves native flora and fauna, including threatened species, populations and ecological communities, and their habitats (refer to Section 6.2).</p>
<p><b>1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).</b></p>	<p>Not relevant to the proposed modifications.</p>
<p><b>1.3(g) To promote good design and amenity of the built environment.</b></p>	<p>Not relevant to the proposed modifications.</p>
<p><b>1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.</b></p>	<p>Not relevant to the proposed modifications.</p>
<p><b>1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.</b></p>	<p>Not relevant to the proposed modifications.</p>

<b>1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.</b>	Not relevant to the proposed modifications.
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## **8.3 Ecologically sustainable development**

### **8.3.1 The precautionary principle**

The precautionary principle requires evaluation of the threat of serious or irreversible harm to biodiversity. As part of the assessment process, options were considered and assessed with the purpose of reducing the risk of serious and permanent impacts on the environment. The best available technical information, environmental standards and measures were used to minimize environmental risks.

### **8.3.2 Intergenerational equity**

The intergenerational equity principle is concerned with ensuring that the current generation preserves natural and built assets so that wellbeing and productivity are not compromised for future generations. Should the Memorial Avenue Upgrade not proceed, the principle of intergenerational equity may be compromised as future generations would inherit a road with a lower level of service, and a lower level of safety.

### **8.3.3 Conservation of biological diversity and ecological integrity**

This principle requires that the diversity of genes, species and communities, as well as the ecosystems and habitats to which they belong, be maintained and improved to ensure their survival. There is confidence that the proposal, if delivered with implementation of all relevant safeguards, would not significantly impact biological diversity or ecological integrity.

## **8.4 Conclusion**

This Addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modifications as described in this Addendum REF are considered to meet the project objectives, and the implementation of safeguards and management measures as detailed in Table 7-1 would ameliorate or minimise any expected or potential impacts. On balance the proposed modification is considered justified and the following conclusions are made.

### **Significance of impact under NSW legislation**

The proposed modification would not result in a change to the findings of the project REF, Submission Report or Addendum REF (2019) and would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under

Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

**Significance of impact under Australian legislation**

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

## 9 Certification

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This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.



Matt Brookes

**Senior Planner**

**Beca Pty Ltd**

Date: 16 March 2021

I have examined this addendum review of environmental factors and accept it on behalf of Transport for NSW.



Mark Jajou

**Project Contract Manager**

**Infrastructure & Place**

Date: 06 May 2021

## 10 References

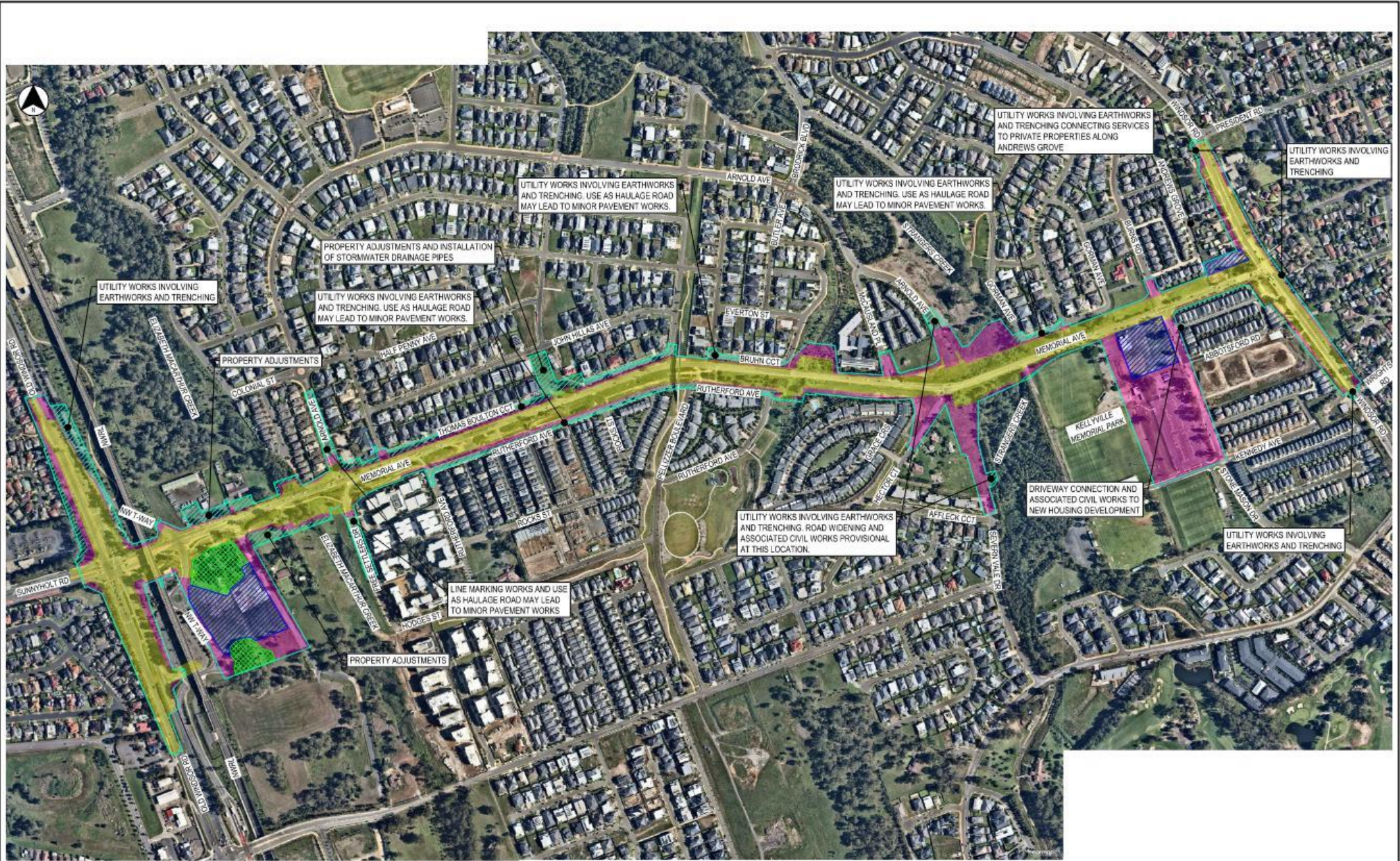
Terms and acronyms used in this addendum REF

Term / Acronym	Description
<b>BC Act</b>	<i>Biodiversity Conservation Act 2016 (NSW).</i>
<b>CEMP</b>	Construction / Contractor's environmental management plan
<b>EIA</b>	Environmental impact assessment
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act 1979 (NSW).</i> Provides the legislative framework for land use planning and development assessment in NSW
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).</i> Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
<b>FM Act</b>	<i>Fisheries Management Act 1994 (NSW)</i>
<b>Heritage Act</b>	<i>Heritage Act 1977 (NSW)</i>
<b>ISEPP</b>	State Environmental Planning Policy (Infrastructure) 2007
<b>LEP</b>	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
<b>NPW Act</b>	<i>National Parks and Wildlife Act 1974 (NSW)</i>
<b>Roads and Maritime</b>	NSW Roads and Maritime was dissolved by the Transport Administration Amendment Bill in August 2019, all function are now managed by Transport for NSW
<b>SEPP</b>	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.

# Appendix A

## Proposed Modification Maps





**LEGEND**

- ADDENDUM REF 2021 BOUNDARY
- ADDENDUM REF 2019 BOUNDARY
- ANCILLARY SITE
- ORIGINAL REF BOUNDARY
- ENVIRONMENTAL PROTECTION ZONE

FIGURE 3-1: KEY FEATURES OF THE PROPOSED MODIFICATION

**MR642 MEMORIAL AVENUE UPGRADE**  
 KEY FEATURES OF THE PROPOSED MODIFICATION  
 OVERVIEW PLAN  
 SCALE 1:9000





## **Appendix B**

**Consideration of clause 228(2) factors and matters of National Environmental Significance and Commonwealth land**

## Clause 228(2) Checklist

In addition to the requirements of the Is an EIS required? (1995/1996) guideline and the Roads and Related Facilities EIS Guideline (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
<p><b>Any environmental impact on a community?</b></p> <p>The safeguards and mitigation measures detailed in the Submissions Report, Project REF, the previous Addendum, and this Addendum are sufficient to address this aspect, including construction traffic management.</p>	Short-term negative
<p><b>Any transformation of a locality?</b></p> <p>The proposed change would not transform the locality.</p>	Nil
<p><b>Any environmental impact on the ecosystems of the locality?</b></p> <p>The proposed change would have negligible impact on ecosystems.</p>	Nil
<p><b>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</b></p> <p>Impacts on environmental quality or values are not expected.</p>	Nil
<p><b>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</b></p> <p>Impacts on significant localities, places or buildings are not expected.</p>	Nil
<p><b>Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</b></p> <p>The nature, location and scope of the proposed change are such that impacts are not expected.</p>	Nil
<p><b>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</b></p> <p>The proposed change would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	Nil
<p><b>Any long-term effects on the environment?</b></p> <p>The proposed changes would result in long-term benefits for the community by supporting the delivery of the Memorial Avenue Upgrade project. No adverse long-term impacts have been identified.</p>	Nil
<p><b>Any degradation of the quality of the environment?</b></p> <p>The impact of the proposed change has been discussed. It would not result in any degradation of the quality of the environment provided safeguards and mitigation measures are implemented.</p>	Nil

Factor	Impact
<p><b>Any risk to the safety of the environment?</b></p> <p>Providing safeguards and mitigation measures are implemented the proposed changes would not represent a risk to the safety of the environment.</p>	Nil
<p><b>Any reduction in the range of beneficial uses of the environment?</b></p> <p>The proposed change would not reduce the range of beneficial uses of the environment.</p>	Nil
<p><b>Any pollution of the environment?</b></p> <p>It is not expected that the proposed change would result in any pollution of the environment provided the project safeguards and mitigation measures are properly implemented.</p>	Nil
<p><b>Any environmental problems associated with the disposal of waste?</b></p> <p>Waste generated by the proposed change would be reused and recycled where possible and disposed of in an appropriate manner. There would be no environmental problems associated with the disposal of waste.</p>	Nil
<p><b>Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</b></p> <p>There would be negligible increased demand on resources, natural or otherwise, which are, or are likely to become in short supply as a result of the proposed change.</p>	Nil
<p><b>Any cumulative environmental effect with other existing or likely future activities?</b></p> <p>Adverse cumulative impacts are not expected.</p>	Nil
<p><b>Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</b></p> <p>The proposed change would not impact on coastal processes or hazards.</p>	Nil

## Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of Water, Agriculture and the Environment.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
<p><b>Any impact on a World Heritage property?</b></p> <p>The proposed change will not have an impact on a World Heritage property.</p>	Nil
<p><b>Any impact on a National Heritage place?</b></p> <p>The proposed change will not have an impact on a National Heritage place.</p>	Nil
<p><b>Any impact on a wetland of international importance?</b></p> <p>The proposed change will not have an impact on a wetland of international importance.</p>	Nil
<p><b>Any impact on a listed threatened species or communities?</b></p> <p>The proposed change will not have an impact on a listed threatened species or community.</p>	Nil
<p><b>Any impacts on listed migratory species?</b></p> <p>The proposed change I will not have an impact on a listed migratory species.</p>	Nil
<p><b>Any impact on a Commonwealth marine area?</b></p> <p>The proposed change will not have an impact on a Commonwealth marine area.</p>	Nil
<p><b>Does the proposed modification involve a nuclear action (including uranium mining)?</b></p> <p>The proposed change does not involve a nuclear action.</p>	Nil
<p><b>Additionally, any impact (direct or indirect) on Commonwealth land?</b></p> <p>The proposed change will not have an impact (either direct or indirect) on Commonwealth Land.</p>	Nil

## **Appendix C**

### **Statutory consultation checklists**

# Infrastructure SEPP

## Certain development types

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No		ISEPP cl. 95A
Bus Depots	Does the project propose a bus depot?	No		ISEPP cl. 95A
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No		ISEPP cl. 95A

## Development within the Coastal Zone

Issue	Description	Yes / No / NA	If 'yes' consult with	ISEPP clause
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No		ISEPP cl. 15A

Note: See interactive map here: <https://www.planning.nsw.gov.au/policy-and-legislation/coastal-management>. Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program

## Council related infrastructure or services

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	ISEPP clause
<b>Stormwater</b>	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
<b>Traffic</b>	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No		ISEPP cl.13(1)(b)

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	ISEPP clause
<b>Sewerage system</b>	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	Yes	Consultation with THSC covered under the REF. No new demand. Staging of the works involves diverting/replacing sewers.	ISEPP cl.13(1)(c)
<b>Water usage</b>	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	Yes	As above. No new demand. Staging of the works involves diverting/replacing watermains.	ISEPP cl.13(1)(d)
<b>Temporary structures</b>	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	No		ISEPP cl.13(1)(e)
<b>Road &amp; footpath excavation</b>	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	Consultation with THSC covered under the REF. Widening will involve staging construction up to the boundary on both sides and constructing a new shared path along Memorial Avenue. A temporary footpath will replace the existing footpath during construction.	ISEPP cl.13(1)(f)

### Local heritage items

Issue	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s)	ISEPP clause
<b>Local heritage</b>	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No		ISEPP cl.14

### Flood liable land

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
<b>Flood liable land</b>	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	Yes, however will not change flood patterns to more than minor.	No consultation required.	ISEPP cl.15
<b>Flood liable land</b>	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	Yes, however only minor works.	No consultation required.	ISEPP cl.15AA

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government.

### Public authorities other than councils

Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
<b>National parks and reserves</b>	Are the works adjacent to a national park or nature reserve, or other area reserved under the <i>National Parks and Wildlife Act 1974</i> , or on land acquired under that Act?	No		ISEPP cl.16(2)(a)



Issue	Potential impact	Yes / No	If 'yes' consult with	ISEPP clause
<b>National parks and reserves</b>	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No		ISEPP cl. 16(2)(b)
<b>Aquatic reserves and marine parks</b>	Are the works adjacent to an aquatic reserve or a marine park declared under the <i>Marine Estate Management Act 2014</i> ?	No		ISEPP cl.16(2)(c)
<b>Sydney Harbour foreshore</b>	Are the works in the Sydney Harbour Foreshore Area as defined by the <i>Sydney Harbour Foreshore Authority Act 1998</i> ?	No		ISEPP cl.16(2)(d)
<b>Bush fire prone land</b>	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No		ISEPP cl.16(2)(f)
<b>Artificial light</b>	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No		ISEPP cl. 16(2)(g)
<b>Defence communications buffer land</b>	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No		ISEPP cl. 16(2)(h)
<b>Mine subsidence land</b>	Are the works on land in a mine subsidence district within the meaning of the <i>Mine Subsidence Compensation Act 1961</i> ?	No		ISEPP cl. 16(2)(i)

## Growth Centres SEPP

Issue	Potential impact	Yes / No	If 'yes' consult with	SEPP clause
<b>Clearing native vegetation</b>	Do the works involve clearing native vegetation (as defined in the Local Land Services Act 2013) on land that is not subject land (as defined in cl 17 of schedule 7 of the <i>Threatened Species Conservation Act 1995</i> )?	No		SEPP 18A

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# **Appendix D**

## **Updated Addendum Biodiversity Assessment**

