

Appin Road Upgrade, Mount Gilead to Ambarvale

Submissions report

Roads and Maritime Services | March 2019



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Prepared by WSP Australia Pty Ltd and Roads and Maritime Services
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Document controls

Approval and authorisation

Title	Appin Road Upgrade, Mount Gilead to Ambarvale Submissions report
Accepted on behalf of Roads and Maritime NSW by	Richard McHenery Project Development Manager
Signed	
Dated	March 2019

Executive summary

Review of Environmental Factors (REF) proposal

Roads and Maritime Services NSW (Roads and Maritime) proposes the staged upgrade of Appin Road between Mount Gilead and Ambarvale. The proposal includes upgrading about 5.4 kilometres of Appin Road between a section of the road in Mount Gilead in the south and the intersection of St Johns Road, Ambarvale in the north.

The key features of the proposal would include:

- Establishment of temporary construction compounds required to build the proposal
- Duplicating the existing Appin Road carriageway from two to four lanes, between Fitzgibbon Lane to approximately 2.5 kilometres south of Copperfield Drive, Rosemeadow using the existing single carriageway for future southbound traffic only and building a two-lane northbound carriageway in the existing road corridor reservation to include provisions for the potential future widening to six lanes
- Upgrading the existing signalised intersection of St Johns Road and Appin Road, including building separated turning lanes
- Upgrading the existing signalised intersection of Fitzgibbon Lane and Kellerman Drive
- Upgrading the existing roundabout intersection of Copperfield Drive and Kellerman Drive to a signalised intersection
- Construction of two new signalised intersections for access to the proposed Mount Gilead residential subdivision
- New line marking and signposting for the new dual lane carriageway
- Provision of new drainage lines and channels where widening impacts overland flows
- Adjustments to existing drainage pit and pipe networks, including upgrade of the existing culvert under Kellerman Drive to the east of Appin Road to improve drainage and installation of an additional 1,200-millimetre pipe in parallel to existing twin box culverts
- Adjustments to existing utilities including construction of a new underground utility corridor to the western side of Appin Road in order to relocate the existing services and accommodate any new services as required for the proposed subdivision at Mount Gilead
- Provision of fauna fencing to the southern extent of the Mount Gilead residential subdivision and rope fauna crossing(s) over Appin Road
- Noise mitigation measures.

REF display

The Australian and NSW governments are funding two individual projects to improve Appin Road including the Appin Road Upgrade between Mount Gilead and Ambarvale and Appin Road Safety Improvements from Brian Road to Gilead. The Appin Road Upgrade would be funded by the NSW Government Housing Acceleration Fund and Lendlease to unlock new housing at Mount Gilead and improve safety and access for local residents and through traffic.

Lendlease worked with Roads and Maritime to prepare a concept design and review of environmental factors (REF) for the Appin Road Upgrade. Roads and Maritime prepared a strategic design and REF for the Appin Road Safety Improvements. Both REFs assessed the potential environmental impact of each project and outline measures to reduce impacts on biodiversity, heritage, noise, property and construction.

While both projects involve modifications to Appin Road, they are two distinct projects requiring two separate environmental assessments and approval processes.

The REF for each project was publicly displayed for 26 days between 19 November and 14 December 2018 at four locations, as detailed in Table 1-1 of this submissions report. The REFs were placed on the Roads and Maritime project website and made available for download. The display locations, website link and invitation to attend one of the three information sessions were advertised in the Macarthur Advertiser and Campbelltown-Macarthur Chronicle on Tuesday 13 November 2018.

Roads and Maritime received 132 submissions for the proposed Appin Road Upgrade and Appin Road Safety Improvements, accepted up until the 19th December 2018. An additional two submissions for the Appin Road Upgrade submitted in January 2019 were also accepted.

Of the 132 submissions, 115 submissions referred to the proposed Appin Road Upgrade and have been addressed within this submissions report. Submissions received in regard to the proposed Appin Road Safety Improvements will be addressed in a separate submissions report. Appendix A lists the respondents and each respondent's allocated submission number. Appendix A also indicates where the issues from each submission have been addressed in Chapter 3 of this submissions report.

Summary of submissions and responses

Biodiversity

A total of 72 submissions (20% of issues raised) were made regarding biodiversity impacts from the proposal. This included concerns regarding the impact assessment approach, construction and operation impacts and the proposed management and mitigation. More specifically key concerns raised in submissions included impacts upon koalas, fauna fencing and koala connectivity issues.

The environmental impact assessment by Roads and Maritime recognises the proposal would impact the local koala population through the direct loss of a small proportion of habitat and increased barrier effects arising from the upgraded road. Without mitigation, this is likely to result in increased koala road kill and injury. The impact of the proposal has been assessed as not significant under both State and Commonwealth due to its limited impacts and the size and wide distribution of the local koala population.

To address the impacts, Roads and Maritime is proposing to establish fauna exclusion fencing to reduce the current levels of road kill on this section of Appin Road. This should protect koalas from vehicle strike and direct koala movement to the south and south west and within primary habitat corridors mapped by the NSW Office of Environment and Heritage (OEH).

The retention of the OEH primary corridors in their entirety and accompanying mitigation measures is considered by OEH as likely to be sufficient habitat to support the long-term survival of koalas in the area (OEH, 2018). Roads and Maritime reviewed the need and effectiveness of east west connectivity options. The assessment confirmed that these options were of limited benefit especially when considering the additional vegetation clearing and costs.

Additional fauna fencing at Noorumba Reserve along the western side of Appin Road has also been included as part of the proposal based on the feedback and recommendations from OEH, independent expert reports and consideration of submissions raised by the community and key stakeholders (refer to Chapter 3 of this submissions report).

Associated or external projects

A total of 50 submissions (14% of issues raised) were made regarding associated or external projects to the proposal. This included comments regarding the Mount Gilead development, Link Road Corridor Study and the Appin Road Safety Improvements.

The proposed upgrade of Appin Road is being undertaken independently of the Mount Gilead development, Link Road Corridor Study and the Appin Road Safety Improvements and therefore issues relating to these are out of the scope of the proposal. Comments received related to the Appin Road Safety Improvements will be addressed in a separate submissions report.

Proposal alternatives / suggestions

A total of 47 submissions (13% of issues raised) were made providing suggestions and alternatives to the proposal. Issues raised included the adequacy of the alternatives/options assessment and requests for additional road/network upgrade options.

In response to issues raised on the adequacy of the alternatives/options assessment, social and environmental impacts of the various options for the proposal were considered within section 2.4 of the REF with the preferred option allowing for a reduced construction program and footprint and therefore minimise environmental and social impacts.

As described above, a number of alternatives and options were identified and considered in developing the proposal and selecting the preferred option. The request for upgrades of other portions of the road network and new roads is outside of the scope of the current proposal but have been noted by Roads and Maritime. The Department of Planning & Environment, Campbelltown Council, Wollondilly Council, Transport for NSW and Roads and Maritime are working together to develop a strategic road network plan to identify road upgrade funding priorities for the existing and future needs of the Greater Macarthur.

Traffic, transport and access

A total of 36 submissions (10% of issues raised) were made regarding traffic, transport and access impacts from the proposal. Issues raised included comments on the impact assessment approach, existing traffic arrangements and construction and operation impacts. A significant number of these submissions questioned the traffic impact assessment approach and comments that the proposal will not improve traffic flow along Appin Road.

The traffic estimations used in the traffic and transport assessment were based on survey data collected. The assessment included consideration of vehicles originating from the Mount Gilead subdivision and other road users. Vehicles originating from the Mount Gilead subdivision were estimated in accordance with the *Roads and Maritime Guidelines for Traffic Generating Developments* (Roads and Maritime, 2013). This was compared to the Roads and Maritime Strategic Traffic Forecasting Model (STFM) to estimate vehicle numbers for 2019, 2023, 2028 and 2031 scenarios.

The objective of the proposal is to improve the capacity and safety of the road for road users. The Appin Road Upgrade includes the duplication of Appin Road from two to four lanes between Fitzgibbon Lane to about 2.5 kilometres south of Copperfield Drive, which is currently single lane in each direction. The results of the traffic and transport assessment indicate that the proposed upgrade would maintain a satisfactory performance level during peak periods for the operational years modelled. This includes the two new intersections at the Mount Gilead subdivision, which would maintain a good level of service during peak hours for the forecasted years. Should further capacity in the road be required beyond this period, the proposal also includes an allowance to further upgrade Appin Road to six-lanes, where the centre median would be utilised to create two additional lanes.

Changes to the REF proposal

The REF proposal included the provision of a fauna fence and/or barriers at suitable locations on either side of Appin Road to prevent fauna accessing the road corridor. The proposed fauna fencing was predominantly focussed on the eastern side of Appin Road. However, the proposed change would result in the addition of about 252 metres of fauna fencing along the western side of Appin Road at Noorumba Reserve (refer to Figure ES-1).

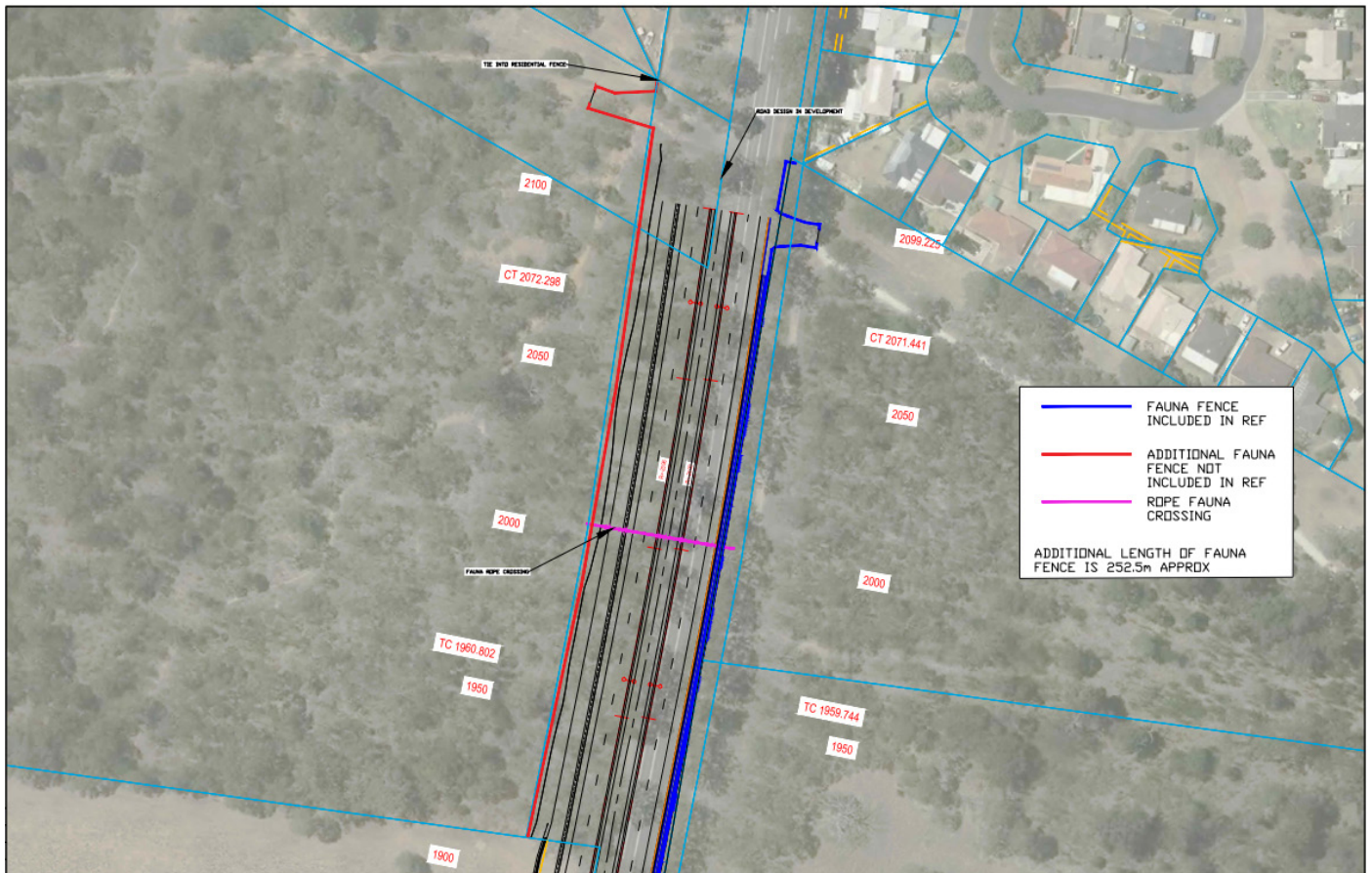


Figure ES-1: Additional fauna fencing along western side of Appin Road at Noorumba Reserve

The proposed change has been implemented based on the feedback and recommendations from OEH, independent expert reports and consideration of submissions raised by the community and key stakeholders.

As no additional vegetation clearing would be required beyond that proposed in the REF, the impacts of this change are consistent with those identified in the REF.

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1 Introduction and background

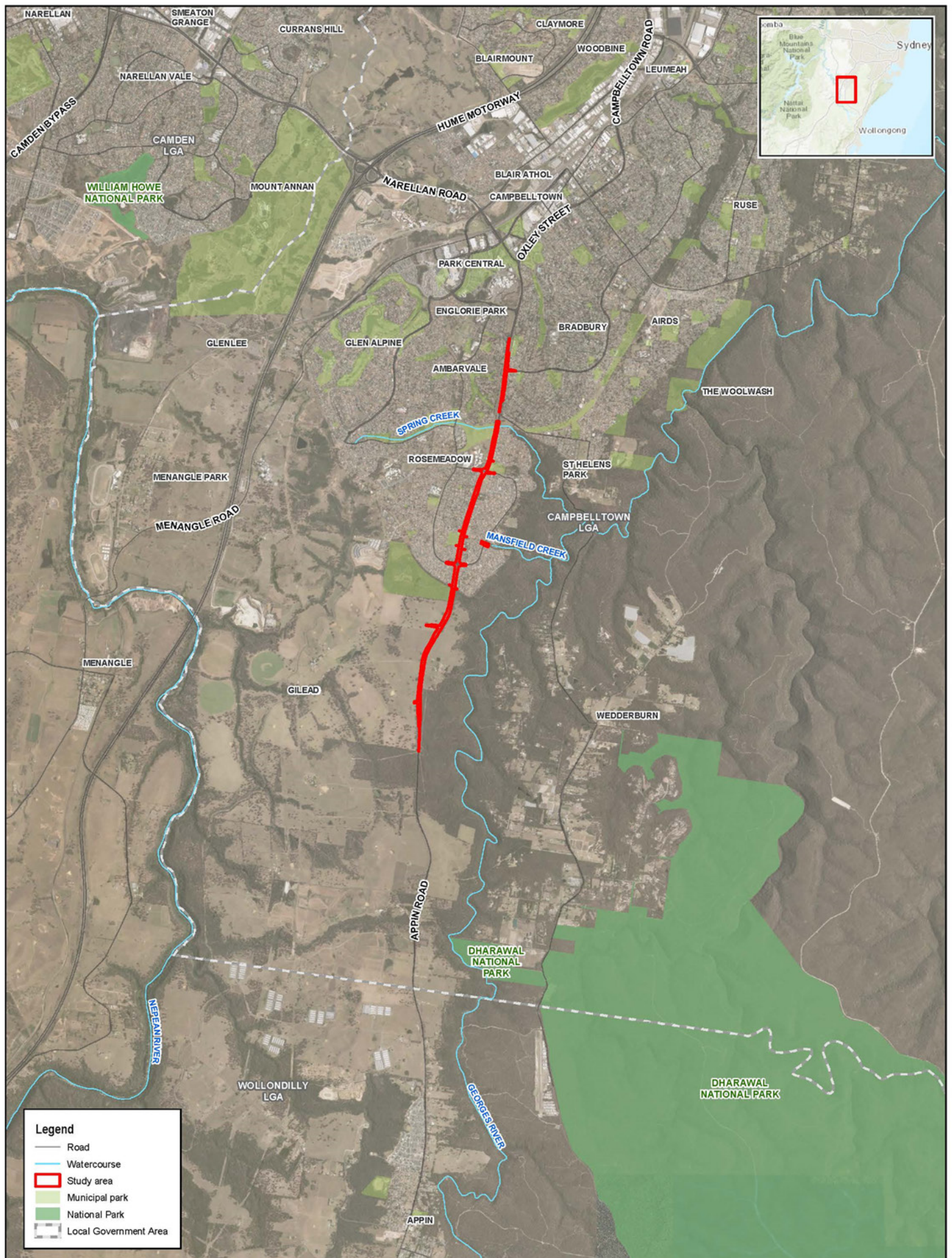
1.1 The proposal

Roads and Maritime Services NSW (Roads and Maritime) proposes the staged upgrade of Appin Road between Mount Gilead and Ambarvale. The proposal includes upgrading about 5.4 kilometres of Appin Road between a section of the road in Mount Gilead in the south and the intersection of St Johns Road, Ambarvale in the north. Figure 1-1 shows the proposal footprint in regional context and Figure 1-2 shows an overview of the key features of the proposal. Detailed figures can be found in section 1.1 of the REF.

The key features of the proposal would include:

- Establishment of temporary construction compounds required to build the proposal
- Duplicating the existing Appin Road carriageway from two to four lanes, between Fitzgibbon Lane to approximately 2.5 kilometres south of Copperfield Drive, Rosemeadow using the existing single carriageway for future southbound traffic only and building a two-lane northbound carriageway in the existing road corridor reservation to include provisions for the potential future widening to six lanes
- Upgrading the existing signalised intersection of St Johns Road and Appin Road, including building separated turning lanes
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- Adjustments to existing utilities including construction of a new underground utility corridor to the western side of Appin Road in order to relocate the existing services and accommodate any new services as required for the proposed subdivision at Mount Gilead
- Provision of fauna fencing to the southern extent of the Mount Gilead residential subdivision and rope fauna crossing(s) over Appin Road
- Noise mitigation measures.

A more detailed description of the proposal is found in the Appin Road Upgrade, Mount Gilead to Ambarvale Review of Environmental Factors prepared by Roads and Maritime in November 2018.



Map: 2113521_GIS_F021_A4

Author: orfanosm



0 660 1,320
m

Date: 24/09/2018

Approved by: -

Coordinate system: GDA 1994 MGA Zone 56

Scale ratio correct when printed at A3

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Appin Road, Mt Gilead, NSW

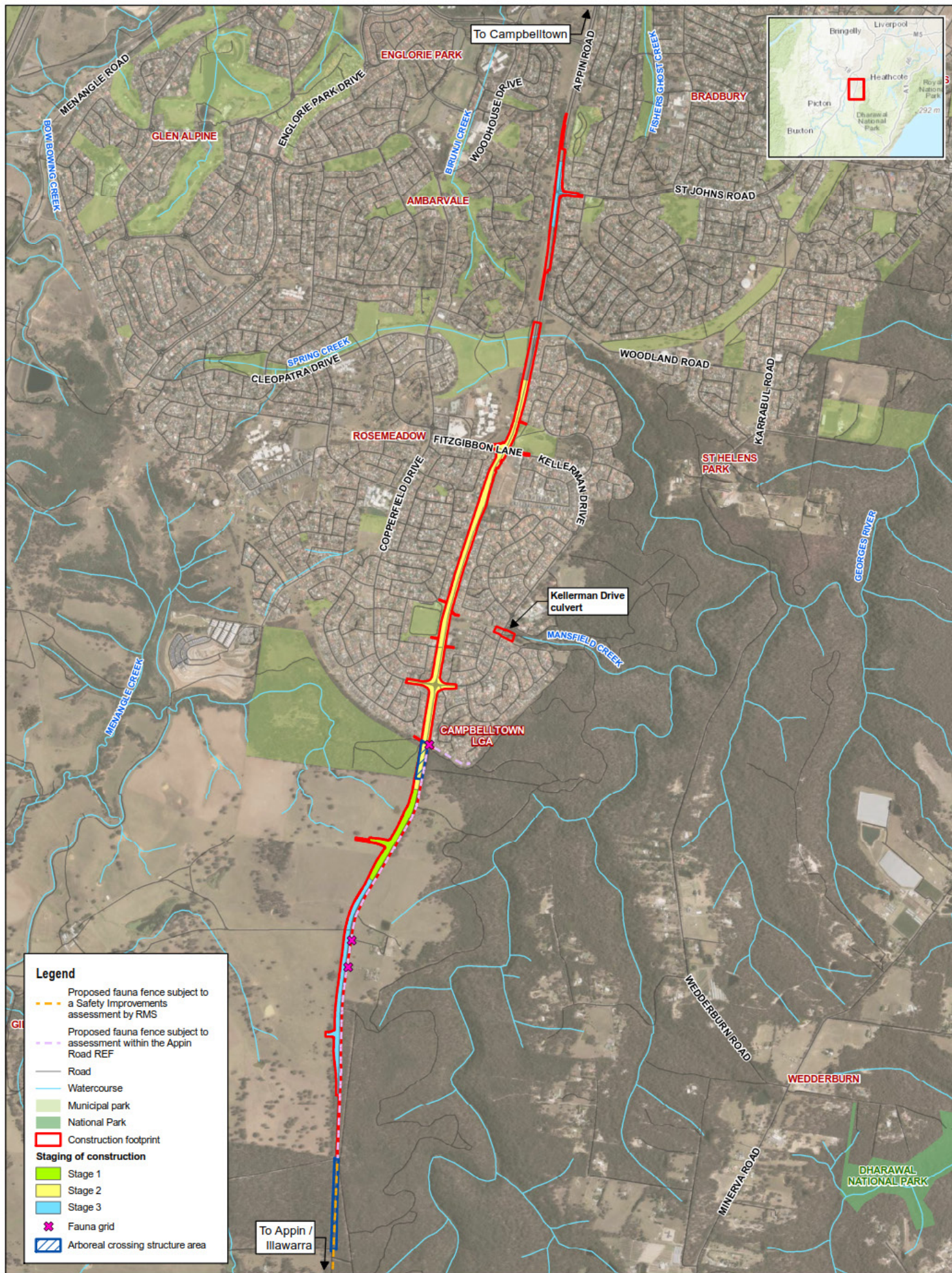


Lend Lease Communities

Appin Road, Mt Gilead, NSW

Figure 1.1
Location of the proposal

www.wsp.com



1.2 REF display

The Australian and NSW governments are funding two individual projects to improve Appin Road including the Appin Road Upgrade between Mount Gilead and Ambarvale and Appin Road Safety Improvements from Brian Road to Gilead. The Appin Road Upgrade would be funded by the NSW Government Housing Acceleration Fund and Lendlease to unlock new housing at Mt Gilead and improve safety and access for local residents and through traffic.

Lendlease worked with Roads and Maritime to prepare a concept design and review of environmental factors (REF) for the Appin Road Upgrade. Roads and Maritime prepared a strategic design and REF for the Appin Road Safety Improvements. Both REFs assessed the potential environmental impact of each project and outline measures to reduce impacts on biodiversity, heritage, noise, property and construction. While both projects involve modifications to Appin Road, they are two distinct projects requiring two separate environmental assessments and approval processes.

The REF for each project was publicly displayed for 26 days between 19 November and 14 December 2018 at four locations, as detailed in Table 1-1. The REFs were placed on the Roads and Maritime project website and made available for download. The display locations, website link and invitation to attend one of the three information sessions were advertised in the Macarthur Advertiser and Campbelltown-Macarthur Chronicle on Tuesday 13 November 2018.

In addition to the above public display, an invitation to comment and copy of the REF for the Appin Road Upgrade was sent directly to several identified stakeholders including relevant Government agencies, Campbelltown City Council and Wollondilly Shire Council.

In July and August 2017, a notification for the upgrade was delivered to landowners who may be affected by environmental investigations that were needed to complete the REF. The distribution zone focused on properties along Appin Road in Rosemeadow and St Helens Park, from Kellerman Drive in the north, towards Theseus Circuit in the south. A free call information line and project email address was promoted through the notification and website. Information about the proposal and environmental investigations, including the July 2017 notification, has been made available on the Roads and Maritime website.

Table 1-1: Display locations

Location	Address
Camden Council Civic Centre	Oxley St, Camden
Narellan Library	Corner Queen & Elyard Street, Narellan
Campbelltown Civic Centre	91 Queen St, Campbelltown
Wollondilly Shire Council	62-64 Menangle Street, Picton

1.3 Purpose of the report

This submissions report relates to the REF prepared for the Appin Road Upgrade, Mount Gilead to Ambarvale and should be read in conjunction with that document.

The REF was placed on public display and submissions relating to the proposal and the REF were received by Roads and Maritime. This submissions report summarises the issues raised and provides responses to each issue (Chapter 2). Since the preparation of the REF, additional fauna fencing is proposed along the western side of Appin Road at Noorumba Reserve (refer to section 3.1), however this minor change would not require the preparation of a preferred infrastructure report. After consideration of the issues raised in the public submissions, the environmental management measures for the proposal (refer to Chapter 7 of the REF) have been revised.

2 Response to issues

Roads and Maritime received 132 submissions for the proposed Appin Road Upgrade and Appin Road Safety Improvements, accepted up until the 19th December 2018. An additional two submissions for the Appin Road Upgrade submitted in January 2019 were also accepted.

Of the 132 submissions, 115 submissions referred to the proposed Appin Road Upgrade and have been addressed within this submissions report. Submissions received in regard to the proposed Appin Road Safety Improvements will be addressed in a separate submissions report. Appendix A lists the respondents and each respondent's allocated submission number. Appendix A also indicates where the issues from each submission have been addressed in Chapter 3 of this submissions report.

2.1 Overview of issues raised

A total of 115 submissions were received in response to the display of the REF. This included:

- 99 from the community
- Three submissions from utility providers
- Four submissions from Councils
- Seven submissions from community groups
- Two 'other'.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated and corresponding responses to the issues have been provided. Where similar issues have been raised in different submissions, only one response has been provided. The issues raised and Roads and Maritime response to these issues forms the basis of this chapter.

Of the submissions received, 3% support the project, 49% object to the project and 48% do not offer a position on the project.

2.1.1 Issues raised by Government agencies

Sydney Water

Sydney Water has existing and proposed assets within and near the subject area for this proposal. Sydney Water raised several points including that:

- Water and wastewater mains are to be replaced like for like, unless otherwise advised
- New mains are to be designed and constructed to WSA 03-2011-3.1 SW Edition-2012
- Water mains must not be located within the roads batter slope, either located at the toe or road shoulder
- Roads and Maritime must provide details of construction timings for road upgrade works for construction of the water mains from Copperfield Drive to the Mount Gilead site
- Sydney Water Group Property request confirmation on the alignment of the Appin Road widening proposal
- Amplification of the mains may be required to facilitate future growth along the development corridor. This will be assessed as adjustment applications are referred to Sydney Water for investigation
- Access will need to be retained throughout the life of the project

- Consideration in regards to staging & timing will need to be undertaken as part of the design work & delivery of the project, to allow for shutdown & reconnection of assets to ensure that services are maintained.

In their submission, Sydney Water outlined critical water assets that would be impacted by the proposal and states that they must be consulted in regards to plans for new water mains. They also highlight procedures Roads and Maritime must follow and standards to which construction on water mains must adhere.

WaterNSW

WaterNSW identified that the Appin Road Upgrade would not impact WaterNSW land or infrastructure.

Wollondilly Shire Council

Brian Road, which forms the southern end of the investigation area for the proposed Appin Road Safety Improvements, is within the Wollondilly Local Government Area (LGA). Issues raised in their submission include:

- Highlighting the need for continued safety improvements on Appin Road to be pursued independently from any development proposals
- Requests for information regarding the location of environmental offsets for impacts to Critically Endangered Ecological Communities of Cumberland Plain Woodland and Shale Sandstone Transition Forests to be made public
- Council requests a scope of measures for koala protection, including 'road furniture' or culverts
- Council requests information on the locations and proposed environmental offset strategies for the hollow bearing trees that will be removed, including hollows considered to be 'live'
- Assessment of potential salinity impacts should be further explored and potentially mitigated
- The relationship between the proposed upgrades and the planned growth in the Greater Macarthur area should be articulated.

South Western Sydney Local Health District

The proposed Appin Road upgrade falls within the South Western Sydney Local Health District. In their submission, South Western Sydney Local Health District recognised the influence the built environment has on health outcomes and highlighted the importance of including a safe pedestrian and cycling path along Appin Road from Mount Gilead to Rosemeadow and surrounding areas. They suggest the cycling infrastructure be an off-road cycleway or a shared path.

Campbelltown City Council

Campbelltown City Council drew attention to several issues in their submission, including:

- Appin Road should be designed as a four-lane road consistent with existing sections from Fitzgibbon Lane to Narellan Road and through traffic should be diverted via the future Spring Farm Parkway and Outer Sydney Orbital to free up capacity on Appin Road and Narellan Road
- Recommendation that the study area be reviewed and options to connect Appin Road to the M31 Hume Motorway be assessed

- Concerns regarding the traffic modelling, particularly that more growth was modelled than may be realistic, leading to larger intersections than may be required. Council recommends that transport modelling be updated to account for the Outer Sydney Orbital North South Rail Link, Greater MacArthur 2040 and Special Infrastructure Contributions
- Highlighted the absence of any bus priority or bus facilities. In the vicinity of the intersection of Appin Road to Kellerman / Copperfield Drive, bus stop provisions must be included
- Grade separation of the pedestrian phase should be considered at the intersection of Fitzgibbon Lane and Kellerman Drive
- Drainage works required on Appin Road and Kellerman Drive downstream of Oswald Reserve detention basin have not yet been agreed with Council
- Council has concerns that a breakdown lane will be affected by the St Johns Road Intersection
- Council highlights the lack of ecological road design solutions to minimize impacts on biodiversity values in the South Campbelltown area, including fauna over/underpasses.

Detailed assessment of the issues raised by Government or agencies and responses to those issues, can be found in Appendix B of this submissions report.

2.1.2 Issues raised by the public

Major concerns raised by the public involved the impact of road widening on biodiversity, the use of connectivity structures for local fauna and alternative suggestions. There were 50 submissions that raised issues out of the scope of this proposal, including the Mount Gilead development and the proposed Appin Road Safety Improvements south of this study area. There were several submissions that questioned the necessity of the proposed upgrades, the legitimacy of the traffic modelling, or the proposal's ability to meet the project objectives. There were also a number of submissions that raised issues regarding potential air quality impacts stemming from the proposal and the process of community and stakeholder consultation that was undertaken by Roads and Maritime during the REF display period. Details of the issues raised by the public can be found in sections 2.2 to 2.21 of this submissions report. A summary of the percentages of submissions raising key issues is provided in Figure 2-1.

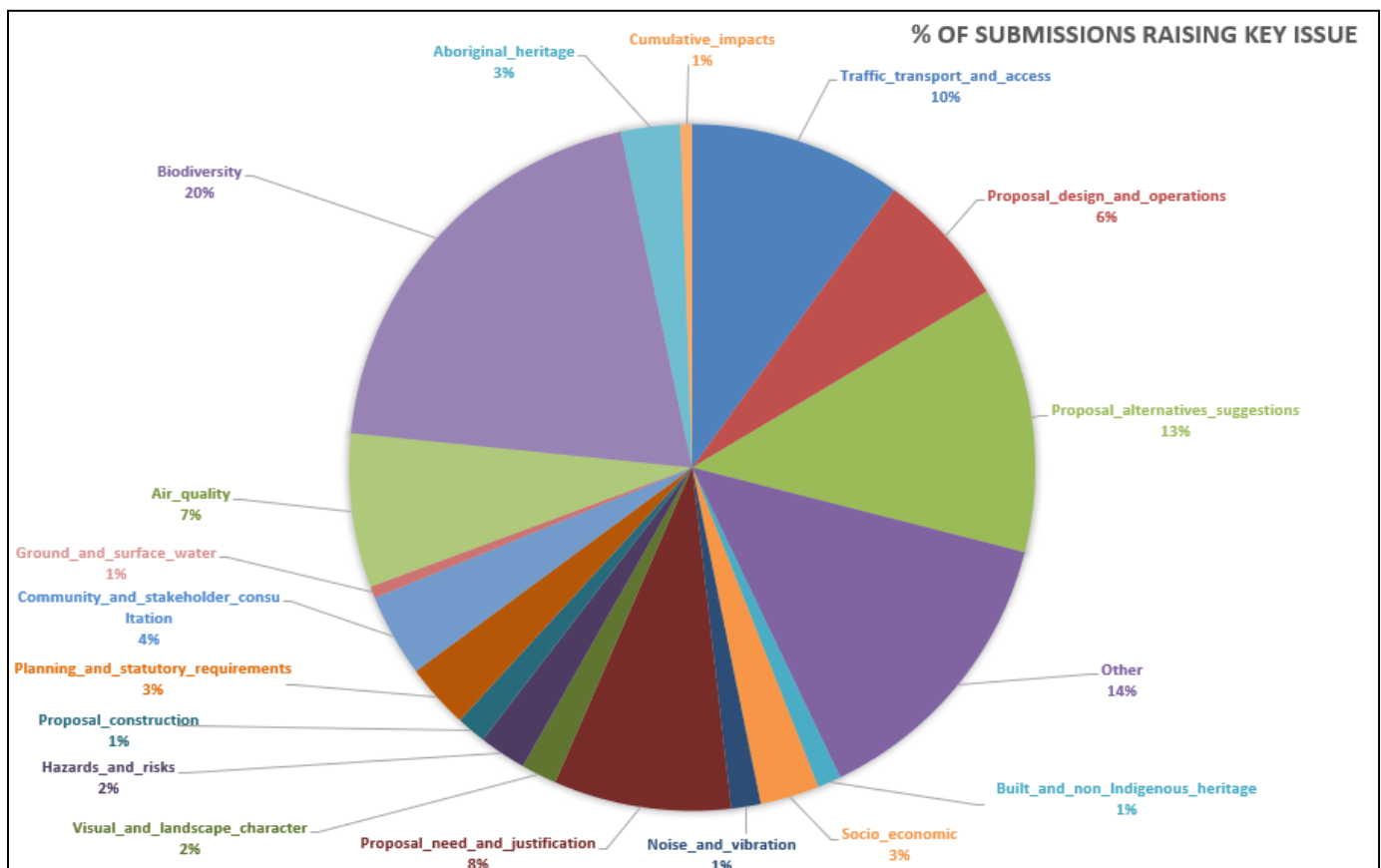


Figure 2-1: Percentage of submissions raising key issues

2.2 Planning and statutory requirements

2.2.1 Planning approval process

Submission number(s)

AS33, AS39, AS41

Issue description

- Suggests that there is a lack of planning and process.
- Suggests that an environmental impact statement (EIS) and referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is required
- A comment was made which argued that an EPBC Act referral should have been required for the Appin Road projects due to the loss in core koala habitat.

Response

The REF has been carried out in accordance with the provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000*. As the current proposal is for a road and is to be carried out on behalf of Roads and Maritime, it can be assessed under Division 5.1 of the EP&A Act. As Roads and Maritime is the relevant determining authority they are required to assess the activity under Part 5 of the EP&A Act. In particular, prior to granting an approval for such an activity, Roads and Maritime is obliged under section 5.5 of the EP&A Act to examine all matters that affect or are likely to affect the environment because of the activity.

The REF has examined and considered impacts affecting or likely to affect the environment from building and operating the proposal. As identified in section 8.3.1 of the REF, the proposal's impacts are not likely to be significant and therefore preparation of an EIS under Division 5.2 of the EP&A Act is not required. Section 6.1.3 of the REF, further identified that the proposal is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the *Biodiversity Conservation Act 2016*, *Fisheries Management Act 1994* and EPBC Act.

Roads and Maritime's road activities affecting nationally listed threatened species, endangered ecological communities and migratory species are the subject of a "strategic assessment" approval under the EPBC Act where those activities are captured under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*. Where the strategic assessment applies, Roads and Maritime is not required to refer REFs for road activities affecting nationally listed biodiversity matters to the Australian Government, subject to compliance with the terms of the strategic assessment approval. In accordance with the strategic assessment approval, Roads and Maritime is not required to lodge a referral for the proposal (refer to section 2.16.2 of this submissions report).

2.2.2 Adequacy of the REF documentation

Submission number(s)

AS10, AS28, AS38, AS39, AU58, AU60, AU62, AU66

Issue description

- Suggests that the REF does not adequately address environmental concerns with particular reference to heritage, traffic and air quality
- Suggests that the REF be withdrawn and resubmitted for public display due to environmental concerns not being adequately addressed.

Response

A range of technical studies were undertaken as part of the assessment of the proposal. These were included as appendices of the REF. Each of these technical studies provided a detailed scope and impact assessment of the proposal on Aboriginal heritage (Appendix G) and non-Aboriginal heritage (Appendix H). Traffic and air quality impacts are discussed in section 6.4 and section 6.11 with mitigation measures provided in section 7 of the REF.

Studies used current information (as current and available at the time of preparation) and included an assessment of the practical implications of the proposal on the existing environment.

The REF fulfils the requirements of Division 5.5 of the EP&A Act to 'take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity' and has been prepared in accordance with Clause 228 of the *Environmental Planning and Assessment Regulation 2000*.

2.3 Community and stakeholder consultation

2.3.1 Consultation during public exhibition of the REF

Submission number(s)

AU22, AS39, AS40, AS41, AU82

Issue description

- Comment that the maps used during public display were helpful
- Suggests that all the proposed upgrades to Appin Road should have been on display during the consultation session, rather than one section
- Comment that the community information session at Rosemeadow had the maps displayed in a separate room
- Comment that the Appin Road Upgrade project team at the consultation session had not heard of the proposed Georges River Parkway project
- Comment that the Appin Road Upgrade project team at the consultation session were not aware of the locations of concrete barriers
- Comment that the aerial imagery provided in the interactive portal on the Roads and Maritime website is out of date.

Response

Roads and Maritime acknowledges feedback provided by respondents. Roads and Maritime is committed to continuous improvement and welcomes feedback to help improve communication with the community and other stakeholders. Feedback can be provided via the Roads and Maritime website <https://www.rms.nsw.gov.au/contact-us>, the project email address appinroadupgrade@rms.nsw.gov.au or phone number 1800 411 588.

2.3.2 General concern regarding the project team's engagement with the community

Submission number(s)

AU15, AS09, AS39, AU64, AU66, AU81, AU82

Issue description

- Comment that the community should have been informed earlier about the proposal.
- Comment that the timing of releasing documents for public comment was at an inconvenient time and the duration of public display was too short
- Comment that the feedback provided be considered seriously
- Comment that the proposal does not reflect the concerns raised by the community
- Comment that 7-Eleven or its patrons were unaware of the proposed median on Kellerman Drive.

Response

A detailed overview of the consultation activities that Roads and Maritime undertook for the proposal both before and during the preparation of the REF was provided in Chapter 5 of the REF. As outlined in section 5.2 of the REF, communication and consultation with the community for the proposal has been undertaken since July 2017 via notifications and the Roads and Maritime website. Roads and Maritime also informed the community of the consultation period via a community update distributed to around 7,000 households, advertisements in the local newspapers, media releases and announcements, by door knocking and the distribution of email updates to community members who have signed up to the project database.

The REF was publicly displayed for 26 days between 19 and 14 December 2018 at four locations (refer to Table 1-1) and placed on the Roads and Maritime project website. However, late submissions were received and accepted until 19 December 2018 as well as two additional submissions in January 2019. Roads and Maritime considers that the timing and duration of the display of the REF to be sufficient for the public to comment on the proposal.

Roads and Maritime is committed to community and stakeholder engagement beyond the planning phase and will continue consultation through detailed design, construction and operation of the project.

2.3.3 Requests for further consultation

Submission number(s)

AU06, AU46, AS15, AU82

Issue description

- Request for additional consultation regarding the proposal
- Suggests that Roads and Maritime consult with other government agencies (e.g. OEH, Forestry Corporation of NSW, local governments and Department of Energy and Environment) and community interest groups such as the Total Environment Centre, International Fund for Animal Welfare and Georges River Environmental Alliance.

Response

As identified in section 5.5 of the REF, various government agencies and stakeholders have been consulted about the proposal including:

- Department of Planning and Environment
- NSW Office of Environment and Heritage (OEH)
- Transport for NSW
- Campbelltown City Council
- NSW Rural Fire Service
- Service providers.

Roads and Maritime have worked with these agencies through the preparation of the concept design, REF and specialist reports including actively participating in proposal workshops and technical reviews.

Roads and Maritime is committed to community and stakeholder engagement during and beyond the planning phase and will continue consultation through detailed design, construction and operation phases of the project.

Opportunities to work with other government agencies and community interest groups throughout these phases will be explored.

2.3.4 Requests for information from Roads and Maritime

Submission number(s)

AU06, AS06

Issue description

- Questions who will be responsible for the maintenance of the noise wall due to potential vandalism
- Request for construction plans for the Kellerman Drive and Fitzgibbon Lane intersection.

Response

The noise wall will be maintained by Roads and Maritime and/or Campbelltown City Council during operation of the proposal with confirmation of the ultimate ownership and maintenance to be determined during detailed design. This will include ongoing inspections which are required to ensure that graffiti is removed promptly (to discourage further graffiti) and to ascertain that structural and acoustic integrity are maintained. The design of the noise wall will be further refined in detailed design to explore options such as anti-graffiti protective treatment, and other measures to minimise construction and maintenance costs and reduce the risk of graffiti.

The current design shows adjustments to the access and exits of the 7-Eleven site due to the additional lanes introduced on Appin Road and upgraded intersection at Kellerman Drive and Fitzgibbon Lane. The changes to the existing arrangements are driven by safety, in particular sight distance issues for eastbound traffic on Kellerman Drive being the requirement as per Austroads *Guide to Road Design Part 4a Unsignalised and Signalised Intersection*. Construction plans have been provided as per the request and consultation on the final design will continue in conjunction with Roads and Maritime, Campbelltown City Council and landowners.

2.4 Proposal need and justification

2.4.1 Adequacy of existing road network

Submission number(s)

AU35, AS33, AS37, AS38, AS39, AS41, AU51, AU52, AU56, AU58, AU60, AU61, AU62, AU63, AU64, AU66, AU67

Issue description

- Questions the need for the proposal
- Suggests that Appin Road is adequate or only requires minor modifications to cater for the current population of the area
- Suggests that intersection upgrades are unnecessary and/or will not reduce congestion
- Comment that upgrading Appin Road between Mount Gilead and Ambarvale will not alleviate congestion on the entire road
- Comment that bottlenecks will continue to occur as people access the shopping precincts.

Response

As detailed in section 2.1 of the REF, Appin Road is currently used by an average of 10,000 vehicles per day and safety issues have been raised regarding the relatively high volume of traffic on the road. Roads and Maritime completed a safety review of Appin Road in 2014 and recommended that a number of upgrades be done on the road. Improvements to Appin Road are also required to increase the capacity of the road, to cater for the predicted additional traffic from increased housing. The proposed upgrade to Appin Road is required to reduce congestion, improve the safety of Appin Road, provide road connection for new homes within Mount Gilead, provide additional capacity for future land releases and enable the efficient delivery of additional lanes to Appin Road to cater for future demands, if required (and subject to further assessment).

The proposal includes upgrading the existing intersection of St Johns Road and Appin Road, including building separated turning lanes, upgrading the intersection of Fitzgibbon Lane and Kellerman Drive, upgrading the roundabout intersection of Copperfield Drive and Kellerman Drive to a signalised intersection and constructing two new intersections for access to the proposed Mount Gilead residential subdivision. Section 2.5 of the REF outlines the preferred option and summarises the basis of selection. These key upgrades were identified from the outcomes of the *Traffic, Transport and Access Study for Mount Gilead* (Parsons Brinckerhoff, 2014) and subsequent traffic modelling (Cardno, 2016) of the intersections using a population forecast from Bureau of Statistics and Analytics.

The proposed Appin Road upgrades are intended to improve the safety of Appin Road and increase the road capacity to allow future growth in the Greater Macarthur Growth Area. This proposal is being undertaken independently of other road upgrades and developments in the area. For more information on upgrades to other sections of Appin Road please visit: <https://www.rms.nsw.gov.au/projects/sydney-west/appin-road/index.html>.

Shopping precincts identified in the socio-economic impact assessment report include Bradbury Shopping Village, Rosemeadow Marketplace and Macarthur Shopping Centre. The proposal involves upgrading the intersection of St. John's Road and Appin Road to include separated turning lanes, which will ease access to and from Bradbury Shopping Village. Similarly, the proposal involves upgrading the intersection of Fitzgibbon Lane and Kellerman Drive, which will also ease access to and from Rosemeadow Marketplace. Intersections servicing Macarthur Shopping Centre are out of the scope of this proposal.

2.4.2 Benefits of the project

Submission number(s)

AU35, AU69

Issue description

- Questions the benefits provided by the proposed road upgrades
- Suggests that the intersection upgrades do not address the needs of Appin residents
- Suggests that the upgrades are not suitable for the area or for commuters.

Response

Roads and Maritime completed a safety review of Appin Road in 2014 and a number of safety issues were identified, including the width of existing lanes and shoulders of the road at several locations. Upgrading Appin Road was recommended to address the safety issues and improve the safety of the road for local users. These recommendations took into consideration the forecasted population growth and land release areas outlined in the *Greater Macarthur 2040 Plan* (Department of Planning and Environment, 2017), *A Plan for Growing Sydney* (Department of Planning and Environment, 2014) and the *Western Sydney*

District Plan (Greater Sydney Commission, 2018). Improving the capacity of Appin Road is proposed to improve vehicle movements on Appin Road for local users considering future traffic modelling.

Section 2.4 of the REF outlines the options development for this proposal, which considered the *Traffic, Transport and Access Study* (Parsons Brinckerhoff, 2014) and subsequent traffic modelling (Cardno, 2016) that assessed traffic conditions for Appin Road and identified mitigation measures which included upgrades to several intersections along Appin Road. These intersection upgrades were recommended to accommodate the future increase in traffic.

2.4.3 Other general comments

Submission number(s)

AU35, AU49, AS10, AS33, AS36, AS38, AS46, AU50, AU51, AU52, AU54, AU56, AU58, AU60, AU62, AU64, AU66, AU67, AU69, AU75, AU76, AU77, AU78, AU79

Issue description

- Comments that the proposal is a result of, or will primarily benefit, development approvals
- Suggests that the upgrades are not intended to alleviate issues with Appin Road
- Comments that road upgrades are not proposed for the more dangerous stretches of Appin Road
- Suggests that the proposal is not in the public interest
- Suggests that a less impactful option be developed.

Response

In 2014, Roads and Maritime completed a safety review of a section of Appin Road, which included part of the proposal location (Roads and Maritime, 2014). This proposal was developed in anticipation of future population and traffic increases and considering the outcomes of the safety review which recommended several upgrades. This safety review and the *Traffic, Transport and Access Study* (Parsons Brinckerhoff, 2014) informed a strategic design prepared by J. Wyndham Prince in 2015. Subsequent traffic modelling (Cardno, 2016) identified that to improve safety along Appin Road, considering future growth in the area, road widening and upgraded intersections was required.

A number of alternatives and options were identified and considered in developing the proposal and selecting the preferred option. Options considered are outlined in Table 2-3 of the REF and comparison of the options is outlined in Table 2-4 of the REF. The preferred option was selected based on its ability to deliver road network improvements, reduce congestion, improve traffic flow, maintain safety, be future-proofed for six lanes and considering the environmental and social impacts generated during construction and operation.

The proposed Appin Road upgrades are intended to improve the safety of Appin Road and increase the road capacity to allow future growth in the Greater Macarthur Growth Area. This proposal is being undertaken independently of other road upgrades. For more information on upgrades to other sections of Appin Road please visit <https://www.rms.nsw.gov.au/projects/sydney-west/appin-road/index.html>.

2.4.4 Ability to meet project objectives

Submission number(s)

AS28, AS33

Issue description

- Suggests that the proposal will be unable to improve the safety of the road users
- Suggests that the proposal is unable to provide long-term benefits to the local and regional community and economy.

Response

The Appin Road Upgrade proposal is proposed to alleviate current safety issues and future capacity issues that have been identified in a Roads and Maritime safety audit (2014), the *Traffic, Transport and Access Study* (Parsons Brinckerhoff, 2014) and traffic modelling (Cardno, 2016). The socio-economic assessment prepared for the proposal determined that the proposal would likely benefit the local and regional economy and was unlikely to impact upon the socio-economic profile of the area. Details of the potential socio-economic impacts of the proposal can be found in section 6.9.3 of the REF.

2.5 Proposal alternatives / suggestions

2.5.1 Adequacy of alternatives / options assessment

Submission number(s)

AU43, AU46, AS05, AS28, AS39, AS41

Issue description

- Requests an environmental analysis of the alternative options be undertaken to ensure the best options has minimal impact
- Suggests that a mode alternative analysis has not been considered in the proposal
- Suggests that traffic dwell time be considered in the options assessment to inform the cost of the options
- Suggests that lowering the speed limit and introducing speed cameras along Appin Road will be a better option to improve road safety
- Suggests that Appin Road be placed in an underground tunnel.

Response

As identified in Table 2-4 of the REF, social and environmental impacts of the various options for the upgrade of Appin Road have been considered with the preferred option allowing for a reduced construction program and footprint and therefore minimise environmental and social impacts.

The objective of the project is to develop a proposal to upgrade a section of Appin Road to a required standard to accommodate the assessed vehicular traffic generation of the proposed Mount Gilead residential development. This included a rigorous options selection process with investigation, consideration and analysis of various alternatives. The proposal has been developed to properly cater for alternative modes including general traffic, freight and active transport as required.

Thorough investigations, traffic modelling analysis of dwell time and economic appraisal of alternative design options enabled development of an optimum design solution. Features of the proposal such as; road widening, two new traffic signal controlled intersections and upgrades to three existing intersections will increase the level of service of the upgraded section of Appin Road and improve traffic flow and operational efficiency as a result decreased congestion and reduced delay or dwell time especially at intersections, as identified in section 6.4.3 of the REF.

While lowering the speed limit and introducing speed cameras have been shown to improve safety, it would not fulfil the proposal objectives to reduce congestion and improve travel times along Appin Road as identified in section 2.3.1 of the REF.

With respect to the suggestion that Appin Road be placed in to an underground tunnel, this option would have significant costs and environmental and social impacts that are associated with tunnelling. Tunnelling is predominantly considered where there are limitations to widening the existing road corridor and require significant amounts of property acquisition. Given that tunnelling is not consistent with the objectives of the proposal and would have implications for property access it is not considered a feasible alternative and out of the scope of the proposal.

2.5.2 Request for additional road / network upgrade options

Submission number(s)

AU03, AU26, AU28, AU33, AU35, AU36, AU39, AU40, AS01, AS03, AS04, AS08, AS10, AS19, AS20, AS21, AS23, AS24, AS25, AS26, AS29, AS33, AS34, AS35, AS36, AS37, AS38, AS39, AS41, AS45, AS46, AU50, AU54, AU58, AU60, AU61, AU62, AU63, AU64, AU66, AU67, AU69

Issue description

- Requests the upgrade of the entire length of Appin Road
- Suggests that the upgrades for Appin Road be extended to the shopping precinct at Appin
- Request for Appin Road to become a dual carriageway from Campbelltown to Brian Road
- Requests that Kennedy Street should be extended behind Appin Park Reserve and to Market Street
- Requests provisions be made to further widen Appin Road to a six or eight lane arrangement
- Requests an alternate road connecting from Appin Road to the Hume Highway (M31)
- Suggests that a bypass of Appin is required
- Request for a road linking Picton Road to Hume Highway (M31)
- Comment that there is a lack of public transport in the area
- Comment that the buses that run along Appin Road are infrequent
- Request for a rail line between Macarthur and Wollongong.

Response

As presented in section 2.4 of the REF, a number of alternatives and options were identified and considered in developing the proposal and selecting the preferred option. The request for upgrades of other portions of the road network and new roads is considered outside of the scope of the current proposal but have been noted by Roads and Maritime. The Department of Planning & Environment, Campbelltown Council, Wollondilly Council, Transport for NSW and Roads and Maritime are working together to develop a

strategic road network plan to identify road upgrade funding priorities for the existing and future needs of the Greater Macarthur land release precincts.

The Appin Road Upgrade proposal has been designed to future proof for a six-lane arrangement. The current proposal footprint allows for widening from the proposed four-lanes to an ultimate six-lane carriageway. Provisions are being made on the location of the utilities, traffic signals, retaining walls, noise walls and fauna fencing.

Public transport is being considered as a key action within the *Greater Macarthur 2040: An interim plan for the Greater Macarthur Growth Area* and includes collaboration with Transport for NSW and Department of Planning and Environment on business cases for public transport and road improvements. The broader transport planning across Sydney is being considered as part of Transport for NSW's Future Transport Strategy which sets out a vision, strategic directions and customer outcomes, with infrastructure and services plans for Greater Sydney and Regional NSW. The strategy will guide transport investment over the longer term. More information on the Future Transport Strategy is available on the Future Transport website at <http://future.transport.nsw.gov.au/>.

2.6 Proposal design and operations

2.6.1 Pedestrian and cyclist facilities

Submission number(s)

AU05

Issue description

- Request for a shared path along the length of Appin Road between Appin and Campbelltown.

Response

As identified in section 6.4.3 of the REF, the proposal includes a 2.5 metre shoulder on the northbound carriageway of Appin Road to facilitate a connection with the existing road network for cyclists. This is an improvement to the existing road environment, which requires cyclists to use trafficable lanes, increasing the safety of the road environment for all users. The proposal also includes a 4.5-metre wide verge on the northbound carriageway, south of Fitzgibbon Lane, to allow for a potential future shared path.

2.6.2 Landscaping and public domain

Submission number(s)

AU53

Issue description

- Comments whether the trees on the eastern side of Appin Road would be removed
- Comments whether there will be any replanting for the proposal.

Response

Partial vegetation removal would be required along the eastern side of Appin Road between St Johns Road and Kellerman Drive for the intersection upgrades and portions south of Kellerman Drive for the road widening (refer to Figure 6-1 to Figure 6-4 of the REF).

As identified in section 6.8.4 of the REF, an urban design strategy and plan (refer to Appendix I of the REF) will be implemented to restore disturbed areas with appropriate landscaping treatment and native plantings. The primary objective of the strategy is to provide an attractive semi urban road with scattered tree canopy with planted highlights. It is noted that the opportunity for tree planting is restricted. Where tree planting within the road corridor is not possible, there may be opportunities to negotiate plantings within adjacent properties to mitigate impacts.

2.6.3 Speed limits

Submission number(s)

AU01, AS05

Issue description

- Suggests that Kellerman Drive be speed limited to 50 kilometres per hour
- Comment that the speed limits will be dropped too low.

Response

The proposal will reduce the posted speed limit to 50 kilometres per hour on the approaches to the Fitzgibbon Lane and Kellerman Drive intersection.

During construction of the proposal there will be a road work speed limit in place. However, during operation Appin Road would operate between 70-80 kilometres per hour at the proposal location, reducing to 50 kilometres per hour in residential areas in accordance with the NSW Speed Zoning Guidelines for local urban areas.

2.6.4 Other structures/facilities

Submission number(s)

AS04, AS12, AS30, AS39, AU53

Issue description

- Comment that roundabouts should not be replaced by traffic lights as they impede traffic flow
- Question whether the verge area on Appin Road between Fitzgibbon Lane and Kellerman Drive is a breakdown lane
- Comment on whether there would be any protection for properties backing on to Appin Road
- Comment on the maintenance of the area between the noise wall and property fences
- Comment that the REF does not show the location of the dam for drainage of Area 1 in section 2.2.2 of the REF. Suggests that that these dams will be dewatered and filled in as part of the Mount Gilead development
- Comment on the proposed noise walls regarding height and distance to property fences.

Response

The proposed traffic signals at the Copperfield Road/Appin Road/Kellerman Drive intersection will have signal phasing and durations for optimal traffic flows. Roads and Maritime continuously monitors the traffic flow on the road network and makes regular adjustments to the traffic signal phasing, where necessary, to improve journey time reliability.

The verge area on Appin Road between Fitzgibbon Lane and Kellerman Drive is required to accommodate a number of new and relocated utilities. This area is also a future provision for a shared pedestrian/cyclist path. In addition, noise mitigations (i.e. noise walls) are proposed between the Copperfield Road and Fitzgibbon Lane intersection which would be implemented in accordance with the *Roads and Maritime Noise Mitigation Guideline*.

The inclusion of noise walls would provide some protection for properties that back on to Appin Road. Additional safety measures required for property protection will be determined during detailed design.

All the existing vegetation within the road corridor will be removed and appropriate landscape measures will be implemented to take into consideration safety, maintenance and operation. The area between the noise wall and property fence would be maintained by Roads and Maritime.

Figure 6-9 in the REF shows the drainage outfall location for Area 1. As identified in section 6.3.2 of the REF, surface water will be collected in swales, crossing the road from the southbound side via the culvert and discharging to a farm dam to the west of Appin Road. The dam will be maintained during operation for the purposes of stormwater outfall.

As per section 6.5 of the REF, noise mitigation measures will be required along the eastern and western side of Appin Road. The measures will be a combination of noise walls with a maximum height of 3.5 m and at property mitigations which would be determined during the detailed design in accordance with the *Roads and Maritime Noise Mitigation Guideline*.

2.6.5 Road configuration – Appin Road

Submission number(s)

AU05, AS07

Issue description

- Comment that the Gilead entrance could provide an alternate entrance toward the Dharawal National Park to improve access for national park users
- Comment whether a parking/service lane would be provided on the west side of Appin Road between Copperfield Drive and Kellerman Drive.

Response

The request for the alternate entrance to the Dharawal National Park is beyond the scope of the Appin Road Upgrade.

Providing parking facilities on the western side of the road corridor will trigger operational issues and major safety issues on the proposed 80 km/h dual carriageway. Campbelltown City Council has implemented some measures at this location to discourage parking and improve safety concerns.

2.6.6 Road configuration – Kellerman Drive

Submission number(s)

AU01, AU04, AS06, AU82

Issue description

- Request to install additional speed calming devices such as speed humps and chicanes similar to those in Copperfield Drive on Kellerman Drive
- Comment that traffic turning right from Kellerman Drive onto Appin Road are not given sufficient green light allowance considering pedestrian and oncoming traffic. Suggests a green turn right light should be provided for this traffic
- Comment that it is confusing for vehicles turning right from Kellerman Drive, onto Appin Road. Most times, people are confused whether they need to give way to vehicles turning left from Fitzgibbons lane onto Appin Road
- Comment whether Kellerman Drive would be widened
- Comment that minor road widening on both sides of Kellerman Drive adjacent to the intersection of Appin Road, would improve the safety and functionality of Kellerman Drive without closing the right in/right out access to 7-Eleven.

Response

As noted in section 2.6.3 of this submissions report, the proposal will reduce the posted speed limit to 50 kilometres per hour Fitzgibbon Lane and Kellerman Drive on the approaches to the intersection with Appin Road. The request for speed calming devices on Kellerman Drive is out of the scope of the Appin Road Upgrade and is within Campbelltown City Council's jurisdiction.

The upgraded intersection of Kellerman Drive will provide a dedicated right turning lane on to Appin Road including a dedicated right turn signal.

The current design shows adjustments to the access and exits of the 7-Eleven site which includes some road widening on Kellerman Drive. Consultation on the final design will continue in conjunction with Roads and Maritime, Campbelltown City Council and landowners, particularly noting it is within Campbelltown City Council's jurisdiction and any impact on the Appin Road intersection will require Roads and Maritime input.

2.6.7 Emergency management

Submission number(s)

AU28, AS23, AS33, AS34, AS37, AS38, AU56, AU66

Issue description

- Comment that in the event of an accident significant congestion occurs on Appin Road and results in extended travel times for emergency services to respond.

Response

As noted in section 6.9.4 of the REF, access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.

During operation of the proposal, the additional lanes and shoulder lanes would improve the ability of emergency services to travel along Appin Road in the event of an emergency.

2.7 Proposal construction

2.7.1 Construction methodology

Submission number(s)

AS30

Issue description

- Queries the process for the removal of vegetation along Appin Road and associated safety issues.

Response

Vegetation removal required for the road upgrade will be undertaken with appropriate landscape measures to take into consideration safety, maintenance and operation. A tree clearing protocol will be developed as part of the Construction Environmental Management Plan for the Appin Road Upgrade proposal.

2.7.2 Construction program and staging

Submission number(s)

AS03, AS05, AS28, AU72

Issue description

- Objects to a staged construction period and requests a consolidated program of works
- Requests information on whether noise walls will be installed before road works or on completion
- Suggests the road be built as a dual carriageway as traffic would be unimpeded as the extra road is built
- Suggests the upgrades be delayed to coincide with the Link Road Corridor Study between Appin Road and Menangle Road and the Spring Farm Parkway and develop an integrated transport strategy.

Response

A detailed construction plan would be prepared once the proposal's design is finalised. The actual construction work method may vary from the indicative method provided section 3.3 of the REF. Roads and Maritime anticipates the proposal would be built over a period of approximately four years, which is subject to project funding. As stated in section 3.3.2 of the REF, continuous construction cannot be guaranteed as it would respond to funding, land purchase and uptake. The construction program would also be affected by the need to coordinate with utility and services providers, property owners, developers and businesses.

Due to design constraints and construction staging requirements it may not be possible to install all noise walls required for the proposal prior to roadworks. However, where possible, noise walls are planned to be installed as soon as possible during the construction phase.

The proposed road upgrades involve the creation of a dual carriageway. This proposal has been designed to allow the existing Appin Road to remain operational during construction, with work to be undertaken behind safety barriers.

The Appin Road upgrades have been proposed to address current safety issues, as well as future increases in vehicle movements on the road. Traffic modelling (Cardno, 2017) identifies that upgrades are required for Appin Road to accommodate for the forecasted traffic demand outlined in section 6.4.2 of the REF.

The Link Road Corridor Study and Spring Farm Parkway projects are separate to the Appin Road Upgrade and out of the current scope. However, is currently being investigated by Roads and Maritime.

2.7.3 Construction work hours

Submission number(s)

AU72

Issue description

- Requests information on whether noise walls will be installed at night.

Response

As stated in section 3.3.2 of the REF, some construction activities are likely to be required to be undertaken outside of the standard working hours in order to minimise disruption to peak hour traffic and public transport operation, maintain property and pedestrian access during the day and provide a safe working environment for construction workers. Noise wall construction is not identified as an activity that must be undertaken outside of standard working hours, however details on the measures that will be taken prior to work outside of standard working hours are detailed in section 3.3.2 and section 7.3 of the REF.

2.8 Traffic, transport and access

2.8.1 Existing traffic arrangements

Submission number(s)

AU01

Issue description

- Requests the proposal prevents right turn movements for east bound traffic from Kellerman Drive into the service station on Appin Road due to safety concerns with the existing arrangement
- Suggests that the width of Kellerman Drive is too narrow to allow west bound vehicles to turn into the service station.

Response

The proposal includes modification of Kellerman Drive as part of the upgrade of the intersection with Appin Road and Fitzgibbon Lane.

The design of the upgrade does not allow for right turn movements into the service station for vehicles travelling eastbound on Kellerman Drive. Left turn movements into the service station for westbound vehicles travelling on Kellerman Drive would be maintained.

However, access to the service station is being investigated further during detailed design of the project, including the potential provision of a right turn lane into the service station for eastbound traffic. An assessment of the potential right turn lane would be undertaken to confirm it meets the minimum safety requirements.

Access to the service existing driveway on Appin Road would be maintained for the proposal, with entry and exit from the service station via left in left out movements only.

2.8.2 Construction traffic impacts

Submission number(s)

AS05

Issue description

- Raises concern over the impact on traffic during construction due to existing traffic delays.

Response

Impacts to traffic during construction of the proposal were assessed in the Construction Traffic and Transport Assessment Report (WSP 2017c) and Traffic Modelling Study (Cardno 2017) and detailed in section 6.4.3 of the REF. It is noted that the proposal includes duplication of Appin Road on the western side, with operation of the existing road maintained during the majority of construction to minimise impacts to traffic.

The proposal would require the use temporary intersection layouts during construction which would cause traffic delays. However, the results of the traffic assessment indicate that the existing level of service (LoS) would be maintained at the majority of intersections during peak construction times. Overall minimal impact to traffic was predicated for construction of the proposal.

The upgrade of Appin Road would significantly reduce the travel time of all vehicles in peak periods compared to the existing case if no upgrades were to occur, providing long term benefit for road users.

2.8.3 Operational impacts to property access

Submission number(s)

AU28

Issue description

- Queried proposed access to the Mount Gilead subdivision and whether vehicles entering Appin Road could travel south.

Response

The proposal includes construction of two new intersections for access to the proposed Mount Gilead subdivision. The new intersections would comprise three-way signalised intersections facilitating left and right turns onto Appin Road for vehicles travelling northbound and southbound.

Dedicated turning lanes on Appin Road would facilitate vehicles entering the Mount Gilead subdivision for both northbound and southbound vehicles on Appin Road.

Section 3.2.4 of the REF describes the details of the intersection and proposed access to the Mount Gilead subdivision in more detail.

2.8.4 Operational parking impacts

Submission number(s)

AU33, AS40

Issue description

- Commented that there is not enough parking at schools or local shops
- Potential impact on local shops due to the absence of, or unsafe, parking arrangements.

Response

Some access to businesses along Appin Road and Kellerman Drive would be temporarily impacted during construction of the proposal, including the temporary removal of the existing informal parking on the western side of Appin Road. However, existing access and parking arrangements would be maintained during operation of the project, including informal parking on the duplicated sections of road. All reinstated parking would meet the requirements of Roads and Maritime safety guidelines.

The improvement of access and parking at local schools and shops outside of the proposal footprint is outside the scope of the proposal, however Roads and Maritime will forward the query to Campbelltown City Council for consideration.

2.8.5 Operational traffic impacts

Submission number(s)

AU23, AU28, AU30, AU33, AU38, AU39, AU47, AU49, AS01, AS04, AS23, AS24, AS25, AS36, AS39, AS46, AU50, AU51, AU52, AU54, AU56, AU58, AU60, AU61, AU62, AU64, AU66, AU67, AU69

Issue description

- Comment that there is already traffic congestion on Appin Road
- Comment that the proposal will result in congestion at the new intersections for the Mount Gilead Subdivision
- Suggestion that the proposal will cause congestion along Appin Road, outside of the proposal footprint
- Comment that the proposal will not improve traffic flow or will result in more congestion
- The proposal will not cater for the additional vehicles to be generated by the Mount Gilead subdivision
- The proposal already includes dual carriageway
- The proposal will not improve traffic flow in Appin
- Queried the validity of the traffic estimations used in traffic assessment, if based on 2014 data
- The proposal will increase traffic hazards.

Response

The section of Appin Road within the proposal is currently subject to congestion and delays due to the existing traffic volumes on the road. This is attributed to the capacity of the road, which predominantly comprises a single lane in each direction and existing intersections. The objective of the proposal is to improve the capacity and safety of the road for road users. The Appin Road Upgrade proposal (as

described in Chapter 3 of the REF) includes the duplication of Appin Road to from two to four lanes between Fitzgibbon Lane to about 2.5 kilometres south of Copperfield Drive, which is currently single lane in each direction.

The traffic and transport assessment is included in section 6.4 of the REF. The traffic estimations used in the assessment were based on survey data completed in 2016 (Cardno, 2016), this data superseded previous data collected for a Traffic Management and Accessibility Plan completed in 2014 (Parsons Brinckerhoff, 2014) which was not used in the assessment. Existing traffic volumes were compared to estimated traffic volumes generated by the Mount Gilead subdivision and forecasted traffic volumes estimated from the and Roads and Maritime Strategic Traffic Forecasting Model for Appin Road for 2019, 2023, 2028 and 2031 scenarios.

The results of the traffic and transport assessment indicate that the proposed upgrade would maintain a satisfactory performance level during peak periods for the operational years modelled. This includes the two new intersections at the Mount Gilead Subdivision, which would maintain a good level of service during peak hours for the forecasted years. Should further capacity in the road be required beyond this period, the proposal also includes an allowance to further upgrade Appin Road to six-lanes, where the centre median would be utilised to create two additional lanes.

The improvement of traffic flow within Appin and other areas of the road network are outside the scope of the proposal. However, Roads and Maritime will continue to investigate the need for further upgrades to Appin Road and other roads in the area to improve the operation of the overall road network.

Traffic and transport impact assessment was undertaken to inform the REF. The impacts to traffic hazards that could potentially arise due to the proposal are detailed in section 6.4 of the REF. It is anticipated that the proposal will significantly improve road safety due to the separation of traffic flows and upgraded intersections.

2.8.6 Traffic impact assessment approach

Submission number(s)

AU23, AU28, AU38, AU39, AU40, AU47, AS33, AS36, AS38, AS46, AU50, AU51, AU54, AU56, AU58, AU60, AU61, AU62, AU63, AU64, AU66

Issue description

- Questioned the adequacy of the modelling of traffic flows
- Suggested there was insufficient consideration of traffic flows travelling south on Appin Road from the Mount Gilead subdivision
- The assessment did not consider impacts in other sections of Appin Road or vehicles not originating from the Mount Gilead subdivision.

Response

The traffic and transport assessment is included in section 6.4 of the REF. The traffic estimations used in the assessment were based on survey data collected. The assessment included consideration of vehicles originating from the Mount Gilead subdivision and other road users. Vehicles originating from the Mount Gilead subdivision were estimated in accordance with the Roads and Maritime Guidelines for Traffic Generating Developments (Roads and Maritime, 2013). This was compared to the Roads and Maritime Strategic Traffic Forecasting Model to estimate vehicle numbers for 2019, 2023, 2028 and 2031 scenarios.

The traffic and transport assessment included the following assumptions for the estimation of northbound and southbound vehicle movements from the Mount Gilead Subdivision:

- 95 per cent of development trips head to/from the North
- 5 per cent of development trips head to/from the South
- Inbound/outbound split of 20 per cent / 80 per cent in AM and 80 per cent / 20 per cent in PM.

These assumptions were based on Journey to Work data for the neighbouring residential area of Appin, where residents have a 97 per cent north and 3 per cent south trip distribution. Based on this data, the assumption of northbound and southbound traffic movements used in the REF is accurate for the locality.

The assessment did not include consideration of other areas of the road network outside of the proposal, as this is outside the scope of the proposal. However, Roads and Maritime will continue to investigate the need for further upgrades to Appin Road and other roads in the area to improve the operation of the overall road network.

2.9 Land use and property

2.9.1 Property and land use impacts

Submission number(s)

AU36

Issue description

- Suggest that the proposal will change the rural lifestyle of the area.

Response

The Greater Macarthur Priority Growth Area, as outlined in the *Western City District Plan* (Greater Sydney Commission, 2018) and *Greater Macarthur 2040 Interim Plan* (DP&E, 2018), identifies Mount Gilead as a significant area to improve housing capacity. Taking into consideration updated land use and population forecast Bureau of Statistics and Analytics for future use scenarios up to and including 2031, traffic modelling indicates that without upgrade, Appin Road would be subject to significant congestion. The proposed upgrade is therefore required to reduce congestion and improve the safety of Appin Road.

2.10 Noise and vibration

2.10.1 Construction noise and/or vibration impacts

Submission number(s)

AS09

Issue description

- Query regarding the measures to minimise construction traffic noise for those houses that back on to Appin Road.

Response

The Appin Road Upgrade proposal includes new noise mitigations on both sides of the road corridor, from Noorumba Reserve to the Fitzgibbon Lane intersections with Appin Road. Appendix F of the REF includes the Noise and Vibration Assessment, which shows the assessment undertaken and the location of noise

mitigation strategies. The final noise mitigation solution will be further investigated during detailed design and most likely will be a combination of noise mitigations including road design, traffic management, lower noise pavement services, noise barriers in the form of walls, fences or earth mounds and at-property treatments. Detailed exploration of potential safeguards and mitigation measures can be found in section 6.5.5 of the REF.

2.10.2 Operational noise/vibration impacts

Submission number(s)

AU06, AS09

Issue description

- Query regarding the measures to minimise operational traffic noise for those houses that back on to Appin Road
- Query regarding the impact of noise on two story houses.

Response

The Appin Road Upgrade proposal includes new noise mitigations on both sides of the road corridor, from Noorumba Reserve to the Fitzgibbon Lane intersections with Appin Road. Appendix F of the REF includes the Noise and Vibration Assessment, which shows the assessment undertaken and the location of the noise walls. The final noise mitigation solution will be further investigated during detailed design and most likely will be a combination of noise mitigations including road design, traffic management, lower noise pavement services, noise barriers in the form of walls, fences or earth mounds and at property treatments. Detailed exploration of potential safeguards and mitigation measures can be found in section 6.5.5 of the REF. Potential operational noise and vibration impacts are described in section 6.5.4 of the REF and safety and management measures are included in section 6.5.5 of the REF.

2.10.3 Management and mitigation of noise and/or vibration

Submission number(s)

AU02, AU06, AU18, AS30

Issue description

- Query regarding whether noise walls would be installed for houses backing on to Appin Road
- Query regarding the impact that noise walls will have on property fences including complying swimming pool fences
- Query regarding at-property noise and vibration treatments.

Response

The Appin Road Upgrade proposal includes noise mitigations on both sides of the road corridor, from Noorumba Reserve to the Fitzgibbon Lane intersection on Appin Road. Appendix F of the REF includes the Noise and Vibration Assessment shows the location of noise walls along Appin Road. The final noise mitigation solution will be further investigated during detailed design and will be a combination of noise mitigations including road design, traffic management, lower noise pavement services, noise barriers in the form of walls, fences or earth mounds and at property treatments. Detailed exploration of potential safeguards and mitigation measures is identified in section 6.5.5 of the REF.

2.11 Visual and landscape character

2.11.1 Noise walls

Submission number(s)

AU06, AS28, AS30, AU41, AS40

Issue description

- Comment that concrete noise walls will have a detrimental visual impact
- Raises concern over the use of timber for the noise wall
- Requests information on the visual design of noise walls
- Requests information on the shadow impacts of the noise wall
- Requests that noise walls be positioned further from their property boundary.

Response

Preliminary noise modelling south of Woodlands Road indicates the need for noise walls within the section of road stretching between Noorumba Reserve, to Fitzgibbon Lane. To mitigate the visual impacts of the noise walls, trees will be planted in scattered groups between the clear-zone and noise walls in places. Before the vegetation and trees are established, the noise walls would be highly visible, however once established the detrimental visual impact will be minimal. Section 4.2 of the Urban Design, Landscape Character and Visual Impact Assessment (refer to Appendix I of REF) outlines mitigation measures and recommendations to minimise the visual impact of the proposed noise wall. The final height and design of the noise wall would be determined during the detailed design phase in accordance with the Roads and Maritime Noise Mitigation Guideline.

Appendix F of the REF includes the Noise and Vibration Assessment which shows the acoustic assessment undertaken and details the identified location of the noise walls. However, the final noise mitigation solution is pending further investigations and will likely be a combination of noise mitigations i.e. noise walls with at property mitigations.

Mitigation measures to minimise the visual impact of the noise walls are outlined in Table 6-51 of the REF.

2.12 Non-Aboriginal heritage

2.12.1 Non-Aboriginal heritage impact assessment approach

Submission number(s)

AS18, AS20

Issue description

- Comment that there was no mention of the Hume-Hovell Monument
- Suggests that the historical significance of trees along Appin Road have not been considered.

Response

As part of the proposal, a Statement of Heritage Impact (SoHI) has been prepared (refer to Appendix H of the REF). This is in accordance with the NSW Heritage Office & Department of Urban Affairs and Planning *NSW Heritage Manual (1996)* and NSW Heritage Office *Statements of Heritage Impact* (NSW Heritage Office, 2002). Detailed site studies were undertaken by heritage specialists and recommendations and mitigation strategies have been developed for each non-Aboriginal heritage site identified. Summary of the findings and strategies developed from the SoHI are detailed in section 6.7 of the REF. The Hume-Hovell Monument does not fall within the study area for the proposed works and therefore has not been considered in the non-Aboriginal heritage assessment for the REF. The trees along Appin Road are not listed heritage items, however a visual assessment of the trees along Appin Road was undertaken as part of the Landscape and Visual Impact Assessment (refer to Appendix I of the REF) and strategies to mitigate potential impacts can be found in section 6.8.4 of the REF.

2.12.2 Management and mitigation

Submission number(s)

AS18

Issue description

- Access to the Hume-Hovell Monument is dangerous without a layby.

Response

The Hume-Hovell Expedition Memorial is located outside the study area for this proposal. For more information on road upgrades between Mount Gilead and Appin, or to inquire about potential hazards on the road, please visit the Roads and Maritime website <https://www.rms.nsw.gov.au/projects/sydney-west/appin-road/index.html#Interactiveportal>.

2.12.3 General Non-Aboriginal Heritage Impacts – Construction

Submission number(s)

AS42

Issue description

- Raises concerns over potential heritage impacts on Appin Road due to links to Macquarie era settlement.
- Expresses concern over the preservation of Appin Road between Rosemeadow and Appin.
- Expresses concern regarding the preservation of the fronts of agricultural properties along Appin Road.

Response

As part of the proposal, a Statement of Heritage Impact has been prepared (refer to Appendix H of the REF). This is in accordance with the NSW Heritage Office & Department of Urban Affairs and Planning *NSW Heritage Manual (1996)* and NSW Heritage Office *Statements of Heritage Impact* (NSW Heritage Office, 2002). The SoHI can be found in Appendix H of the REF. Detailed site studies were undertaken by heritage specialists and recommendations and mitigation strategies have been developed for each non-Aboriginal heritage site identified. Table 6-43 of the REF outlines all State Heritage Register and Local Environmental Plan items located within, or nearby the study area. Section 6.7.3 describes the potential impacts to each of these non-Aboriginal heritage sites and it has been concluded that with implementation

of the safeguards and management measures detailed in section 6.7.4 of the REF that the impacts to Local and State Heritage sites will be minor to negligible or none.

2.12.4 General Non-Aboriginal Heritage Impacts – Operation

Submission number(s)

AS39

Issue description

- Raises concern over the visual impacts of noise walls on the Mount Gilead homestead.

Response

As part of the proposal, a Statement of Heritage Impact has been prepared (refer to Appendix H of the REF). This is in accordance with the NSW Heritage Office & Department of Urban Affairs and Planning *NSW Heritage Manual (1996)* and NSW Heritage Office *Statements of Heritage Impact* (NSW Heritage Office, 2002). Detailed site studies were undertaken by heritage specialists and recommendations and mitigation strategies have been developed for each non-Aboriginal heritage site identified. The Mount Gilead Homestead falls outside of the visual impact buffer zone established in the Statement of Heritage Impact and therefore no visual impacts to the Homestead are anticipated.

2.13 Socio-economic

2.13.1 Socio-economic impact assessment approach

Submission number(s)

AU33, AS40, AU71

Issue description

- Raises concern that a social impact study was not done for the residents of Appin
- Highlights the impact that biodiversity has on community wellbeing.

Response

To inform the REF for this proposal, a socio-economic impact assessment was undertaken on the communities surrounding the study area, located between Mount Gilead and Ambarvale (refer to section 6.9 of the REF). This assessment is in accordance with the *Environmental Impact Assessment Practice Note: Socio-economic assessment: EIA-N05* (Roads and Maritime, 2013c). The study also considered, to a limited extent, the wider local government area of Campbelltown City Council and the Greater Sydney Region. For documents relating to the proposed Appin Road Safety Improvements between Appin and Mount Gilead please visit <https://www.rms.nsw.gov.au/projects/sydney-west/appin-road/project-documents.html>.

The impact of vegetation removal and biodiversity impacts on community values are addressed in section 6.9.3 of the REF. It is acknowledged that road widening and removal of vegetation may impact upon community values and emphasised that the road would be built to current design standards incorporating tree retention and new canopy coverage wherever possible. In addition, mitigation measures for biodiversity impacts are listed in Table 6-11 of the REF.

2.13.2 Socio-economic impacts – construction

Submission number(s)

AS28

Issue description

- Questions the economic impact of traffic delays during construction.

Response

The socio-economic assessment prepared for the REF states that minor delays may occur locally and acknowledges the resulting potential for user frustration. Section 6.4.3 of the REF outlines potential traffic impacts and highlights that two-way traffic adjacent to or through construction zones would be maintained throughout construction to minimise these delays. The Construction Traffic and Transport Report (WSP, 2017) prepared to inform the REF concluded that the proposed construction work would have minimal impact to the performance of intersections within the study area and that traffic delays due to increased vehicle movements would be minor. Traffic modelling assessed that the upgrades are required to reduce congestion of Appin Road given estimated increases in future traffic and it was determined that travel times along Appin Road would improve under the proposal, compared to if it was not built.

2.13.3 Socio-economic impacts – operational

Submission number(s)

AS19, AU35, AU38, AU81, AU82

Issue description

- Raises concern that the proposal will increase travel times and user frustration on Appin Road
- Raises concern that the proposal will decrease the quality of living in the area
- Raises concern that the volume of land development, alongside inadequate infrastructure projects may impact community wellbeing
- Raises concern that traffic issues and overdevelopment may impact mental health in the community
- Questions whether a socio-economic impact assessment has been done for the residents of Appin
- Raises concern that the commercial viability of the 7-Eleven at St Helens Park will be impacted by the introduction of a median on Kellerman Drive
- Comments that the closure of the median on Kellerman Drive would result in a significant loss in amenity and liveability for residents.

Response

Operational traffic and transport impacts from the proposal have been addressed in section 6.4.3 of the REF. It was determined that the upgrade of Appin Road would reduce the travel time of all vehicles in peak periods compared to the existing case if no upgrades were to occur.

To inform the REF for this proposal, a socio-economic impact assessment was undertaken on the communities surrounding the study area, located between Mount Gilead and Ambarvale (refer to section 6.9 of the REF). This assessment is in accordance with the *Environmental Impact Assessment Practice Note: Socio-economic assessment: EIA-N05* (Roads and Maritime, 2013). It was determined that the

proposal, once operational, would be unlikely to affect the area's overall socioeconomic profile and indirect quality of living improvements would include a safer commute to and from the area, decreased congestion and a reduction of crashes.

Appin Road is identified as a key road that services the Greater Macarthur Growth Area as identified in the *Greater Macarthur Plan* (NSW Department of Planning and Environment 2018) and provides a connection to several potential land release areas. Upgrading Appin Road between Mount Gilead and Ambarvale is required infrastructure to cater for predicted traffic increases and population growth in the area. Once operational, the road upgrades will benefit the community by providing adequate connectivity to future developments, as well as a safer and less congested road. The upgrade of Appin Road would reduce the travel time of all vehicles in peak periods and reduce user frustration that would otherwise arise due to increased population and vehicle movements.

The socio-economic assessment also considered to a limited extent, the wider local government area of Campbelltown City Council and the Greater Sydney Region. For documents relating to the proposed Appin Road Safety Improvements between Appin and Mount Gilead please visit

<https://www.rms.nsw.gov.au/projects/sydney-west/appin-road/project-documents.html>.

The current design proposes to restrict the right turn movements to and from Kellerman Drive into the 7-Eleven. The proposed changes to the existing arrangements are driven by safety, in particular sight distance issues being the requirement as per *Austrroads Guide to Road Design Part 4a Unsignalised and Signalised Intersection*. Consultation on the final design will continue in conjunction with Roads and Maritime, Campbelltown City Council and landowners, to consider the noted commercial, amenity and liveability concerns in conjunction with the safety requirements.

2.14 Ground and surface water

2.14.1 Groundwater and surface water impact assessment approach

Submission number(s)

AS39

Issue description

- Raises concern over discrepancies between a groundwater assessment report for dwellings on Mount Gilead and the hydrology and drainage assessment prepared for this proposal.

Response

As described in section 6.3 of the REF, an assessment was undertaken of the hydrogeology, hydrology and flooding impacts that could arise as a result of the proposal. Groundwater was identified in the study area, however it was determined that excavation required for the proposal would be unlikely to intersect regional groundwater to warrant a detailed assessment.

2.14.2 Surface water impacts – construction

Submission number(s)

AS39

Issue description

- Raises concern over sedimentation and salinity impact to Noorumba Reserve, Menangle Creek and the Nepean River from discharge during construction.

Response

Potential surface water impacts during construction are detailed in section 6.3.3 of the REF. Surface water discharge from stormwater infrastructure and drainage lines is expected to impact nearby surface waters including Spring Creek and Mansfield Creek during operation. Potential surface water impacts during construction would be limited to periods of rainfall and with implementation of erosion and sediment control measures and other safeguards and management measures detailed in section 6.2.4 of the REF, it was determined that potential impacts to surface water are not likely to be significant.

2.14.3 Surface water impacts – operation

Submission number(s)

AS39

Issue description

- Suggests that grates, pollution control traps and an artificial wetland on the corner of Woodland Road and Appin Road be installed
- Raises concern that Appin Road upgrades will impact on the Noorumba Reserve dam and its capacity to hold water generated in times of high rainfall
- Raises concern over the potential sedimentation and pollution impacts of increasing the volume of water that Spring Creek is expected to carry
- Comment that the runoff from the proposed Mount Gilead housing development has not been considered in the surface water impact assessment
- Raises concern that Appin Road upgrades will impact the salinity of Menangle Creek and the Nepean River.

Response

Section 6.3 of the REF explores the pollutant loads potentially generated by the road upgrades and the subsequent impacts. It is noted that pollutant loads and sediment are currently picked up in the grass swales and/or stormwater infrastructure adjacent to the road. Therefore, using a combination of the existing and proposed vegetated swales, bioretention swales and hydrodynamic separator no additional measures are considered necessary to achieve baseline pollutant targets.

It is noted in section 6.6.6 of the REF that potential operational impacts to surface water due to the proposal include an increase in the volume and rate of stormwater runoff to specific discharge points. Noorumba Reserve dam is not considered a discharge point for stormwater along Appin Road. As discussed in Appendix E of the REF, the proposal includes a stormwater drainage system that would detain and hold water to minimise the impact to Spring Creek and its capacity.

Further assessment of the Mount Gilead subdivision design would be required to incorporate water quality treatment measures from Appin Road at sections adjacent to the residential development. The hydrology and flooding impacts of the subdivision would be considered prior to construction and would take into account cumulative impacts of the Appin Road Upgrade.

As discussed in sections 6.2.2 and 6.3.2 of the REF, soils from the study area were assessed and it was determined that the samples were non-saline and expected to yield negligible salinity effects.

2.14.4 Groundwater impacts – construction

Submission number(s)

AS39

Issue description

- Queries whether earthworks releasing water from the water table may result in salinity and drainage problems.

Response

As described in section 6.3 of the REF, an assessment was undertaken of the hydrogeology, hydrology and flooding impacts that could arise as a result of the proposal. Groundwater was identified in the study area, however it was determined that excavation required for the proposal would be unlikely to intersect regional groundwater.

2.14.5 Flooding

Submission number(s)

AU02, AS39

Issue description

- Queries whether drainage works would be carried out on Appin Road to prevent flooding
- Suggests that the works may impact on flooding in the Glenfield causeway
- Raises concern regarding the absence of on-site detention (OSD) basins in the proposal and its impact on flooding.

Response

A hydrology and hydraulics assessment has been undertaken to inform the current design. Details of this assessment can be found in section 6.3 and Appendix E of the REF. This assessment identified the need to improve the stormwater system within the study area to address the flooding issues. The proposed drainage works and flooding levels have been reviewed and discussed with Campbelltown City Council. Campbelltown City Council is in the process of developing a Floodplain Risk Management Study and Plan for the Campbelltown LGA. With implementation of the mitigation measures as described in section 6.3.4 of the REF, the potential for flooding impacts is not considered to be significant.

As per section 3.2.4 of the REF, an OSD facility will be incorporated into the Mount Gilead subdivision footprint, however no OSD basins have been included in this proposal.

2.15 Aboriginal heritage

2.15.1 Aboriginal heritage impacts – construction

Submission number(s)

AS20, AS23, AS34, AS37, AS38, AS39, AS40, AS41, AU66

Issue description

- Raises concern regarding potential Aboriginal scar trees along the study area being impacted by construction.

Response

An Aboriginal Heritage assessment was undertaken in accordance with Roads and Maritime *Procedure for Aboriginal Cultural Heritage and Consultation Investigation* guidelines. Details of the Aboriginal Heritage assessment methodology can be found in section 6.6.1 of the REF. No registered Aboriginal Heritage sites or items are located within or in close proximity to the study area and no Aboriginal objects were identified during surveys of the study area. In addition, as per section 5.3 of the REF, consultation with the Aboriginal community was undertaken and no issues were raised. The study area is contained within the boundaries of the Tharawal Local Aboriginal Land Council. Tharawal Local Aboriginal Land Council did not advise of any areas of cultural significance present in the study area.

2.15.2 Management and mitigation

Submission number(s)

AU35, AS41

Issue description

- Raises concern over mitigation strategies in place for potential Aboriginal heritage scar trees.

Response

As identified in section 2.15.1 above, an Aboriginal Heritage assessment was undertaken in accordance with Roads and Maritime *Procedure for Aboriginal Cultural Heritage and Consultation Investigation* guidelines. Details of the Aboriginal Heritage assessment methodology can be found in section 6.6.1 of the REF. No registered Aboriginal Heritage sites or items are located within or nearby the study area and no Aboriginal objects were identified during surveys of the study area. In addition, as per section 5.3 of the REF, consultation with the Aboriginal community was undertaken and no issues were raised. The study area is contained within the boundaries of the Tharawal Local Aboriginal Land Council and Tharawal Local Aboriginal Land Council did not provide advice that any areas of cultural significance were present in the study area, however safeguards and management measures that would be implemented in regard to Aboriginal Heritage sites or items are outlined in Table 6-42 of the REF.

2.16 Biodiversity

2.16.1 Biodiversity impact assessment approach

Submission number(s)

AU10, AU28, AU33, AU43, AS28, AS39, AS41, AU66, AU69, AU71, AU75, AU76, AU80

Issue description

- Adequacy of the field surveys:
 - Questions the reliance on desktop information
 - Raises concern over insufficient recording of koala habitat to allow protection
 - Questions the presence of the Cumberland Plain Land Snail
 - Collection of data on scats, including scat sizes for the assessment was inadequate
 - Comments that the assessment did not include observations of koala calls
 - Comments that weather conditions during the field survey period were unsuitable (hot and dry) to observe koalas
 - Comments that AnaBat surveys for microbats should have been undertaken within Browns Bush and Noorumba Reserve
 - Comments that the assessment underestimated the numbers of koalas in the region.
- Consideration of impact to the koala
 - States there is insufficient consideration of koalas in the assessment
 - States that there is insufficient information such as densities, sex, breeding and movements for the koala
 - Comments that the assessment of koala habitat on the western side of Appin Road as poor quality and not important to the survival of koalas is incorrect as these areas can provide important habitat
 - Comments that east-west movements of the koala have been inadequately assessed in the REF.
- Consideration of impact to other fauna species:
 - Raises concern that other species with a moderate-high likelihood of occurring within the study area such as the gang-gang cockatoo, glossy black-cockatoo, powerful owl, squirrel glider, heath monitor and brush tail rock wallaby were not given sufficient consideration.
- Significant impact:
 - Disagrees that the proposal would not have a significant impact on a threatened species, population or ecological community.
- Lack of consideration of expert reports
 - Raises concern that the results of expert reports were not considered in the assessment
 - Comments that the assessment does not take into consideration other expert reports and advice.
- Comments that residential development on the western side of Appin Road includes corridors and other biobanking sites for the koala which should be considered in the assessment.

Response

Adequacy of the field surveys

A review of desktop information was undertaken prior to the field survey. Desktop information used in the assessment included database searches and a review of previous assessments prepared for the area (detailed in Table 2.2 of Appendix C of the REF). This desktop information was subsequently ground truthed through field surveys.

Details of the field survey undertaken for the biodiversity assessment are detailed in section 6.1.1 and Appendix C of the REF. The field surveys were undertaken in accordance with the Biodiversity Assessment Method (BAM) 2017 (Office of Environment & Heritage, 2017).

The field surveys were undertaken in September and November 2017 with typical mild weather conditions noted at the time of survey. Weather conditions observed are considered generally favourable for completion of the field surveys.

Targeted field surveys were undertaken for the Cumberland Plain Land Snail using the active search technique. This species was recorded within the study area and subsequently considered in the impact assessment for the proposal.

Targeted field surveys undertaken for the koala included scat and spotlight searches, call playbacks and opportunistic searches. Analysis of scats was not undertaken. Whilst the analysis of scats can provide information on the sex and other characteristics, this analysis is beyond the scope of the assessment.

AnaBat surveys for Microchiropteran bats were not undertaken. However, the biodiversity assessment included a review of the results of previous AnaBat survey's undertaken for area's adjacent to Appin Road (Australia, 2016). Microchiropteran bats were recorded during these surveys and their presence within the study area was assumed in the impact assessment for the proposal.

Consideration of impact to the koala, including expert reports

The impacts of the proposal on the koala, including loss of habitat and recognised corridors were subject to a detailed Assessment of Significance (AoS) in accordance with the following State and Commonwealth legislative guidelines:

- *Threatened species assessment guidelines – assessment of significance for BC Act listed biodiversity* (Department of Environment and Climate Change, 2007)
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance for EPBC Act listed biodiversity* (Department of the Environment, 2013)
- *Referral guidelines for species listed under the EPBC Act* (Department of the Environment and Energy, 2017).

The biodiversity assessment considered the following information in considering impacts to the koala, including:

- Consultation with government and key stakeholders
- Detailed results of the field surveys undertaken for the proposal (WSP, 2018) and locality (Eco Logical Australia, 2015, Eco Logical Australia, 2016)
- Relevant literature (Phillips and Callaghan, 2000) (Phillips and Callaghan, 2011), (Biolink Ecological Consultants, 2016), (Department of Environment and Climate Change, 2008), (Department of the Environment, 2009) (Office for Environment & Heritage, 2017)
- Current NSW OEH atlas database records (OEH 2018)
- Governments expert (OEH) advice (Office for Environment & Heritage, 2018).

These studies included further consideration of the regional koala population, including population densities, sex, breeding and regional movements which were incorporated into the conclusions on the potential impacts to koalas from the proposal and the identified management and mitigation strategies.

At the time of the preparation of the REF, several significant koala studies were under way and being completed by DP&E, Campbelltown Council and OEH, including two independent expert reports (Biolink Ecological Consultants, 2018) (Crowther, 2018). Subsequently further consideration of the impacts of the proposal has been undertaken below.

Assessment of the significance of impact for koala

The koala population in the Campbelltown area is currently considered to be stable, largely disease free and showing signs of recovery/expansion (Biolink Ecological Consultants, 2017b, Biolink Ecological Consultants, 2018). This expansion has been further inferred by the increasing road deaths along Appin Road resulting from the likely expanding population looking to extend into currently unoccupied fringing habitats (Biolink Ecological Consultants, 2017b, Biolink Ecological Consultants, 2018).

The majority of the local population, which has been estimated at >100 individuals (Crowther, 2018) (Biolink Ecological Consultants, 2016) and possibly up to 200 (Biolink Ecological Consultants, 2018) occurs east of Appin Road associated with extensive tracts of remnant vegetation, most of which is securely conserved, along the Georges River, Wedderburn plateau and to the south of Appin where it links with the Nepean River (Office for Environment & Heritage, 2018).

In contrast, most of the koala habitat to be impacted by the proposal is in a disturbed condition, within an existing urban landscape and/or road corridor. Despite the relatively poor condition of the habitat to be impacted by the proposal, the koala is known to use these disturbed habitats within the locality (Martin Schulz, 2018)(WSP, 2018).

Appin Road currently bisects an area of good condition remnant vegetation acknowledged in the biodiversity assessment as providing known koala habitat (Biolink Ecological Consultants, 2016, Biolink Ecological Consultants, 2017b, Biolink Ecological Consultants, 2018)(WSP, 2018) which includes on the western side, Noorumba Reserve.

The Noorumba Reserve is approximately <60 ha in size and based on a comparative analysis of the estimated occupation of koalas in the similar sized patches of habitat on the western side of Appin Road (Beulah Biobank), is likely to provide habitat for a relatively small portion of the local population (2-3 resident koalas) (Crowther, 2018).

The Noorumba Reserve provides some interrupted connectivity to isolated fragments of native vegetation, including core koala habitat further to the west along Menangle Creek, which in turn drains into the Nepean River (referred to as the Noorumba Reserve Corridor). Biolink (Biolink Ecological Consultants, 2016, Biolink Ecological Consultants, 2017b, Biolink Ecological Consultants, 2018) identified the Noorumba Reserve Corridor as one of four locally important east west corridors between Meadowbank and Appin for the local koala population.

While the biodiversity assessment recognises that the Noorumba Reserve Corridor currently provides for dispersal of koalas into Noorumba Reserve, this dispersal is faced with two significant barriers in the form of the existing Appin Road and the Upper Canal System. The tenuous connectivity beyond the reserve is currently subject to significant uncertainty around future residential development and preservation of lands by multiple land owners to establish the corridor.

Targeted surveys by Ecological (2015, 2016), WSP (2018), Biolink (2017b) and others have identified active koala use of habitat within Noorumba Reserve corridor to be largely restricted to the reserve itself (Office for Environment & Heritage, 2018). More specifically, the Biolink (2017b) study which generally considered habitat use by koalas within the study area as more extensive than anticipated, found no

evidence of koala use within the Noorumba Reserve corridor across multiple sites to the west of the reserve (Biolink ecological consultants, 2017a).

The Koala Corridor Projects Generalised Approach to Planning Connectivity at Local and Regional Scales (GAPCLoSR) analysis (Biolink Ecological Consultants, 2018) of the baseline conditions recognises the existing challenges to this corridor, including the relatively high cost associated with overcoming the barriers formed by Appin Road, the Upper Canal System and distances of more than 220 m between koala habitat patches associated with the corridor along Menangle Creek. The limitations of the existing connectivity of the Noorumba Reserve corridor beyond the reserve, is further highlighted by the Figures 4 and 5 of the GAPCLoSR analysis (Biolink Ecological Consultants, 2018) which identifies the baseline conditions “least cost pathway” as passing through the centre of the proposed Mount Gilead Development and not along the Menangle Creek corridor identified by Biolink (2016) and Biolink (2017b).

Primary corridors are the most important in the landscape for koalas in terms of total habitat patch size and connectedness (Office for Environment & Heritage, 2018). The Noorumba Reserve corridor does not form a “Primary corridor” as verified by the GAPCLoSR investigation (Biolink Ecological Consultants, 2018).

While the GAPCLoSR analysis (Biolink Ecological Consultants, 2018) under future land use scenarios of a yet to be established corridor reserve network does identify the Noorumba Reserve corridor as providing east west connectivity beyond the Noorumba Reserve and along Menangle Creek, comparatively, the OEH “Primary” corridors and two of the four identified “Secondary” east west corridors between Rosemeadow and Appin are of greater importance to koalas in the landscape overall in terms of total habitat patch size and connectedness (Biolink Ecological Consultants, 2018).

The establishment of any future Noorumba Reserve corridor will result in approximately nine kilometres of existing and/or approved urban development interface boundaries to be managed in perpetuity. Given the well documented evidence of koala harm in urban environments (Koala Expert Panel, 2017), (McAlpine, 2015), (McAlpine, 2006), the current advice from OEH advocates for the exclusion of koalas from these areas, by keeping koalas on the edge and outside of the Greater Macarthur Growth Area, rather than in the east west Noorumba Reserve corridor (Office for Environment & Heritage, 2018).

The secondary corridors identified by OEH are not considered critical to the long-term survival of the region’s koala population. This is based on the retention of primary corridors, amount of habitat available within secondary corridors and the presence of primary corridors that could facilitate broad east-west movement for koalas between Wilton and Douglas Park (Office for Environment & Heritage, 2018).

The retention of the OEH primary corridors in their entirety and accompanying mitigation measures is considered by OEH as likely to be sufficient habitat to support the long-term survival of koalas in the area (Office for Environment & Heritage, 2018).

Following further consideration of the additional information provided in the submissions, it is considered the findings of the biodiversity assessment provides an adequate assessment of the projects impacts on the koala. The assessment recognises the proposal would have an impact on the local koala population through the direct loss of a small proportion of habitat in the locality and result in the further fragmentation of a recognised secondary east west koala corridor. However, the proposal is unlikely to have an adverse effect on the life cycle of the koala to the extent that is likely to lead to the risk of extinction of the species in the locality. Therefore, a Species Impact Statement (SIS) is not required under the BC Act.

Similarly, the AoS for the koala under Commonwealth legislation is also unlikely to result in a significant impact to the local population and as such the biodiversity assessment concludes a referral is not required. Roads and Maritime acknowledge that the EcoLogical report (2018) recommends Roads and Maritime apply a precautionary approach and contact the Department of Environment and Energy (DoEE) regarding the assessment of the proposals impacts on the koala under Commonwealth requirements. Roads and Maritime have subsequently consulted with DoEE who have confirmed the proposal is being assessed in accordance with the requirements of the Roads and Maritime EPBC Act strategic assessment approval.

Consideration of impact to species other than the koala

Consideration of fauna species potentially occurring in the area in the biodiversity assessment was based on the habitat profile for the species and other habitat information in the Threatened Species Profile Database (Office of Environment & Heritage, 2016). This was compared to the habitat types identified during the field surveys to determine the potential for a species to occur. The assessment also included consideration of the dates and locations of nearby records and information about species populations in the locality.

Species such as the gang-gang cockatoos, glossy black-cockatoos, powerful owls, squirrel gliders and the heath monitor were identified as having a moderate or higher potential for occurrence within the study area. It is noted that the potential occurrence of the brush tailed wallaby was considered to be low for the proposal, as it generally occurs in inland and sub-coastal south eastern Australia where it inhabits rock slopes.

The impact from the proposal to the area potential habitat of threatened fauna species with a moderate or higher potential to occur within the locality was considered in the biodiversity assessment and it was concluded that the area of impact would not be significant to the overall habitat in the region for any species. It is noted that further discussion of the impact to koala habitat is provided in section 2.16.3.

Consideration of corridors and other biobanking sites for the koala on the western side of Appin Road includes which should be considered in the assessment

As discussed above, the biodiversity assessment included consideration of the corridors and other areas of habitat for the koala on the western side of Appin Road. Further consideration of these corridors is provided in the section above.

2.16.2 Biodiversity impacts – construction

Submission number(s)

AU25, AU33, AU34, AU36, AU41, AU45, AU46, AU48, AS39, AU53, AU58, AU60, AU62, AU77, AU78, AU79, AU80

Issue description

- Comments that construction will impact on threatened species including the koala and squirrel gliders
- Comments that construction will impact too much vegetation
- Comments that construction of the proposal will impact on habitat for the koala and other species including native birds and possums
- Concerns over the impact on the Noorumba Reserve BioBanking site
- Comments that the widened road will impact on habitat for threatened fauna.

Response

Impacts to biodiversity from construction of the proposal are discussed in section 6.1 and Appendix C of the REF.

The proposal would impact on about 7.28 hectares of native vegetation including habitat potentially supporting threatened fauna species, including the koalas and squirrel gliders. This includes about 6.22 hectares of habitat for the koala (of which 2.38 hectares is considered to be in medium to high condition). As identified in section 6.1.3 of the REF, the proposal would also result in the loss of at least

four live hollow-bearing trees and removal of dead wood on the ground, which is scattered through parts of the study area at a low density.

Safeguards and management measures identified in section 6.1.4 of the REF will be implemented to account for the impacts during construction, including the preparation of a Flora and Fauna Management Plan and fencing plan for koalas.

The proposal would not impact on vegetation within the Noorumba Reserve BioBanking site.

2.16.3 Biodiversity impacts – operation

Submission number(s)

AU13, AU14, AU33, AU34, AU35, AU44, AU47, AS20, AS21, AS23, AS24, AS25, AS26, AS28, AS34, AS39, AS41, AS42, AU50, AU52, AU54, AU67, AU71, AU75, AU76, AU77, AU78, AU79, AU80

Issue description

- East west migration of koalas
 - Concerns that the proposal, in combination with climate change, will have a significant impact on the koala
 - Comments that the proposal will impact on the genetic diversity of koalas in the region.
- Forced migration of koalas to other areas:
 - Concerns that koalas will be forced to migrate to other areas where there are diseased colony's or other risks to their survival.
- Migration of other native fauna across Appin Road
 - Concerns that the use of noise barriers will impact the movement of native fauna
 - Native fauna such as squirrel gliders will not be able to cross the widened road due to the increased distance, leading to road mortality and the provision of a rope crossing is inadequate.
- Impacts within the Mount Gilead Subdivision
 - Concerns that the removal of dams within the Mount Gilead Subdivision will remove water sources for native fauna.
- Impacts to Noorumba Reserve and Beulah Reserve
 - Raised that the loss of vegetation from Noorumba Reserve will remove habitat and devalue the site
 - Raised that the loss of vegetation from Beulah Reserve will remove habitat and devalue the site.
- Widening of Appin Road
 - Concerns that the road widening will result in increased road mortality from koalas on either side of Appin Road.
- Comments that the NSW Government has a duty of care to protect koalas.

Response

Disruption of the east-west movement of koalas

As discussed in section 2.16.1 above, corridors identified to support the east-west movement of koalas within the proposal footprint include Noorumba Reserve. Assessment of koalas movements in the region indicate that the east-west movement of koalas is not considered critical to the long-term survival of the region's koala population. This is based on the retention of primary corridors, amount of habitat available within secondary corridors and the presence of primary corridors that could facilitate broad east-west movement for koalas between Wilton and Douglas Park (i.e. Allens Creek and Cataract corridors, with the latter corridor located only another four kilometres south of the Ousedale secondary koala corridor) (OEH, 2018).

Roads and Maritime are committed in the short term to providing mitigation aimed at minimising the existing impacts on the koala population from road mortality along Appin Road, while developing a long-term strategy to establish a koala crossing supporting the east-west movement of koalas across Appin Road in the most appropriate location. Further discussion on management and mitigation is provided in section 2.16.4 below.

Migration of koalas to other areas

As identified in the Biodiversity Assessment prepared for the proposal and other assessments by OEH (OEH 2018) and others (Biolink 2016, 2017, 2018), a "Primary" north south corridor (east of Appin Road) is identified. The proposal would not impact the migration of koalas on the eastern side of Appin Road.

West of Appin Road, the Noorumba Reserve corridor is recognised as a secondary koala Corridor (OEH 2018) and provides opportunities for future connectivity along Menangle creek to Nepean River (Biolink 2017 2018) however there is little evidence this corridor is currently used regularly by koalas beyond the reserve. Roads and Maritime will investigate, in consultation with, and meeting the requirements of OEH, management of koalas potentially using the remnant habitats within Noorumba Reserve to the large tracts of remnant vegetation along Appin Road in accordance with the recommendations of the expert report by Crowther (2018).

Overall, the proposal is not expected to significantly alter the current migratory paths of koalas in the region and/or result in the forced migration of koalas further distances in search of food and other resources.

Movement of other native fauna across Appin Road

The proposal includes the provision of a fauna fence and/or barriers at suitable locations on either side of Appin Road to prevent fauna accessing the road corridor. Therefore, infrastructure within Appin Road would not pose any significant risk to fauna.

The proposal allows for the provision of an arboreal crossing structure at Noorumba Reserve to support the crossing of Squirrel Gliders and other arboreal species, across Appin Road.

Impacts within the Mount Gilead Subdivision

The Mount Gilead Subdivision was subject to a separate environmental assessment and is outside the scope of the REF.

Widening of Appin Road

The proposal includes the provision of a fauna fence and/or barriers at suitable locations on either side of Appin Road to prevent fauna accessing the road corridor and the subsequent risk of entrapment and road mortality.

Therefore, the increased width of Appin Road and additional infrastructure from the proposal would not pose any significant risk to fauna.

Comments that the NSW Government has a duty of care to protect koalas

The Appin Road Upgrade Biodiversity Assessment and REF has been prepared in accordance with all statutory and Roads and Maritime requirements while in regards to the koala gone beyond these requirements to consult directly with Campbelltown City Council and key stakeholders throughout the proposals development as well as participating alongside Campbelltown City Council in the koala Roundtable meetings.

2.16.4 Management and mitigation

Submission number(s)

AU07, AU08, AU09, AU10, AU11, AU12, AU13, AU14, AU15, AU16, AU17, AU19, AU20, AU21, AU25, AU28, AU35, AU38, AU39, AU40, AU41, AU43, AU44, AU45, AU46, AU49, AS15, AS21, AS28, AS29, AS33, AS37, AS39, AS40, AS41, AS43, AS47, DP01, AU56, AU58, AU60, AU62, AU63, AU64, AU66, AU69, AU71, AU75, AU76, AU77, AU78, AU79, AU80

Issue description

- General mitigation:
 - Comments that the management and mitigation measures do not consider the importance of the east west movements of koalas
 - Comments that an overpass or underpass should be provided to facilitate east west movements of the koala and other species
 - Concern that there is insufficient protection of koalas, including protection from disease
 - Concern that further trees will be impacted as part of residential development in the area
 - Concerns that relocation of koalas will result in them attempting to return to the original area
 - Concern over management strategies for koalas and other fauna in the event of a bushfire
 - Comments that the management measures do not address the management of koalas within the Greater Macarthur Growth Area
 - Comments that the management measures contradict those implemented for other areas such as Coffs Harbour.
- Fauna fences and koala connectivity
 - Comments that the fauna fence should be on both sides of Appin Road
 - Fauna fencing should be combined with an overpass or underpass
 - Concern that other expert advice indicates that fauna fences should be accompanied with movement structures
 - Comments that the extent of the fence is insufficient to prevent koala's crossing the road
 - Comments that an overpass and/or underpass for koalas should be constructed to facilitate movements across Appin Road, including at Noorumba Reserve
 - Concerns that the fauna fence would trap koalas in the event of a fire
 - Concerns that the fencing strategy should be finalised prior to detailed design of the proposal
 - Comments that koalas will climb the fauna fence to cross Appin Road
 - Comments that koalas will migrate around the fauna fence onto Appin Road
 - Comments that the fauna fencing will limit the available food and resources for koalas
 - Comments that the fauna fence will impact the breeding and genetic diversity of koalas in the region
 - Concerns that koala movements on the eastern and western sides of Appin Road are important to the populations survival
 - Comments that the fauna fence should include Beulah Reserve
 - Comments that the noise barrier on the eastern side is insufficient

- Concerns that the fauna fence will negatively impact on the biodiversity of Noorumba Reserve
- Concerns that fauna crossing Appin Road from the west will be trapped on Appin Road by the fauna fence on the eastern side
- Concerns that the fauna fence will force koalas to migrate into other koala populations impacted by chlamydia
- Comments that the fauna fence will extend only to the Safety Improvements Project in the south
- Comments that the fauna fence will need to be maintained.

Response

General mitigation

Roads and Maritime are committed in the short term to providing mitigation aimed at minimising the existing impacts on the koala population from road mortality along Appin Road. A long term strategy for movements of koala across Appin Road will be developed as part of a whole of government approach and, in consultation with key stakeholders. The aim is to ensure that the need for connectivity is fully investigated for possible provision as part of future upgrades to Appin Road and properly located to meet long term conservation koala management outcomes. This would ensure that a suitably secure and preserved corridor is provided which is consistent with the proposed Greater Macarthur strategy and incorporated within the proposed Cumberland Plain Conservation Plan.

A preliminary feasibility study of underpass design identified that fauna underpasses in the vicinity of Noorumba Reserve are significantly limited by topography (crest of a ridgeline), underground services network and would likely require substantial additional clearing of good condition critically endangered ecological community, Shale Sandstone Transition Forest from within and adjoining to the established Noorumba Reserve Biobank. Similarly, a fauna land bridge and/or overpasses in this location is also limited by topography (crest/ridgeline) and would result in even more substantial disturbances clearing of the good condition critically endangered ecological community, Shale Sandstone Transition Forest from within and adjoining to the established Noorumba Reserve Biobank.

It is acknowledged that wildlife crossing structures are fundamental to best practice corridor design (NSW Roads and Maritime Services 2012) and where possible the installation of a crossing structure at Noorumba Reserve for the koala is recommended by Campbelltown Council (Biolink 2017) and the expert reports (Biolink 2018 and Crowther 2018). However, when considering the significant engineering design limitations above combined with the existing disturbed condition and tenuous linkages of the proposed Noorumba Reserve corridor beyond the reserve, the current expert advice of OEH (OEH 2018) that the proposed Noorumba Reserve corridor is of questionable importance comparably to the koalas “Primary” corridor network and any future use of this corridor is considered likely to result in an increased threats to the koala from existing and approved future residential interface, the provision of an underpass and/or overpass at Noorumba Reserve is not currently supported.

The provision of connectivity structures in the short term is not currently supported. A long-term strategy for movements of koala across Appin Road will be developed as part of a whole of government approach and, in consultation with key stakeholders. The aim is to ensure that the need for connectivity is fully investigated for possible provision as part of future upgrades to Appin Road and properly located to meet long term conservation koala management outcomes. This would ensure that a suitably secure and preserved corridor is provided which is consistent with the proposed Greater Macarthur strategy and incorporated within the proposed Cumberland Plain Conservation Plan.

Roads and Maritime will investigate, in consultation with, and meeting the requirements of OEH, management of koalas potentially using the remnant habitats within Noorumba Reserve to the large tracts of remnant vegetation along Appin Road in accordance with the recommendations of the expert report by Crowther (2018).

In the event of a bushfire, the inclusion of fencing will provide a barrier to koalas trying to disperse to the west at Noorumba Reserve, however in the case of a bushfire the majority of the fence line will be bound to the east by an extensive cleared area providing between 150-400 meter buffer from the nearest area of bushland and is likely to result in a safe area within a firebreak. Furthermore, in areas where vegetated connectivity to the proposed fence line exists, there are cleared north south fire trails immediately to the west of proposed fence line providing opportunities for Rural Fire Services (RFS) containment line that doesn't impact on koalas bound by the fence line. Future consultation with RFS regarding access requirements will be undertaken during detailed design.

Given the well documented evidence of koala harm in urban environments (Koala Expert Panel 2017, McAlpine *et al.* 2015 McAlpine *et al* 2006b)), the current advice from OEH advocates for the exclusion of koalas from these areas, by keeping koalas on the edge and outside of the Greater Macarthur Growth Area, rather than in the east west Noorumba Reserve corridor (OEH 2018).

The management measures proposed for this proposal have been developed in consultation with key stakeholders to ensure that they are relevant to the Appin Road Upgrade proposal. These mitigation measures will be further refined during the detailed design phase.

Koala connectivity

The South-west Sydney koala population is acknowledged to be stable, largely disease free and showing signs of recovery and expansion.

The population is centred on higher fertility soils on the Wedderburn Plateau and the shale transitional forests fringing large expanses of water catchment lands. These large areas of contiguous habitat have been mapped as primary koala habitat by OEH and border Campbelltown Local Government Area (LGAs) to the east and south and continue into Wollondilly and Wingecarribee LGAs.

Animals are understood to be dispersing from these areas to the south and west including into remnant bushland west of Appin Road, north of the township of Appin and south of Rosemeadow. This section of Appin Road currently bisects known koala habitat at a number of locations between Rosemeadow and Appin. These areas have been mapped by OEH as secondary koala habitat corridors based on remnant size and fragmentation.

This area is locally known as a koala road kill hotspot with an increasing number of reports of koala road kill along Appin Road north of Appin.

The environmental impact assessment by Roads and Maritime recognises the proposal would impact the local koala population through the direct loss of a small proportion of habitat and increased barrier effects arising from the upgraded road. Without mitigation, this is likely to result in increased koala road kill and injury. The impact of the proposal has been assessed as not significant under both State and Commonwealth due to its limited impacts and the size and wide distribution of the local koala population.

To address the impacts, Roads and Maritime is proposing to establish fauna exclusion fencing to reduce the current levels of road kill on this section of Appin Road. This should protect koalas from vehicle strike and direct koala movement to the south and south west and within primary habitat corridors mapped by OEH. Roads and Maritime has considered whether this fence could trap koalas in the event of wildfire arising from within the catchment lands to the east. Roads and Maritime considers that this is unlikely due to the presence of a cleared easement parallel and to the east to the proposed fence alignment.

Roads and Maritime has also considered whether connectivity should be provided in this location. Roads and Maritime considers that there is significant uncertainty regarding the long term value of any connectivity structure provided to Noorumba or Beulah Reserves due to the residential development plans to the west. This uncertainty should be resolved once the Greater Macarthur 2040 strategy and the supporting Cumberland Plain Conservation Plan are finalised and Roads and Maritime will continue to work with DP&E and OEH on these strategies.

Given the well documented evidence of koala harm in urban environments (Koala Expert Panel 2017, McAlpine et al. 2015, McAlpine et al, 2006b), the current advice from OEH is that koalas should be separated from road and urban areas in the Greater Macarthur Growth Area by appropriate fencing that also excludes dogs from the koala corridors.

A preliminary examination of the feasibility of fauna underpasses indicated that the provision of such structures is significantly limited due to the topography and underground services networks. An overpass or underpass at any potential connection location would likely require substantial additional clearing of good condition critically endangered ecological communities including within the Noorumba Reserve BioBank site.

The provision of connectivity structures in the short term is not currently supported. A long term strategy for movements of koala across Appin Road will be developed as part of a whole of government approach and, in consultation with key stakeholders. The aim is to ensure that the need for connectivity is fully investigated for possible provision as part of future upgrades to Appin Road and properly located to meet long term conservation koala management outcomes. This would ensure that a suitably secure and preserved corridor is provided which is consistent with the proposed Greater Macarthur strategy and incorporated within the proposed Cumberland Plain Conservation Plan.

Fauna fences

Roads and Maritime are committed in the short term to providing mitigation aimed at minimising the existing impacts on the koala population from road mortality along Appin Road, while developing a long-term strategy to establish a koala crossing supporting the east-west movement of koalas across Appin Road in the most appropriate location.

Figure 5-1 of the biodiversity assessment for the Appin Road Upgrade (Appendix C of the REF) presents a proposed fauna fence only on the eastern side of Appin Road. However, the western side of Appin Road was still subject to the Mount Gilead development's detailed infrastructure design (landscaping and noise wall barriers). Irrespective of the Mount Gilead development, Roads and Maritime are committed to providing fauna fencing, where proposed, in accordance with Campbelltown City Councils Draft CKPOM Section 6.4.6(ii) a) and recommendations of the expert reports (Crowther 2018) (Biolink 2018). This will incorporate koala-grids or other approved devices installed at fence-ends and driveways and other access points to prevent koala access to the road corridor (as committed in Section 5.2 and Figure 5-1 of Appendix C of the REF).

The provision of exclusion fencing is an intrusive mitigation measure, with or without the provision of associated crossing structures and as such is likely to result in changes to the existing threats and the creation of new threats to the local koala population and other associated wildlife. These threats may include but not be limited to; changes to existing home territories, intra species conflict, resource competition, stress and risk from wildfire. However, despite the likely impacts associated with the provision of fauna fencing, maintaining the current arrangement without any fauna fencing and corresponding increase in koala road mortality is widely considered to be more detrimental (OEH 2018, Crowther 2018).

The final design and implementation of the fauna fencing will be developed prior to construction as part of the detailed design of associated infrastructure (e.g. fencing) and landscaping. The preparation of construction environmental management documentation, design and implementation of the fauna fencing will be undertaken in consultation with key stakeholders to ensure koala road mortality along Appin Road is minimised.

The extension of the final fence locations adjoining cleared lands will also consider the local understanding of the maximum crossing distance of 220 m that a koala had been recorded from a patch of vegetation (Biolink 2018). As identified in the mitigation measures of the REF, fauna fencing would be further investigated during the detailed design phase and the use of koala proof fencing and koala grids (at access points) along Appin Road in areas of likely occurrence would be undertaken. Additional fauna fencing at

Noorumba Reserve along the western side of Appin Road has also been included as part of the proposal (refer to Chapter 3 of this submissions report).

It is acknowledged that wildlife crossing structures (including underpasses and overpasses) are fundamental to best practice corridor design (NSW Roads and Maritime Services 2012) and where possible the installation of a crossing structures at Noorumba Reserve for the koala is recommended by Campbelltown Council (Biolink 2017) and the expert reports (Biolink 2018 and Crowther 2018). However, when considering the significant engineering design limitations as discussed above combined with the existing disturbed condition and tenuous linkages of the proposed Noorumba Reserve corridor beyond the reserve, the current expert advice of OEH (OEH 2018) that the proposed Noorumba Reserve corridor is of questionable importance comparably to the koalas “Primary” corridor network and any future use of this corridor is considered likely to result in an increased threats to the koala from existing and approved future residential interface, the provision of an underpass and/or overpass at Noorumba Reserve is not currently supported.

An appropriate long-term maintenance program and management agreement plan will be established under the terms of the Roads Act for the fauna fence.

2.17 Air quality

2.17.1 Air quality impact assessment approach

Submission number(s)

AS33, AS39

Issue description

- Comment whether an independent air quality monitoring has been completed recently for the area
- Suggest that an Air Quality Impact Assessment be undertaken for the proposal which includes potential health effects
- Suggest that the proposal must take in to consideration the additional air pollution that will be generated from proposed dwellings, industry and emissions associated with the future Western Sydney Airport.

Response

As identified in section 6.11.1 of the REF, existing ambient air quality of the proposal area based on Campbelltown regional data indicates relatively consistent and ‘good-to-very-good’ air quality (OEH, 2016). Likely contributions to poorer air quality in the region are road traffic emissions evident through peak-hour air quality reductions, the surrounding industry in Campbelltown and natural effects such as bushfires throughout summer. Given the scale of this proposal and implementation of safeguards and management measures, potential air quality impacts are not considered to be significant.

Consideration of emissions from the future Western Sydney Airport is out of the scope of the proposal.

2.17.2 Air quality impacts – operation

Submission number(s)

AU33, AU38, AU40, AU47, AU48, AU49, AS33, AS36, AS37, AS38, AS39, AS46, AU50, AU51, AU52, AU54, AU56, AU58, AU60, AU61, AU62, AU64, AU66, AU67, AU69

Issue description

- Suggest that the existing poor air quality of the area will be further degraded with the additional traffic in the area and result in potential health impacts
- Comment that the removal of trees will further exasperate air quality issues.

Response

As identified in section 6.11.1 of the REF, existing ambient air quality of the proposal area based on Campbelltown regional data indicates relatively consistent and ‘good-to-very-good’ air quality (OEH, 2016). Likely contributions to poorer air quality in the region are road traffic emissions evident through peak-hour air quality reductions, the surrounding industry in Campbelltown and natural effects such as bushfires throughout summer. While it is acknowledged that an increase in traffic would increase traffic related gaseous emissions, the proposal is not likely to result in an increase in traffic and is rather the result of an increase in surrounding residential development and associated vehicles, which is beyond the scope of the proposal.

As identified in section 6.8.3 of the REF, an urban design strategy and plan (refer to Appendix I of the REF) would aim, where possible, to restore disturbed areas with appropriate landscaping treatment and native planting.

2.18 Greenhouse gas and climate change

2.18.1 Climate change impacts from the project

Submission number(s)

AU53

Issue description

- Suggests that removal of trees will impact upon local ambient temperatures.

Response

As identified in section 6.8.4 of the REF, an Urban Design Strategy and Plan (refer to Appendix I of the REF) will be implemented to restore disturbed areas, where possible, with appropriate landscaping treatment and native planting. Where tree planting within the road corridor is not possible, there may be opportunities to negotiate plantings within adjacent properties to mitigate impacts to local ambient temperatures. The Roads and Maritime Environmental Sustainability Strategy would be considered during detailed design, which includes objectives such as mitigating potential impacts to the environmental quality of the area.

2.19 Hazards and risks

2.19.1 General hazards and risks – operation

Submission number(s)

AU28

Issue description

- Suggests that the REF does not consider traffic hazards that could occur.

Response

A traffic and transport impact assessment was undertaken to inform the REF. The impacts to traffic hazards that could potentially arise due to the proposal are detailed in section 6.4 of the REF. It is anticipated that the proposal will significantly improve road safety due to the separation of traffic flows and upgraded intersections.

2.19.2 Collisions, conflicts and accidents

Submission number(s)

AU28, AU35, AS26, AS39, AU61, AU62, AU64, AU66, AU67, AU69, AU82

Issue description

- Raises concern over the safety of entering and/or exiting the proposed Mount Gilead development
- Suggests that the safety of road users should be prioritised
- Suggests that trees on the side of the road pose a safety issue
- Expresses concern that merging lanes will pose a hazard
- Suggests the road upgrades will increase vehicle accidents
- Suggests that the median on Kellerman Drive will promote bad driver behaviour and create a safety risk.

Response

A key proposal objective is to improve road safety, the design has considered this and prioritised the safety of road users.

The proposal includes building two new intersections to provide safe access to the Mount Gilead subdivision and future housing development. Details of the preliminary project design are included in section 3 of the REF.

As detailed in section 6.4.2 of the REF, the safety of Appin Road has been identified as a significant issue. Roads and Maritime completed a safety review of Appin Road in 2014 and a number of safety issues were identified, including the width of existing lanes and shoulders of the road at several locations. Trees on the side of the road would be behind barriers per the design criteria in Table 3-1 of the REF. The proposed upgrades to Appin Road are intended to address the safety issues and improve the safety of the road for local users. Improving the capacity of Appin Road is proposed to improve vehicle movements on Appin Road for local users considering future traffic modelling. Considering the outcome of the Traffic and Transport Assessment Report prepared (WSP, 2017), the proposal is anticipated to reduce collisions, conflicts and accidents along Appin Road between Mount Gilead and Ambarvale.

The current design proposes to restrict the right turn movements to and from Kellerman Drive into the 7-Eleven. The changes to the existing arrangements are driven by safety, in particular sight distance issues being the requirement as per *Austroads Guide to Road Design Part 4a Unsignalised and Signalised Intersection*.

2.19.3 Collisions and conflicts with pedestrians/cyclists

Submission number(s)

AU30, AU33, AU35

Issue description

- Raises concern over pedestrians crossing the road to access St Helens Park Reserve and Ambarvale High school
- Comment that the safety of Appin school children is compromised with the current situation
- Comment that Macquariedale Road is a hazard for pedestrians.

Response

Table 3-4 in the REF includes a description of the proposed upgrades to the intersection of Fitzgibbon Lane and Kellerman Drive. This upgrade will include crossing provisions, including a staged crossing at the intersection, to improve the safety and accessibility of the intersection. The proposed upgrades are intended to improve the safety of all road users. A 40 kilometre per hour zone will be maintained around Fitzgibbon Lane to ensure safe access to Ambarvale High School.

School zones within Appin and Macquariedale Road are out of the scope of this proposal. To make suggestions or provide feedback to Roads and Maritime please visit <https://www.rms.nsw.gov.au/contact-us/>.

2.20 Cumulative impacts

2.20.1 Cumulative impacts – operation

Submission number(s)

AS40, AU80

Issue description

- Raised concern over the increase in coal trucks on Appin Road due to West Cliff Coal Washery project
- Raised concern over the rate at which infrastructure projects in the area are affecting wildlife.

Response

The West Cliff Colliery Washery Upgrade was completed in June 2011. Resulting increases in traffic on Appin Road have been taken into account in the traffic assessments that informed the proposal, including the *Traffic, Transport and Access Study for Mount Gilead* (Parsons Brinckerhoff, 2014), *Traffic Modelling Study* (Cardno 2016), *Traffic Modelling Study* (Cardno, 2017) and the *Roads and Maritime Appin Road Safety Review* (Roads and Maritime, 2014).

A cumulative impacts assessment was undertaken as part of the environmental assessment that informed the REF. Table 6-59 of the REF outlines projects that are currently being built, or plan to be built near the proposal over the next few years. Safeguards and management measures include all environmental management plans considering other developments in the area.

The Traffic Modelling Study (Cardno, 2017) assessed the traffic and intersection capacities required to support future year scenarios on Appin Road, allowing for estimated increases in background traffic. This study identified the Appin Road upgrades as required to achieve capacity for the forecasted traffic demand. The proposed upgrades are required to reduce congestion and improve the safety of Appin Road given future traffic increases.

A number of safeguards and management measures were identified in the REF to minimise adverse impacts on wildlife. These mitigation measures include a Construction Environmental Management Plan, a Flora and Fauna Management Plan in accordance with Roads and Maritime's *Biodiversity Guidelines: Protecting and Managing Biodiversity on Roads and Maritime Projects* (Roads and Maritime, 2016) and a Biodiversity Offset Strategy in accordance with the *Guidelines for Biodiversity Offsets* (Roads and Maritime, 2011) and the *Biodiversity Assessment Methodology* (Office of Environment and Heritage, 2018). Biodiversity mitigation measures are detailed in Table 6-11 of the REF.

2.21 Other

2.21.1 Support for the project

Submission number(s)

AU03, AS02, AU71

Issue description

- Expresses support for the proposed road upgrades.

Response

Roads and Maritime acknowledges your support for the proposed road upgrades.

2.21.2 Associated or external projects

Submission number(s)

AS39, AS40

Issue description

- Suggests that koala fencing be considered at Deadmans Bridge along Heathcote Road
- Questions why Roads and Maritime has not undertaken roadworks on Kings Fall Bridge and the Loddon River Bridge
- Questions why a curve near Loddon River has been taken out and replaced with a sweeping curve.

Response

These projects are not related to the Appin Road Upgrade and out of scope of the proposal. For general inquiries please visit Roads and Maritime's website <https://www.rms.nsw.gov.au/contact-us/>.

2.21.3 Mount Gilead development

Submission number(s)

AU16, AU28, AU34, AU35, AU38, AU40, AU47, AS05, AS20, AS26, AS33, AS36, AS37, AS38, AS39, AS40, AS41, AS43, AS46, AU50, AU51, AU53, AU54, AU56, AU58, AU60, AU61, AU62, AU63, AU66, AU80

Issue description

- Suggests that development plans being discontinued would negate the need for road upgrades
- Comment that the road will be overburdened by the increased traffic to and from the development
- Suggests that developers be liable for the southern portion of road upgrades
- Suggests the development in Mount Gilead will negatively impact the local koala community
- Queries whether a government agency has investigated the need for the Mount Gilead development
- Suggests that the development be delayed until road upgrades are completed
- Suggests that the development is not in line with the community's values or wishes
- Queries whether new housing developments are required to be built close to public transport options
- Suggests the size of lots in the new development is too small
- Suggests the development will negatively impact the environment and biodiversity
- Suggests the development will create unemployment issues in the area
- Suggests that the subdivision for the development is on land that should be National Heritage
- Questions the timing of the koala scat survey undertaken for the development application
- Suggests that there has been a lack of infrastructure projects to serve the new development
- Suggests that the rural lifestyle of the area will be changed by development.

Response

The proposed upgrade of Appin Road is being undertaken independently of the Mount Gilead development and therefore issues relating to the Mount Gilead development are out of scope.

Roads and Maritime completed a safety review of Appin Road in 2014 and a number of safety issues were identified, including the width of existing lanes and shoulders of the road at a number of locations.

Upgrading Appin Road was recommended to address the safety issues and improve the safety of the road for local users, independent of the Mount Gilead development plans.

The Mount Gilead subdivision and development is out of the scope of the REF, however the proposal includes building two new intersections to provide safe access to the Mount Gilead subdivision and future housing development. The Greater Macarthur Priority Growth Area, as outlined in the *Western City District Plan* (Greater Sydney Commission, 2018) and *Greater Macarthur 2040 Interim Plan* (DP&E, 2018), identifies Mount Gilead as a significant area to improve housing capacity. A planning proposal to rezone a parcel of land in Mount Gilead was approved by Campbelltown City Council in September 2017. The rezoning of 210 hectares of land within Mount Gilead includes 138 hectares of previously cleared farm land and 58 hectares for open space, riparian areas, rural land and biodiversity corridors. This is supported by *A Plan for Growing Sydney* (2014) which highlights the land along Appin Road as the Macarthur South Urban

Investigation Area for future growth. In line with these District Plans, traffic modelling indicates that without upgrade, Appin Road would be subject to significant congestion. The Appin Road upgrades have therefore been proposed with full consideration of future increase in vehicle movements from the Mount Gilead development.

For more information on the planning proposal for the Mount Gilead development, including biodiversity, cumulative impacts, socio-economic impacts and heritage assessment please contact Campbelltown City Council: <https://www.campbelltown.nsw.gov.au/ContactUs>.

2.21.4 Link Road Corridor Study

Submission number(s)

AU35, AS07, AS08, AS10, AS19, AS20, AS21, AS23, AS24, AS25, AS26, AS32, AS33, AS34, AS35, AS39, AS40, AS45, AU80

Issue description

- Raises concern that the proposed Link Road Corridor Study will impact upon the environment and biodiversity
- Queries whether it is intended for the Link Road Corridor Study to include both northbound and southbound access to/from Hume Motorway
- Queries the lack of northbound exit
- Expression of support for the proposed Link Road Corridor Study
- Raises concern that the proposed Link Road Corridor Study will direct high volumes of traffic onto Appin Road
- Suggests that an Appin Bypass option be explored
- Queries the level of assessment done into the environmental impacts of the proposed Link Road Corridor Study
- Suggests that the location of the Link Road Corridor Study be determined before commencement of Appin Road upgrades to model the cumulative impacts on surface water and flooding
- Comment that the vehicle movements required to build the Link Road Corridor Study should be considered in Appin Road traffic modelling
- Queries the direction and use of the proposed Link Road Corridor Study
- Queries the impact on the Noorumba Reserve
- Comment that installing the Link Road along the northern boundary of Noorumba would increase the need for an east-west overpass into Noorumba Reserve.

Response

Options for a proposed Link Road Corridor Study to provide a key connection between Appin Road, Gilead and Menangle Road, Menangle Park will be assessed by Roads and Maritime in 2019. This proposal is separate to the proposed Appin Road Upgrades, however is similarly intended to improve connectivity and support affordable housing in the Greater Macarthur Growth Area. Once the options assessment has concluded, Roads and Maritime will undergo community consultation and provide an opportunity to pose queries and feedback on the location, environmental impacts, traffic and transport impact and justification of the proposed Link Road Corridor Study.

To inquire about the Link Road Corridor Study, or its association to Appin Road and Spring Farm Parkway, please visit the Appin Road Improvements and Spring Farm Parkway web portal:

<https://v2.communityanalytics.com.au/rms/macarthur#>.

2.21.5 Appin Road safety improvements

Submission number(s)

AU33, AU35, AS19, AS20, AS21, AS23, AS24, AS25, AS26, AS27, AS32, AS33, AS34, AS35, AS37, AS40, AS42, AS45

Issue description

- Raises concern that the safety improvements will be inadequate to cater for increases in traffic
- Suggests that the safety works are cosmetic in nature
- Suggests that Appin Road be duplicated rather than undergo safety improvements
- Raises concern over the impact of median barriers on local fauna
- Suggests that cycleways be integrated into the Appin Road Safety Improvements
- Raises concern over hazards generated by U-turn bays
- Suggests that public transport infrastructure be integrated into the Appin Road Safety Improvements
- Expression of support for overtaking lanes
- Expresses support of Appin Road Safety Improvements independent to development proposals
- Comment that the Appin-Rosemeadow section of Appin Road is not the most dangerous.

Response

The proposed Appin Road Safety Improvements are being explored by Roads and Maritime independently from the proposed Appin Road Upgrades. However, comments received related to the Appin Road Safety Improvements will be addressed in a separate submissions report.

2.21.6 Other

Submission number(s)

AU16, AU30, AU33, AU35, AU37, AU47, AS04, AS23, AS33, AS37, AS38, AS39, AS40, AS41, AS47, DP01, AU58, AU60, AU62, AU66, AU71

Issue description

- Raises concern over potential contaminated land issues
- Queries who is responsible for the bus stop on Macquariedale Road
- Suggests parking options be explored for schools in Appin
- Suggests that the entrance to shopping precincts on both sides of Appin Road should be upgraded
- Raises concern over the number of educational facilities in the area
- Suggests that the developer contribute to funding for the southern end of Appin Road

- Raises concerns over the power dynamic created by a developer owning a public road
- Suggests a united approach to Appin Road upgrades between councils and Roads and Maritime
- Comment that koala and ecotourism opportunities be explored
- Suggests an alternate road to the Highway be considered to connect Appin Road to Wollongong, with an option to exit to Appin
- Suggests a rail line be established between Macarthur and Wollongong
- Queries whether the Department of Education has been offered sites in Gilead for schools
- Raises concern that affordable housing will impact the lifestyle of all residents in the area and increase crime
- Raises concern over the impacts to underemployment and unemployment
- Comment that the Broughton's Pass bridge was not delivered
- Raises concern over Roads and Maritime reports changing
- Comment on the intentions of the M5 Federal highway
- Expresses concern regarding the conduct of the Greater Sydney Commission
- Queries police presence in Appin
- Comment on the funding of roads to Port Kembla and other ports being diverted to other road projects
- Queries the communication between Wollondilly and Campbelltown Council during the process of Mount Gilead land rezoning
- Suggests that traffic counter statistics from Appin Road be displayed on the Roads and Maritime website
- Query regarding the disposal of liquid waste from Sydney in Campbelltown
- Suggests that there is uncertainty within the community over plans for an Appin Bypass
- Questions the impacts of land sale to developers along the Appin Bulli Road
- Suggests that the Spring Farm Road extension allow for wider lanes, a breakdown lane and noise walls
- Suggests that the Appin Road upgrades and Appin bypass project be displayed to the public as one project
- Requests information regarding upgrades on Broughton's Pass and Wilton Road
- Raises concern over immigration
- Suggests that Roads and Maritime consider the "Investigation of the Impact of Roads on koalas" report prepared on behalf of Australian Museum Business Services when shaping their policies.

Response

Roads and Maritime acknowledges your concern regarding contaminated land concerns in the vicinity of the proposal. Comprehensive contaminated land assessment and mitigation development is undertaken for all road projects with a potential for contaminated land issues as part of the environmental review (refer to Appendix D of the REF).

Department of Planning and Environment have established a draft Special Infrastructure Contribution which would provide developer contribution to Greater Macarthur Land Release and supporting infrastructure, which will include roads, intersections, bridges, public transport and schools. Over the next 20 years, the Special Infrastructure Contribution contributions for the Greater Macarthur Land Release Area are estimated to be approximately \$1.58 billion.

The Spring Farm Parkway project is external to the proposed Appin Road upgrades and out of the scope of this proposal. Roads and Maritime is currently undergoing options assessment and Aboriginal Heritage assessment in the study area. Further information and opportunities to make suggestions and feedback will be released. To follow the project, please visit <https://www.rms.nsw.gov.au/projects/sydney-west/spring-farm-parkway/index.html>.

For more information on the planning proposal for the Mount Gilead development, including socio-economic impact assessment, please visit the Campbelltown City Council website <https://www.campbelltown.nsw.gov.au/home>.

For queries about Roads and Maritime projects, proposals and websites not related to the proposed Appin Road upgrades, please submit an online inquiry to Roads and Maritime at <https://www.rms.nsw.gov.au/contact-us/>.

Other issues raised are considered beyond the scope of this proposal.

3 Changes to the proposal

3.1 Provision of fauna fencing at Noorumba Reserve

3.1.1 Description

The REF proposal included the provision of a fauna fence and/or barriers at suitable locations on either side of Appin Road to prevent fauna accessing the road corridor. The proposed fauna fencing was predominantly focussed on the eastern side of Appin Road. However, the proposed change would result in the addition of about 252 m of fauna fencing along the western side of Appin Road at Noorumba Reserve (refer to Figure 3-1).

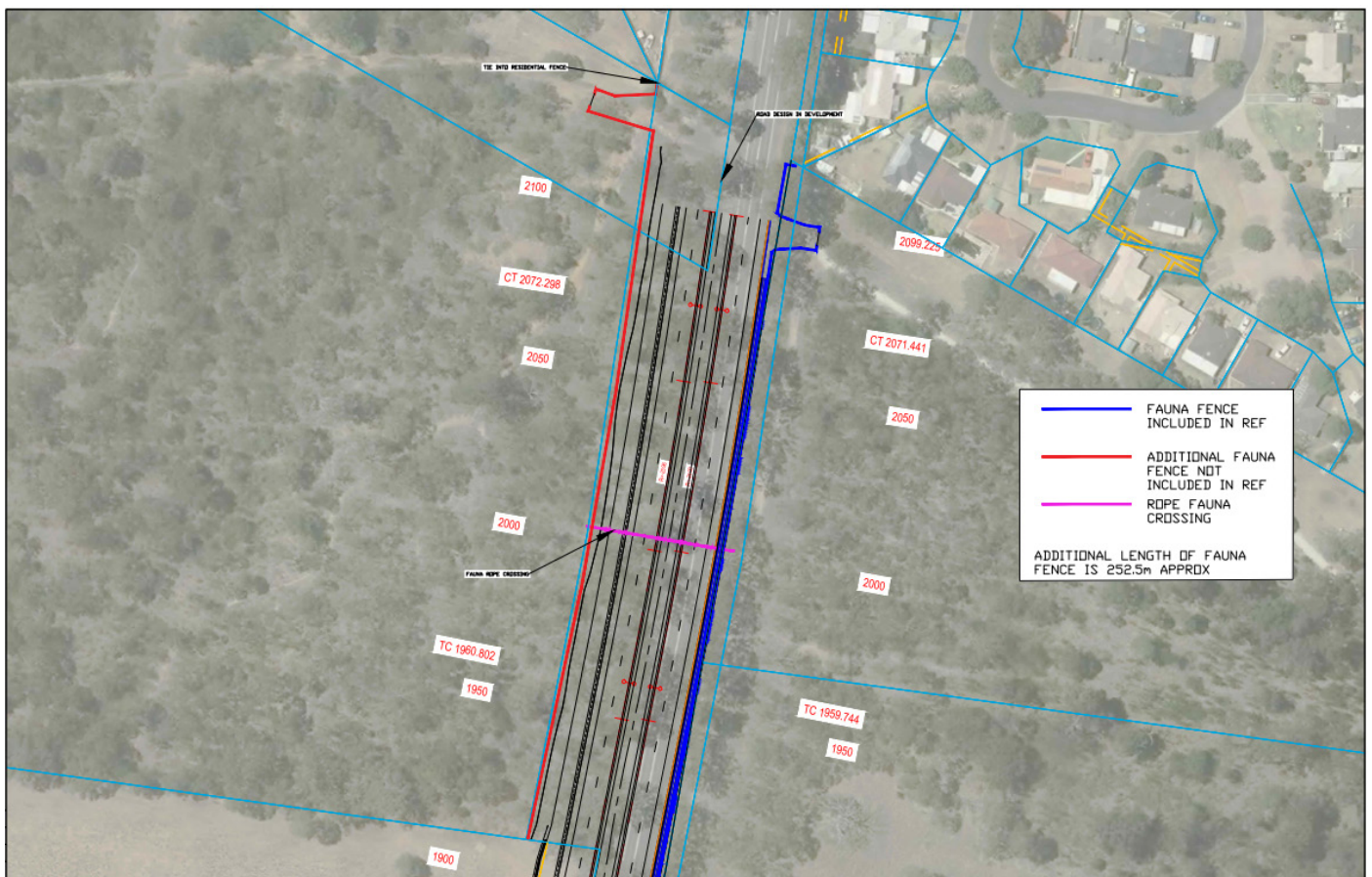


Figure 3-1: Proposed fauna fencing at Noorumba Reserve

The proposed change has been implemented based on the feedback and recommendations from OEH, independent expert reports and consideration of submissions raised by the community and key stakeholders.

Similar to the proposed fencing in the REF, the fauna fence would typically comprise a 1.8 m chain wire fence with a galvanised sheet at the top to prevent climbing of fauna.

As identified in section 3.2 of the REF, clearing of up to five metres from the existing road pavement would be required for the installation of the fauna fence, safety barrier and to provide access for maintenance and repairs. A section of about 600 m in length would require a six metres cleared zone to accommodate installation of a culvert. The typical five metres cross-section for the fauna fence is shown in Figure 3-2 below.

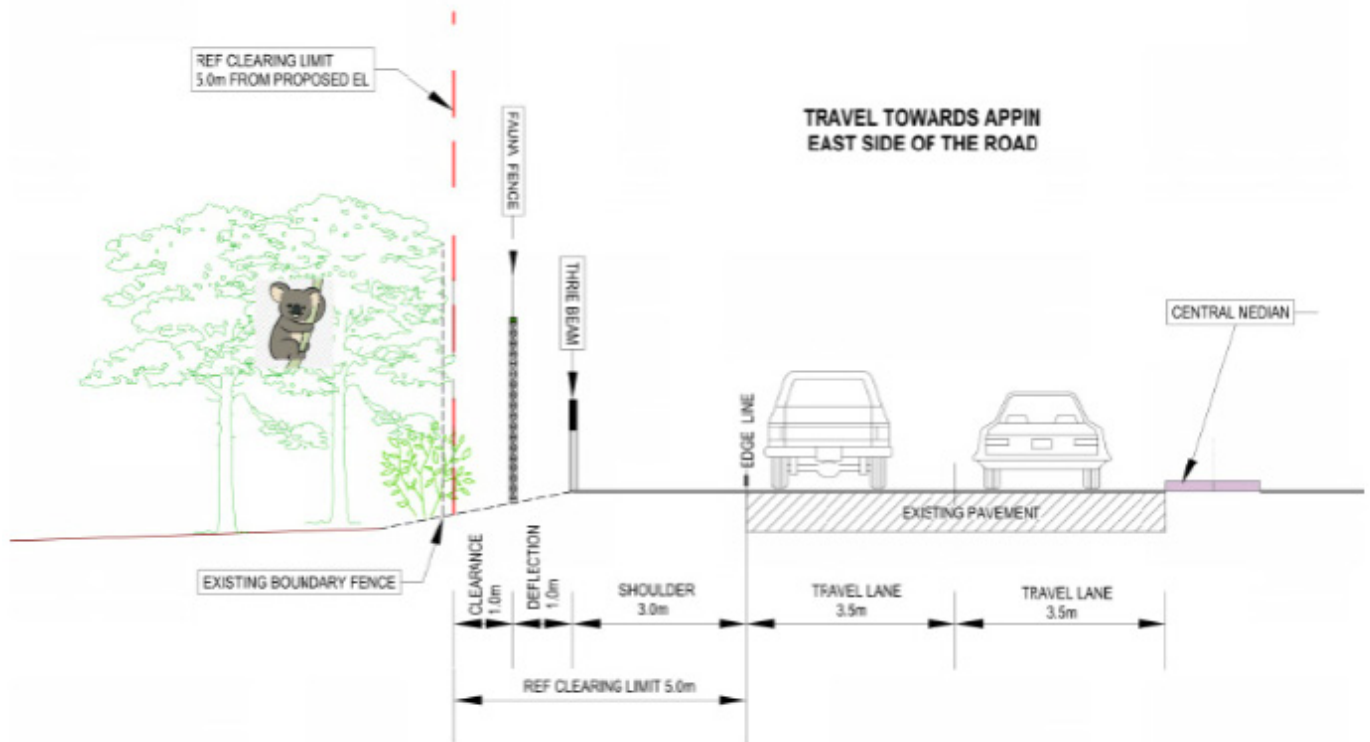


Figure 3-2 Typical cross-section of the fauna fence

3.1.2 Environmental assessment

Description of existing environment

The study area is located adjacent to a section of remnant bushland associated with Noorumba Reserve which separates agricultural land from the residential areas to the north. This section of remnant bushland extends as a dense corridor to the east and west, with Appin Road intersecting the two areas.

Potential impacts

As no additional vegetation clearing would be required beyond that proposed in the REF, the impacts of this change are consistent with those identified in the REF.

Revised safeguards and mitigation measures

No additional safeguards or mitigation measures beyond those identified in the REF would be required.

4 Environmental management

The REF for the Appin Road Upgrade, Mount Gilead to Ambarvale identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (section 7.2 of the REF).

After consideration of the issues raised in the public submissions and changes to the proposal, the safeguard and management measures have been revised. Additional safeguards and management measures are provided in section 4.2. These include investigating koala management within Noorumba Reserve, consultation with RFS regarding the fauna fence, additional consultation regarding the Kellerman Drive interface and investigating the need for additional property protection.

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.

4.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Construction Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan), QA Specification G40 – Clearing and Grubbing and QA Specification G10 – Traffic Management.

4.2 Summary of safeguards and management measures

The REF for the Appin Road Upgrade, Mount Gilead to Ambarvale identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the proposal (refer to Chapter 7 of the REF) have been revised. Should the proposal proceed, the environmental management measures in Table 4-1 will guide the subsequent phases of the proposal. Additional and/or modified environmental safeguards and management measures to those presented in the REF have been underlined and deleted measures, or parts of measures, have been struck out.

Table 4-1: Summary of environmental safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
1	Biodiversity	<p>A Flora and Fauna Management Plan will be prepared in accordance with Roads and Maritime's <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA, 2011c) and implemented as part of the CEMP. It will include, but not be limited to:</p> <ul style="list-style-type: none"> Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas Requirements set out in the <i>Landscape Guideline</i> (RTA, 2008) Pre-clearing survey requirements Procedures for unexpected threatened species finds and fauna handling Procedures addressing relevant matters specified in the <i>Policy and guidelines for fish habitat conservation and management</i> (DPI Fisheries, 2013) Protocols to manage weeds and pathogens. 	Contractor	Detailed design/pre-construction	Core standard safeguard B1 Section 4.8 of QA G36 Environment Protection
2	Biodiversity	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Contractor	Detailed design/pre-construction	Core standard safeguard B2
3	Native vegetation removal and re-establishment	A Biodiversity Offset Strategy would be prepared during the detailed design phase. This strategy would be prepared in accordance with the Guidelines for Biodiversity Offsets (Roads and Maritime, 2011a) and the NSW BioBanking Assessment Methodology 2014.	Contractor	Detailed design	Additional safeguard B3
4	General ecological mitigation	Ensure any fauna encountered onsite would be managed in accordance with Biodiversity Guidelines, Guide 9 (fauna handling) (Roads and Maritime, 2016b).	Contractor	Pre-construction	Additional safeguard B4
5	General ecological mitigation	<p>In addition to the requirements of Core standard safeguard B1, the Flora and Fauna Management Plan would also include:</p> <ul style="list-style-type: none"> A site walkover to confirm clearing boundaries and sensitive locations before starting work Identify, in toolbox talks, where biodiversity controls would be included. 	Contractor	Pre-construction	Additional safeguard B5

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
6	Invasive and noxious weed management	<p>Develop a weed management plan (WMP) in accordance with Biodiversity Guidelines, Guide 6 (Roads and Maritime, 2016b) to include:</p> <ul style="list-style-type: none"> • Identification of the weeds on site (confirm during ecologist pre-clearing inspection) • Weed management priorities and objectives • Sensitive environmental areas within or adjacent to the site • The location of weed infested areas • Weed control methods • Measures to prevent the spread of weeds, including machinery hygiene procedures and disposal requirements • A monitoring program to measure the success of weed management • Communication with local Council noxious weed representative. 	Contractor	Pre-construction	Additional safeguard B6
7	Risk of pathogen and pest species	If hygiene procedures are required onsite, ensure the Flora and Fauna Management Plan includes hygiene protocols to prevent the introduction and spread of such pathogens as specified in Biodiversity Guidelines: (Roads and Maritime, 2016b). Manage all pathogens (e.g. Chytrid, myrtle rust and phytophthora) in accordance with the Biodiversity Guidelines, Guide 7 (Roads and Maritime, 2016b).	Contractor	Pre-construction	Additional safeguard B7
8	Unexpected discovery of threatened species	If unexpected flora or fauna are discovered stop work immediately and implement the Roads and Maritime Unexpected Threatened Species Find Procedure in the Biodiversity Guidelines, Guide 1 (Roads and Maritime, 2016b).	Contractor	Construction	Additional safeguard B8
9	Injury and mortality impacts while building the proposal	<p>Implement the following controls: under the Flora and Fauna Management Plan:</p> <ul style="list-style-type: none"> • Manage fauna in accordance with Biodiversity Guidelines, Guide 9 (Roads and Maritime, 2016b) • Remove any habitat in accordance with Biodiversity Guidelines, Guide 4 (Roads and Maritime, 2016b). 	Contractor	Construction	Additional safeguard B9

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
10	Native vegetation removal and re-establishment Threatened species habitat and habitat features	Implement the following controls under the Flora and Fauna Management Plan: <ul style="list-style-type: none"> Undertake pre-clearance checks in accordance with Biodiversity Guidelines, Guide 1 (Roads and Maritime, 2016b) Create exclusions zones in accordance with Biodiversity Guidelines, Guide 2 (Roads and Maritime, 2016b) Re-establish native vegetation in accordance with Biodiversity Guidelines, Guide 3 (Roads and Maritime, 2016b) Reinstate habitat in accordance with Biodiversity Guidelines, Guide 5 and Guide 8 (Roads and Maritime, 2016b). 	Contractor	Construction	Additional safeguard B10
11	Koala habitat	Fauna fencing and arboreal rope bridges would be implemented in accordance with the details described within this REF to the southern extent of the Mount Gilead residential subdivision.	Contractor	Pre-construction	Additional safeguard B11
12	Koala	Koala proof fencing would be further investigated during the detailed design phase and the use of koala proof fencing and koala grids (at access points) along Appin Road in areas of likely occurrence would be undertaken.	Roads and Maritime/ Contractor	Detailed design	Additional safeguard B12
13	<u>Koala management</u>	<u>Roads and Maritime will investigate, in consultation with, and meeting the requirements of OEH, management of koalas potentially using the remnant habitats within Noorumba Reserve to the large tracts of remnant vegetation along Appin Road in accordance with the recommendations of the expert report by Crowther (2018).</u>	<u>Roads and Maritime/ Contractor</u>	<u>Detailed design/ Pre-construction</u>	<u>Additional safeguard B13</u>
14	Wildlife connectivity impacts	Implement connectivity controls in accordance with the Wildlife Connectivity Guidelines for Road Projects (Roads and Maritime, 2016c). This would include providing connectivity structures for arboreal animals, such as glider crossings.	Contractor	Construction	Additional safeguard B14
15	<u>Consultation with RFS</u>	<u>Future consultation with the RFS regarding the fauna fence and access requirements will be undertaken during detailed design.</u>	<u>Roads and Maritime/ Contractor</u>	<u>Detailed design/ Pre-construction</u>	<u>Additional safeguard B15</u>

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
16	Contaminated land	<p>A Contaminated Land Management Plan will be prepared in accordance with the <i>Guideline for the Management of Contamination</i> (Roads and Maritime, 2013b) and implemented as part of the CEMP. The plan will include, but not be limited to:</p> <ul style="list-style-type: none"> • Capture and management of any surface runoff contaminated by exposure to the contaminated land • Measures to ensure the safety of site personnel and local communities during construction. 	Contractor	Detailed design/ Pre-construction	Core standard safeguard C1 Section 4.2 of QA G36 Environment Protection
17	Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Roads and Maritime Environment Manager and/or EPA.	Contractor	Construction	Core standard safeguard C2 Section 4.2 of QA G36 Environment Protection
18	Contaminated land	Areas identified to contain surface lying wastes, including the areas of ACM and SMF would be remediated prior to construction. All waste should be disposed of to a suitably licenced landfill facility.	Contractor	Detailed design/ Pre-construction	Core standard safeguard C3 Section 4.2 of QA G36 Environment Protection
19	Accidental spills	A site-specific emergency spill plan will be developed and include spill management measures in accordance with the Roads and Maritime <i>Code of Practice for Water Management</i> (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Roads and Maritime and EPA officers).	Contractor	Detailed design/ Pre-construction	Core standard safeguard C4 Section 4.3 of QA G36 Environment Protection
20	Hydrology and flooding	<p>A contingency and evacuation plan will be prepared for a potential flood event while the proposal is being built. The plan will:</p> <ul style="list-style-type: none"> • Evaluate what flood event would trigger the plan • Include evacuation procedures • Include a map indicating the area that is flood prone and the locations where to evacuate. 	Contractor	Pre-construction Construction	Additional safeguard: HF1

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
21	Hydrology and flooding	The layout and detail of the drainage system including water quality treatments, discharge points, swale design and scour protection will be refined during detailed design in consultation with the Roads and Maritime Environment Branch.	Contractor	Detailed design	Additional safeguard: HF2
22	Hydrology and flooding	Drainage line crossing points will be designed in accordance with Guidelines for Watercourse Crossings (DPI Water, 2012).	Contractor	Detailed design	Additional safeguard: HF3
23	Traffic and transport	<p>A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Roads and Maritime <i>Traffic Control at Work Sites Manual</i> (Roads and Maritime, 2010) and <i>QA Specification G10 Control of Traffic</i> (Roads and Maritime, 2008a). The TMP will include:</p> <ul style="list-style-type: none"> • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • Monitoring, review and amendment mechanisms. 	Contractor	Detailed design/ Pre-construction	Core standard safeguard TT1 Section 4.8 of QA G36 Environment Protection
24	Property access	<ul style="list-style-type: none"> • Property access will be maintained where feasible and reasonable and property owners will be consulted before starting any work that may temporarily restrict or control access • (Side) road and lane closures will be minimised where feasible and reasonable. 	Contractor	Construction	Additional safeguard: TT2

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
25	Traffic management at ancillary sites	<p>The following traffic management provisions will be provided at each ancillary facility:</p> <ul style="list-style-type: none"> • Appropriate 'sight distances' to allow traffic to safely enter and exit • Temporary painted road lines to provide delineation • Suitable intersection arrangements where required • Other controls to separate, slow down, or temporarily stop traffic to allow for safe entry and exit. 	Contractor	Construction	Additional safeguard: TT3
26	Staged crossing	A communications plan for the operation and use of the new staged pedestrian crossing will be prepared.	Roads and Maritime	Post-construction/operation	Additional safeguard: TT4
27	<u>Kellerman Drive interface</u>	<u>During detailed design, consultation on the design of the Kellerman Drive access to the 7-Eleven site will continue in conjunction with Roads and Maritime, Campbelltown City Council and landowners.</u>	<u>Roads and Maritime Contractor</u>	<u>Detailed design</u>	<u>Additional safeguard TT5</u>
28	Noise and vibration	<p>A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the <i>Interim Construction Noise Guideline</i> (ICNG) (DECC, 2009) and identify:</p> <ul style="list-style-type: none"> • All potential significant noise and vibration generating activities associated with the activity • Feasible and reasonable mitigation measures to be implemented, taking into account <i>Beyond the Pavement: urban design policy, process and principles</i> (Roads and Maritime, 2014b). • A monitoring program to assess performance against relevant noise and vibration criteria • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. 	Contractor	Detailed design/pre-construction	<p>Core standard safeguard NV1</p> <p>Section 4.6 of QA G36 Environment Protection</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
29	Construction noise and vibration	<p>All sensitive receivers (e.g. schools, local residents) likely to be affected will be notified at least five days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of:</p> <ul style="list-style-type: none"> • The proposal • The construction period and construction hours • Contact information for proposal management staff • Complaint and incident reporting • How to obtain further information. 	Contractor	Construction	Additional Safeguard NV2
30	Construction noise	<ul style="list-style-type: none"> • Work will be undertaken in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime, 2016a) • Stationary and directional noise sources will be orientated away from sensitive receivers • Vehicles, obstacles and stockpiles will be utilised on site to provide shielding to receivers, especially for static noise sources • Equipment that has noise levels equal to or less than the sound power levels in Table 12.1 of Appendix F will be used • The simultaneous use of high noise generating equipment will be limited. The use will also be limited to standard hours where possible • Plant will be switched off when not in use • Plant, tools and equipment will be used such that noise is reduced to the minimum required. 	Contractor	Construction	Additional Safeguard NV3

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
31	Construction traffic noise	<p>The NVMP would include provisions to reduce the potential impact of construction traffic noise including:</p> <ul style="list-style-type: none"> Restricting travel routes to and from the project site to using the main roads (e.g. arterial roads) and to avoid local roads and roads where residential receivers are potentially impacted Prohibiting the use of engine/compression brakes in or near residential areas Promoting driving behaviour that reduces potential noise impacts Prohibiting idling of plant and equipment engines near residential receivers when not in use Strategic positioning of site accesses to minimise the chance of trucks passing by residential receivers, especially at night. 	Contractor	Construction	Additional Safeguard NV4
32	Construction vibration	<ul style="list-style-type: none"> Lower powered equipment should be used when working in close proximity to vibration sensitive receivers where possible Building condition /dilapidation surveys should be completed both before and after the works and attended vibration monitoring undertaken when works are proposed within the specified safe working distances Where work is required within the nominated safe working, additional vibration mitigation measures detailed in Table 12.2 of Appendix F should be considered 	Contractor	Construction	Additional Safeguard NV5
33	Noise and vibration complaints	<p>Attended noise and/or vibration monitoring will be undertaken following a complaint. Report the monitoring results as soon as possible. In the case that exceedances of the management levels are recorded, review the situation and identify means to reduce the impacts to noise and vibration sensitive receivers. This is to include revision to the CNVMP where required.</p>	Contractor	Construction	Additional Safeguard NV6

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
34	Operational noise mitigation	<p>Mitigation measures to minimise operational noise will be investigated, including:</p> <ul style="list-style-type: none"> • Quieter pavement surfaces and suitability of such pavement types for through lanes and areas of acceleration, deceleration and turning movements • Noise walls • Property treatments for residually affected receivers where feasible and reasonable. 	Contractor	Detailed Design	Additional Safeguard NV7
35	Property treatments	Where at property treatments are identified, consider implementing these at the commencement of construction. These treatments would alleviate any noise concerns/ complaints during the construction period.	Contractor	Construction	Additional Safeguard NV8
36	Aboriginal heritage	<p>The <i>Standard Management Procedure - Unexpected Heritage Items</i> (Roads and Maritime, 2015d) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Roads and Maritime does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place.</p> <p>Work will only re-commence once the requirements of that Procedure have been satisfied.</p>	Contractor	Detailed design/pre-construction	<p>Core standard safeguard AH1</p> <p>Section 4.9 of QA G36 Environment Protection</p>
37	Aboriginal heritage	Further assessment of Aboriginal cultural heritage would be completed for the proposal for areas previously identified as of high archaeological potential (Virtus, 2017), in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime, 2011).	Roads and Maritime	Pre-construction	Additional safeguard AH2
38	Aboriginal heritage	An AHIP for would be obtained prior any works potentially impacting Aboriginal heritage.	Roads and Maritime	Pre-construction	Additional safeguard AH3
39	Non-Aboriginal heritage	A Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to Non-Aboriginal heritage. The NAHMP will be prepared in consultation with the Office of Environment and Heritage	Contractor	Detailed design/pre-construction	<p>Core standard safeguard H1</p> <p>Section 4.10 of QA G36 Environment Protection</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
40	Non-Aboriginal heritage	<ul style="list-style-type: none"> The <i>Standard Management Procedure - Unexpected Heritage Items</i> (Roads and Maritime, 2015d) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered Work will only re-commence once the requirements of that Procedure have been satisfied. 	Contactor	Detailed design/ pre-construction	Core standard safeguard H2 Section 4.10 of QA G36 Environment Protection
41	Non-Aboriginal heritage	A heritage induction would be provided for all workers prior to works commencing and include the values of the sites, avoidance procedure and contacts (site manager, Roads and Maritime heritage officer) for reporting unexpected archaeological finds, or inadvertent impacts to heritage items.	Contractor	Pre-construction/ construction	Additional safeguard H3
42	Loss of screening	Retention of natural vegetation screening will be retained wherever possible throughout the design and construction. Where impact to vegetation cannot be avoided, planting of new vegetation would be carried out.	Environmental Manager, Designers and All construction personnel	Detailed design/ pre-construction/ post-construction	Additional safeguard H4
43	Vibration impact on Silos	There is the potential risk for impacts to this heritage item from vibration during construction, depending on the nature of equipment utilised. Construction vibration damage to heritage items would be managed during the project and careful ongoing monitoring would be required. The construction methodology for works adjacent to the Silos is subject to approval by Roads and Maritime prior to the commencement of works in this area. Low vibration construction tools and alternatives will be considered wherever possible for works adjacent to the Silos and outlined in the CEMP.	Environmental Manager, Designers and All construction personnel	Detailed design/ pre-construction/ post-construction	Additional safeguard H5
44	Construction of noise walls on Denfield homestead	Construction of retaining walls close to Denfield homestead would not occur within two metres of the property boundary, nor would they impact upon the root systems of vegetation that runs along the property boundary. The construction of the noise wall at Denfield homestead would incorporate interpretive design elements that express elements of the place's history and integrate into the design as it develops. This expression can take many forms on the panels of the noise wall, but will keep with the recognised State significant values of Denfield homestead.	Environmental Manager, Designers and All construction personnel	Detailed design/p re-construction/ post-construction	Additional safeguard H6

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
45	Landscape character and visual impact	<p>An Urban Design Plan will be prepared to support the final detailed project design and implemented as part of the CEMP.</p> <p>The Urban Design Plan will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan will include design treatments for:</p> <ul style="list-style-type: none"> • Location and identification of existing vegetation and proposed landscaped areas, including species to be used • Built elements including retaining walls and noise walls • Fixtures such as seating, lighting, fencing and signs • Details of the staging of landscape work taking account of related environmental controls such as erosion and sedimentation controls and drainage • Procedures for monitoring and maintaining landscaped areas • Details on the proposed fauna fence. <p>The Urban Design Plan will be prepared in accordance with relevant guidelines, including:</p> <ul style="list-style-type: none"> • Beyond the Pavement urban design policy, process and principles (Roads and Maritime, 2014b) • Landscape Guideline (RTA, 2008) • Noise Wall Design Guidelines (RTA, 2006) • Shotcrete Design Guideline (RTA, 2005). 	Contractor	Detailed design/pre-construction	Core standard safeguard UD1
46	Operational light spill impacts	The lighting design specification will be developed minimise light spill and light glare in accordance with the provisions of AS4282-1997 Control of the Obtrusive Effect of Outdoor Lighting (Standards Australia, 1997). This may require the use of directional lighting, cut-offs or filters.	Contractor	Detailed design	Additional safeguard: UD2
47	Operational visual and amenity impacts	Opportunity to improve planting, including within medians and verges and adjoining private property should be investigated and implemented where feasible.	Contractor	Detailed design	Additional safeguard: UD3

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
48	Operational visual and amenity impacts	Where feasible and reasonable, opportunities to reduce the visual impact of built structures such as retaining and noise walls, would be implemented through design and selection of materials and colours.	Contractor	Detailed design	Additional safeguard: UD4
49	Construction light spill impacts	Measures to minimise the use and spill from temporary and construction lighting will be introduced onsite	Contractor	Construction	Additional safeguard: UD5
50	Socio-economic	<p>A Communication Plan (CP) will be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The CP will include (as a minimum):</p> <ul style="list-style-type: none"> • Mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions • Contact name and number for complaints. <p>The CP will be prepared in accordance with Road and Maritimes' <i>Community Involvement and Communications Resource Manual</i> (Roads and Maritime, 2008b).</p>	Contacto	Detailed design/ pre-construction	Core standard safeguard SE1
51	Property acquisition	All property acquisition will be carried out in accordance with the <i>Land Acquisition Information Guide</i> (Roads and Maritime, 2012a) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	Roads and Maritime project manager	Pre-construction and construction	Core standard safeguard SE2
52	Impacts on business and the community during construction	Road users, including freight companies will be informed of changed conditions, including likely disruptions to access during construction.	Construction contractor	Pre-construction and construction	Additional safeguard SE3
53	Community impacts during construction across the proposal footprint	Consultation will be undertaken with potentially affected residences prior to the commencement of and during works in accordance with the Roads and Maritime's Community Involvement and Communications Resource Manual. Consultation will include but not limited to door knocks, newsletters or letter box drops providing information on the proposed works, working hours and a contact name and number for more information or to register complaints.	Roads and Maritime/ Construction contractor	Pre-construction and construction	Additional safeguard SE4

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
54	Community impacts during construction across the proposal footprint	A complaint handling procedure and register will be included in the CEMP. The complaints register will be maintained throughout construction.	Construction contractor	Pre-construction, construction	Additional safeguard SE5
55	Emergency Access	Access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	Construction contractor	Construction	Additional safeguard SE6
56	Impacts to properties	Consultation will be undertaken with all affected property owners during detailed design and construction to develop and implement measures to mitigate impacts on land use viability, infrastructure and severance.	Roads and Maritime	Detailed Design	Additional safeguard SE7
57	Temporary utility service interruption	Residents and businesses will be notified before any utility interruption	Contractor	Pre-construction	Additional safeguard: SE8
58	Utility relocation and adjustment	A utility management <u>plan</u> will be prepared to include: <ul style="list-style-type: none"> Utility company consultation Maintenance and emergency access requirements Construction staging and programming conflicts. 	Roads and Maritime Contractor	<u>Detailed design,</u> <u>Pre-construction,</u> <u>Construction</u>	Additional safeguard: SE9

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
59	General Waste Management	<p>A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:</p> <ul style="list-style-type: none"> Measures to avoid and minimise waste associated with the project Classification of wastes and management options (re-use, recycle, stockpile, disposal) Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions Procedures for storage, transport and disposal Monitoring, record keeping and reporting. <p>The WMP will be prepared taking into account the <i>Environmental Procedure - Management of Wastes on Roads and Maritime Services Land</i> (Roads and Maritime, 2014d) and relevant Roads and Maritime Waste Fact Sheets.</p>	Contactor	Detailed design/ pre-construction	Core standard safeguard W1 Section 4.2 of QA G36 Environment Protection
60	General waste impacts	Waste accumulation, littering and general tidiness will be monitored during routine site inspections.	Contractor	Construction	Additional safeguard: W2
61	Resource minimisation	Recycled, durable and low embodied energy products will be used to reduce primary resource demand in instances where the materials are cost and performance competitive and comparable in environmental performance (e.g. where quality control specifications allow).	Contractor	Construction Operation	Additional safeguard: W3

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
62	Hazard and Risk	<p>A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to:</p> <ul style="list-style-type: none"> • Details of hazards and risks associated with the activity • Measures to be implemented during construction to minimise these risks • Record keeping arrangements, including information on the materials present on the site, material safety data sheets and personnel trained and authorised to use such materials • A monitoring program to assess performance in managing the identified risks • Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. <p>The HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice and EPA or Office of Environment and Heritage publications.</p>	Contractor	Detailed design/ pre-construction	Core Safeguard HAZ1

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
63	Hazard and Risk	<p>Where possible, hazardous materials and dangerous goods, avoided or substituted for less hazardous alternatives throughout the construction process. Where this is not possible, in the case for necessary fuels, oils and fluids required for activities in the proposal for example, the appropriate management and handling procedures will be implemented as part of the CEMP. This will include a Hazard and Risk Management Plan (HRMP) and Waste Management Plan (WMP) which will include, but not be limited to measures to avoid the generation of hazardous wastes and the appropriate procedures for their storage, transport and disposal.</p> <p>The WMP will be prepared taking into account the <i>Environmental Procedure – Management of Wastes on Roads and Maritime Services Land</i> (Roads and Maritime, 2014d) and other relevant Roads and Maritime hazardous materials and dangerous goods handling procedures to reduce environmental and worker risk such as <i>Managing the risks of working with bitumen and bituminous products</i> (Roads and Maritime, 2013e).</p> <p>The appropriate management and removal of existing hazardous materials and dangerous goods identified adjacent to the proposed works in the form of asbestos containing materials (ACM) and synthetic fibre materials (SFM) is addressed in section 6.2.4.</p>	Contractor	Pre-construction/ Construction	Additional Safeguard HAZ2
64	<u>Property protection</u>	<u>Additional safety measures required to provide protection for private properties along Appin Road will be investigated during detailed design.</u>	<u>Roads and Maritime Contractor</u>	<u>Detailed design</u>	<u>Additional safeguard HAZ3</u>

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
65	Air Quality	<p>An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the CEMP. The AQMP will include, but not be limited to:</p> <ul style="list-style-type: none"> • A procedure for monitoring dust onsite and weather conditions • An identification procedure for potential sources of air pollution and mitigation measures for likely scenarios such as imposing speed limits throughout the proposal footprint and site compounds • Maintaining air quality management objectives consistent with any relevant published EPA and/or OEH guidelines • Compliance with Stockpile Site Management Guidelines (Roads and Maritime, 2015a) • Methods to manage work during strong winds or other adverse weather conditions such as reducing active earthworks on hot windy days • Implement a vehicle, plant and machinery maintenance program to comply with manufacturers specifications and ensure compliance with the <i>NSW Protection of Environment Operations Act 1997</i>. <p>A progressive rehabilitation strategy for exposed surfaces.</p>	Contractor	Detailed design/pre-construction	Core standard safeguard AQ1 Section 4.4 of QA G36 Environment Protection
66	Greenhouse gas and climate change	<p>Detailed design will consider opportunities to reduce building and construction material quantities and use appropriate materials wherever reasonable and feasible.</p> <p>Pavement design will ensure resilience against extreme temperature and intense and more frequent rainfall events.</p> <p>The use of climate tolerant vegetation will be considered and its ability to align with the existing landscape will be included in the landscape character and visual amenity design.</p>	Contractor	Detailed Design	Additional safeguard GG1
67	Greenhouse gas and climate change	Equipment performance and running and idling times will be monitored and managed to reduce emissions.	Contractor	Construction	Additional safeguard GG2

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard/additional safeguard
68	Cumulative impacts	<p>Other developers will be consulted:</p> <ul style="list-style-type: none"> To obtain information about project timeframes and impacts. Identify and implement appropriate safeguards and management measures to minimise cumulative impacts. If required, this may include implementing traffic management controls in consultation with other project developers to minimise cumulative construction traffic impacts on Appin Road. <p>To manage the interfaces of the proposal's staging and programming in combination with the other projects occurring in the area.</p>	Roads and Maritime Contractor	Pre-construction Construction	Additional safeguard: CI1
69	Cumulative impacts	All environmental management plans will be prepared to consider other developments in the area.	Contractor	Pre-construction	Additional safeguard: CI2
70	Cumulative impacts	Further consideration of the proposal and the Appin Road safety improvement work would be undertaken.	Roads and Maritime	Pre-construction	Additional safeguard: CI3

4.3 Licensing and approvals

A summary of the licenses and approvals required for the proposal are provided in Table 4-2.

Table 4-2: Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Roads Act 1993</i> (s138)	Road occupancy licence to dig up, erect a structure or carry out work in, on or over a road.	Prior to start of the activity

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Appendix A

Response to issues

Respondent	Objective email No.	Section number where issues are addressed
Community member: Individual	AU01	2.6.3, 2.6.6, 2.8.1
Community member: Individual	AU02	2.10.3, 2.14.5
Community member: Individual	AU03	2.5.2, 2.21.1
Community member: Individual	AU04	2.6.6
Community member: Individual	AU05	2.6.1, 2.6.5
Community member: Individual	AU06	2.3.3, 2.3.4, 2.10.2, 2.10.3, 2.11.1
Community member: Individual	AU07	2.16.4
Community member: Individual	AU08	2.16.4
Community member: Individual	AU09	2.16.4
Community member: Individual	AU10	2.2.2, 2.16.1, 2.16.4
Community member: Individual	AU11	2.16.4
Community member: Individual	AU12	2.16.4
Community member: Individual	AU13	2.16.3, 2.16.4
Community member: Individual	AU14	2.16.3, 2.16.4
Community member: Individual	AU15	2.3.2, 2.16.4
Community member: Individual	AU16	2.16.4, 2.21.3, 2.21.6
Community member: Individual	AU17	2.16.4
Community member: Individual	AU18	2.10.3
Community member: Individual	AU19	2.16.4
Community member: Individual	AU20	2.16.4

Respondent	Objective email No.	Section number where issues are addressed
Community member: Individual	AU21	2.16.4
Community member: Individual	AU22	2.3.1
Community member: Individual	AU23	2.8.5, 2.8.6
Utility provider: Sydney Water	AU24	Refer to Appendix B
Community group: Georges River Environmental Alliance	AU25	2.16.2, 2.16.4
Community member: Individual	AU26	2.5.2
Community member: Individual	AU28	2.5.2, 2.6.7, 2.8.3, 2.8.5, 2.8.6, 2.16.1, 2.16.4, 2.19.1, 2.19.2, 2.21.3
Utility provider: Telstra	AU29	Refer to Appendix B
Community member: Individual	AU30	2.8.5, 2.19.3, 2.21.6
Utility provider: WaterNSW	AU31	Refer to Appendix B
Council: Wollondilly Shire Council	AU32	Refer to Appendix B
Community member: Individual	AU33	2.5.2, 2.8.4, 2.8.5, 2.13.1, 2.16.1, 2.16.2, 2.16.3, 2.17.2, 2.19.3, 2.21.5, 2.21.6
Community member: Individual	AU34	2.16.2, 2.16.3, 2.21.3
Community member: Individual	AU35	2.4.1, 2.4.3, 2.4.4, 2.5.2, 2.13.3, 2.15.3, 2.16.3, 2.16.4, 2.19.2, 2.19.3, 2.21.3, 2.21.4, 2.21.5, 2.21.6
Community member: Individual	AU36	2.5.2, 2.9.1, 2.16.2, 2.21.6
Other: South Western Sydney LHD	AU37	Refer to Appendix B
Community member: Individual	AU38	2.8.5, 2.8.6, 2.13.3, 2.16.4, 2.17.2, 2.21.3
Community member: Individual	AU39	2.5.2, 2.8.5, 2.8.6, 2.16.4
Community member: Individual	AU40	2.5.2, 2.8.5, 2.8.6, 2.16.4, 2.17.2, 2.21.3
Community member: Individual	AU41	2.11.1, 2.16.2, 2.16.4

Respondent	Objective email No.	Section number where issues are addressed
Council: Wollondilly Shire Council	AU42	Refer to Appendix B
Community group: Georges River Environmental Alliance	AU43	2.5.1, 2.16.1, 2.16.4
Community member: Individual	AU44	2.16.3, 2.16.4
Community group: Total Environment Centre	AU45	2.16.2, 2.16.4
Community group: Oatley Flora and Fauna Society	AU46	2.3.3, 2.5.1, 2.16.2, 2.16.4
Community member: Individual	AU47	2.8.5, 2.8.6, 2.16.3, 2.17.2, 2.21.3, 2.21.6
Community member: Individual	AU48	2.16.2, 2.17.2
Community member: Individual	AU49	2.4.3, 2.8.5, 2.16.4, 2.17.2
Community member: Individual	AS01	2.5.2, 2.8.5
Community member: Individual	AS02	2.21.1
Community member: Individual	AS03	2.5.2, 2.7.2
Community member: Individual	AS04	2.6.4, 2.5.2, 2.8.5
Community member: Individual	AS05	2.5.1, 2.6.3, 2.7.2, 2.8.5, 2.21.3
Community member: Individual	AS06	2.3.4, 2.6.6
Community member: Individual	AS07	2.6.5, 2.21.4
Community member: Individual	AS08	2.5.2, 2.21.4
Community member: Individual	AS09	2.3.2, 2.10.1, 2.10.2
Community member: Individual	AS10	2.4.3, 2.5.2, 2.21.4
Community member: Individual	AS12	2.6.4

Respondent	Objective email No.	Section number where issues are addressed
Community member: Individual	AS15	2.3.3, 2.16.4
Community member: Individual	AS18	2.12.1, 2.12.2
Community member: Individual	AS19	2.5.2, 2.13.3, 2.21.4, 2.21.5
Community member: Individual	AS20	2.5.2, 2.12.1, 2.15.2, 2.16.3, 2.21.3, 2.21.4, 2.21.5
Community member: Individual	AS21	2.5.2, 2.16.4, 2.16.3, 2.21.4, 2.21.5
Community member: Individual	AS23	2.5.2, 2.6.7, 2.8.5, 2.15.2, 2.16.3, 2.21.4, 2.21.5, 2.21.6
Community member: Individual	AS24	2.5.2, 2.8.5, 2.16.3, 2.21.4, 2.21.5
Community member: Individual	AS25	2.5.2, 2.8.5, 2.16.3, 2.21.4, 2.21.5
Community member: Individual	AS26	2.5.2, 2.16.3, 2.19.2, 2.21.3, 2.21.4, 2.21.5
Community member: Individual	AS27	2.21.5
Community member: Individual	AS28	2.2.2, 2.4.4, 2.5.1, 2.7.2, 2.11.1, 2.13.2, 2.16.1, 2.16.3, 2.16.4
Community member: Individual	AS29	2.5.2, 2.16.4
Community member: Individual	AS30	2.6.4, 2.7.1, 2.10.3, 2.11.1
Council: Campbelltown City Council	AS31	Refer to Appendix B
Community member: Individual	AS32	2.21.4, 2.21.5
Community member: Individual	AS33	2.2.1, 2.4.1, 2.4.3, 2.4.4, 2.5.2, 2.6.7, 2.8.6, 2.16.4, 2.17.1, 2.17.2, 2.21.3, 2.21.4, 2.21.5, 2.21.6
Community member: Individual	AS34	2.5.2, 2.6.7, 2.15.2, 2.16.3, 2.21.4, 2.21.5
Community member: Individual	AS35	2.5.2, 2.21.4, 2.21.5
Community member: Individual	AS36	2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.4, 2.17.2, 2.21.3
Community member: Individual	AS37	2.4.1, 2.5.2, 2.6.7, 2.15.2, 2.16.4, 2.17.2, 2.21.3, 2.21.5, 2.21.6

Respondent	Objective email No.	Section number where issues are addressed
Community member: Individual	AS38	2.2.2, 2.4.1, 2.4.3, 2.5.2, 2.6.7, 2.8.6, 2.15.2, 2.17.2, 2.21.3, 2.21.6
Community member: Individual	AS39	2.2.1, 2.2.2, 2.3.1, 2.3.2, 2.4.1, 2.5.1, 2.5.2, 2.6.4, 2.8.5, 2.12.4, 2.14.1, 2.14.2, 2.14.3, 2.14.4, 2.14.5, 2.15.1, 2.16.1, 2.16.2, 2.16.3, 2.16.4, 2.17.1, 2.17.2, 2.19.2, 2.21.2, 2.21.3, 2.21.4, 2.21.6
Community group: Save Mt. Gilead Inc.	AS40	2.3.1, 2.8.8, 2.11.1, 2.13.1, 2.15.2, 2.16.4, 2.20.1, 2.21.2, 2.21.3, 2.21.4, 2.21.5, 2.21.6
Community member: Individual	AS41	2.2.1, 2.3.1, 2.4.1, 2.5.1, 2.15.2, 2.15.3, 2.16.1, 2.16.3, 2.16.4, 2.21.3, 2.21.6
Community group: Help Save Appin Inc.	AS42	2.16.3, 2.21.5
Community Group: Save Mt. Gilead Inc.	AS43	2.16.4, 2.21.3
Community member: Individual	AS45	2.5.2, 2.21.4, 2.21.5
Community member: Individual	AS46	2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.21.3
Community member: Individual	AS47	2.16.4, 2.21.6
Council: Campbelltown City Council	AS48	Refer to Appendix B
Community member: Individual	DP01	2.16.4, 2.21.6
Community member: Individual	AU50	2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.3, 2.17.2, 2.21.3
Community member: Individual	AU51	2.4.1, 2.4.3, 2.8.5, 2.8.6, 2.16.4, 2.17.2, 2.21.3
Community member: Individual	AU52	2.4.1, 2.4.3, 2.8.5, 2.16.3, 2.17.2
Community member: Individual	AU53	2.6.2, 2.6.4, 2.11.1, 2.16.2, 2.18.1, 2.21.3
Community member: Individual	AU54	2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.3, 2.17.2, 2.21.3
Community member: Individual	AU56	2.4.1, 2.4.3, 2.6.7, 2.8.5, 2.8.6, 2.16.4, 2.17.2, 2.21.3
Community member: Individual	AU58	2.2.2, 2.4.1, 2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.2, 2.16.4, 2.17.2, 2.19.2, 2.21.3, 2.21.6
Community member: Individual	AU60	2.2.2, 2.4.1, 2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.2, 2.16.4, 2.17.2, 2.19.2, 2.21.3, 2.21.6

Respondent	Objective email No.	Section number where issues are addressed
Community member: Individual	AU61	2.4.1, 2.5.2, 2.8.5, 2.8.6, 2.17.2, 2.19.2, 2.21.3
Community member: Individual	AU62	2.2.2, 2.4.1, 2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.2, 2.16.4, 2.17.2, 2.21.3, 2.21.6
Community member: Individual	AU63	2.4.1, 2.5.2, 2.8.6, 2.16.4, 2.17.2, 2.21.3
Community member: Individual	AU64	2.3.2, 2.4.1, 2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.4, 2.17.2
Community member: Individual	AU66	2.2.2, 2.3.2, 2.4.1, 2.4.3, 2.5.2, 2.6.7, 2.8.5, 2.8.6, 2.15.1, 2.16.1, 2.16.4, 2.17.2, 2.19.2, 2.21.3, 2.21.6
Community member: Individual	AU67	2.4.1, 2.4.3, 2.5.2, 2.8.5, 2.8.6, 2.16.3, 2.17.2, 2.19.2
Community member: Individual	AU69	2.4.2, 2.4.3, 2.5.2, 2.8.5, 2.16.1, 2.16.4, 2.17.2, 2.19.2
Community member: Individual	AU71	2.13.1, 2.16.1, 2.16.3, 2.16.4, 2.21.1, 2.21.6
Community member: Individual	AU72	2.7.2, 2.7.3
Community member: Individual	AU75	2.4.3, 2.16.1, 2.16.3, 2.16.4
Community member: Individual	AU76	2.4.3, 2.16.1, 2.16.3, 2.16.4
Community member: Individual	AU77	2.4.3, 2.16.2, 2.16.3, 2.16.4
Community member: Individual	AU78	2.4.3, 2.16.2, 2.16.3, 2.16.4
Community member: Individual	AU79	2.4.3, 2.16.2, 2.16.3, 2.16.4
Community member: Individual	AU80	2.2.1, 2.16.1, 2.16.2, 2.16.3, 2.16.4, 2.20.1, 2.21.3, 2.21.4
Local business: 7-Eleven	AU81	2.3.2, 2.13.3
Community member: Individual	AU82	2.3.1, 2.3.2, 2.3.3, 2.6.6, 2.13.3, 2.19.2

Appendix B

Response to government and key stakeholder submissions

Sydney Water

Sydney Water provided a submission regarding the project in December 2018. Their submission number is AU24. A summary of the comments and issues raised in the submission is provided in Table B-1.

Table B-1

Item	Summary of issue	Response
1.0	General	
1.1	Sydney Water identified that there are existing and proposed assets within and near the proposed Appin Road Upgrade area. Suggests Roads and Maritime will need to consult with Sydney Water regarding the plans for new water mains to be laid in this location required to service the new development at Mount Gilead.	Roads and Maritime acknowledges the existence of Sydney Water assets within and surrounding the study area. As identified in section 6.9.4 of the REF, a utility management plan will be prepared to include utility company consultation, maintenance and emergency access requirements and construction staging and programming conflicts.
1.2	Sydney Water identified the need to accommodate accessibility of pipes for operational and maintenance purposes, new pavement locations & changes to structures.	Sydney Water's operational requirements will be considered as part of detailed design. Where adjustments are required to be made to utilities, the design of these adjustments would ensure that Sydney Water can maintain appropriate access for operational and maintenance purposes. As identified in section 6.9.4 of the REF, a utility management plan will be prepared to include utility company consultation, maintenance and emergency access requirements and construction staging and programming conflicts.
1.3	Sydney Water requested confirmation on the alignment of the Appin Road Upgrade, specifically the acquisition corridor & landowners affected by the project.	Roads and Maritime acknowledges the request for information and will provide this to Sydney Water.
2.0	Regulations, Policies & Codes	
2.1	Sydney Water suggested that Roads and Maritime consider staging and timing as part of detailed design and delivery of the project. This is to allow for shutdown and reconnection of Sydney Water assets to ensure that Sydney Water maintains services in line with its Operating Licence.	Roads and Maritime acknowledges the requirements of the Sydney Water Operating License and is committed to protecting service supply. Consideration of the requirements of Sydney Water's Operating License would be considered during detailed design and construction staging.

Item	Summary of issue	Response
2.2	Sydney Water comments that Section 73 applications are required for the project.	Roads and Maritime would obtain all relevant certificates from Sydney Water.
2.3	Sydney Water comments that water and sewer mains should be designed with standard clearances as per the Water Services Association (WSA) Codes.	Roads and Maritime would follow the requirements of WSA Codes during detailed design, including the design of water and sewer mains with standard clearances.
3.0	Works Done on Sydney Water Assets	
3.1	Sydney Water recommends that existing water and wastewater mains are to be replaced like for like, unless otherwise advised.	Roads and Maritime acknowledges that water and wastewater mains are to be replaced like for like and would maintain consultation with Sydney Water regarding replacement of existing water and wastewater mains.
3.2	Sydney Water suggested that amplification of the mains may be required to facilitate future growth along the development corridor.	Roads and Maritime acknowledges that mains may require amplification to facilitate future growth in the area and would maintain consultation with Sydney Water regarding adjustment applications.
4.0	Location of Sydney Water Assets	
4.1	Sydney Water comments that water mains must not be located within the roads batter slope, either located at the toe or road shoulder.	Roads and Maritime acknowledges that water mains must not be located within the roads batter slope and will locate proposed water mains at the toe or road shoulder.
4.2	Sydney Water comments that there are critical water assets that are impacted by the proposal.	Roads and Maritime acknowledges that the proposal would impact water assets and is committed to design and construction that complies with WSA Codes and Sydney Water processes.
4.3	Sydney Water comments that there are two main sections where critical sewer mains intersect Appin Road.	Roads and Maritime acknowledges the location of critical sewer mains intersecting the proposal and is committed to design and construction that complies with the relevant Codes and Sydney Water processes.
6.0	Environment	
6.1	Sydney Water recommends that any future environmental approval will need to consider the discharge protocols of chlorinated water due to shutdown & reconnection of live Sydney Water assets that require adjustment.	Roads and Maritime is committed to minimising and mitigating the potential environmental impacts caused by the proposed works and acknowledges that any future environmental approvals would require consideration of chlorinated water discharge.

Item	Summary of issue	Response
6.2	Sydney Water suggested that the dumping of water from water mains after chlorination/disinfection will be an issue if the cement lined pipes are filled and not managed. Comment that this would also require pH correction before discharge to the environment.	Roads and Maritime acknowledges the potential environmental impacts posed by the discharge of water and would follow relevant procedures and best practice regarding water discharge. Roads and Maritime would continue consultation with Sydney Water regarding this issue.
7.0	Design	
7.1	Sydney Water suggested design needs to ensure all connections are possible in 12 to 24 hours as the pump station is the only supply for Rosemeadow.	Roads and Maritime acknowledges the necessity to ensure connections are possible in this time frame and will consider this during detailed design.
7.2	Sydney Water suggested that water and sewer mains should be designed so that if one has a leak and needs to be excavated, it does not require the other mains to be isolated.	Roads and Maritime will consider opportunities to incorporate Sydney Water's feedback during detailed design. As identified in section 6.9.4 of the REF, a utility management plan will be prepared to include utility company consultation, maintenance and emergency access requirements and construction staging and programming conflicts.
8.0	Waste water	
8.1	Sydney Water suggested the proposed Appin Road Upgrade will potentially impact wastewater assets that are part of the Ambarvale & Appin systems that discharge to Glenfield.	Roads and Maritime acknowledges the potential impacts to Sydney Water wastewater assets that could arise from the proposal. Roads and Maritime is committed to minimising and mitigating potential impacts to Sydney Water Assets and the environment.
9.0	Construction	
9.1	Sydney Water requested that Roads Maritime provide details of construction timings for road upgrade works for construction of the water mains from Copperfield Drive to 700m south of the Mount Gilead site.	Roads and Maritime is committed to maintaining consultation with Sydney Water and would provide details of construction timings to Sydney Water.
10.0	Mount Gilead Development	
10.1	Sydney Water comments that Mount Gilead would be serviced by the water main to the southernmost extent of the proposed road upgrade works.	Roads and Maritime acknowledges the intersection of the proposal and the water main which would service the Mount Gilead development.

Item	Summary of issue	Response
10.2	Sydney Water comments that the water pumping station on the western side of Mount Gilead development site & the proposed road upgrade works must not encroach on the land for these proposed facilities.	Roads and Maritime acknowledges that the proposed upgrades must not encroach on land required for utility provisions for the Mount Gilead development.
10.3	Sydney Water recommended a slip lane off Appin Road of the Reservoir must be provided for a safe access road to the proposed reservoir site.	The request for a slip lane off Appin Road is out of the scope of the Appin Road Upgrade.
10.4	Sydney Water comments that tees required under the proposed noise wall & are to be maintenance free unless the noise wall can be dismantled to get to into the pump station	The final design of noise walls is pending further review and Roads and Maritime would consider access to the pump station during detailed design.
10.5	Sydney Water requested a meeting with Roads and Maritime to discuss timings/details.	Roads and Maritime is committed to maintaining consultation with Sydney Water regarding timings and details for the proposed road upgrades.

Telstra

Telstra provided a submission regarding the project in December 2018. Their submission number is AU29. A summary of the comments and issues raised in the submission is provided in Table B-2.

Table B-2

Item	Summary of issue	Response
1.0	General	
1.1	Comment that Telstra has major infrastructure located along the proposed upgrade of Appin Road.	Roads and Maritime acknowledges the locations of major Telstra infrastructure within the study area and is committed to minimising impacts to these assets.
3.2	Comment that there are no existing Telstra road side cabinets or pillars within the proposal, hence this area has transferred to NBN Co.	Roads and Maritime acknowledges that there are no side cabinets or pillars within the proposal.
4.0	Construction Impacts	
4.1	Comment that any possible bridge upgrades that will have an impact on existing Telstra network may require new conduit to be install along the bridge to house Telstra assets.	Roads and Maritime acknowledges that any potential bridge upgrades would require alteration or installation of a conduit to house Telstra assets and is committed to maintaining consultation with Telstra regarding the proposal.
4.2	Telstra requests that a Dial Before You Dig search be undertaken before any excavation work commences.	Roads and Maritime would confirm the location of utilities during detailed design in consultation with Telstra, including undertaking Dial Before You Dig searches.

WaterNSW

WaterNSW provided a submission regarding the project in December 2018. Their submission number is AU31. A summary of the comments and issues raised in the submission is provided in Table B-3.

Table B-3

Item	Summary of issue	Response
1.0	General	
1.1	WaterNSW identified the works on Appin Road will not impact WaterNSW land or infrastructure.	Roads and Maritime acknowledges that the proposed Appin Road Upgrade will not impact WaterNSW land or infrastructure.

Wollondilly Shire Council

Wollondilly Shire Council (hereafter referred to as Council) provided a submission regarding the project in December 2018. Their submission number is AU32 and AU42. A summary of the comments and issues raised in the submission is provided in Table B-4.

Table B-4

Item	Summary of issue	Response
1.0	General	
1.1	Comment that Wollondilly Shire Council adjoins the Campbelltown Local Government Area (LGA) and shares Appin Road. Notes that the southern end of the proposal is within the Wollondilly LGA.	Roads and Maritime acknowledges Council's jurisdiction. The Appin Road Upgrade between Mount Gilead and Ambarvale is entirely within the Campbelltown LGA. The works on Appin Road between Brian Road and Gilead are being responded to independently of this submissions report as part of the Appin Road Safety Improvements submissions report.
1.2	Wollondilly Shire Council assumes that the works, at least in part, are an undertaking through the adopted Voluntary Planning Agreement (VPA) for the Mount Gilead rezoning.	The Appin Road Upgrade forms part of a VPA.
1.3	We note the Strategic Transport Infrastructure Study for the Greater Macarthur Growth Area (DP&E, 2017) and the need to upgrade Appin Road to three lanes each way and trust these projects are working towards the implementation of the Greater Macarthur Growth Area Infrastructure schedule.	The proposed upgrades include provisions for a future widening of Appin Road between Mount Gilead and Ambarvale to three lanes. The proposal has also been developed in accordance with the Greater Macarthur Growth Area Infrastructure schedule.
1.4	Council suggests the REF has not clearly articulated the relationship of the proposed safety upgrades and the future upgrades of Appin Road required as a result of the significant planned growth in the Greater Macarthur area. Suggests that neither the REF or draft Special Infrastructure Contribution have adequately addressed this or funding sources. Suggests that all reports should be cognisant of one another and should look at the upgrades in a holistic sense.	As detailed in the Community Update released for the Appin Road proposals in November 2018, funding sources for the two proposals differ. Funding for the proposed Appin Road Upgrade between Mount Gilead and Ambarvale would be sourced from the NSW Government Housing Acceleration Fund and would include developer contributions. Funding for the proposed Appin Road Safety Improvements between Brian Road and Gilead would be sourced from the Australian Government. The proposed safety improvements and road upgrade of Appin Road are two distinct projects which require independent REFs and will undergo independent planning approval pathways, however are being similarly pursued to improve the safety and capacity of Appin Road.

Item	Summary of issue	Response
1.5	Council suggest that the safety improvements for Appin Road be pursued independently of any development process and urge Roads and Maritime to continue safety upgrades on Appin Road.	The proposed safety improvements to Appin Road are being pursued separately to this proposal as part of the Appin Road Safety Improvements proposal as identified in Item 1.4.
1.6	Council suggests that additional investigations into potential salinity issues should be undertaken for any areas where concrete infrastructure is proposed. Suggests that the shale derived clays and shallow groundwater lenses can potentially yield salinity issues.	As identified in section 6.3.2, URS (2003) assessed the salinity associated with surface soils (0–300 mm depth). All surface soil samples were non-saline. Soils of this class are expected to yield negligible salinity effects (Hazelton and Murphy, 1992).
2.0	Biodiversity	
2.1	Council comment that koala fencing is referred to as the best and most economically viable option, however without a comprehensive Koala Plan of Management and site investigation, suggest that the koala fencing is presumptive. Suggest that with an expanding koala population, koala fencing is not the best solution without additional road furniture or culverts to maintain habitat links to the more fertile shale-based habitat to the west of Appin Road.	<p>The immediate installation of exclusion fencing to reduce the increasing road mortality of the local koala population along Appin Road is largely unanimously supported by all key stakeholders and experts (Crowther 2018, Biolink 2018, Biolink 2017, OEH 2018).</p> <p>Roads and Maritime are committed in the short term to providing mitigation aimed at minimising the existing impacts on the koala population from road mortality along Appin Road, while developing a long-term strategy to establish a koala crossing supporting the east-west movement of koalas across Appin Road in the most appropriate location.</p> <p>Additional information is provided in Appendix C.</p>
2.2	Council requests that a greater level of information in relation to the location of offsets made regarding the Critically Endangered Ecological Communities of Cumberland Plain Woodland and Shale Sandstone Transition Forests be made public and provided to both Wollondilly Shire Council and Campbelltown City Council.	Table 6-11 of the REF, states that a Biodiversity Offset Strategy would be prepared during the detailed design phase in accordance with the Roads and Maritime <i>Guideline for Biodiversity Offsets</i> (Roads and Maritime Services 2016). Roads and Maritime will provide details of the location of biodiversity offsets to Wollondilly Shire Council and Campbelltown City Councils once finalised.

Item	Summary of issue	Response
2.3	Council requests that a greater level of information in relation to the installation of 'road furniture' or culverts to ensure that koalas have maximum opportunity to forage for food in their preferred habitat.	Additional safeguards B11 and B12 in table 6-11 of the REF outline that koala proof fencing would be investigated during detailed design phase and that fauna fencing and arboreal rope bridges would be implemented according to details with the REF to the southern extent of the Mount Gilead residential subdivision. The final locations and design of additional road furniture will be determined in the detailed design phase and is therefore subject to change, however Roads and Maritime is committed to maintaining communication with Council regarding additional road furniture.
2.4	Council seeks greater level of information in relation to the 19 hollow bearing trees that will be removed, including hollows considered to be "live" (meaning they are being utilised and limiting habitat opportunities for species such as Large Pied Eared Bat, Little Lorikeet and the Eastern Bentwing Bat). Council requests that this information be provided publically.	Appendix C of the REF – Biodiversity Assessment (Table 4.4) identifies that the proposal will impact on a minimum of four live hollow bearing trees and one dead stag (five total), while Appendix E identifies the proposal impacts on approximately six hollow bearing trees to be removed. Hollow bearing trees are mapped in Figure 3-1 of Appendix C of the REF with approximately six hollow bearing trees within the study area. While the proposal will aim to minimise impacts on these hollow bearing trees through the detailed design and construction. The Biodiversity Assessment Appendix E and Figure 3-1 correctly assumes that approximately six hollow bearing trees will be removed
2.5	Comment that measures to ensure that koalas have maximum opportunity to forage for food in their preferred habitat i.e. 'road furniture' or culverts have been highlighted in the Biodiversity Assessment, but have not been continued into the REF.	Additional safeguards B11 and B12 in table 6-11 of the REF outline that koala proof fencing would be investigated during detailed design phase and that fauna fencing and arboreal rope bridges would be implemented according to details with the REF to the southern extent of the Mount Gilead residential subdivision. The final locations and design of additional road furniture will be determined in the detailed design phase and is therefore subject to change.

Item	Summary of issue	Response
2.6	Comment that section 3.12 of the Biodiversity Assessment identifies that the Noorumba Reserve is fragmented and claim that any habitat protection to the West of Appin Road is not viable and quote OEH staff. It is noted that this section of the report is not relying on scientific data or research.	The expert reports by Crowther (2018) and Biolink (2018) have been considered in the development of OEH conservation advice on the koala (OEH 2018). The OEH is the government authority responsible for the protection and management of threatened species, including the koala within NSW. Their considered conservation advice incorporates the current understanding and proposed conservation of koalas within the locality not just within the Campbelltown LGA. The assessments of the koala in Appendix C of the REF considered the initial advice of OEH koala experts to Roads and Maritime which is consistent with the subsequent OEH conservation advice on the koala (OEH 2018).
2.7	Comment that there are discrepancies in the Biodiversity Assessment regarding the total amount of hollow bearing trees that will be impacted by the proposal. Council wishes to know how these will be addressed and would prefer to see a local offset provided.	Appendix C of the REF – Biodiversity Assessment (Table 4.4) identifies that the proposal will impact on a minimum of four live hollow bearing trees and one dead stag (five total), while Appendix E identifies the proposal impacts on approximately six hollow bearing trees to be removed. Hollow bearing trees are mapped in Figure 3-1 of Appendix C of the REF with approximately six hollow bearing trees within the study area. While the proposal will aim to minimise impacts on these hollow bearing trees through the detailed design and construction. The Biodiversity Assessment Appendix E and Figure 3-1 correctly assumes that approximately six hollow bearing trees will be removed
2.8	Council has concerns about the absence of a comprehensive Koala Plan of Management.	The proposal has been assessed as not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the <i>Biodiversity Conservation Act 2016</i> or <i>Environment Protection and Biodiversity Conservation Act 1999</i> , therefore a species impact assessment or plan of management is not required. However, the Draft Campbelltown Comprehensive Koala Plan of Management, while not approved by DP&E, has been considered within the REF. For more details on the consideration of the Campbelltown Comprehensive Koala Plan of Management see section 6.1.2 of the REF and section 3.12 of the Biodiversity Assessment.

Item	Summary of issue	Response
2.9	Comment that the Biodiversity Assessment clearly defines east west corridors and koala presence data. Council is concerned that the corridors whilst fragmented in their vegetation structure, clearly have regular koala sightings. Suggests that the recommendations of the report discredit this corridor based on its fragmented structure, rather than its capacity to provide habitat for koalas.	<p>While the Noorumba Reserve contains Core habitat with regular koala use and sightings, the areas beyond the reserve and particularly beyond the Sydney Water canal are not subject to regular sightings or pattern of use by the koala. Targeted surveys by Ecological (2015, 2016), WSP (2018), Biolink (2017) and others have identified active koala use of habitat within Noorumba Reserve corridor to be largely restricted to the reserve itself (OEH 2018). More specifically, the Biolink (2017) study which generally considered habitat use by koalas as more extensive than anticipated, found no evidence of koala use within the Noorumba Reserve corridor across multiple sites to the west of the reserve (Biolink 2017).</p> <p>The Noorumba Reserve corridor is a recognised as a “Secondary” koala Corridor (OEH 2018) and provides opportunities for future connectivity along Menangle creek to Nepean River (Biolink 2017 2018) however there is little evidence this corridor is currently used regularly by koalas beyond the reserve.</p> <p>Additional information is provided in Appendix C of this submissions report.</p>
2.10	Council requests how the hollow bearing trees that will be impacted by the proposal will be addressed.	<p>Appendix C of the REF – Biodiversity Assessment acknowledges the proposals impacts on habitat for Threatened species including removal of approximately six hollow bearing trees and has recommended in Section 5.1 the provision of supplementary habitat including nest boxes in accordance with Roads and Maritime standard mitigation policies including; <i>Guide 5: Re-use of woody debris and bushrock</i> and <i>Guide 8: Nest boxes, from the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (Roads and Traffic Authority 2011).</p> <p>The Nest Box Management Plan will be developed prior to construction as part of the proposals environmental management documentation.</p>

South Western Sydney Local Health District

South Western Sydney Local Health District provided a submission regarding the project in December 2018. Their submission number is AU37. A summary of the comments and issues raised in the submission is provided in Table B-5.

Table B-5

Item	Summary of issue	Response
1.0	Active transport	
1.1	South Western Sydney Local Health District comments that the built environment can significantly influence health outcomes and has identified this upgrade as an opportunity to improve the liveability of Campbelltown through walking and cycling infrastructure. South Western Sydney Local Health District recommends that the proposal include explicit funding and land provision for pedestrian and cycling infrastructure along Appin Road. In addition, South Western Sydney Local Health District recommends that the cycling infrastructure be an off-road cycleway or shared path.	As identified in section 6.4.3 of the REF, the proposal includes a 2.5 metre shoulder on the northbound carriageway of Appin Road to facilitate a connection with the existing road network for cyclists. This is an improvement to the existing road environment, which requires cyclists to use trafficable lanes, increasing the safety of the road environment for all users. The concept design also includes an allowance for the provision of a potential future shared path on land adjacent to the northbound carriageway, which would promote cycling during any future upgrade stages.

Campbelltown City Council

Campbelltown City Council (known hereafter as Council) provided a submission regarding the project in December 2018. Their submission numbers are AS31 and AS48. A summary of the comments and issues raised in the submission is provided in Table B-6.

Table B-6

Item	Summary of issue	Response
1.0	General	
1.1	Council comments that the proposed six lane upgrade of Appin Road between Rosemeadow and Mount Gilead is inconsistent with Council's vision for the Campbelltown Central Business District	<p>The proposal includes duplicating the existing Appin Road carriageway from two to four lanes, between Fitzgibbon Lane to about 2.5 kilometres south of Copperfield Drive. This would include provisions for the potential future widening to six lanes.</p> <p>As identified in section 5.5 of the REF, Campbelltown City Council have been consulted about the proposal and have worked with Council during the preparation of the concept design and REF.</p>
1.2	Comment that Council is supportive of the need to upgrade Appin Road to address urgent road safety improvements and transport planning outcomes to support development of Mount Gilead.	Roads and Maritime acknowledges Council's support for the proposed upgrades to Appin Road.
2.0	Traffic	
2.1	Council suggest that the proposed upgrade of Appin Road between Rosemeadow and Mount Gilead does not consider the role of Appin Road/Narellan Road in carrying through traffic.	<p>The traffic estimations used in the assessment (refer to section 6.4 of the REF) included consideration of vehicles originating from the Mount Gilead subdivision and other road users. Vehicles originating from the Mount Gilead subdivision were estimated in accordance with the Roads and Maritime Guidelines for Traffic Generating Developments (Roads and Maritime, 2013).</p> <p>The assessment did not include consideration of other areas of the road network outside of the proposal, as this is outside the scope of the proposal. However, Roads and Maritime will continue to investigate the need for further upgrades to Appin Road and other roads in the area to improve the operation of the overall road network.</p>

Item	Summary of issue	Response
2.2	Council comments that Appin Road should be serving a regional arterial function, delivering traffic to Campbelltown from areas to the south, not a State Road function transferring through traffic across Campbelltown.	<p>As noted in section 2.1 of the REF, Appin Road is a strategically important arterial road connecting motorists travelling between Sydney's south west region and the Illawarra.</p> <p>The proposed upgrade to Appin Road is required to reduce congestion, improve the safety of Appin Road, provide road connection for new homes within Mount Gilead and provide additional capacity for future land releases.</p>
2.3	Council comments that through traffic should be diverted via the future Spring Farm Parkway and Outer Sydney Orbital when constructed. This would free up capacity on Appin Road and Narellan Road to service the growing traffic needs of the Campbelltown/Macarthur growth precinct identified in the State Government's Corridor Strategy and further supported in Greater Macarthur 2040.	The proposed Spring Farm Parkway and Outer Sydney Orbital are out of the scope of the proposed Appin Road Upgrade and are being explored independently. However, Council's comments have been passed on to the respective project teams for consideration.
2.4	Council comments that modelling used to inform the proposal includes growth in suburbs which are fully developed and relatively new. Council suggests that this shows unrealistic growth on side roads, leading to larger intersection upgrades than may be required.	Roads and Maritime completed a safety review of a section of Appin Road in 2014 and a Traffic, Transport and Access Study (WSP, 2014) for Mount Gilead was undertaken. Considering the conclusions and recommendations from these studies, it was determined that upgrades of Appin Road should involve upgrading the roundabout at Kellerman Drive and Copperfield Drive and signalised intersections at Kellerman Drive and Fitzgibbon Lane and St Johns Road. Further traffic modelling was completed in late 2016 (Cardno, 2016) taking into consideration updated land use and population forecast Bureau of Statistics and Analytics for future use scenarios up to and including 2031.
2.5	Council suggests that modelling assumptions be updated to reflect a strategic level assessment of future transport planning outcomes for South Campbelltown.	<p>As identified in section 6.4.1 of the REF, the operational assessment for traffic modelling was undertaken using SIDRA and forecasted traffic volumes estimated from the Strategic Traffic Forecasting Model (STFM) for Appin Road.</p> <p>Roads and Maritime consider the traffic modelling undertaken is sufficient for the purposes of informing the REF and future traffic volumes.</p>

Item	Summary of issue	Response
3.0	Design	
3.1	Council suggest that Appin Road should be designed as a four-lane road consistent with the existing sections of Appin Road from Fitzgibbon Lane to Narellan Road.	The proposal includes upgrading Appin Road to four-lanes between Fitzgibbon Lane to approximately 2.5 kilometres south of Copperfield Drive, Rosemeadow using the existing single carriageway for future southbound traffic only, and building a two-lane northbound carriageway in the existing road corridor reservation to include provisions for the potential future widening to six lanes. The request for providing four-lanes along the entire length of Appin Road is considered outside of the scope of the current proposal but is noted by Roads and Maritime.
3.2	Drainage works required on Appin Road and Kellerman Drive downstream of Oswald Reserve detention basin have not yet been agreed with Council.	The layout and detail of the drainage systems, including those required on Appin Road and Kellerman Drive, will be refined during detailed design and Roads and Maritime will continue consultation with Council regarding drainage works done on Council land.
3.3	Council has concerns regarding the proposed staged crossing on Appin Road given the number of school children using this intersection to access Ambarvale High School. Therefore, grade separation of the pedestrian phase should be considered.	Although a staged crossing is proposed, the proposed median has been designed to be wide enough to store pedestrians. As identified in section 6.4.3 of the REF, a communications plan for the operation and use of the new staged pedestrian crossing will be prepared.
4.0	Public Transport	
4.1	Comment that consideration should be given to priority intersection treatments and signal phasing for the new Northern and Southern access road into Gilead for a potential future public transport project.	Alternate intersection treatments and signal phasing for a future public transport project is considered beyond the scope of the proposal.
4.2	Comment that the works in the vicinity of the Kellerman Drive/Copperfield Drive intersection with Appin Road need to include provision for bus stops.	As identified in section 6.4.3, existing bus stops on Copperfield Drive and Kellerman Drive would be retained.

Item	Summary of issue	Response
5.0	Other Projects	
5.1	Council suggest that cost savings from reducing the corridor width to four lanes (suggested in item 3.1) would be better applied towards the Link Road Corridor Study currently under investigation.	In April 2017, Roads and Maritime identified that any upgrade of Appin Road would need to allow for future widening of the road to six lanes, which is consistent with the current future network needs outlined in the Strategic Transport Infrastructure Study for the Greater Macarthur Growth Area (DP&E, 2017).
5.2	Council comment that there is an urgent need for the current Link Road Corridor Study to look at options to connect Appin Road to the M31 and provide Greater Macarthur Priority Growth Area (GMPGA) with an effective bypass of the Campbelltown/ Macarthur CBD.	The proposed Link Road Corridor Study is being pursued separately to the Appin Road Upgrades and out of scope of this project. However, Council's comments have been forwarded to the Link Road Corridor Study project team.
5.3	Council comment that east-west transport corridors to service GMPGA developments need to be considered with the key corridor being the Spring Farm Arterial	The proposed Link Road Corridor Study is being pursued separately to the Appin Road Upgrade and out of scope of this project.
5.4	Council comments that they have been participating in the current Link Road Corridor Study and acknowledge the efforts of the Roads and Maritime team to engage with Council. Council suggest that the feedback provided via this engagement relates to the extent of the study area which is considered insufficient to fully consider all available routes.	The proposed Link Road Corridor Study is being pursued separately to the Appin Road Upgrade and out of scope of this project.
6.0	Biodiversity	
6.1	Council suggests that there is the need for improved coordination between State and Local Government to ensure that planning for biodiversity outcomes in the South Campbelltown area are addressed during the strategic planning process.	Roads and Maritime will continue to work with DP&E and OEH on the proposed <i>Biodiversity Conservation Act 2016</i> biodiversity certification of the Macarthur and Wilton residential planning precincts. Roads and Maritime understands that a Conservation Plan supporting the biodiversity certification process will be exhibited for public comment later in 2019.

Item	Summary of issue	Response
6.2	Council highlights their resolution regarding the immediate installation of overpasses and koala exclusion fencing along the current alignment of Appin Road and the requirement for the installation of fauna fencing, appropriate tunnels and high crossing points, to enable safe access through wildlife corridors as part of future development in Mount Gilead.	Refer to Appendix C.
6.3	Comment that it is unclear why fauna fencing is proposed to be installed on one side of Appin Road for the Appin Road Upgrade, Mount Gilead to Ambarvale, but on both sides in the Appin Road Safety Improvements.	Refer to Appendix C.
6.4	Council comments that reference in the REF (section 3.12) to Council's draft Campbelltown CKPoM has relied entirely on OEH per comm advice instead of referencing the actual provisions in the CKPoM.	Refer to Appendix C.
6.5	Council suggests that the proposed mitigation measures for the koala are inadequate and not in accordance with the draft CKPoM	Refer to Appendix C.
6.6	Council comments that the findings of the South Campbelltown Koala Habitat Connectivity Study (Biolink, 2017) which were provided to DP&E, Roads and Maritime and OEH; reiterating the need to establish east-west natural asset corridors across Appin Road to be supported by wildlife underpasses and overpasses.	<p>Since the preparation of the Appin Road Upgrade REF and Biodiversity Assessment and through the public submissions process, additional publications and information on the koala were provided for further consideration and inclusion within the Biodiversity Assessment including the South Campbelltown Koala Habitat Connectivity Study (Biolink 2017). This study has been considered in the preparation of these responses.</p> <p>Additional information is provided in Appendix C.</p>

Item	Summary of issue	Response
6.7	Council comment that there are inconsistencies in the proposed fencing approach and likelihood of cluster mortalities along Appin Road where the barrier fencing ends.	<p>The final design and implementation of the fauna exclusion fencing for the Appin Road Upgrade proposal and The Safety Improvements Works will be developed prior to construction as part of the detailed design of associated infrastructure (e.g. fencing) and landscaping, the preparation of construction environmental management documentation and in consultation with key stakeholders to ensure koala road mortality along Appin Road is minimised. A single fauna fencing strategy will be developed for both projects to ensure coordinated delivery of the fence.</p> <p>While there are minor inconsistencies in the Biodiversity Assessment for the two proposals, in regards to the presentation of the indicative fence location and approach, Roads and Maritime are committed to providing fauna fencing, where proposed, in accordance with Campbelltown City Councils Draft CKPOM Section 6.4.6(ii) a) and recommendations of the expert reports (Crowther 2018) (Biolink 2018). This will incorporate koala-grids or other approved devices installed at fence-ends and driveways and other access points to prevent koala access to the road corridor (as committed in Section 5.2 and Figure 5-1 of Appendix C of the REF).</p> <p>The extension of the final fence locations adjoining cleared lands will also consider the local understanding of the maximum distance of 220 m that a koala had been recorded from a patch of vegetation (Biolink 2018).</p>
6.8	Council suggest that the REF has failed to sufficiently consider cumulative impacts. For example, the impact of the concurrent Appin Road projects was not addressed in either REF.	Refer to Appendix C.
6.9	Council suggest that the Appin Road Upgrade and Safety Improvements work projects offer little in terms of measures to ensure unavoidable impacts to biodiversity values are mitigated.	As identified in section 6.1.4 of the REF, A Flora and Fauna Management Plan will be prepared as well as a variety of additional biodiversity mitigation measures to further avoid and minimise native vegetation or habitat removal during detailed design.
6.10	Council suggest that the mitigation measures proposed contravene the most pertinent corridor design principles in regards to the installation of barrier fencing without the provision of wildlife crossing structures.	Refer to Appendix C.

Item	Summary of issue	Response
6.11	Council comment that the biodiversity offsets currently proposed in the REF are considered to be inadequate. Council suggest a consistent method for the assessment of biodiversity should be employed; and a BDAR should be prepared using the BAM under the BC Act in order for the Chief Executive of OEH to give concurrence on SISs.	The requirements to provide biodiversity offset for the proposals residual impacts were clearly identified and committed within Section 6.2 and Section 7 of the Biodiversity Assessment. The quantum of the biodiversity offsets for the proposal have been determined in accordance with the approved legislative requirements and the determining authorities; <i>Guideline for Biodiversity Offsets</i> (Roads & Maritime Services 2016). In addition, it should be noted that there are no legislative requirements under the BC Act for public authorities under Part 5 of the EP&A Act to provide biodiversity offsets for residual impacts on biodiversity impacts.
6.12	Council suggest that a Species Impact Statement (SIS) is required for significant impact to critically endangered ecological communities.	The proposal clearing of 14.18 ha of vegetation includes 7.28 ha of native vegetation commensurate with the two Threatened ecological communities (TECs) Shale Sandstone Transition Forest and Cumberland Plain Woodland listed under the BC Act. The Biodiversity Assessment (Appendix C of the REF) has undertaken Assessment of Significance (AoS) in accordance with the BC Act and found that given the majority (4.91 ha) of the TECs are in poor condition, characterised by highly disturbed roadside fragments of derived grassland or isolated canopy trees over an exotic understorey and the small proportion of SSTF (0.19%) and CPW (0.6%) to be impacted within the locality, the proposal is unlikely to have a significant impact on these TECs. As such the Biodiversity Assessment determined that a Species Impact Statement (SIS) for impacts to these TECs is not required.
6.13	Council suggest that the following mitigation measures are required: <ul style="list-style-type: none"> • Nest box Management Plan • Glider Connectivity Strategy • Relocation of Cumberland Plain Land Snail. 	Refer to Appendix C.

Item	Summary of issue	Response
6.14	Council comment that a review of the Assessments of Significance (AOS) which were undertaken as part of each REF, were found to trigger a 'significant impact' for a number of threatened species entities; and consequently, SISs are required to be prepared for significant impact to endangered ecological communities and koalas.	Refer to Appendix C.
6.15	Council suggest that a Population Viability Analysis (PVA) required to support position on koala population.	The preparation of a population viability analysis (PVA) for the koala is outside of scope and legislative requirements of the proposals assessment of the koala under the <i>Biodiversity Conservation Act</i> 2016. However, it is understood that OEH in consultation with DP&E may consider the need for a PVA for the koala as part of the future development of the MA structure plan and Cumberland Plan Conservation Plan.
6.16	Council comment that a Referral to the Minister for the Environment under the EPBC Act is required due to 'the lack of mitigation measures proposed (eg land bridges or underpasses) and loss of habitat critical to the survival for koalas'.	Refer to Appendix C.
6.17	Council suggest that there is a lack of reference to any of the independent expert reports that have been produced.	Refer to Appendix C.
11.0	Community and Stakeholder Engagement	
11.1	Council suggest that the designated review timeframe for submissions, being less than the statutory 30 day requirement, is considered inadequate for the concurrent exhibition of two REFs.	The REF was publicly displayed for 26 days between 19th November 2018 and 14th December 2018. However, there is no statutory requirement to publicly display a REF. Roads and Maritime considers that the duration of the display of the REF to be sufficient for the public and Council to comment on the proposal.

Item	Summary of issue	Response
11.2	Council suggest that truncated timeframe for consultation activities, which were not adequately advertised.	<p>As identified in section 5.6 of the REF, communication and consultation activities planned for the public display of the REF included:</p> <ul style="list-style-type: none"> • Properties that are directly affected by the proposal (e.g. by a nearby noise wall) will be doorknocked prior to the REF going on public display • A community update that includes an outline of the proposal, the main findings of the REF and details on where people can find out more information and provide feedback, will be delivered to properties in a nominated corridor along the road alignment. The update will advertise the community information sessions • The community update will be emailed to local stakeholder organisations who may be interested in or affected by the proposal • Advertisements in local newspapers and social media will be used to encourage people to view the REF and attend one of the community information sessions.
12.0	Requests for additional information	
12.1	Council suggest that there has been a lack of transparency, accountability and proper process observed in the koala roundtable meetings.	Refer to Appendix C.
12.3	Council comment that specialist reports commissioned by OEH were never released to the koala roundtable participants, despite Council requesting them on a number of occasions.	The koala roundtable was facilitated by DP&E and outside of the scope of the REF.
12.4	Council suggest that transparency of the process is diminished by the lack of access to specialist reports becoming the subject of a GIPA request by a concerned NGO.	The koala roundtable was facilitated by DP&E and outside of the scope of the REF.

Appendix C

Additional supporting information for Campbelltown City Council
submission on biodiversity issues

This appendix provides a detailed response to Campbelltown City Council's (CCC) submission to the Appin Road Upgrade biodiversity issues.

CCC response dated 14 December 2018 included two attachments; a summary table of comments on the REF (Attachment A) and supporting assessment review by an independent expert (Attachment B). Below is a detailed response to each of the key issues raised in these attachments.

Deficiency in 'test of significance' findings under the Threatened Species Conservation Act 1995 (TSC Act) – determination of significant impact and insufficient of proposed biodiversity offsets. Cumulative impacts of both the Appin Road Upgrade and Safety Improvements REF requires a species impact statement (SIS) for significant impact to Critically Endangered Ecological Communities (CEEC) and the Koala

The impacts of the proposal on the koala, including loss of habitat and recognised corridors were subject to a detailed Assessment of Significance (AoS) in accordance with the following State and Commonwealth legislative guidelines:

- *Threatened species assessment guidelines – assessment of significance for BC Act listed biodiversity* (Department of Environment and Climate Change 2007)
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance for EPBC Act listed biodiversity* (Department of the Environment 2013)
- *Referral guidelines for species listed under the EPBC Act* (Department of the Environment and Energy 2017).

The AoS for the proposal were focused on the proposals specific impacts including the recognised loss of a relatively small proportion locally of the koalas core habitat (6.22 ha or <1% of potential habitat within 10km of the proposal), which is predominately restricted to fragmented, poor condition remnants along the existing Appin Road and the increased fragmentation/barrier to the "Secondary" koala corridor identified by OEH (2018) and Biolink (2017, 2018) in the vicinity of the Noorumba Reserve.

The Biodiversity Assessment incorporated consultation with government and key stakeholders, relied upon the detailed results of the field surveys undertaken for the proposal (WSP 2018) and locality (Ecological 2015, 2016), relevant literature (Phillips and Callaghan 2000), (Phillips and Callaghan 2011), (Biolink Ecological Consultants 2016), (DECC 2008), (DEWHA 2009) (OEH 2017) current NSW OEH atlas database records (OEH 2018) and the governments expert (OEH) advice in consideration of the proposals impacts on the Koala. At the time of the Biodiversity Assessment and REFs preparation, several significant koala studies were under way and being completed by DP&E, Campbelltown City Council and OEH, including two independent expert reports (Biolink 2018 and Crowther 2018). The Biodiversity Assessment referenced the personal communication between Roads and Maritime and OEH koala expert Kylie Madden in lieu of the formal written advice from OEH at the time.

Since the preparation of the Biodiversity Assessment and through the public submissions process, additional publications and information on the Koala were provided for further consideration and inclusion within the BA. These included:

- Updated advice for koala conservation in relation to the Greater Macarthur Growth Area (GA) (OEH 2018)
- South Campbelltown Koala Habitat Connectivity Study (Biolink 2017)
- Koala Corridor Project – Campbelltown City Council & Wollondilly Local Government Areas: Greater Macarthur Growth Area. Final Report to NSW Office of Environment & Heritage (Biolink 2018)
- Expert Review of Office of Environment and Heritage (OEH) Project "Temporary fencing on Appin Road – Analysis of costs and benefits for Koalas" (Crowther 2018)
- Koala Scat Survey – Campbelltown LGA – East of Appin Road (Schulz 2018).

The relevance of these additional references to the proposals impact on the Koala are discussed below.

The Koala population in the Campbelltown area is currently considered to be stable, largely disease free and showing signs of recovery/expansion (Biolink 2017 and Biolink 2018). This expansion has been further inferred by the increasing road deaths along Appin Road (and other roads in the locality), resulting from the likely expanding population looking to extend into currently unoccupied fringing habitats (Biolink 2017 and Biolink 2018).

The majority of the local population, which has been estimated at >100 individuals (Crowther 2018, Biolink Ecological Consultants 2016) and possibly up to 200 (Biolink 2018), occurs east of Appin Road associated with extensive tracts of remnant vegetation, some of which is securely conserved, along the Georges River, Wedderburn plateau and to the south of Appin where it links with the Nepean River (OEH 2018).

In contrast, most of the koala habitat to be impacted by the proposal is in a disturbed condition, within an existing urban landscape and/or road corridor. Despite the relatively poor condition of the habitat to be impacted by the proposal, the koala is known to use these disturbed habitats within the locality (Schulz 2018, WSP 2018).

Appin Road currently bisects an area of good condition remnant vegetation acknowledged in the Biodiversity Assessment as providing known koala habitat (Biolink 2016, 2017, 2018) (WSP 2018) which includes on the western side, Noorumba Reserve. This area is locally known as a koala road mortality hot spot (Crowther 2018). The proposal will exacerbate the existing Appin Road barrier to the Core Koala habitat in the west including Noorumba Reserve by proposing to establish koala exclusion fencing without the provision of a koala crossing structure.

The Noorumba Reserve is approximately <60 ha in size (Crowther 2018) and as such using a comparative analysis of the estimated occupation of koalas in the similar sized patches of habitat on the western side of Appin Road (Beulah Biobank), is likely to provide habitat for relatively small proportion of the local population (2-3 resident koalas) (Crowther 2018).

The Noorumba Reserve provides some interrupted connectivity to isolated fragments of native vegetation, including Core Koala habitat further to the west along Menangle Creek, which in turn drains into the Nepean River (referred to as the Noorumba Reserve Corridor). Biolink (2016, 2017, 2018) identified the Noorumba Reserve Corridor as one of four locally important east west corridors between Meadowbank and Appin for the local koala population.

While the Biodiversity Assessment recognises the Noorumba Reserve Corridor currently provides for dispersal of Koalas into Noorumba Reserve, this dispersal is faced with two significant barriers in the form of the existing Appin Road and the Upper Canal System. The tenuous connectivity beyond the reserve is currently subject to significant uncertainty around future ongoing investment and preservation of lands by multiple land owners to establish the corridor.

Targeted surveys by Ecological (2015, 2016), WSP (2018), Biolink (2017) and others have identified active koala habitat within Noorumba Reserve corridor to be largely restricted to the reserve itself (OEH 2018). More specifically, the Biolink (2017) study which generally considered habitat use by koalas within the study area as more extensive than anticipated, found no evidence of koala use within the Noorumba Reserve corridor across multiple sites to the west of the reserve (Biolink 2017).

The Koala Corridor Projects Generalised Approach to Planning Connectivity at Local and Regional Scales (GAPCLoSR) analysis (Biolink 2018) of the baseline conditions recognises the existing challenges to this corridor, including the relatively high cost associated with overcoming the barriers formed by Appin Road and the Upper Canal System and distances of more than 220 m between koala habitat patches associated with the corridor along Menangle Creek. The limitations of the existing connectivity of the Noorumba Reserve corridor beyond the reserve, is further highlighted by the Figures 4 and 5 of the GAPCLoSR analysis (Biolink 2018), which identifies the baseline conditions “least cost pathway” as passing through the

centre of the proposed Mt Gilead Development and not along the Menangle Creek corridor identified by Biolink (2016) and Biolink (2017).

The Noorumba Reserve corridor does not form a “Primary corridor” mapped by OEH and verified by the GAPCLOSR investigation (Biolink 2018) as the most important in the landscape for koalas in terms of total habitat patch size and connectedness (OEH 2018).

While the GAPCLOSR analysis (Biolink 2018) under future land use scenarios of a yet to be established corridor reserve network does identify the Noorumba Reserve corridor as providing east west connectivity beyond the Noorumba Reserve and along Menangle Creek, comparatively, the OEH “Primary corridors” and two of the four identified “Secondary” east west corridors between Rosemeadow and Appin are of greater importance to koalas in the landscape overall in terms of total habitat patch size and connectedness (Biolink 2018).

The establishment of any future Noorumba Reserve corridor will result in approximately nine kilometres of existing and/or approved urban development interface boundaries to be managed in perpetuity. Given the well documented evidence of koala harm in urban environments (Koala Expert Panel 2017, McAlpine et al. 2015 McAlpine et al 2006b)), the current advice from OEH advocates for the exclusion of koalas from these areas, by keeping koalas on the edge and outside of the Greater Macarthur GA, rather than in the east west Noorumba Reserve corridor (OEH 2018).

The secondary corridors identified by OEH are not considered critical to the long-term survival of the region’s koala population. This is based on the retention of “Primary” corridors, amount of habitat available within “Secondary” corridors and the presence of “Primary” corridors that could facilitate broad east-west movement for koalas between Wilton and Douglas Park (i.e. Allens Creek and Cataract corridors, with the latter corridor located only another four kilometres south of the Ousedale “Secondary” koala corridor) (OEH 2018).

The retention of the OEH “Primary” corridors in their entirety and accompanying mitigation measures is considered by OEH as likely to be sufficient habitat to support the long-term survival of koalas in the area (OEH 2018).

Following further consideration of the additional information provided in the submissions, it is considered the findings of the biodiversity assessment provides an adequate assessment of the projects impacts on the koala. The assessment recognises the proposal would have an impact on the local koala population through the direct loss of a small proportion of habitat in the locality and result in the further fragmentation of a recognised “Secondary” east west koala corridor. However, the proposal is unlikely to have an adverse effect on the life cycle of the koala to the extent that is likely to lead to the risk of extinction of the species in the locality. Therefore, a Species Impact Statement (SIS) is not required under the BC Act.

Inadequacy of proposed mitigation measures - Nestbox Management Plan, Glider Connectivity and Cumberland Plain Land Snail translocation strategy is required. Section 6.4.6 (ii) of the revised draft CKPoM needs to be considered

Nestbox Management Plan: The Biodiversity Assessment acknowledges the proposals impacts on habitat for threatened species including removal of approximately six hollow bearing trees and has recommended in Section 5.1 the provision of supplementary habitat including nest boxes in accordance with Roads and Maritime standard mitigation policies including; *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Nest boxes, from the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (Roads and Traffic Authority 2011). The Nest Box Management Plan will be developed prior to construction as part of the proposals environmental management documentation.

- Glider connectivity: The Biodiversity Assessment has recommended the preparation of a Glider Connectivity Strategy be prepared as part of the mitigation package for the proposal in section 5.2. This glider connectivity strategy will be developed prior to construction

- **Cumberland Plain Land Snail:** The Biodiversity Assessment acknowledges the proposals impacts including potential injury to species during construction and has recommended in section 5.1 that construction be undertaken in accordance with Roads and Maritime standard mitigation policies including; *Guide 9: Fauna handling* and *Guide 4: Clearing of vegetation and removal of bushrock*; of the Roads and Maritime Biodiversity Guidelines: *Protecting and managing biodiversity on RTA projects* (Roads and Traffic Authority 2011). While not specified within the Biodiversity Assessment these standard Roads and Maritime procedures include detailed preclearing surveys prior to disturbance. A comprehensive flora and fauna management plan detailing the proposed mitigation in accordance with Roads and Maritime policy will be developed prior to construction and it is recommended that this plan specify preclearing and relocation requirements for the Cumberland Plain Snail
- **CKPoM:** Roads and Maritime are committed in the short term to providing mitigation aimed at minimising the existing impacts on the koala population from road mortality along Appin Road, while working with DP&E and OEH to develop a long-term strategy to establish a koala crossing supporting the east-west movement of koalas across Appin Road in the most appropriate location.

The final design and implementation of the fauna fencing will be developed prior to construction as part of the detailed design of associated infrastructure (e.g. fencing), landscaping and the preparation of environmental management documentation in consultation with key stakeholders to ensure koala road mortality along Appin Road is minimised.

Figure 5-1 of the Biodiversity Assessment presents a proposed fauna fence on only the eastern side of Appin Road as the western side of Appin Road was still subject to the Mt Gilead developments final detailed infrastructure design (landscaping and noise wall barriers). Irrespective of the Mount Gilead development, Roads and Maritime are committed to providing fauna fencing, where proposed, in accordance with Campbelltown City Councils Draft CKPOM Section 6.4.6(ii) a) and recommendations of the expert reports (Crowther 2018) (Biolink 2018). This will incorporate koala-grids or other approved devices installed at fence-ends and driveways and other access points to prevent koala access to the road corridor (as committed in Section 5.2 and Figure 5-1 of Appendix C of the REF).

The Biodiversity Assessment made commitments in section 5.2 and shown in Figure 5-1 to incorporate koala-grids or other approved devices installed at fence-ends and driveways and other access points to prevent koala access to the road corridor in accordance with the Campbelltown Councils Draft CKPOM Section 6.4.6(ii) b).

The Biodiversity Assessment is inconsistent with Campbelltown Councils Draft CKPOM Section 6.4.6(ii) c) requirements for the standard application of connectivity structures such as overpasses or underpasses. However, the Draft CKPOM also makes provisions where significant topographical or engineering constraints exist in Section 6.4.6(ii) d) for alternative solutions that do not compromise the long-term viability of the koala population.

The preliminary feasibility design of connectivity structures such as overpasses or underpasses in the vicinity of Noorumba Reserve are significantly constrained by topographical, ecological and land use conflict (Noorumba Biobank).

When considering the existing disturbed condition and tenuous linkages of the proposed Noorumba Reserve corridor beyond the reserve, the current expert advice of OEH (OEH 2018) is that the proposed Noorumba Reserve corridor is of questionable importance comparably to the koalas "Primary" corridor network and koala use of the Noorumba Reserve corridor is considered likely to substantially increase the threats to the koala along the existing and approved future residential interface. The lack of a connectivity structure in this location is unlikely to lead to the long term viability of the koala population being compromised.

Fauna overpasses and/or underpass required

A preliminary feasibility study of underpass design identified that fauna underpasses in the vicinity of Noorumba Reserve are significantly limited by topography (crest of a ridgeline), underground services network and would likely require substantial additional clearing of good condition critically endangered ecological community (CEEC), Shale Sandstone Transition Forest (SSTF) from within and adjoining to the established Noorumba Reserve Biobank. Similarly, a fauna land bridge and/or overpasses in this location is also limited by topography (crest/ridgeline) and would result in even more substantial clearing of the good condition CEEC, SSTF from within and adjoining to the established Noorumba Reserve Biobank.

It is acknowledged that wildlife crossing structures are fundamental to best practice corridor design (NSW Roads and Maritime Services 2012) and where possible the installation of a crossing structures at Noorumba Reserve for the koala is recommended by Campbelltown Council (Biolink 2017) and the expert reports (Biolink 2018 and Crowther 2018). However, when considering the significant engineering design limitations above combined with the existing disturbed condition and tenuous linkages of the proposed Noorumba Reserve corridor beyond the reserve, the current expert advice of OEH (OEH 2018) is that the proposed Noorumba Reserve corridor is of questionable importance comparably to the koalas "Primary" corridor network and any future use of this corridor is considered likely to result in an increased threats to the koala from existing and approved future residential interface, the provision of an underpass and/or overpass at Noorumba Reserve is not currently supported.

A preliminary examination of the feasibility of fauna underpasses indicated that the provision of such structures is significantly limited due to the topography and underground services networks. An overpass or underpass at any potential connection location would likely require substantial additional clearing of good condition critically endangered ecological communities including within the BioBank Site.

The provision of connectivity structures in the short term is not currently supported. A long term strategy for movements of koala across Appin Road will be developed as part of a whole of government approach and, in consultation with key stakeholders. The aim is to ensure that the need for connectivity is fully investigated for possible provision as part of future upgrades to Appin Road and properly located to meet long term conservation koala management outcomes. This would ensure that a suitably secure and preserved corridor is provided which is consistent with the proposed Greater Macarthur strategy and incorporated within the proposed Cumberland Plain Conservation Plan.

Inadequacy of the proposed fauna fencing

The immediate installation of exclusion fencing to reduce the increasing road mortality of the local koala population along Appin road is largely unanimously supported by all key stakeholders and experts (Crowther 2018, Biolink 2018, Biolink 2017, OEH 2018). The proposal will provide an opportunity to install fencing and/or preventive infrastructure along a significant stretch of this recognised hot spot for koala road mortality (Crowther 2018). The provision of exclusion fencing is an intrusive mitigation measure, with or without the provision of associated crossing structures, and as such is likely to result in changes to the existing threats and the creation of new threats to the local koala population and other associated wildlife. These threats may include but not be limited to; changes to existing home territories, intra species conflict, resource competition, stress, risk from wildfire and new urban interfaces. However, despite the likely impacts associated with the provision of fencing, maintaining the status quo and the corresponding increase in koala road mortality is widely considered to be more detrimental (OEH 2018, Crowther 2018).

Roads and Maritime are committed in the short term to providing mitigation aimed at minimising the existing impacts on the koala population from road mortality along Appin Road, while developing a long-term strategy to establish a koala crossing supporting the east-west movement of koalas across Appin Road in the most appropriate location.

The final design and implementation of the fauna exclusion fencing will be developed prior to construction as part of the detailed design of associated infrastructure (e.g. fencing) and landscaping and the

preparation of construction environmental management documentation and in consultation with key stakeholders to ensure koala road mortality along Appin Road is minimised. Additional fauna fencing at Noorumba Reserve along the western side of Appin Road has also been included as part of the proposal (refer to Chapter 3 of this submissions report).

Figure 5-1 of the Biodiversity Assessment presents a proposed fauna fence only on the eastern side of Appin Road. However, the western side of Appin Road was still subject to the Mt Gilead developments detailed infrastructure design (landscaping and noise wall barriers). Irrespective of the Mt Gilead development, Roads and Maritime are committed to providing fauna fencing, where proposed, in accordance with Campbelltown City Councils Draft CKPOM Section 6.4.6(ii) a) and recommendations of the expert reports (Crowther 2018) (Biolink 2018). This will incorporate koala-grids or other approved devices installed at fence-ends and driveways and other access points to prevent koala access to the road corridor (as committed in Section 5.2 and Figure 5-1 of Appendix C of the REF).

The extension of the final fence locations adjoining cleared lands will also consider the local understanding of the maximum crossing distance of 220 metres that a koala had been recorded from a patch of vegetation (Biolink 2018).

Furthermore, Roads and Maritime will investigate, in consultation with, and meeting the requirements of OEH, management of koalas potentially using the remnant habitats within Noorumba Reserve to the large tracts of remnant vegetation along Appin Road in accordance with the recommendations of the expert report by Crowther (2018).

Lack of transparency, accountability and proper process

The Appin Road Upgrade Biodiversity Assessment and REF has been prepared in accordance with all statutory and Roads and Maritime requirements and, in regards to the koala, has gone beyond these requirements to consult directly with CCC and key stakeholders throughout the proposals development as well as participating alongside CCC in the koala roundtable meetings.

The Biodiversity Assessment incorporated consultation with government and key stakeholders, used relevant publicly accessible literature ((Phillips and Callaghan 2000), Biolink Ecological Consultants 2016), current NSW OEH atlas database records (OEH 2018) and advice from the Governments koala expert (OEH) in consideration of the proposals impacts on the koala. At the time of preparing the assessment for the Biodiversity Assessment and REF, several significant koala studies were under way and being completed by DP&E, Campbelltown Council and OEH, including the two independent koala expert reports. The Biodiversity Assessment referenced the personal communication between Roads and Maritime and OEH koala expert Kylie Madden in lieu of any formal written advice from OEH at the time. OEH has subsequently provided draft conservation advice summarising the position of the current koala research for the region (OEH 2018) and Roads and Maritime have been provided with additional local published material on the koala (Biolink 2017, 2018). The OEH advice incorporated the information of current OEH studies, available published information and considered independent expert reports (Biolink 2018) (Crowther 2018). This OEH advice is consistent with the assessment of the Biodiversity Assessment in that it acknowledges the koala use of the "Secondary Corridor" at Noorumba Reserve as habitat and provides limited east west movement of koalas at this location. Importantly OEH advice also identifies that the corridor in this location was less important for koalas in the landscape overall in terms of total habitat patch size and connectedness and that the OEH-named corridors, Simpsons-Elladale and Ousedale-Mallaty appeared more important than Noorumba Reserve.

The Biodiversity Assessment has been prepared using expert advice, relevant guidelines and available information on species to provide a transparent presentation of the findings of all survey results and in the assessment of the proposal impacts.

The relevant NSW statutory process for environmental impact assessment has been undertaken for the proposal. The likely significance of impact on threatened species has been comprehensively assessed in accordance with the Section 5A of the *Environmental Planning and Assessment Act 1979* (now amended). In relation to the koala, this assessment concluded that this proposal, as mitigated, was unlikely to have a significant impact on the local koala population and a Species Impact Statement and OEH concurrence or the preparation of a Biodiversity Development Assessment Report was not required. The assessment concluded that the fencing proposed along Appin Road should reduce current levels of koala road fatality.

The relevant Commonwealth statutory process for environmental impact assessment has also been undertaken for the proposal. The project was assessed in accordance with relevant guidelines including Commonwealth referral guidelines for the koala which also concluded that the project was unlikely to have a significant impact on koalas. It is noted that Roads and Maritime projects assessed via a REF are subject to the provisions of the EPBC Act Strategic Assessment approval. The effect of this approval is that Roads and Maritime REF projects that are likely to have a significant impact on threatened species such as the koala do not require referral to the Commonwealth Department of Environment and Energy for a controlled action determination.

Failure to consider cumulative impacts

While the cumulative impacts of the proposal were considered in section 6.1.2 of the REF and discussed in section 4.2.5 of the Biodiversity Assessment, at the time of the report preparation, the detailed assessment of the Appin Road Safety Improvements was not finalised for inclusion. These impacts however are now known and will be addressed in the submissions report prepared for the project and considered in the determination of the proposal.

A summary of the cumulative impacts of these two proposals on key biodiversity values are provided below in Table C-1.

Table C-1: Summary of the cumulative impacts of these two proposals on key biodiversity values

Proposal	Impacts on Koala Habitat (ha)	Impacts on SSTF (ha)	Impacts on CPW (ha)	Total loss of native vegetation (ha)	Impacts on wildlife corridors
Appin Road Upgrade (WSP 2018)	6.22	4.11	3.17	7.28	Intersects one Koala "Secondary" corridors connecting "Primary" and "Secondary" Koala habitat east and west of Appin Road.
Appin Road Safety Improvements Works (Ecological 2018)	4.75	1.81	1.88	3.69 ha	Intersects two Koala "Secondary" corridors, connecting "Primary" and "Secondary" koala habitat east and west of Appin Road.
Cumulative	10.97	5.92	5.05	10.97	Intersects three Koala "Secondary" corridors, connecting "Primary" and "Secondary" koala habitat east and west of Appin Road

Cumulatively, these projects will impact on approximately 10.97 ha of native vegetation and habitat for the koala, much of which is dominated by derived grasslands and remnant canopy trees over an exotic understorey within linear fragmented patches of roadside vegetation. All the native vegetation to be impacted is characteristic of the threatened ecological communities, Cumberland Plain Woodland, or Shale Sandstone Transition Forest as listed under State and Commonwealth legislation.

Furthermore, the cumulative impact of both proposals will result in the intersection of three of the four mapped “Secondary” east west corridors for the koala and associated wildlife (OEH 2018, Biolink 2018, Biolink 2017 and Biolink 2016).

Roads and Maritime have proposed in the short term to providing mitigation aimed at minimising the existing impacts on the koala population from road mortality along Appin Road through the establishment of fauna/koala wildlife exclusion fencing, while developing a long-term strategy to establish a koala crossing supporting the east-west movement of koalas across Appin Road in the most appropriate location. The cumulative Biodiversity Assessments have identified that the provision of crossing structures at the three-intersected “Secondary” east west corridors is constrained by existing topographical, ecological and existing land uses (Noorumba and Beulah Biobanks).

In the absence of any crossing structures at the three “Secondary” corridors, the cumulative impacts of these two proposals may be of significance to the local koala population.

Expert reports have been ignored, and perceived bias with OEH’s role in the process

The expert reports by Crowther (2018) and Biolink (2018) have been considered in the development of OEH conservation advice on the koala (OEH 2018). The OEH is the government authority responsible for the protection and management of threatened species, including the koala within NSW. Their considered conservation advice incorporates the current understanding and proposed conservation of koalas within the locality not just within the Campbelltown LGA. The assessments of the koala in the Biodiversity Assessment considered the initial advice of OEH koala experts to Roads and Maritime which is consistent with the subsequent OEH conservation advice on the koala (OEH 2018).

Contravenes the basic objectives of corridor design principles and guidelines

The Biodiversity Assessment section 5.2 recognises the implementation of crossing structures should be considered with the installation of barrier fencing as a basic objective of corridor design principles and guidelines including Roads and Maritime, Wildlife Connectivity Guidelines for Road Projects (NSW Roads and Maritime Services 2012 draft). The proposal has incorporated this consideration within section 5.2 of the Biodiversity Assessment and made provision for the inclusion of crossing structures for arboreal mammals and gliders. While the proposal has further investigated preliminary engineering feasibility designs for under and/or overpasses, these structures in this location are highly constrained by both topographic, environmental and land use challenges. Furthermore, the provision of terrestrial mammal and koala crossing structures in this location is likely to exacerbate threats from the significant proposed and existing urban interfaces adjoining the corridor west of Appin Road.

A long term strategy for movements of koala across Appin Road will be developed as part of a whole of government approach and, in consultation with key stakeholders. The aim is to ensure that the need for connectivity is fully investigated for possible provision as part of future upgrades to Appin Road and properly located to meet long term conservation koala management outcomes. This would ensure that a suitably secure and preserved corridor is provided which is consistent with the proposed Greater Macarthur strategy and incorporated within the proposed Cumberland Plain Conservation Plan.

Referral to the Minister for the Environment under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 has not been undertaken

As the EPBC Act strategic assessment approval for road development activities (See <http://environment.gov.au/protection/assessments/strategic/nsw-roads-and-traffic-management>) applies to this proposal. As such, a referral is not required provided that Roads and Maritime meet all its commitments under the strategic assessment approval including the requirement not to proceed when the impacts of the proposal are not acceptable. Roads and Maritime did take the opportunity to discuss the Biodiversity Assessment undertaken and the operation of the strategic assessment approval with the Department of Environment and Energy. Department of Environment and Energy did not indicate at any of the meetings that Roads and Maritime were not meeting its commitments under the strategic assessment approval and therefore did not require the project to be referred (on the basis of unacceptable impacts).



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Customer feedback
Roads and Maritime
Locked Bag 928,
North Sydney NSW 2059

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