South Batemans Bay Link Road

Review of environmental factors

Transport for NSW | April 2020
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Document controls

Approval and authorisation

Title
South Batemans Bay Link Road review of environmental factors

Accepted on behalf of NSW Transport for NSW Services by:
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Signed: [Signature]

Dated: 22 April 2020

Document status

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<th>Document status</th>
<th>Date</th>
<th>Prepared by</th>
<th>Reviewed by</th>
</tr>
</thead>
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<tr>
<td>Draft for TfNSW review</td>
<td>29/01/2020</td>
<td>Michael Stojanoski</td>
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</tr>
<tr>
<td>Second Draft for review</td>
<td>18/03/2020</td>
<td>Michael Stojanoski</td>
<td>Cassy Baxter</td>
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<tr>
<td>Final Draft</td>
<td>6/04/2020</td>
<td>Michael Stojanoski</td>
<td>Cassy Baxter, Kevin Roberts</td>
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<tr>
<td>Updated Final Draft</td>
<td>9/04/2020</td>
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Executive summary

The proposal

Transport for NSW is proposing to connect the Princes Highway with the existing South Batemans Bay Link Road at Glenella Road, Batemans Bay (the proposal), which would improve safety and access. Key features of the proposal include:

- A new roundabout on the Princes Highway, including:
  - two southbound lanes through the roundabout
  - a single northbound right turn lane through the roundabout to Glenella Road
  - a northbound bypass lane on the Princes Highway
  - a single lane entry and exit to and from Glenella Road

- Upgrade of Glenella Road as a two-lane road (one lane in each direction between the new roundabout on the Princes Highway and Heron Road)

- A new T-intersection at the junction of the existing The Ridge Road and Glenella Road

- Utility protection or relocation for telecommunication, electrical and water infrastructure

- Earthworks including cuttings, embankments and retaining walls

- Lighting, signage and supporting infrastructure

- Establishment and use of temporary ancillary facilities during construction, including site offices, plant laydown areas, access tracks, stockpile sites, water quality controls and vehicle turning bays

- Drainage and stormwater management infrastructure along the road corridor

- Site rehabilitation and landscaping work.

Construction of the proposal is planned to be completed by 2023.

Need for the proposal

Batemans Bay currently experiences congestion along Beach Road and in the Central Business District (CBD) due to growth in the region and increases in traffic during peak holiday periods. The Princes Highway is an important connection for regional road users and is a key route for commuter, recreational and commercial traffic movements.

Beach Road connects with the Princes Highway just south of the Batemans Bay Bridge. Beach Road is a main road which extends east through the Batemans Bay CBD, then south-east to various residential areas and beaches from Catalina to Surf Beach.

There is an identified need to improve road connections to the communities to the south of Batemans Bay to support the strategic long-term growth and development of the south coast region.

In June 2014, the NSW Government announced $10 million for the South Batemans Bay Link Road project to improve traffic flow through Batemans Bay and along Beach Road. This funding was used by Eurobodalla Shire Council (Council) to construct the first stage of the project between George Bass Drive and Heron Road and was completed in early 2019.

This completed section of the road is now known as Glenella Road, as is the narrow unsealed road between Heron Road and the Princes Highway. Thirty million dollars to complete the remaining portion of the South Batemans Bay Link Road, including a safe connection to the Princes Highway, was announced by the NSW Government in January 2019 and would be carried out by Transport for NSW.

The proposal would provide a safe and efficient alternative access to the southern coastal villages that would help ease current and future congestion in the Batemans Bay CBD, particularly along Beach Road. The proposal would also allow for land use development and increase freight access and productivity in the Batemans Bay CBD, southern coastal villages and proposed Surf Beach employment lands.
Proposal objectives

The primary objective of the proposal is to improve network connectivity by providing a safe and efficient connection between the Princes Highway and the South Batemans Bay Link Road.

Other objectives include:

- Improve traffic and pedestrian amenity in the Batemans Bay CBD
- Facilitate land use development in the Batemans Bay CBD and southern coastal villages to support residential property and employment growth
- Increase freight productivity for heavy vehicles accessing the southern coastal villages and proposed Surf Beach employment lands.

Options considered

A number of options were considered and assessed during the development of the proposal. Transport for NSW investigated and assessed four options for the intersection of Glenella Road with the Princes Highway:

- Option 1: A roundabout including a northbound bypass lane on the Princes Highway
- Option 2: A seagull with vehicles turning right onto the highway from Glenella Road, crossing the two southbound lanes onto a protected northbound lane before merging
- Option 3: A left in left out with a no right turn into or out of the South Batemans Bay Link Road allowed
- Option 4: A channelised right turn with a dedicated northbound lane for vehicles turning right into Glenella Road from the Princes Highway.

Options 2 and 4 were ranked lowest against road safety objectives, as right turning vehicles would be required to look for gaps across two high speed traffic lanes to enter and exit Glenella Road. Although Option 3 was the lowest cost option, it did not cater for all movements and was not considered to provide sufficient network benefits.

Option 1 allows safe entry and exit from Glenella Road and was considered the preferred option as it met the project objectives, provides the best value for money, and has the lowest environmental and property impacts. It also ranked highest in constructability, requiring smaller retaining structures than the other options and less disruption to highway traffic.

The preferred option was publicly displayed in November 2019 to give the community an opportunity to learn about the preferred option assessment process and provide feedback.

A consultation report outlining the feedback received during the display of the preferred option is available on the project website.

Statutory and planning framework

*State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)* aims to facilitate the effective delivery of infrastructure across the State. Clause 94 of the ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. The proposal is subject to assessment under a review of environmental factors (REF) under Division 5.1 of the EP&A Act. Consent from Council is not required.

The proposal has considered Commonwealth and NSW legislation and regulation including the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

The proposal would be unlikely to cause a significant impact on the environment. Therefore, an Environmental Impact Statement and approval from the Minister for Planning under Division 5.2 of the EP&A Act are not needed. A Biodiversity Development Assessment Report or Species Impact Statement is
not required. The proposal is not likely to have a significant impact on matters of national environmental significance and has not been referred to the Commonwealth government.

Part of the proposal is located within Mogo State Forest. Some of the land affected by the proposal that would form part of the new road corridor may require revocation of the State Forest status in accordance with the provisions of the *Forestry Act 2012*. This process may involve a resolution or Act of Parliament.

**Community and stakeholder consultation**

During the development of the proposal the following stakeholders have been consulted:

- Batemans Bay region residents and businesses
- Aboriginal community stakeholder and knowledge holders, including Batemans Bay Local Aboriginal Land Council (BBLALC), Mogo Local Aboriginal Land Council (MLALC), South Coast NSW Aboriginal Elders and the South Coast People
- Eurobodalla Shire Council
- Forestry Corporation of NSW
- State Government agencies and departments
- Utility providers, including Essential Energy and Optus
- Emergency services, including NSW Ambulance (Surf Beach), State Emergency Services (SES) and Rural Fire Services NSW.

The main comments raised during consultation were in relation to:

- Inadequacy of existing infrastructure (such as sight lines, capacity of Princes Highway)
- Design features of the preferred option for the proposal
- Impacts to local businesses
- Environmental impacts associated with the proposal such as biodiversity, water quality, contaminated land, heritage, traffic and transport.

**Environmental impacts**

The proposal would result in the following main potential environmental impacts.

**Biodiversity**

The proposal would result in the removal of up to 22.68 hectares of native vegetation. This value assumes that all the vegetation within the construction boundary would be cleared or affected by construction works and is a worst case estimate. Efforts to reduce removal of vegetation would be made during detailed design and construction planning. Native vegetation within the construction boundary includes:

- 15.95 ha of breeding habitat for glossy black cockatoo (listed as vulnerable under the BC Act)
- 7.69 ha of breeding habitat for sooty owl (listed as vulnerable under the BC Act)
- 21.79 ha of ecosystem credit species habitat
- Up to 72 hollow bearing trees
- No threatened ecological communities
- No threatened flora species habitat
- No Class 1 or Class 2 watercourses or watercourses that would be likely to provide habitat for threatened aquatic species.

The proposal has been assessed as not likely to significantly impact threatened species, populations or ecological communities listed under the BC Act or EPBC Act. This assessment included considerations of the effects of the recent Clyde Mountain bushfire which affected about 84,000 ha of land within Eurobodalla Shire.
Impacts on biodiversity would be minimised through the implementation of management and mitigation measures identified in this REF. Biodiversity offsets may be required in accordance with Roads and Maritime Guideline for Biodiversity Offsets.

**Water quality**

There are sensitive receiving environments located from about 500 metres from the proposal. These include Hanging Rock Creek wetland, State Environmental Planning Policy (Coastal Management) protected wetlands, Batemans Marine Park and oyster leases.

Impacts on water quality could occur during construction from the pollution of storm water run-off with eroded soil, sediments, fuels and other hazardous material spills. Highly erodible soils and steep slopes have been identified as the main risk for water management during construction.

Impacts during operations could occur as a result of spills and leaks from vehicles, and increased storm water runoff from roads.

Construction and operational water quality devices would be further investigated during detailed design.

**Contaminated land**

There is low to moderate potential for contaminated land within most of the construction boundary. Two locations (Old Sawmill site and uncontrolled landfill adjacent to Glenella Road) have been identified as having a high likelihood of containing asbestos material due to historic land use and practices. Measures would be developed and implemented before starting construction to manage and minimise health and environmental risks.

**Traffic and transport**

During construction of the proposal, minor delays would be experienced by vehicles travelling along the Princes Highway while the roundabout is being built. The disruption would be associated with reduced speeds, temporary lane closures and minor increases in traffic volumes on the surrounding road network. The Princes Highway would retain one lane in each direction at all times to ensure through traffic would be largely unaffected.

Once complete, the proposal would improve road connections for the coastal communities south of Batemans Bay, increase the capacity and accessibility of the Batemans Bay road network and reduce through traffic in the Batemans Bay CBD, particularly during peak holiday periods.

Emergency services and heavy vehicles would have increased accessibility to the Princes Highway. The proposal offers opportunity to improve emergency access and response time.

**Noise and vibration**

The proposed construction work would be carried out during standard construction hours where practicable. There would be some level of noise disturbance experienced by some residents located along Albatross Road, Gannet Place, Heron Road and Vista Avenue (Catalina) during some phases of construction.

Overall, the proposal would result in some increased operational noise levels throughout the surrounding noise catchments. This is due to the predicted increase in traffic travelling on Glenella Road and, to a lesser extent, on Heron Road and George Bass Drive. However, for the ten years following completion of the proposal, Glenella Road is predicted to carry less than 2,500 vehicles per day and the level of traffic noise experienced by the majority to residents would be relatively minor.

Two residential properties facing Glenella Road, one dwelling facing Heron Road and one non-residential property located near George Bass Drive would be eligible for consideration for at-property treatments to mitigate traffic noise intrusion.
Aboriginal heritage
The proposal would impact on two Aboriginal sites containing artefact scatters that were identified during field investigations. These sites have been assessed as having low archaeological significance.

An Aboriginal Heritage Impact Permit (AHIP) would be required for impacts on these sites and any unknown items potentially impacted by the proposal.

Landscape character and visual impact
The proposal would have an impact on views in and around the study area. While the work would take place for the most part within an established road corridor, it would impact on key viewpoints, with the greatest potential impact being on road users and visitors of the Roundhill Round Hill Lookout.

Due to the recent bushfires, impacts on sensitive visual receivers would vary during construction and the first 15 years of operation. These impacts would be dependent on the level and speed of recovery of the surrounding landscape.

How will the potential impacts be managed?
This REF identifies comprehensive mitigation and management measures that would be implemented to avoid, manage, mitigate and monitor impacts during construction and operation of the proposal. These measures include but are not limited to:

- A construction environmental management plan (CEMP) to coordinate construction activities and manage potential impacts
- A noise and vibration management plan (NVMP) prepared in accordance with the Construction Noise and Vibration Guideline (Transport for NSW, 2016) to minimise construction noise impacts
- An erosion and sedimentation control plan to minimise water quality impacts during construction
- An Asbestos Management Plan prepared in accordance with SafeWork NSW Code of Practice
- An Aboriginal Heritage Management Plan to minimise impacts on Aboriginal heritage and provide instruction for consultation with Local Aboriginal Land Councils and Registered Aboriginal Parties.

Justification and conclusion
The REF proposal is considered to align with a number of Commonwealth and NSW strategies and plans including:

- Princes Highway Corridor Strategy, Australian Government
- State Infrastructure Strategy 2018-2038: Building Momentum
- NSW Future Transport Strategy 2056
- South East and Tableland Regional Plan 2036
- NSW Freight and Ports Plan 2019-2023
- NSW Road Safety Plan 2021
- Tourism and Transport Plan
- NSW South Coast Marine Tourism Strategy
- Transport for NSW, Connecting to the future, Our 10 Year Blueprint.

The proposal is considered to be an important upgrade to the area of Batemans Bay as it would improve network connectivity by providing a safe and efficient connection between the Princes Highway and the South Batemans Bay Link Road.

The proposal would have the following benefits, which align to the proposal key objectives:
<table>
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| Provide a safe and efficient intersection between the Princes Highway and Glenella Road | Improve travel times and connectivity to the southern coastal villages  
Increase access and capacity to support growth in Batemans Bay and southern coastal villages  
Improve access in emergencies  
Reduce the number and severity of crashes in this location. |
| Improve traffic and pedestrian amenity in the Batemans Bay CBD                     | Improve safety for pedestrians and cyclists on Beach Road and in the Batemans Bay town centre  
Enhance liveability and amenity of Batemans Bay, contribute to its attractiveness, sustainability and success |
| Facilitate land use development in the Batemans Bay CBD and southern coastal villages to support residential property and employment growth | A road network with increased capacity for future traffic growth  
Increase access and capacity to support growth in Batemans Bay southern coastal villages |
| Increase freight productivity for heavy vehicles accessing the southern coastal villages and the proposed Surf Beach employment lands | Improve access for business and freight for the southern coastal villages |

Though environmental impacts would occur, they can be effectively mitigated and managed with the application of safeguards outlined within the REF. The benefits of the proposal are considered to outweigh the expected impacts on the environment.

**Display of the review of environmental factors**

This REF is on display for comment between from Monday 27 April to Sunday 24 May 2020. You can access the REF documents in the following ways:

**Internet**

The documents are available as pdf files on the Transport for NSW website at nswroads.work/sbblr

**Display**

The REF can be viewed at the following locations:

- Transport for NSW, Level 4 90 Crown Street, Wollongong
- Batemans Bay Service NSW, 341 Orient Street, Batemans Bay

**Copies by request**

Printed and electronic copies are available by contacting the project team on 1800 549 159 noting that there may be a charge for hard copies, CD or USB.
How can I make a submission?

To make a submission about this proposal, please send your written comments to:

Attention: South Batemans Bay Link Road Project Manager
PO Box 477 Wollongong NSW 2500

Or

southbatemansbaylinkroad@rms.nsw.gov.au

Submissions must be received by Sunday 24 May 2020. Submissions will be managed in accordance with the Transport for NSW Services Privacy Statement. For further information, please see our Privacy Management Plan at www.transport.nsw.gov.au/about-us/transport-privacy or contact us at privacy@transport.nsw.gov.au for a copy.

What happens next?

Transport for NSW will collate and consider the submissions received during the public display of the REF and will determine if the proposal should proceed.

Transport for NSW will keep the community and stakeholders informed across any decisions in relation to the REF, and continue to consult with them prior to and during construction as the proposal proceeds.

Feedback from this display period will help further refine the design of the South Batemans Bay Link Road project.

If Transport has environmental approval for the proposal to proceed, we will finalise the design and call for construction tenders.
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1. Introduction

1.1 Proposal identification

Transport for NSW is proposing to connect the Princes Highway with the existing South Batemans Bay Link Road at Glenella Road (the proposal). The proposal would include a new roundabout at the intersection of the Princes Highway and Glenella Road and a new two-lane road (one lane in each direction) between the roundabout and Glenella Road. The proposal would generally follow the current alignment of Glenella Road, between Heron Road and the Princes Highway, to complete the South Batemans Bay Link Road project. The proposal location is shown in Figure 1-1.

Construction of the proposal is planned to be completed by 2023.

The proposal is subject to assessment under a review of environmental factors (REF) under Division 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

1.1.1 Proposal background

The proposal is located south of Batemans Bay in the Eurobodalla local government area (LGA). Most of the proposal area is located in existing local and State road reserves, managed by Eurobodalla Shire Council and Transport for NSW, respectively. Part of the proposal is located within Mogo State Forest, managed by the Forestry Corporation of NSW. Section 3 describes the proposal in more detail. The location of the proposal is shown in Figure 1-1.

The Princes Highway is an important connection for regional motorists and is a key route for local, recreational and commercial traffic movements. The traffic volume on the Princes Highway just south of Batemans Bay is about 8,800 vehicles per day with 8.3 per cent heavy vehicles and a growth rate of about 1.2 per cent per year.

Batemans Bay is the main commercial centre of the Eurobodalla Shire. The central business district (CBD) has a mix of commercial, community, recreational and residential land uses. There is further urban residential land located along the coastal villages south of Batemans Bay. The area is a popular tourist destination, particularly for Australian Capital Territory (ACT) residents, and the Batemans Bay population increases substantially during holiday periods.

Beach Road is a regional road and a major sub-arterial road through the Batemans Bay CBD linking the Princes Highway just south of the Batemans Bay Bridge to the various residential areas and beaches south of the CBD, from Catalina to Surf Beach and further south along George Bass Drive. Beach Road often experiences congestion, particularly during holiday periods.

In June 2014, the NSW Government announced $10 million for the South Batemans Bay Link Road project to improve traffic flow through Batemans Bay including Beach Road, and support future growth in the region. In early 2019, Eurobodalla Shire Council completed construction of the first stage of the South Batemans Bay Link Road between George Bass Drive and Heron Road, east of the Princes Highway. This section is known as Glenella Road.

In January 2019, the NSW Government announced funding of $30 million for Transport for NSW to finalise planning and build the proposal to deliver travel time improvements to the local community by alleviating congestion within the Batemans Bay CBD and provide the necessary infrastructure to support the region’s growth.
1.1.2 Key features of the proposal

The proposal would include a new roundabout on the Princes Highway south of Batemans Bay and a new two-lane road (one lane in each direction) between the roundabout and Heron Road. The proposal would generally follow the current alignment of Glenella Road (formerly known as The Ridge Road) between Heron Road and the Princes Highway to complete the South Batemans Bay Link Road project.

Key features of the proposal are shown in Figure 1-2 and include:

- A new roundabout on the Princes Highway, including:
  - two southbound lanes through the roundabout
  - a single northbound right turn lane through the roundabout to Glenella Road
  - a northbound bypass lane on the highway
  - a single lane entry and exit to and from Glenella Road.
- Upgrade of Glenella Road as a two-lane road (one lane in each direction) between the new roundabout on the Princes Highway and Heron Road
- A new T-intersection at the junction of the existing The Ridge Road and Glenella Road
- Utility protection or relocation for telecommunication, electrical and water infrastructure
- Earthworks including cuttings, embankments and retaining walls
- Lighting, signage and supporting infrastructure
- Establishment and use of temporary ancillary facilities during construction, including site offices, plant laydown areas, access tracks, stockpile sites, water quality controls and vehicle turning bays
- Drainage and stormwater management infrastructure along the road corridor
- Site rehabilitation and landscaping work.

The proposal would allow for land use development and increase freight access and productivity in the Batemans Bay CBD, southern coastal villages and proposed Surf Beach employment lands. The proposal would also provide a safe and efficient alternative access to the southern coastal villages that would help ease current and future congestion in the Batemans Bay CBD, particularly along Beach Road.

An overview of the proposal is provided in Section 3.
Key features of the proposal

SOUTH BATEMANS BAY LINK ROAD PROJECT

Diagram showing:
- Proposed new roundabout
- Northbound bypass lane
- Watercourse (LPI)
- Proposed gabion retaining wall
- Access track centrelines
- Cadastre / road corridor (TfNSW)
- Cutting
- Embankment
- Proposed road design
- Ancillary site

Legend:
- Construction boundary
- Watercourse (LPI)
- Proposed gabion retaining wall
- Access track centrelines
- Cadastre / road corridor (TfNSW)
- Cutting
- Embankment
- Proposed road design
- Ancillary site

Map produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-04-09 | Project: 8202006301
Coordinate System: GDA 1994 MGA Zone 56
Map: 8202006301-GS-070-REF_KeyFeatures.mxd
Aerial imagery supplied by Nearmap (September, 2019)
1.2 Purpose of the report

This REF has been prepared by Cardno NSW/ACT Pty Ltd on behalf of Transport for NSW. For the purposes of the work, Transport for NSW is the proponent and the determining authority under Division 5.1 of the EP&A Act.

The purpose of the REF is to describe the proposal, to document the likely impacts of the proposal on the environment and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in the context of clause 228 of the Environmental Planning and Assessment Regulation 2000, the factors in Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979 (Is an EIS required? guidelines) (DUAP, 1995/1996), Roads and Related Facilities EIS Guideline (DUAP 1996), the Biodiversity Conservation Act 2016 (BC Act), the Fisheries Management Act 1994 (FM Act), and the Australian Government’s Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

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

The findings of the REF would be considered when assessing:

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

This section describes the need for the proposal in terms of its strategic setting and operational need. It identifies the various options considered and the selection of the preferred option for the proposal.

2.1 Strategic need for the proposal

2.1.1 State Infrastructure Strategy 2018-2038: Building Momentum

The State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018) is a 20 year strategy that aims to improve NSW’s economic prosperity and global competitiveness while meeting the challenges of population growth and remaining a great place to live and work. The proposal contributes to achieving the goals for transport by:

- Supporting the ‘hub and spoke’ model of connected regional centres
- Providing safer, more efficient road freight corridors
- Removing constraints on the local road network
- Providing infrastructure to keep pace with regional population growth
- Supporting the development of regional hubs by enhancing their accessibility and connectivity.

2.1.2 NSW Future Transport Strategy 2056

The NSW Future Transport Strategy 2056 (NSW Government 2018) is an overarching strategy, supported by a suite of plans to achieve a 40-year vision for the NSW transport system. The plan identifies a ‘hub and spoke’ network of services for regional areas to provide better connections between communities and improved access to regional cities and centres. The proposal supports this ‘hub and spoke’ model by providing the infrastructure necessary for Batemans Bay to act as a key hub for employment and services in regional NSW. The strategy identifies ‘Customer Outcomes’ to aid in the prioritisation and approval of infrastructure projects in regional NSW. The proposal contributes to the following ‘Customer Outcomes’:

- Sustaining and enhancing the liveability of our places – The proposal improves the overall experience for locals and visitors alike who interact with the Batemans Bay CBD and surrounding network
- Connecting people and places in growing regions – The proposal improves the overall connectivity between Batemans Bay, Sydney and Canberra
- Safely, efficiently and reliably moving people and goods – The proposal would improve road safety in the area for all types of road users.

2.1.3 South East and Tableland Regional Plan 2036

The South East and Tablelands Regional Plan 2036 (NSW Government 2017) provides the 20-year strategy to deliver the vision for the region’s future. The implementation plan identifies Batemans Bay as a strategic centre for the region with access to the surrounding coastal region and the nearby Moruya Airport centred on this location. The proposal is consistent with the key goals and main directives of the plan including:

- Direction 9: Grow tourism in the region – The Princes Highway is a key tourist route, which provides access between the NSW South Coast, Sydney and Canberra. The reduction of congestion, improvements to safety and increased ease of access provided by this proposal would make the...
Batemans Bay area (and the wider south coast region) more desirable as a tourist destination. In turn, this would result in an improvement in the economic stimulus that the tourism industry currently provides to the area.

- Direction 11: Enhance strategic transport links to support economic growth – The Princes Highway is the main link along the NSW South Coast. Improving this link would address local congestion issues and improve road safety and freight logistics in Batemans Bay whilst providing the support required for the NSW South Coast to continue growing.

- Direction 12: Promote business activities in urban centres – The proposal would reduce congestion through the Batemans Bay CBD, improving the ease of operations for all businesses based in the CBD as well as attracting new business.

- Direction 20: Enhance access to goods and services by improving transport connections – The proposal would reduce the average commute times and ease of access for local residents and businesses to basic goods and services, improving the quality of life and economic opportunity available to the area.

The Regional Plan also specifically identifies the need to improve transport, communications and other infrastructure within the Eurobodalla LGA whilst improving employment and tourism opportunities.

### 2.1.4 NSW Freight and Ports Plan 2018-2023

The NSW Freight and Ports Strategy (TfNSW 2013) details how the NSW Government will provide an efficient freight network for the public and private sectors to sustain the local economies across NSW. It highlights short, medium and long-term tasks to improve freight movement on the network. The Strategy would inform government and commercial investment decisions across all modes of transport and allow for the alignment of purpose.

The proposal would contribute to the delivery of a freight network that supports economic growth by improving efficiency for freight accessing the proposed Surf Beach employment lands and servicing coastal villages further to the south. The proposal would also contribute to efficiency, safety and access objectives by reducing the number of heavy vehicles passing through the Batemans Bay CBD, which would in turn result in safety and amenity improvements for the local community.

### 2.1.5 NSW Road Safety Plan 2021

The NSW Road Safety Plan 2021 (NSW Government 2018) features targeted and proven initiatives that will help NSW progress towards the goal of reducing road-related fatalities by 30 per cent by 2021. The Plan is a priority for the Government to improve road safety, addressing key trends, behaviours and the types of crashes occurring on NSW roads.

The proposal would provide a safe connection between the Princes Highway and Glenella Road. This upgrade would simultaneously improve road safety in the area for a diverse group of users including heavy vehicles, local traffic and vulnerable road users (such as pedestrians and cyclists), all of which are key targets of the plan.

### 2.1.6 Tourism and Transport Plan

The Tourism and Transport Plan (NSW Government 2018) was created in recognition of the critical interconnection between transport and tourism in regional NSW. The proposal has the potential to support and enhance existing tourism as well as create new economic development opportunities for Batemans Bay. The wider NSW South Coast region would also benefit by providing greater access to the south coast of NSW, making tourism in the area more attractive and seamless.
2.1.7 NSW South Coast Marine Tourism Strategy

The NSW South Coast Marine Tourism Strategy (NSW Government 2019) identifies Batemans Bay as a “key mid-South Coast visitor hub complemented by the tourism potential of the marine park”. The plan identifies the need for future infrastructure upgrades to the area and the key role they will play in improving marine tourism on the South Coast.

The proposal directly aligns with this Strategy in that it would improve connectivity between Canberra and Sydney with the Batemans Bay area, including with local beaches and supporting the tourism industry the area is known for.

2.1.8 Transport for NSW, Connecting to the future – 10 year blueprint

Connecting to the Future 10 year Blueprint outlines Transport for NSW ambitions and strategic priorities for the next 10 years to support the NSW Future Transport Strategy 2056. The Blueprint identifies a framework to deliver strategic priorities and ambitions, structured around four primary outcomes:

1. For customers: Connecting our customers’ whole lives
2. For communities: Successful places
3. For the people of NSW: Strong economy and quality of life
4. For the people of Transport for NSW: Thriving people doing meaningful work.

The proposal supports the framework identified in the Blueprint by:

- Delivering a necessary link within the transport system in order to provide safe and seamless journeys for people travelling to and from Batemans Bay and the southern coastal townships
- Improving communities and their environs by contributing to an integrated, resilient and accessible transport network that makes Batemans Bay a great place to live, work and visit
- Improving the economy of Batemans Bay by reducing congestion during peak seasons and facilitating future land use development in the Batemans Bay CBD and southern coastal villages to support residential property and employment growth.

2.1.9 Princes Highway Corridor Strategy, Australian Government

The Australian Government's Infrastructure Investment Program supports land transport projects that will strengthen the national economy, through making regional roads safer and more efficient.

The Princes Highway is a priority for investment. Through the 2019/20 budget, the Government has committed to upgrading the Princes Highway across NSW, VIC and SA.

Within the Commonwealth Princes Highway Corridor Strategy, the Investment Roadmap provides an initial list of projects to inform Australian and State Government investment. The Investment Roadmap is intended to be a living document and should be reviewed from time to time to reflect any shifts in Australian or State Government priorities. The South Batemans Bay Link Road is identified within the Investment Road Map under Initiative 7 – Address intersection to improve safety and efficiency.

2.2 Existing infrastructure

The Princes Highway is an important connection for regional road users and a key route for commuter, recreational and commercial traffic movements. Beach Road connects with the Princes Highway just south of the Batemans Bay Bridge. Beach Road extends east through the Batemans Bay CBD, then south-east to
various residential areas and beaches from Catalina to Surf Beach (Figure 1-1). Eurobodalla Shire Council has observed Beach Road often experiences congestion, particularly during holiday periods.

The potential benefits of connecting the Princes Highway with the South Batemans Bay Link Road include:

- Improving journey reliability and reducing delays by enabling access to the South Batemans Bay Link Road from the Princes Highway
- Reducing traffic congestion through the Batemans Bay CBD
- Improving road safety and reducing the rate of fatal and serious injury crashes
- Improving freight access and travel time
- Supporting residential and employment growth by improving access to areas south-east of the Batemans Bay CBD.

2.2.1 Princes Highway

The Princes Highway is a state road functioning as an arterial road through Batemans Bay. The Princes Highway south of Cranbrook Road has one northbound lane and two southbound lanes that form part of an important tourist and freight link between Sydney, the South Coast, Gippsland and Melbourne. The Princes Highway is the major freight corridor for Eurobodalla Shire, linking with Sydney, the Illawarra and Victoria. The Kings Highway, joining the Princes Highway immediately to the north of Batemans Bay, provides freight access across the coastal escarpment to Canberra and the Southern Tablelands.

B-double access is restricted to the Princes Highway, Kings Highway and the section of Beach Road from Princes Highway to Batehaven. The two southbound lanes begin to merge into one at the location of the existing intersection with Glenella Road. The terrain between Batemans Bay and Mogo is rugged and the Princes Highway is located along a ridge line between Cranbrook Road and Lattas Point Road in South Batemans Bay. As a result, the road in this area is winding and steep with a number of grades at or exceeding 10 per cent.

The existing lane configuration on the Princes Highway within the construction boundary consists of:

- Two southbound lanes from the Cranbrook Road intersection merging to one lane, just to the south of the existing intersection with Glenella Road
- Two northbound lanes merging to one lane, about 400 metres south of the existing intersection with Glenella Road
- Speed limit of 90 km/h in both directions.

The posted speed limit on the Princes Highway through the Batemans Bay urban area is 70 km/h. This increases to 90 km/h between the southern outskirts of Batemans Bay and the northern outskirts of the Mogo urban area.

The Princes Highway between Cranbrook Road and Lattas Point Road has a high crash history, with 29 crashes occurring from October 2013 to September 2018, including one fatal and nine serious injury crashes. This crash record is extremely high compared to nearby sections of the Princes Highway and other major highways in NSW.

2.2.2 Glenella Road

Glenella Road is a local road running east-west and connecting George Bass Drive to the Princes Highway. A section of the road between Heron Road and George Bass Drive was recently upgraded by Council as part of the South Batemans Bay Link Road project. The two-lane sealed road provides additional connectivity to the residential areas in the north/east of Catalina via Heron Road and ultimately back to Beach Road via Country Club Drive. Glenella Road joins George Bass Drive by a roundabout intersection.
completed in 2019. The road has been closed to traffic to the west of Heron Road, prohibiting access to the unsealed section and The Ridge Road.

Glenella Road between The Ridge Road and the Princes Highway is a narrow, winding, unsealed two-way road with no street lighting. The terrain is steeply sloped and heavily vegetated on either side of the road alignment. Glenella Road is mostly constructed as cut into the hillside with areas in the northern portion of the road approaching the Princes Highway being constructed as a fill.

The existing intersection of Glenella Road and the Princes Highway consists of a T-junction without traffic lights. Sight distance to the intersection is limited and has been raised as a safety concern by the community. The junction of Glenella Road with the Princes Highway coincides with the termination of an overtaking lane along the highway, as well as a second forest trail. The terminating left lane also acts as an acceleration lane for vehicles turning left onto the Princes Highway from Glenella Road. There is no speed limit posted along Glenella Road between The Ridge Road and the Princes Highway and the road is not formally linked with the surrounding road network.

2.3 Proposal objectives

The main objective of the proposal is to provide a safe and efficient connection between the Princes Highway and the South Batemans Bay Link Road. The proposal would facilitate a direct connection to the Princes Highway to coastal communities’ south of the Batemans Bay CBD. Transport for NSW has also identified the following secondary proposal objectives:

- Facilitate land use development in the Batemans Bay CBD and southern coastal villages to support residential property and employment growth
- Increase freight productivity for heavy vehicles accessing the southern coastal villages and the proposed Surf Beach employment lands
- Improve traffic and pedestrian amenity in the Batemans Bay CBD.

2.4 Alternatives and options considered

2.4.1 Methodology for selection of preferred option

Transport for NSW carried out an options assessment process to identify and evaluate a range of alternatives to connect the existing South Batemans Bay Link Road with the Princes Highway.

The methodology for the options assessment included:

- Identification of the need for the proposal
- Identification of proposal issues and constraints through review of:
  - Existing technical reports, including traffic issues
  - Preliminary environmental and geotechnical investigations
- Develop options – whereby four options for the intersection of the South Batemans Bay Link Road and the Princes Highway were developed based on earlier work carried out in 2015. These options can be found in Section 2.4.2
- Options assessment process and identification of the preferred option – Six evaluation criteria were selected based on the proposal objectives and the issues and constraints previously identified. Each option was then assessed against the criteria described in Section 2.4.3 through an options evaluation workshop carried out in September 2019, which included technical experts and key project
stakeholders. This process resulted in the preferred option detailed in Section 2.5 being identified. Prior to finalising this recommendation the project team asked for feedback from Eurobodalla Shire Council and key community stakeholders on the preferred option for the intersection and new road. The Preferred Option Report was publicly displayed from 25 October to 22 November 2019 and the community was invited to provide feedback. A number of written, face to face and digital engagement activities including a community update, drop in sessions, advertising and social media, were carried out to advise stakeholders and the community of the preferred option during this time.

- The outcomes of this consultation process and further technical advice were used to refine the design as described in Sections 2.6, 3.1 and 3.2.

2.4.2 Identified options

Transport for NSW identified the following four main options for the South Batemans Bay Link Road connection to the Princes Highway (shown in Figure 2-1):

- Roundabout (Option 1)
- Seagull (Option 2)
- Left in left out (Option 3)
- Channelised right turn (Option 4)

A base case ‘Do Nothing’ option was not considered for this proposal. The base case does not meet the proposal objectives as specified in Section 2.3, which includes facilitating land use development in the southern coastal areas, improve connectivity and safety, and improve traffic and pedestrian amenity in the Batemans Bay CBD. Glenella Road and the Princes Highway would continue to have road efficiency and safety issues under the base case option. The base case option would not provide a satisfactory solution to meet the objectives of the proposal.

Option 1 – Roundabout

Option 1 is a roundabout on the Princes Highway, which connects to Glenella Road. The design was adopted from the early development work carried out in 2015. The roundabout option provides a bypass lane for vehicles travelling north on the Princes Highway, two southbound lanes on the highway through the roundabout and a single lane entry and exit to and from Glenella Road.

The design of batters around the intersection was flattened to increase sight distance on approach to the intersection. Vehicles travelling north on the Princes Highway would utilise the bypass lane. The right turn out of Glenella Road northbound would merge to the left about 200 metres north of the roundabout. The existing southbound merge on the Princes Highway located about 350 metres south of the roundabout would remain. The roundabout option includes a posted speed limit of 60 km/h on Glenella Road and 70km/h on the Princes Highway.

The roundabout would be constructed on the eastern side of the existing highway. No work on the western side of the highway would be required. A smaller angle of approach can be utilised for the roundabout option than for other options. Proposed retaining structures within the gully on eastern side of the Princes Highway would be smaller in size compared to the other options proposed.

Option 2 – Seagull

Option 2 is a full seagull intersection on the Princes Highway, connecting to Glenella Road. The seagull intersection option would retain one northbound and two southbound lanes on the Princes Highway. Vehicles turning right (northbound) onto the highway from Glenella Road would be required to cross the two southbound lanes on the highway and onto a dedicated northbound lane. They would then merge to the left about 200 metres north of the new intersection. A channelised (dedicated) left turn would be
available for vehicles travelling south on the Princes Highway entering Glenella Road to improve sight
distances for northbound vehicles exiting Glenella Road.

The design of batters around the intersection were flattened to increase sight distance on approach to the
intersection. The existing southbound merge on the Princes Highway, located about 350 metres south of
the new intersection would remain. The seagull option would need a posted speed limit of 60 km/h on
Glenella Road and 70 km/h on the Princes Highway.

Construction of the seagull option would require substantial work for about one kilometre of the highway,
including installation of retaining structures and widening on the western side of the highway to enable
adequate merge distances. Substantial retaining structures would be required through the gully on the
eastern side of the Princes Highway near the intersection to enable adequate approach and sight distances
from Glenella Road.

**Option 3 – Left in left out**

Option 3 is a left in left out intersection arrangement on the Princes Highway, connecting to Glenella Road.
The left in left out intersection option would retain one northbound and two southbound lanes on the
Princes Highway. No right turn into or out of Glenella Road would be allowed. A raised central median
along the Highway would be provided to further reinforce and restrict a right turn out of Glenella Road. A
left in left out intersection is the only option that restricts movements in and out of Glenella Road.

A channelised left turn would be available for vehicles travelling south on the Princes Highway and entering
Glenella Road, to improve sight distances for exiting southbound vehicles. The design of batters around the
intersection were flattened to increase sight distance on approach to the intersection. The existing
southbound merge, located about 350 metres south of the new intersection would remain. The left in left
out option would need a posted speed limit of 60 km/h on Glenella Road. However, the posted speed limit
on the Princes Highway would remain at 90 km/h.

As a result of including the raised central median, widening along the western side of the Princes Highway
would be required near the intersection. Substantial retaining structures would be required through the gully
on the eastern side of the Princes Highway near the intersection to enable adequate approach and sight
distances from Glenella Road.

**Option 4 – Channelised right turn**

Option 4 is a channelised right turn intersection on the Princes Highway, connecting to Glenella Road. The
channelised right turn intersection option would retain one northbound and two southbound lanes on the
Princes Highway. A dedicated northbound lane would be available for vehicles turning right into Glenella
Road from the Princes Highway. Vehicles turning right from Glenella Road to travel north on the highway
would need to cross two southbound lanes on the highway and immediately merge with northbound
highway traffic. The existing southbound merge on the Princes Highway, located about 350 metres south of
the new intersection would remain. The design of batters around the intersection were flattened to increase
sight distance on approach to the intersection. The channelised right turn option would need a posted
speed limit of 60 km/h on the South Batemans Bay Link Road and 70 km/h on the Princes Highway.

Widening along the western side of the Princes Highway would be required near the intersection.
Substantial retaining structures would be required through the gully on the eastern side of the Princes
Highway near the intersection to enable adequate approach and sight distances from Glenella Road.
Preferred option - roundabout

To Batemans Bay

Other options
Seagull

Princes Highway

Left in left out

Channelled right turn

To Batehaven

The Ridge Road

Glenella Road

Figure 2-1: Proposal options
2.4.3 Analysis of options

The options selection processes considered a range of factors closely related to the proposal objectives (Section 2.3) that would best enable the most effective differentiation between identified options. The assessment considered a range of options and factors that focussed on criteria that was relative to the proposal objectives. These include:

- Road safety – The safety on the worksite and to the travelling public during construction, and design is inherently safer for road users
- Traffic efficiency – Effectively reduce traffic within Batemans Bay CBD (Beach Road) and ensure sufficient traffic capacity of each intersection option to meet typical peak periods and holiday flows
- Environment – Minimise impact to the environment and the local community
- Property – Minimise the amount of land that would need to be leased or acquired in order to build the option
- Constructability – Provides for flexibility in construction method and minimises potential issues associated with construction activities and impacts on utilities
- Cost – Assessment of proposed options against the funding available for the proposal.

A comparative assessment was carried out on each of the four proposed options with regard to the assessment criteria detailed above and is shown in Table 2-1. A ranking of one indicates the best option comparatively, and a ranking of four indicates the worst option comparatively. Where options were considered to be equivalent, they were ranked in the same position.

<table>
<thead>
<tr>
<th>Assessment criteria</th>
<th>Roundabout (Option 1)</th>
<th>Seagull (Option 2)</th>
<th>Left in left out (Option 3)</th>
<th>Channelised right turn (Option 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road safety</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Traffic efficiency</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Environment</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Property</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Constructability</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Cost</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Options 2 and 4 were ranked lowest against road safety objectives, as right turning vehicles would be required to look for gaps across two high speed traffic lanes to enter and exit Glenella Road. Although Option 3 was the lowest cost option, it did not cater for all movements and was not considered to provide sufficient network benefits.
2.5 Preferred option

The options assessment identified Option 1 – Roundabout as the preferred connection to the Princes Highway, as defined in the options assessment outcome shown in Table 2-1. Option 1 would facilitate a reduced speed limit on the highway and provide a physical structure to slow traffic, while having a low number of vehicle conflict points. This option was chosen due to the potential reduction in severity and amount of crashes on the Princes Highway in comparison to the other options assessed. A roundabout would enable all traffic movements to and from the proposal, while maintaining efficient north and southbound travel on the Princes Highway.

Option 1 allows safe entry and egress from Glenella Road and was considered the preferred option as it meets the proposal objectives, provides the best value for money and was considered to have the lowest environmental and property impacts due to its construction footprint. It also ranked highest in constructability, requiring smaller retaining structures than the other options and less disruption to highway traffic.

Option 1 was also considered to best meet the main objective of the proposal: to provide a safe and efficient connection between the Princes Highway and the South Batemans Bay Link Road.

2.6 Design refinements

Since the options assessment process, design refinements to the proposal include:

- The right turn out of Glenella Road northbound would enter a continuous northbound lane, with traffic from the northbound bypass lane merging into this lane about 250 metres north of the roundabout. This distance is measured from the centre of the roundabout to the start of the merge, the merge itself is suitable for 4 seconds of travel time with grade correction for 80km/
- An embankment is proposed instead of a high retaining wall on approach to the roundabout intersection. The use of the embankment provides a more balanced cut to fill ratio, reduces disposal costs and improves construction efficiency and drainage design for the proposal, without increasing environmental impacts
- A widened centre median on the Princes Highway to the north of the roundabout, resulting in works being required on the western side of the Princes Highway and allowing future work to tie into a 1.6 metre central median.
3. Description of the proposal

This section describes the proposal and provides descriptions of existing conditions, the design parameters including major design features, the construction method and associated infrastructure and activities.

3.1 The proposal

The proposal would include the construction of a new roundabout on the Princes Highway south of Batemans Bay and an upgrade of Glenella Road as a two-lane road (one lane in each direction) between the roundabout and Heron Road, as shown in Figure 1-2.

Key features of the proposal include:

- A new roundabout on the Princes Highway, including:
  - two southbound lanes through the roundabout
  - a single northbound right turn lane through the roundabout to Glenella Road
  - a northbound bypass lane on the highway
  - a single lane entry and exit to and from Glenella Road.

- Upgrade of Glenella Road as a two-lane road (one lane in each direction) between the new roundabout on the Princes Highway and Heron Road

- A new T-intersection at the junction of the existing The Ridge Road and Glenella Road

- Utility protection or relocation including for telecommunication, electrical and water infrastructure

- Earthworks including cuttings, embankments and retaining walls

- Intersection lighting, signage and supporting infrastructure

- Establishment and use of temporary ancillary facilities during construction, including site offices, plant laydown areas, access tracks, stockpile sites, water quality controls and vehicle turning bays

- Drainage and stormwater management infrastructure along the road corridor

- Site rehabilitation and landscaping work.

3.2 Design

3.2.1 Design criteria

The proposal has been designed to satisfy relevant standards and guidelines, including:

- Guide to Road Design (Austroads 2015) including Roads and Maritime Services (Roads and Maritime) Supplements

- Beyond the Pavement - Roads and Maritime Services urban design policy, procedure and design principles (Roads and Maritime 2014)

- Road Safety Audit Manual and Checklist (RTA 2005b)

- Roads and Maritime Services Delineation Manual (Roads and Maritime 2012b)

- Austroads Guide and Commentary Series (Austroads 2009)

- Austroads Design Vehicles and Turning Path Templates (Austroads 2006)

- Roads and Maritime Services NSW Speed Zone Guidelines (RTA, 2011b)

Specific design criteria for elements of the proposal are presented in Table 3-1.

### Table 3-1: Design criteria

<table>
<thead>
<tr>
<th>Design element</th>
<th>Design criteria – Glenella Road (Princes Highway to Glenella Road)</th>
<th>Design criteria – Princes Highway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carriageway</td>
<td>Single carriageway, one lane in either direction</td>
<td>Roundabout at the intersection of the new Glenella Road. The Princes Highway is currently 2 lanes southbound and one lane northbound through this section.</td>
</tr>
<tr>
<td>Existing posted speed limit</td>
<td>80 km/h (noting the existing geometric criteria would not meet a design speed of 90km/h)</td>
<td>90 km/h (noting the existing geometric criteria would not meet a design speed of 100km/h)</td>
</tr>
<tr>
<td>Proposed design speed limit</td>
<td>60 km/h</td>
<td>70 km/h</td>
</tr>
<tr>
<td>Proposed posted speed limit</td>
<td>60 km/h</td>
<td>70 km/h</td>
</tr>
<tr>
<td>Turning movement: Design vehicle</td>
<td>19 metre Semi-Trailer</td>
<td>26 metre B-Double</td>
</tr>
<tr>
<td>Minimum stopping sight distance</td>
<td>64 metres (with additional grade corrections)</td>
<td>83 metres (with additional grade corrections)</td>
</tr>
<tr>
<td>Horizontal alignment: Minimum horizontal radius</td>
<td>91 (desirable minimum with emax 7%)</td>
<td>148 (desirable minimum with emax 7%)</td>
</tr>
<tr>
<td>Maximum vertical grade</td>
<td>7-9% (rolling terrain)</td>
<td>5-7% (rolling terrain)</td>
</tr>
<tr>
<td>Traffic lane width mainline</td>
<td>3.2 metre traffic lane and additional width for curve widening. Below 60.R turning templates would be used. 90-100.R 0.8-0.7 metre curve widening. 120.R 0.6 metre curve widening and 140.R-160.R 0.5-0.4 metre curve widening.</td>
<td>3.5 metre traffic lanes additional width for curve widening. 200.R-250.R 0.4-0.5 metre curve widening.</td>
</tr>
<tr>
<td>Outside shoulder widths</td>
<td>2.0 metres</td>
<td>2.5 metres in northbound direction</td>
</tr>
<tr>
<td>Inside shoulder widths</td>
<td>n/a</td>
<td>2 metres in southbound direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6 metre central median north of the roundabout</td>
</tr>
<tr>
<td>Batter</td>
<td>Fill – generally 2:1, Large embankment 2:1 with 1.5 metre wide benching, Retaining</td>
<td>Fill – 2:1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cut – 1.5:1</td>
</tr>
</tbody>
</table>
### Design element | Design criteria – Glenella Road (Princes Highway to Glenella Road) | Design criteria – Princes Highway
---|---|---
Verge width | Wall 2:1 with 3.0 metre bench and gabion basket retaining wall. Cut – 0.5:1 slope with maximum height 7.0 metre. 4.0 metre benching required at 7.0 metre height. | 
Shared use paths | Fill – 1.0 metre with embankment Cut – 0.5 metre adjacent to SO gutter Retaining wall – 1.5 metres. | Fill – 1.5 metre with embankment slope Cut – 0.5 metre adjacent to SO gutter

#### 3.2.2 Engineering constraints

The major engineering constraints considered in the design of the proposal include:

- **Underground utility infrastructure** – There is an underground fibre optic cable as part of the National Broadband Network (NBN) managed by Optus located immediately below the surface of the electrical easement, which crosses Glenella Road. The location of the NBN pits may require lowering and/or mechanical protection of the NBN cable across Glenella Road depending on the final vertical alignment.

- **Overhead power lines** – The 11 kV overhead power lines crossing Glenella Road may be encroached during the widening of cut batters and fill embankments. The height of the overhead clearance would need to be assessed prior to commencement of works in accordance with the SafeWork NSW Work Near Overhead Power Lines to ensure there is a safe distance. The alignment of Glenella Road in this location would need to be considered to avoid impacts on and potential relocation of power lines. The overhead power lines crossing Lattas Point Road would need to be considered to avoid interaction between mobile plant and equipment using the ancillary site as a turning bay facility.

- **Erosion and sedimentation control** – The steeply sloping topography of the construction boundary may limit the ability to safely access the site to install construction erosion and sedimentation controls, including construction of sediment basins and to control stormwater runoff at the work site.

- **Heron Road landfill** – The former Heron Road landfill site on the existing Glenella Road potentially contains landfill materials. Disturbance may occur during construction of the tie-in to the existing upgraded section of Glenella Road or through use of the area as an ancillary site. Eurobodalla Shire Council has advised Transport for NSW that the landfill was remediated during the previous Glenella Road works undertaken by Council. Investigations at the former landfill site identified the site as having low potential for contamination risk for the proposal.

#### 3.2.3 Major design features

**Roundabout intersection**

The proposal provides a new roundabout intersection between the Princes Highway and Glenella Road, located about 150 metres from the existing unsealed intersection. The new intersection would be a roundabout and includes the following features:
Two southbound lanes through the roundabout
A single northbound right turn lane through the roundabout to Glenella Road
A northbound bypass lane on the highway
A single lane entry and exit to and from Glenella Road.

The batters around the intersection would be designed and constructed to increase sight distances on approach to the intersection. Vehicles travelling north on the Princes Highway in the bypass lane would merge to the right from about 250 metres north of the roundabout. The existing southbound merge on the Princes Highway located about 350 metres south of the roundabout would remain. Lighting at the roundabout intersection would be installed to increase visibility for road users. The detailed design stage of the proposal would determine the amount of lighting required at the roundabout intersection.

Glenella Road

Due to the topographic constraints along Glenella Road, Transport for NSW concluded that utilising the existing alignment of Glenella Road to connect to Heron Road and the Princes Highway would provide value for money, safer construction and lower environmental impacts. This section of road would also include:

- A two-lane road cross section (one lane in each direction), about one kilometre in length, between the new roundabout and Heron Road
- 2 metre shoulders along the new road narrowing to 1 metre shoulders at the connection with the existing Glenella Road to the east
- A new T-intersection with Glenella Road and The Ridge Road.

Additional activities would be required to tie in the proposal to Glenella Road that would include pavement work to create consistent levels between the existing Glenella Road and The Ridge Road alignment. Street lighting would be installed along Glenella Road on approach to the Princes Highway to provide greater visibility for road users during night time driving. Lighting may also be required at the intersection of Glenella Road and The Ridge Road. The amount of lighting required along Glenella Road would be determined during the detailed design phase.

3.2.4 Drainage

The need for and options for use of bio-filtration swales would be investigated during detailed design to provide improvements to drainage once construction of the proposal is completed. The bio-filtration swales would normally use grass and other dense vegetation to filter sediment and other materials out of water running through the proposal. The bio-filtration swales would provide capacity for improved spill containment during operation.

3.3 Construction activities

The proposed construction boundary is shown in Figure 1-2 and defines the proposal area. All proposed works, construction activities and potential impacts detailed in the following sections would be undertaken within the construction boundary.

3.3.1 Work methodology

Construction activities would be carried out in accordance with a Construction Environmental Management Plan (CEMP) to ensure work complies with Transport for NSW’s commitments and legislative requirements.
Detailed work methodologies would be identified by the construction contractor. The proposal would be anticipated to involve work methodologies and sequencing, including:

- Site establishment and early works
- Utility adjustment works
- Vegetation clearing and grubbing
- Earthworks
- Retaining wall and batter stabilisation
- Drainage
- Road pavement and intersection construction
- Landscaping
- Removal of ancillary facilities and site rehabilitation.

**Site establishment and early works**

- Site survey, geotechnical and other investigations
- Installation of fencing and sediment and erosion controls
- Removal and clean-up of remnant building and any hazardous material where required
- Minor earthworks to establish temporary construction access tracks, level areas for ancillary sites and water quality control basins where required
- Minor vegetation clearing and grubbing works
- Establishment of site compound and ancillary facilities
- Establishment of site access points along the proposal alignment.

**Utility adjustment works**

Utility adjustment works for the proposal would likely comprise the following:

- Relocation of above ground infrastructure where required
- Testing and cutover of overhead electricity utilities into new infrastructure
- Excavation of trenches and construction of pits and conduits for underground utilities
- Installation of mechanical / physical protection of underground NBN and fibre optic network lines
- Installation of bedding material and relocation of utilities within the new trenches and conduits
- Decommissioning and removal of redundant utilities where required.

**Vegetation clearing and grubbing**

Vegetation clearing and grubbing for the proposal would likely comprise the following:

- Establishment of clearing limits
- Pre-clearing ecological survey to identify habitat trees that require staged clearing and vegetation that is to be retained during the construction of the proposal
- Felling of trees as required
- Mulching of felled logs
- Due to the topography of the proposal area, personnel equipped with chainsaws may be used to provide more control for the felling of trees and vegetation
- Mulched material would be reused onsite where possible for erosion and sediment control, and landscaping.
Earthworks

Areas required to be cut along Glenella Road would most likely require ripping with a D7 to D9 dozer, with the potential for some rock cutting and/or hammering at the base of the proposed cuts where rock is likely to be of higher strength. Excavation and hauling of cut materials are typically undertaken using:

- Excavator and articulated dump trucks
- Excavator and body trucks (with or without dog trailers)
- Excavator and rigid off highway dump trucks.

Earthworks activities would include:

- Stripping, stockpiling and management of topsoil and unsuitable material
- Excavation and fill for road formation, including for fill embankments and retaining walls
- On-site reuse of excavated material where possible, construction of sight mounds along the proposal where suitable and disposal of unsuitable and excess material to a licenced waste disposal facility.

The proposed earthworks are detailed in Section 0.

Retaining walls and batter stabilisation

The following options would be investigated during the detailed design of the proposal:

- Reinforce soil wall (RSW)
- Gravity based retaining wall (GBRW).

Whilst not in the current design, if a RSW is proposed it would be designed in accordance with the Roads and Maritime QA Specification R57 Design of Retaining Walls and constructed in accordance with Roads and Maritime Specification R59 Construction of Reinforced Soil Walls. The RSW system generally consists of:

- Soil reinforcement – Components which are embedded in the reinforced fill material and act through interface friction, bearing or other means to provide the stability and structural integrity of the RSW
- Facing element – Elements retaining the reinforced fill material, with provision for connection to the soil reinforcement
- Reinforced fill material – Granular soil, decomposed rock or crushed rock fill material in the RSW in which the soil reinforcement is embedded.

Should a GBRW be proposed, such as gabion wall systems, it shall be designed and constructed in accordance with the Roads and Maritime QA Specification R55 Rock Filled Gabion and Mattresses. Typically, a gabion retaining wall structure consists of:

- Gabion baskets – a galvanised steel mesh basket, which act as both the gravity component, providing resistance against movement and sliding, and the facing element of the wall
- Gabion rock fill – Granular rock backfill which is placed within the gabion baskets.

Due to favourable conditions encountered on site (competent rock materials, moderate strength and weathering, and observed fracture spacing and orientation), likely batter stabilisation in the form of drape mesh may be all that is required. Confirmation of the type and frequency of additional measures such as spot bolting of specific blocks or the application of shotcrete to weathered or fractured zones is to be determined during the detailed design. Additional stabilisation measures in the form of revegetation would be undertaken in accordance with Road and Maritime Guideline for Batter Surface Stabilisation using vegetation.
**Drainage**

Drainage lines, pits and subsoil drains would be connected to existing drainage lines along the Princes Highway and Glenella Road, and natural watercourses along the route. Existing or new cross drainage culverts would be extended or constructed along Glenella Road. The use of temporary sediment basins to be installed during the construction of the proposal would be considered and assessed during the detailed design stage.

**Road pavement and intersection construction**

A preliminary pavement design for Glenella Road and roundabout intersection has been prepared by Transport for NSW, which allows for a flexible pavement comprising unbound gravel pavement layers. The pavement works would be constructed with plant and equipment such as graders and smooth drum rollers, refer to Section 3.3.4 for proposed plant equipment. If the subgrade comprises weathered or fresh rock material, a drainage layer would be constructed on the floor during construction. Where possible, site-won materials would be used from excavated cuts, otherwise pavement materials would be imported from established off site quarry sources for the proposal. Imported pavement materials would be transported and delivered to the site using truck and dog combinations. The use of semi-tippers has been considered for use, however the lack of turning areas within the construction boundary may require the semi tippers to exit via Glenella Road.

Glenella Road would be closed to the public between the Princes Highway and Heron Road during construction of the proposal. The use of a primer seal with a short curing duration would be preferred as the sealing and bonding agent for the road pavement to reduce the close down period. The final sprayed bituminous seal would then be applied once the primer seal has cured. Stockpile and laydown areas would require the use of seal aggregates, overnight parking of the spray seal equipment and heating of the bitumen.

**Landscaping, removal of ancillary facilities and site rehabilitation**

Landscaping across the proposal would involve the rehabilitation of disturbed areas in accordance with the Revegetation Plan (refer to Section 6.9).

Upon completion of works, site ancillary facilities would be removed and all areas disturbed by the construction of the proposal would be rehabilitated in accordance with the Revegetation Plan.

**3.3.2 Construction hours and duration**

It is anticipated that the construction works would be complete in 2023.

Construction hours for the proposal would be in accordance with the Interim Construction Noise Guideline (DECC 2009b) (ICNG) which defines the standard construction working hours as follows:

- Monday to Friday: 7 am to 6 pm
- Saturday: 8 am to 1 pm
- Sundays and public holidays: no work.

It is anticipated that some works may need to be carried out outside of standard construction hours, such as where works would interrupt the operation of the Princes Highway, utility adjustments or other work required to be completed out of hours. Any out of hours work would be undertaken in accordance with the Construction Noise and Vibration Guidelines (Roads and Maritime, 2016).
### 3.3.3 Plant and equipment

An indicative list of plant and equipment that would typically be required for the proposal is provided in Table 3-2. Additional equipment that is likely to be used would be identified during construction planning by the construction contractor.

#### Table 3-2: Strategic alignment of the proposal

<table>
<thead>
<tr>
<th>Construction Phase</th>
<th>Plant and Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility relocation works</td>
<td>Excavator&lt;br&gt;Bobcat&lt;br&gt;Road sweeper&lt;br&gt;Vacuum truck&lt;br&gt;Haulage trucks&lt;br&gt;Small tools and equipment&lt;br&gt;Concrete plant and equipment&lt;br&gt;Light vehicles&lt;br&gt;Mobile cranes&lt;br&gt;Elevated work platform</td>
</tr>
<tr>
<td>Clearing and grubbing</td>
<td>Excavator&lt;br&gt;Bulldozer&lt;br&gt;Mulching equipment&lt;br&gt;Chainsaws&lt;br&gt;Haulage trucks&lt;br&gt;Log trucks</td>
</tr>
<tr>
<td>Earthworks and drainage</td>
<td>Excavator&lt;br&gt;Articulated dump trucks&lt;br&gt;Bulldozer&lt;br&gt;Grader&lt;br&gt;Pad foot and smooth drum rollers&lt;br&gt;Backhoe&lt;br&gt;Compactors</td>
</tr>
<tr>
<td>Retaining wall and batter stabilisation</td>
<td>Concrete trucks and pumps&lt;br&gt;Excavator&lt;br&gt;Mobile crane / Franna&lt;br&gt;Small equipment&lt;br&gt;Shotcrete equipment&lt;br&gt;Excavator with drill attachment</td>
</tr>
<tr>
<td>Road pavement and intersection construction</td>
<td>Grader&lt;br&gt;Pad foot and smooth drum rollers&lt;br&gt;Milling machine&lt;br&gt;Asphalt paver&lt;br&gt;Light vehicle&lt;br&gt;Line marking equipment&lt;br&gt;Bitumen sprayer&lt;br&gt;Aggregate spreading truck&lt;br&gt;Water truck</td>
</tr>
</tbody>
</table>
3.3.4 Earthworks

The proposal would result in about 40,000 cubic metres of cut material throughout the construction boundary as shown in Table 3-3. The suitability of cut material for reuse within the proposal would be determined during the construction of the proposal. Any material unsuitable for reuse within the proposal would be classified in accordance with the NSW EPA Waste Classification Guidelines (EPA 2014) and disposed of at an approved materials recycling or waste disposal facility.

The proposal may result in about 5,000 to 10,000 cubic metres of surplus fill material that may require offsite disposal to a licenced waste facility or other approved use of disposal. The final earthwork requirements and source of materials would be confirmed during the detailed design.

Table 3-3: Earthworks balance

<table>
<thead>
<tr>
<th>Design element</th>
<th>Approximate volume (cubic metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material from excavations (cut)</td>
<td>40,000</td>
</tr>
<tr>
<td>Material required for road alignment and roundabout (fill)</td>
<td>30,000</td>
</tr>
<tr>
<td>Total surplus of cut to fill material</td>
<td>5,000 to 10,000</td>
</tr>
</tbody>
</table>

3.3.5 Source and quantity of materials

Materials to be used to construct the proposal would be sourced from appropriately licensed commercial suppliers in nearby areas and would include the following amounts:

- Asphalt – ~3,000 tonnes
- Concrete – ~650 tonnes
- Bitumen (including adhesion agent) – ~55,000 litres.

None of the materials proposed to be used are considered to be in short supply.

Surplus materials that cannot be used on-site or on adjacent projects would be classified in accordance with the NSW EPA Waste Classification Guidelines (EPA 2014) and disposed of at an approved materials recycling or waste disposal facility.

The amount of water that would be required during construction is unknown at this stage. The amount would depend on material sources and methodologies applied by the contractor. Water would be obtained from the town water supply. Where possible, alternative options for sourcing water would be explored.

3.3.6 Traffic management and access

Construction traffic and site access for construction vehicles

Construction of the proposal would generate light and heavy vehicle movements on the road network. Vehicle movements associated with the proposal would include:

- Delivery of construction materials
- Spoil removal
- Importation of fill material for retaining wall and pavement construction
- Delivery and removal of construction equipment and machinery
- Workers travelling to, from and within the construction boundary.
Construction vehicles would access the site via the Princes Highway, through the Old Sawmill site ancillary facility or Glenella Road. Employee vehicles would park at the proposed site ancillary facilities.

**Access**

The proposal would not restrict access to private property within proximity to the construction boundary. Emergency services would be allowed access within the construction boundary during construction and the Construction Traffic Management Plan (TMP) would consider this as described below.

**Road closures**

The works for the proposal would be undertaken primarily away from the Princes Highway with no long-term closures of the highway. Short-term closures would be scheduled to minimise disruptions to traffic as much as practicable. A single lane would remain open throughout the construction of the proposal to allow for the flow of traffic.

Traffic controls would be implemented on the Princes Highway when works on the roundabout are required.

The section of Glenella Road between the Princes Highway and Heron Road is proposed to be closed for the duration of construction of the proposal. Fencing and signage would be installed to prevent and redirect road users from accessing this road.

A road occupancy licence (ROL) would be obtained prior to road or lane closures.

**Construction traffic management plan**

A TMP would be prepared for the proposal in accordance with the Traffic Control at Work Sites Manual Version 5 and Transport for NSW Specification G10 – Control of Traffic. The plan would provide details of the traffic management and vehicle movements to be implemented during construction for road and construction traffic on the Princes Highway and Glenella Road.

Transport for NSW would consult with emergency services in relation to the closure of Glenella Road and any major disruptions to the Princes Highway during the construction of the proposal.

### 3.4 Ancillary facilities

A range of ancillary facilities would be required to support the construction of the proposal, including:

- Site compound that incorporates site offices, car parking, sheds, workshops and storage
- Plant laydown areas
- Vehicle turning bays
- Area for delivery of imported material including engineered fill, concrete, asphalt and sealing aggregates
- Stockpile areas for topsoil, earthworks, pavement materials, spoil and mulched vegetation.

Three sites have been identified for use as primary ancillary sites for the proposal as shown in Figure 1-2. The ancillary sites include:

- Old Sawmill site
- Glenella Road
- Lattas Point Road.

These sites are further described in Table 3-4. These are located principally in areas that maximise the use of available land or existing infrastructure, and minimise the amount of site preparation required for use. Initial works at these sites may be required at the start of construction, including vegetation clearing,
installation of environmental controls, construction of hardstand areas and stabilised access and provision of additional or augmented utilities and services.

Table 3-4: Primary ancillary sites

<table>
<thead>
<tr>
<th>Ancillary site context</th>
<th>Potential use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Old Sawmill site</strong></td>
<td>The site could accommodate:</td>
</tr>
<tr>
<td>The site is located about 500 metres north of the existing intersection with Glenella Road. The site is tiered over two levels, the top level and part of the lower level are enclosed by a security fence which would need to be repaired prior to using the site. An area on the top level consists of a large slightly uneven gravelled hardstand area adjacent to the main gate along with several existing concrete slabs where the former sawmill processing buildings were located. The lower level is accessed by ramps from the top level. Remains of a former fibro administration building which was burnt down during the 2019/2020 bushfires is present near the entrance of the site. Clean-up of remnant building material would be required. The ancillary site is predominately cleared of vegetation and can be connected to the construction area via existing access tracks. The site is owned by Forestry Corporation of NSW. Transport for NSW would be required to obtain a Forest Permit from the Forestry Corporation of NSW as the ancillary site is outside of the road envelope. A Deed of Agreement for Early Access (DAEA) would be prepared by Forestry Corporation of NSW prior to any works commencing. The site would require some clearing and levelling works to the hardstand areas, and improvements to the entry from the highway. A Detailed Site Investigation (DSI) for the site was undertaken and is summarised in Section 6.4.</td>
<td>• Site compound that incorporates site offices, sheds, workshops and storage • Plant laydown area • Area for delivery of imported materials • Stockpile areas for topsoil, earthworks material, and mulch.</td>
</tr>
<tr>
<td><strong>2. Glenella Road</strong></td>
<td>The site could accommodate:</td>
</tr>
<tr>
<td>The completed Glenella Road corridor is closed to traffic between Heron Road and The Ridge Road. The former landfill site (Heron Road Landfill) was remediated by Council but could potentially contain asbestos materials and would require a risk assessment together with preliminary works to determine if the site is safe for use by workers. The site has direct access to Glenella Road and could have potential use of the verge area to the north of the alignment for additional storage without any clearing of vegetation. Where possible, ground disturbance would be minimised to reduce risk of exposure to potential contamination. The site is further described in Section 6.4.</td>
<td>• Site compound that incorporates site offices, sheds, workshops and storage • Vehicle turning bays • Plant laydown area • Stockpile material for material, spoil and mulch.</td>
</tr>
</tbody>
</table>
Ancillary site context

### 3. Lattas Point Road

The site is located on Lattas Point Road (previously known as Mills Fishing Road), located on the western side of the Princes Highway about 500 metres south of the existing Glenella Road intersection. There is an existing right turn slip lane for entry of southbound traffic from Princes Highway with a large gravelled area just after the intersection of the highway that could be suitable for vehicles to use as a turning bay. Overhead power lines cross the site and may limit other uses for the site. It is located closest to the southern end of proposal.

The site is owned by Forestry Corporation of NSW. Transport for NSW would be required to obtain a Forest Permit from the Forestry Corporation of NSW as the ancillary site is outside of the road envelope. A Deed of Agreement for Early Access (DAEA) would be prepared by Forestry Corporation of NSW prior to any works commencing.

<table>
<thead>
<tr>
<th>Potential use</th>
</tr>
</thead>
<tbody>
<tr>
<td>The site could accommodate:</td>
</tr>
<tr>
<td>• Vehicle turning bays</td>
</tr>
<tr>
<td>• Plant laydown area.</td>
</tr>
</tbody>
</table>

### 3.5 Public utility adjustment

A utility conflict assessment was prepared for the proposal to identify existing utilities within the construction boundary. Existing utilities within the construction boundary are described in Table 3-5. The primary utility conflict occurs at the electrical easement between the proposed alignment and both the Optus underground fibre optic cable and the Essential Energy high voltage overhead power lines. At this location, the main Sydney to Melbourne Optus fibre optic cable currently crosses Glenella Road at a relatively shallow depth. Essential Energy high voltage overhead power lines are present in the same location, with about 8.7 metres clearance above the existing Glenella Road. Clearance requirements would need to be maintained during both construction and operation of the proposal. Other utility conflicts include:

- A second Essential Energy high voltage overhead power line within the electrical easement and a third at Lattas Point Road
- NBN at the western end of Glenella Road
- Council asbestos cement water mains near the Old Sawmill site
- Telstra assets crossing the highway near the Old Sawmill site and at Lattas Point Road.

The level of adjustment of the utilities mentioned above would be determined in the detailed design stage of the proposal.
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity - Essential Energy</td>
<td>Twin overhead transmission lines and poles</td>
<td>Two sets of Essential Energy 11kV overhead power lines cross the proposal east of the Princes Highway, within a cleared easement. There is about 8.7 metres clearance above the existing levels of Glenella Road. A stayed power pole is located about 12 metres from the existing road at this location. Overhead power lines cross the Princes Highway south of Glenella Road and extend onto Lattas Point Road. Several power poles are located at this site.</td>
</tr>
<tr>
<td>Telecommunications - Optus</td>
<td>Underground cables</td>
<td>The main trunk underground Optus fibre optic cable linking Sydney and Melbourne crosses Glenella Road at the electrical easement. The cable is about 0.84 metres below existing ground level in some sections.</td>
</tr>
<tr>
<td>Telecommunications - NBN</td>
<td>Underground cables</td>
<td>NBN underground cable and pits at the western end of Glenella Road and at The Ridge Road south of Glenella Road. The depth of the cable below existing ground level is between 1.2 meters to 2.8 meters below the existing ground surface.</td>
</tr>
</tbody>
</table>
| Telecommunications - Telstra  | Underground cables                        | Telstra underground conduits cross the Princes Highway just north of the Old Sawmill site and also south of Glenella Road and extend onto Lattas Point Road. Potholing was used to locate underground cabling due to copper wiring being present, this allowed for the following cables to be located:  
  - Near the Old Sawmill site, the cable is about 0.405 and 0.800 metres below the existing Princes Highway level  
  - Near Lattas Point Road, the cable is between about 0.605 and 0.770 metres below the existing Princes Highway level. |
| Water - Eurobodalla Shire Council | Three underground asbestos cement watermains (one main is redundant) | Three Eurobodalla Shire Council asbestos cement watermains cross the Princes Highway just south of the Old Sawmill site.  
The depth of the watermains below the existing Princes Highway level is between about 0.543 and 0.595 metres. The water mains are exposed in some locations east of the highway.          |
3.6 Property acquisition

The proposal is located in part within Mogo State Forest, including the Old Sawmill site which would be used as the primary ancillary site. A Deed of Agreement for Early Access (DAEA) would be prepared by Forestry Corporation of NSW to legally permit Transport for NSW to enter and undertake construction works in land zoned as State Forest. Some of the land affected by the proposal may require revocation and acquisition of the State Forest status in accordance with the provisions of the Forestry Act 2012. The DAEA would be accompanied by memorandum of understanding (MOU) to confirm the acquisition process and revocation process. Section 4.2.2 provides more information about the Forestry Act.
4. Statutory and planning framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

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

_Statement Environmental Planning Policy (Infrastructure) 2007_ (ISEPP) aims to facilitate the effective delivery of infrastructure across the State. Clause 94 of the ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

The proposal is appropriately characterised as development for the purposes of a road or road infrastructure facilities, and is to be carried out by or on behalf of Transport for NSW. The proposal can therefore be assessed under Division 5.1 of the EP&A Act 1979. Development consent from council is not required.

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

Part 2 of the ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation required by ISEPP is discussed in Section 5.4 of this REF.

**State Environmental Planning Policy (Coastal Management) 2018**


CM SEPP promotes an integrated and coordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the _Coastal Management Act 2016_. The construction boundary does not include any land identified under this SEPP. The nearest land identified as coastal environment area under the CM SEPP is located about 110 metres to the north west of the construction boundary. Downstream indirect effects on these areas are considered in Section 6.3. Due to the occurrence of coastal wetlands and coastal environment areas in adjoining areas, the drainage design would consider indirect impacts to coastal wetlands during detailed design development.

**State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017**

_The State Environmental Planning Policy (Vegetation in Non-Rural Areas) (VSEPP)_ complements the _Biodiversity Conservation Act 2016_ and the _Local Land Services Amendment Act 2016_ to create a framework for the regulation of clearing of native vegetation in NSW.

Part of the construction boundary along the Princes Highway is identified by the VSEPP as land to which it applies. In accordance with Clauses 8 and 25 of the VSEPP, vegetation clearing for the proposal within areas mapped under the VSEPP would be permitted provided it is assessed and determined under Division 5.1 of the EP&A Act.
State Environmental Planning Policy (Koala Habitat Protection) 2019

The State Environmental Planning Policy No. 44 Koala Habitat Protection (SEPP 44) was the current legislation at the time the biodiversity surveys took place (October to December 2019) but was repealed from 1 March 2020 and replaced by the State Environmental Planning Policy (Koala Habitat Protection) 2019.

This SEPP identifies land that is potential koala habitat and land that is core koala habitat. It provides guidelines and matters for consideration as to whether development consent can be granted in relation to core koala habitat. While neither SEPP apply to the proposal as no development consent is required under ISEPP and there are therefore no specific obligations, koala habitat has been assessed in accordance with SEPP 44 as it was the current legislation at the time the assessment was carried out.

The extent of koala habitat, as defined under the Koala Habitat Protection SEPP, was also considered as part of the Biodiversity Assessment summarised in Section 6.1. Based on the survey results and absence of records, koala populations are not likely to be resident or dependent on the area within the construction boundary for breeding or foraging resources. The construction boundary does not comprise core koala habitat.

4.1.2 Local Environmental Plans

Eurobodalla Local Environment Plan 2012

The construction boundary is located within the Eurobodalla LGA and therefore the Eurobodalla Local Environmental Plan 2012 (Eurobodalla LEP) applies. As shown in Figure 4-1, the construction boundary is zoned RU3 Forestry and SP2 Infrastructure along the Princes Highway corridor.

The SP2 – Infrastructure zone includes the following objectives pursuant to the LEP:

• To provide for infrastructure and relatable uses
• To prevent development that is not compatible with or that may detract from the provision of infrastructure.

The RU3 – Forestry zone includes the following objectives pursuant to the LEP:

• Enable development for forestry purposes
• To enable other development that is compatible with forestry land uses.

The proposal is consistent with the zone and corridor objectives as it is targeted towards providing infrastructure whilst enabling forestry land uses.

The proposal would not hinder the achievement of the above objectives in the context of the LEP.

The proposal is permitted without development consent under ISEPP. Therefore, the consent requirements of the Eurobodalla LEP do not apply.
Zoning Eurobodalla LEP, 2012 (DPE, Oct 2019)

- E2 - Environmental Conservation
- IN1 - General Industrial
- R2 - Low Density Residential
- R5 - Large Lot Residential
- RE1 - Public Recreation
- RE2 - Private Recreation
- RU1 - Primary Production
- RU3 - Forestry
- SP2 - Infrastructure

Legend
- Construction Boundary
- Watercourse (LPI)
- Access track centreline
- Cadastre / road corridor (TfNSW)
- Proposed road design
- Ancillary site

FIGURE 4-1
SOUTH BATEMANS BAY LINK ROAD PROJECT
4.2 Other relevant NSW legislation

4.2.1 Roads Act 1993

The Roads Act 1993 (Roads Act) provides for the classification of roads and the declaration of Transport for NSW and other public authorities as roads authorities for both classified and unclassified roads. It also regulates the carrying out of various activities in, on and over public roads.

The Roads Act also provides for the entry into land for inspection and investigation purposes. The proposed works would be undertaken on a number of public roads in the local area, namely:

- Princes Highway
- Glenella Road
- The Ridge Road
- Lattas Point Road.

Under Section 71 and Section 73 of the Roads Act, Transport for NSW may construct the proposal. However, before construction, a notice must be placed in the local newspaper allowing for any submissions to be made by any person in accordance with the following sections of the Act:

- Section 22 – Preparation of road widening plan
- Section 29 – Fixing the levels of public road
- Section 35 – Closing a non-council public road.

The construction of the proposed roundabout is likely to impact on Princes Highway traffic during the construction period. Transport for NSW would obtain an ROL from the Traffic Management Centre to work on the public roads listed above.

4.2.2 Forestry Act 2012

The Forestry Act 2012 (Forestry Act) provides for (amongst other things) the dedication and revocation of State forests in NSW and the regulation of forestry and non-forestry activities within dedicated State forests, timber reserves and flora reserves. The Forestry Act also establishes the Forestry Corporation of NSW, which is responsible for the management of forestry activities within State Forests.

Activities carried out within State Forests are generally managed in accordance with the Forestry Corporation of NSW’s system, which classifies State Forest land as one of eight categories referred to as Forest Management Zones (FMZ). These management zones differentiate between those areas of State Forests which are set aside for conservation and those areas that are available for other activities including timber harvesting.

The construction boundary is located within Mogo State Forest and includes areas mapped as Special Management (Zone 2), Special Prescription (Zone 3), General Management (Zone 4) and non-forestry use. Road construction is allowed within these zones. A Forestry Permit would be required prior to construction to account for the use of Mogo State Forest areas. This would include the Old Sawmill site, the Lattas Point Road site, access tracks and any other areas outside of the road corridor required for construction within the State Forest.

Some of the land affected by the proposal may require revocation and acquisition of the State Forest status in accordance with the provisions of the Forestry Act 2012. A Deed of Agreement for Early Access (DAEA) prepared prior to construction would be accompanied by a memorandum of understanding (MOU) for
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acquiring State Forest land that may be required for the road corridor on completion of the proposal. This process may also involve a resolution or Act of Parliament.

4.2.3 Crown Lands Management Act 2016

The *Crowns Land Management Act 2016* (Crown Lands Management Act) repealed the Crown Lands Act 1989 on 1 July 2018. The Crown Land Management Act provides the legislative framework for the administration of land that is vested in the Crown in NSW. Ministerial approval is required to grant a ‘lease, licence, permit, easement or right of way over a Crown Reserve’.

Crown land is located immediately north of the construction boundary, however, no Crown land is expected to be affected by the proposal. If Crown land is identified as being affected by the proposal, the relevant requirements of the Crown Lands Management Act and Commonwealth *Native Title Act 1993* would need to be implemented.

4.2.4 Marine Estate Management Act 2014

The *Marine Estate Management Act 2014* provides the rules for the management of the marine estate of New South Wales as well as the declaration and management of marine parks and aquatic reserves.

The Clyde River, near the construction boundary, is part of the Batemans Marine Park, which extends from Murramarang Beach near Bawley Point in the north to the entrance to Wallaga Lake at Murunna Point in the south.

Section 56(3) of the *Marine Estate Management Act 2014* requires that a determining authority must not carry out or approve an activity in the locality of a marine park without considering the criteria set out in that section.

The Batemans Marine Park is about 500 metres from the north-west section of the construction boundary at its closest point, separated by the Cranbrook Road industrial area. As such, it is considered that the proposal is not in the locality of the Batemans Marine Park and therefore Section 56(3) of the *Marine Estate Management Act 2014* would not apply to the proposal.

4.2.5 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) regulates land, air, noise and water pollution in NSW. It also aims to provide opportunity for increased public involvement and access to information regarding environmental protection.

The POEO Act focuses on environmental protection and provisions for the reduction of water, noise and air pollution and the storage, treatment and disposal of waste. No Protection of the Environment Policies (PEPs) are relevant to the proposal. Transport for NSW staff and/or contractors working on behalf of Transport for NSW are required to notify the EPA when a ‘pollution incident’ occurs that is likely to impact upon the environment as per section 148 of the Act. An incident management plan would be included within the Construction Environmental Management Plan (CEMP).

Under Schedule 1 of the POEO Act, an Environment Protection Licence (EPL) is required for scheduled activities, where they include:

- Extraction or processing of more than 50,000 tonnes of material are expected over the life of the project
- The construction of roads with four or more lanes over a continuous length of 5 kilometres within a main road.
The proposal would not result in the construction of four or more lanes over a length of 5 kilometres or more. However, based on the total cut (extraction) requirements for the proposal (40,000 cubic metres/80,000 tonnes) an EPL would be required for the construction works associated with the proposal.

Section 143 of the POEO Act makes it an offence to transport waste to a place that cannot lawfully be used as a waste facility for that waste. Where relevant, waste material required to be disposed off-site would be recorded through a section 143 (S.143; 3A) notice.

4.2.6 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (BC Act) commenced on 25 August 2017, repealing the Threatened Species Conservation Act 1995. The BC Act seeks to conserve biological diversity and promote Ecologically Sustainable Development (ESD) to prevent extinction and promote recovery of threatened species, populations and ecological communities, and to protect areas of outstanding biodiversity value. The BC Act provides a listing of threatened species, populations and ecological communities, areas of outstanding biodiversity value and key threatening processes. A biodiversity impact assessment (Appendix C) was undertaken for the proposal and is discussed in Section 6.1.

The proposal would not have a significant impact on threatened species, populations or ecological communities or their habitats.

4.2.7 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) provides the basis for legal protection and management of National Parks estate and Aboriginal sites and objects in NSW. The Clyde River National Park is about 3.5 kilometres north-west of the construction boundary. There are no National Parks within or near the construction boundary.

Section 86 lists offences relating to harming or desecrating Aboriginal objects. Under Section 90(1) of the Act, where harm to an Aboriginal object or Aboriginal place cannot be avoided, an Aboriginal Heritage Impact Permit (AHIP) is required. The proposal would impact on two Aboriginal heritage artefact scatters (one complete and one partial impact) found during field investigations within the construction boundary. An AHIP would be required prior to commencing construction.

Potential impacts on Aboriginal heritage are discussed in Section 6.7 of this REF.

4.2.8 Heritage Act 1977

The Heritage Act 1977 (Heritage Act) is concerned with all aspects of heritage conservation ranging from the most basic protection against indiscriminate damage and demolition of buildings and sites, through to restoration and enhancement.

Approval under Section 57(1) is required for works to a place, building, work, relic, moveable object, precinct, or land listed on the State Heritage Register. An excavation permit is required under Section 139 to disturb or excavate any land containing or likely to contain a relic.

Section 170 of the Heritage Act requires that culturally significant items or places managed or owned by Government agencies are listed on the departmental Heritage and Conservation Register (Section 170 Register).

There are no listed heritage items within or near the proposal area. Further information on non-Aboriginal heritage is provided in Section 6.8 of this REF.
4.2.9 Biosecurity Act 2015

The Biosecurity Act 2015 (Biosecurity Act) repealed the Noxious Weeds Act 1993. The Biosecurity Act specifies the duties of public and private landholders as to the control of priority weeds. Under the Act, priority weeds have been identified for LGAs and assigned duties of control. Under Part 3 of the Biosecurity Act any person who deals with biosecurity matters (i.e. listed weed species) and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by biosecurity matters has the duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated and minimised.

Three Weeds of National Significance (WONS) and one weed with a control duty under the Biosecurity Act have been recorded within the construction boundary. Weeds and relevant mitigation measures are further considered in Section 6.1.

4.2.10 Fisheries Management Act 1994

The Fisheries Management Act 1994 (FM Act) provides for the protection of fishery resources and values for current and future generations. The FM Act makes it an offence to harm fisheries and resources without an appropriate assessment, inclusion of safeguards and/or the appropriate permissions to carry out certain work. The proposal would not result in any impacts on critical flora and fauna habitats or aquatic threatened species, removing the need to prepare an SIS as per section 221 of the Act. Impacts on aquatic habitats are discussed in Section 6.1 of this REF and in the Biodiversity Assessment (Appendix C). The proposal would not block fish passage or result in any impacts to protected marine vegetation.

No approvals are required under the FM Act for the proposed works. Mitigation measures to prevent any indirect impact on the wider catchment values associated with nearby creek lines and waterbodies are discussed in Sections 6.1, 6.2 and 6.3.

4.2.11 Contaminated Land Management Act 1997

The Contaminated Land Management Act 1997 (CLM Act) establishes a process for investigating, managing and remediating contaminated land. Where contamination is known to be present but does not pose an unacceptable risk to the current or approved land use, management of the contamination and identification of remediation requirements may be dealt with by the local council under the planning and development framework of the EP&A Act.

There are no registered contaminated sites within the construction boundary. However, the construction boundary area has been assessed as having a low to moderate risk of contamination. Unregistered contaminated land risk is discussed in Section 6.4 which adheres to the requirements set out in this Act.

4.2.12 Water Management Act 2000

The Water Sharing Plan for the Clyde River Unregulated and Alluvial Water Sources 2016 applies to the construction boundary. Where a relevant water sharing plan is in place, a person carrying out aquifer interference activities would require an aquifer interference licence under the Water Management Act 2000 (WM Act). However, in accordance with Schedule 4 of the Water Management Regulation 2018, excavation required for the construction of a building, road or infrastructure for an authorised project is exempt of requiring an aquifer interference licence (within a maximum of 3 megalitres of groundwater).

Under Schedule 4 of the Water Management Regulation 2018, a roads authority also does not need to obtain an access licence when water is required for road construction and road maintenance.
Controlled activities under the WM Act apply to ‘waterfront land’ defined as all land within 40 metres of the highest bank of any river, lake or estuary. This would include work near Hanging Rock Creek located 150 metres from the construction boundary. However, under Schedule 4 of the Water Management (General) Regulation 2018 public authorities do not need to obtain a controlled activity approval under the WM Act as long as the activity does not cause any change in the course of the river and the activity has been assessed under the EP&A Act and found not to be likely to significantly affect the environment.

The proposal would not result in changes to the course of Hanging Rock Creek and has been assessed as not having a significant impact on the environment (refer to Section 6.1).

4.2.13 Rural Fires Act 1997

The Rural Fires Act 1997 (Rural Fires Act) provides for the prevention, mitigation and suppression of bush and other fires in LGA’s (or parts of areas) and other parts of the State constituted as rural fire districts. Under the Act, Forestry Corporation of NSW is responsible for controlling fires in the Mogo State Forest and ensuring they do not cause damage to other land or property. Forestry Corporation of NSW is recognised as one of four Fire Authorities under the Rural Fires Act, is a member of the NSW Bush Fire Coordinating Committee, and is subject to the coordinated fire management provisions of the Rural Fires Act. Fire management in the State Forest is guided by the Forestry Corporation of NSW Fire Management Policy, the objectives of the Fire Management Policy include:

- Collaboration with NSW fire authorities to develop bushfire risk management and operations plans, and implement programs for bushfire prevention, mitigation, preparedness, response and recovery
- Work cooperatively with other NSW fire authorities to respond to bushfires to minimise the adverse impacts on human life, and on social, economic and environmental values
- Promote ecosystem health, diversity and resilience in native forests, and as a risk reduction strategy
- Maintain appropriate levels of fire management capability to effectively discharge responsibilities as a sustainable forest manager and statutory fire authority.

The proposal is consistent with the objectives of Forestry Corporation of NSW Fire Management Policy as the proposal would allow for improved access and connectivity within the Mogo State Forest and the greater area of Batemans Bay to prepare, mitigate and suppress bush and other fires in the Eurobodalla Shire LGA.

Under Clause 63 of the Rural Fires Act, all public authorities are required to implement procedures to prevent the occurrence of bush fires on land under their management or control and to minimise the danger of the spread of a bush fire.

The CEMP would include risk mitigation measures to reduce the risk of bush fires. These would include smoking only being allowed within designed areas and waste (including vegetation) not being burned on site.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) a referral is required to the Australian Government Department of the Agriculture, Water and the Environment for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. Appendix A addresses the factors to be considered and provides an overview of the proposal’s impacts.
A referral is not required for proposed road activities that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

The proposal is unlikely to result in significant impacts on matters of national environmental significance and the environment of Commonwealth land.

Potential impacts on biodiversity matters are discussed in Section 6.1 of this REF and Appendix C.

### 4.3.2 Commonwealth Native Title Act 1993

The Commonwealth *Native Title Act 1993* aims to:

- Recognise and protects native title
- Establish ways and standards in which future dealings affecting native title may proceed, including providing procedural rights for registered native title claimants and native title holders in relation to acts which affect native title
- Establish the National Native Title Tribunal.

A Native Title claim has been registered to the NSW south coast. Native Title claim NC2017/003, lodged by the South Coast People, was registered with the National Native Title Tribunal on 31 January 2018. The claim extends along the NSW South Coast from southern Sydney to Eden and is applicable to Crown land within this area.

While Crown land is located immediately north of the construction boundary, no Crown land is expected to be impacted by the proposal. As such, the Native Title claim is not expected to have an effect on the proposal.

### 4.4 Confirmation of statutory position

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

Transport for NSW is the determining authority for the proposal. This REF fulfils Transport for NSW’s obligation under Section 5.5 of the EP&A Act, including examining and taking into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.
5. Consultation

5.1 Consultation strategy

During the preparation of the proposal, consultation with the community and government agencies has been undertaken in accordance with the Roads and Maritime Community Involvement Practice Notes and Resources Manual: A resource manual for staff (RTA, 2010). A Community and Stakeholder Engagement Plan (CSEP) has been prepared for the development stage of the proposal.

The CSEP outlines the key stakeholders and describes the communication and consultation approach and activities that would be used to keep key stakeholders and the community informed during the planning and construction of the proposal.

The primary objectives of the CSEP include:

- To identify the key stakeholders and methods for communicating and engaging with them
- To keep the local community and other key stakeholders regularly informed of project progress
- To provide clear information about what Transport for NSW are seeking feedback on, when and why
- To ensure community and stakeholder feedback is continuously fed into communication and engagement
- To be transparent in all that Transport for NSW undertakes for the proposal
- To encourage participation from communities and other stakeholders
- To listen to feedback, investigate suggestions and report back
- To ensure that project information is distributed in an effective and timely manner
- To work effectively and cooperatively with Council.

5.2 Community involvement

The preferred option report was publicly displayed from 25 October to 22 November 2019 seeking feedback from the community.

Consultation activities undertaken by Transport for NSW during the display included:

- Media release
  - A Media release advising the release of the Preferred Option Report was issued by The Hon Andrew Constance MP on 25 October 2019. The media release was featured in the Bay Post, The Beagle Weekly and on the Transport for NSW website.
- Community update
  - An A4 four page newsletter style community update was published on 25 October 2019 via the project website. The community update contained information about project background and key benefits, the preferred option and how it was identified, and how to provide feedback. Five hundred copies of the community update were printed and distributed to stakeholders at information sessions and placed at static displays locations.
  - An A5 postcard was printed and distributed to 7,600 businesses and residents located in the Batemans Bay, Batehaven, Sunshine Bay, Lilly Pilli, Malua Bay areas. The postcard provided a summary of the preferred option and invited recipients to view the report online and submit feedback.
- Static displays
o Static displays were set-up at Batemans Bay Library, Service NSW Batemans Bay, Eurobodalla Shire Council and the Moruya Library. The static displays provided community members with the opportunity to view the full report on request.

- **Project webpage**
  o The project webpage was updated to include the Preferred Option Report, Community Updates and details of the community drop-in sessions and feedback options. The project webpage is regularly reviewed and updated as new information or latest news becomes available.

- **Community information sessions**
  o Transport for NSW held drop-in sessions at the Village Centre (shopping centre at Batemans Bay) on the 7 November 2019 and at the annual Hand Made Market held at Batemans Bay Soldiers Club on the 9 November 2020. A stand was also set-up outside the Batehaven Newsagency;
    - On Thursday 7 November 100 people visited the drop-in at the Village Centre
    - On Saturday 9 November 150 people visited the Batemans Bay Soldiers Club drop-in and 30 people visited the drop-in at Batehaven Newsagency
    - An advertised session at the Batemans Bay Sunday Markets was cancelled due to poor weather.
  o A total of 280 people attended the drop-in sessions where they were given an opportunity to meet the project team, provide feedback and ask questions regarding the proposal.

- **Advertising**
  o Adverts were placed in the Bay Post on 30 October, 1, 6 and 8 November 2019.

- **Social media**
  o Paid advertisements on Facebook were used to inform the target audience that the preferred option report had been released.

The feedback received during the consultation has assisted the project team to refine the proposal. A community consultation and engagement summary has been prepared and is on the project webpage. This summary provides an overview of the community and stakeholder engagement carried out as well as information about the consultation activities and feedback received.

Table 5-1 outlines the key issues raised by the community during the consultation period.

Table 5-1: Summary of issues raised by the community

<table>
<thead>
<tr>
<th>Group</th>
<th>Issue raised</th>
<th>Response / where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents</td>
<td>The arrows on the proposed roundabout were confusing and appeared to be pointing north</td>
<td>Signage and line marking would be addressed and defined in the detailed design stage of the proposal.</td>
</tr>
<tr>
<td>Residents</td>
<td>The two northbound lanes on the Princes Highway should continue into Batemans Bay</td>
<td>Works north of the Old Sawmill are outside of the scope of the proposal. It is noted that the proposal would result in a reduction in traffic volumes on the Princes Highway to the north of Glenella Road, which may mitigate congestion being experienced in this location. Section 6.5 of the REF identifies potential impacts to traffic and transport during construction and operation.</td>
</tr>
<tr>
<td>Group</td>
<td>Issue raised</td>
<td>Response / where addressed in REF</td>
</tr>
<tr>
<td>--------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Residents</td>
<td>Concerns about sight lines at the intersection of Glenella Road and Princes Highway</td>
<td>The proposed design for the roundabout is located about 150 metres north of the existing Glenella Road intersection with the highway, which improves sight lines and is designed to meet sight line design criteria. Section 3.2 details the design specifications of the proposal.</td>
</tr>
<tr>
<td>Residents</td>
<td>The northbound merge lane along the Princes Highway may not be sufficient to meet future traffic demands</td>
<td>The proposal would not result in increased northbound traffic volumes along the Princes Highway. The operation of the proposal is not expected to have substantial adverse impacts on traffic flow through the Princes Highway. Section 6.5 of this REF details the impacts to traffic along the proposal.</td>
</tr>
<tr>
<td>Residents</td>
<td>Increased traffic on the Princes Highway and Glenella Road once the Batemans Bay Bridge replacement is completed</td>
<td>The traffic modelling undertaken for the proposal as detailed in Section 6.5 of the REF includes consideration of the opening of Batemans Bay Bridge. The increase in peak traffic is not considered to be significant and is not anticipated to have a significant impact on the operation of the Princes Highway. Section 6.5 of the REF identifies potential impacts to traffic and transport during construction and operation.</td>
</tr>
<tr>
<td>Residents</td>
<td>Effect on local wildlife</td>
<td>The proposal would require clearing of native vegetation; however, these impacts are not considered to have a significant impact on fauna species within the construction boundary. Section 6.1 describes the impacts to biodiversity for the proposal.</td>
</tr>
<tr>
<td>Residents</td>
<td>Proposed timing and need to fast track the proposal.</td>
<td>The proposal is planned for completion in 2023. Section 3 describes the proposal in further detail.</td>
</tr>
<tr>
<td>Residents</td>
<td>Need for safe passage of pedestrians along the Princes Highway and Glenella Road</td>
<td>The proposal would be designed with a two-metre shoulder width to allow for the safe passage of cyclists and pedestrians. Section 3 describes the proposal in further detail.</td>
</tr>
<tr>
<td>Local Business</td>
<td>Lack of concern to businesses/customers due to potential reduction in trade in the Batemans Bay CBD.</td>
<td>The proposal would result in no direct impacts to businesses in the Batemans Bay CBD. During construction of the proposal there would be increased spending by the construction workforce. During operations, businesses would benefit somewhat from reduced travel delays to their deliveries, and in the ability of clients to keep on-time appointments.</td>
</tr>
</tbody>
</table>

South Batemans Bay Link Road
Review of environmental factors
<table>
<thead>
<tr>
<th>Group</th>
<th>Issue raised</th>
<th>Response / where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Business</td>
<td>Impact to traffic in Batemans Bay with regard to affecting businesses and trade</td>
<td>Section 6.11 identifies any potential impacts to local businesses. The proposal would improve connectivity and accessibility between the Batemans Bay CBD and coastal settlements. This would reduce traffic volumes along Beach Road, particularly during holiday peaks and other congested periods. This would benefit residents, businesses, tourists and pedestrians improving their ability to access employment, education, social services (including health care) and recreation/entertainment venues. Section 6.11 describes the socio-economic impacts on businesses and trade.</td>
</tr>
<tr>
<td>Local Business</td>
<td>Traffic congestion (mostly in peak holiday periods)</td>
<td>Overall, the proposal improves east-west connectivity for coastal communities south of Batemans Bay and provides more capacity for the Batemans Bay local road network. During holiday periods, it would provide an attractive alternative route to avoid localised congestion in the CBD where through traffic, public transport, and visitor, employee and commercial activities compete for road space. Section 6.5 of the REF identifies potential impacts to traffic and transport during construction and operation.</td>
</tr>
</tbody>
</table>

5.3 Aboriginal community involvement

An Aboriginal heritage assessment was undertaken for the proposal in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigations (PACHCI) (Roads and Maritime, 2011). In accordance with the PACHCI, Transport for NSW have consulted with the Batemans Bay Local Aboriginal Land Council (BBLALC), the Mogo Local Aboriginal Land Council (MLALC), Registered Aboriginal Parties (RAPs) and the registered Native Title Claimant for the area, the South Coast People.

An archaeological survey of the Aboriginal heritage study area was carried out with representatives from BBLALC, MLALC and the South Coast People on 29 July 2019, who later provided a cultural heritage survey report.

Stage 3 of PACHCI was undertaken in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010a). An advertisement providing notification of the assessment and the opportunity to register interest for ongoing consultation was placed in the Koori Mail and Bay Post on 6th November 2019. A total of nine parties registered interest in the overall proposal or were identified following the notification period, who were then invited to provide feedback on the test excavation methodology. No issues with the methodology for the subsurface testing were identified by any stakeholders. The Biodiversity and Conservation Division of the Department of Planning, Industry and Environment (DPIE) was provided with a copy of the methodology for review.

An Aboriginal focus group (AFG) meeting was planned for the 7 December 2019, however was cancelled on 5 December due to the bushfire conditions and closure of the Princes Highway. An Aboriginal Community Engagement Day (ACED) was held on 14 March 2020 in Batemans Bay. This event provided
an opportunity to provide feedback on the draft Cultural Heritage Assessment Report as well as find out more about the proposal and employment opportunities. Following the ACED, two additional parties registered interest in the proposal and for future updates.

Table 5-2 provides a summary of the four PACHCI stages. Table 5-3 provides a summary of the issues raised through consultation with the Aboriginal community and where these issues are addressed in the REF.

Table 5-2: Summary of Transport for NSW Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Initial Transport for NSW assessment</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Site survey and further assessment</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Formal consultation and preparation of a cultural heritage assessment report</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Implement environmental impact assessment recommendations</td>
</tr>
</tbody>
</table>

Table 5-3: Issues raised through Aboriginal community consultation

<table>
<thead>
<tr>
<th>Group</th>
<th>Issue</th>
<th>Response / where addressed in REF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batemans Bay LALC</td>
<td>Aboriginal people would have used this area for sighting of fish in the river, hunting and gathering of fish. Area was used for walkabout tracks by family members and Elders of the BBLALC</td>
<td>The area would be made available to aboriginal communities to access for public leisure upon completion of construction of the proposal. The assessment outlined in Section 6.7 has captured this comment.</td>
</tr>
<tr>
<td>Batemans Bay LALC</td>
<td>Disturbance of the heritage study area from past developments negatively affecting Aboriginal heritage (e.g. utilities, roads, bike trails)</td>
<td>Transport for NSW recognises that the development and delivery of its projects has the potential to impact Aboriginal cultural heritage. By following the PACHCI procedure, Transport for NSW ensures potential impacts are adequately assessed and legislative requirements met. Consultation with the Aboriginal community carried out as part of this process aims to ensure the role, function and views of Aboriginal people are considered and respected. The construction of the proposal would impact two artefact scatters identified during field investigations. Design refinements to the proposal and the construction boundary during detailed design and construction planning phases would seek to reduce disturbance of Aborigional artefacts wherever possible. Section 6.7 outlines the steps taken to ensure impacts on Aboriginal heritage are adequately assessed and minimised.</td>
</tr>
<tr>
<td>Group</td>
<td>Issue</td>
<td>Response / where addressed in REF</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>ACED</td>
<td>Consultation methodology with the Aboriginal community could be improved through more individualised communications (beyond emails and letters) for future engagement.</td>
<td>Noted. This would be considered when preparing the Aboriginal Heritage Management Plan. A safeguard has been included in Section 6.7 to reflect this recommendation.</td>
</tr>
<tr>
<td>ACED</td>
<td>Artefact scatters recovered during test excavations should be returned to country and re-buried in a location that is not likely to be disturbed in the near future but is also close to where they were found.</td>
<td>Artefacts recovered will be re-buried at a suitable location in consultation with the Aboriginal community. A safeguard has been included in Section 6.7 to reflect this recommendation.</td>
</tr>
</tbody>
</table>

Further detail on Aboriginal cultural heritage consultation is included in Appendix J.

### 5.4 ISEPP consultation

Clause 13 to 16 of the ISEPP specify the requirements for consultation with councils and other public authorities for infrastructure development carried out on behalf of a public authority. A review of the proposal against each of these clauses was undertaken (Appendix B) to confirm the need for any ISEPP consultation. The review found the following consultation was required:

- Eurobodalla Shire Council due to:
  - The installation of a temporary structure on, or the enclosing of, a public place that is under a council’s management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential (Clause 13(1)e))
  - The involvement of excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the Roads Act 1993 (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath (Clause 13(1)f)).

An ISEPP consultation letter was issued to Eurobodalla Shire Council on 27 November 2019. A response was received from Eurobodalla Shire Council on the 13 December 2019, confirming support for the proposal. No issues were raised in the response. However, issues raised by Eurobodalla Shire Council more broadly across the design development are summarised in Table 5-4.

### 5.5 Government agency and stakeholder involvement

During the development of the concept design and REF, Transport for NSW consulted with the following key stakeholders:

- Eurobodalla Shire Council
- Forestry Corporation of NSW
- Essential Energy
- Optus
- Department of Planning, Industry and Environment (DPIE)
- Water NSW
• Environment Protection Authority
• Department of Primary Industries (Fisheries)
• Batemans Bay Chamber of Commerce
• NSW Ambulance (Southern NSW Zone)
• State Emergency Services (SES).

Tables 5-4, 5-5 and 5-6 outline the issues raised by Eurobodalla Shire Council, State Government stakeholders, essential service providers and business group stakeholders and how Transport for NSW would address them.

Table 5-4: Issues raised by Eurobodalla Shire Council

<table>
<thead>
<tr>
<th>Group</th>
<th>Issue raised</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eurobodalla Shire Council</td>
<td>Prefer that all turn movements are allowed for the intersection with the Princes Highway, including considerations for 26 metre B-Double trucks.</td>
<td>The proposed roundabout would allow for all movements at the intersection of the Princes Highway and Glenella Road. The proposed design for the Princes Highway allows for 26 metre B-double vehicles in the north-south direction. Glenella Road has been designed for 19 metre semi-trailers. Refer to Section 3.2.</td>
</tr>
<tr>
<td></td>
<td>Transport for NSW will need to consider how the South Batemans Bay Link Road project budget will allow for safety treatments on the Princes Highway</td>
<td>The proposal would improve the safety of the road network. The posted speed limit on Princes Highway is intended to be reduced from 90 km/h to 70 km/h as vehicles approach the new roundabout. This would improve road safety and reduce the severity of injuries from crashes when compared to the existing situation. Other safety features have been incorporated into the concept design where possible and would continue to be refined through the detailed design process. Refer to Section 3.2.</td>
</tr>
<tr>
<td></td>
<td>The council has a priority to encourage active transport around the foreshore and public transport usage. Pedestrian movement is a key issue on Beach Road</td>
<td>By providing an alternative route the proposal would improve connectivity and accessibility between the Batemans Bay CBD and coastal settlements. This offers the opportunity for a reduction in traffic volumes along Beach Road, particularly during holiday peaks and other congested periods, and the potential for increased priority for pedestrian and public transport. Refer to Section 6.5.</td>
</tr>
</tbody>
</table>
### Review of environmental factors

**South Batemans Bay Link Road**

**Revision of environmental factors South Batemans Bay Link Road**

<table>
<thead>
<tr>
<th>Group</th>
<th>Issue raised</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Need for increased capacity on the Princes Highway and duplication between Glenella Road and Cullendulla Drive</td>
<td>The proposal includes two south bound lanes through the roundabout and a northbound bypass lane. However, further upgrades north to the Old Sawmill are outside of the scope of the proposal.</td>
</tr>
<tr>
<td></td>
<td>Ongoing consultation during Detail Design to determine lighting needs across the proposal.</td>
<td>Transport for NSW would continue to consult with the Eurobodalla Shire Council through detailed design development and construction.</td>
</tr>
</tbody>
</table>

Table 5-5: Issues raised by State Government stakeholders

<table>
<thead>
<tr>
<th>Group</th>
<th>Issue raised</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry Corporation of NSW</td>
<td>The Round Hill Lookout may offer opportunity for tourism in the future. Access should be maintained and tourism potential considered in chosen design.</td>
<td>Access for Forestry Corporation of NSW to the Round Hill Lookout would be maintained throughout the proposed construction work. The proposed design would have no impact on potential recreational uses of the surrounding environment, including the Round Hill Lookout.</td>
</tr>
<tr>
<td></td>
<td>Noted historic dumping issues near the intersection of Glenella Road and Heron Road and along Glenella Road</td>
<td>An Asbestos Management Plan would be prepared prior to construction to identify management measures required for the proposal. Refer to Section 6.4.</td>
</tr>
<tr>
<td></td>
<td>Existing access between Princes Highway and Glenella Road is sub-standard due to poor sight lines, creating a safety risk</td>
<td>The proposed roundabout is located about 150m north of the existing Glenella Road intersection with the highway, which improves sight lines and meets design criteria. Mandatory sight distance criteria required for a roundabout include adequate approach sight distance to the holding line/s, which has been achieved. Adequate sight distance within the roundabout is also achieved. Refer to Section 3.2.3.</td>
</tr>
<tr>
<td></td>
<td>Glenella Road is not used as part of normal operations and would not be impacted if closed during construction.</td>
<td>Noted.</td>
</tr>
</tbody>
</table>

South Batemans Bay Link Road
Review of environmental factors

63
<table>
<thead>
<tr>
<th>Group</th>
<th>Issue raised</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Need for continued communication.</td>
<td>Transport for NSW would continue to consult with the Forestry Corporation of NSW through detailed design development and construction.</td>
</tr>
<tr>
<td>WaterNSW</td>
<td>Requests that Transport for NSW continues to consult with WaterNSW for any development that may impact on its assets, infrastructure or land.</td>
<td>WaterNSW would be consulted if any potential impacts on their assets, infrastructure or land are identified. No impacts have currently been identified in association with the proposal.</td>
</tr>
<tr>
<td>Biodiversity and Conservation, Department of Planning, Industry and Environment</td>
<td>The REF should clearly identify any direct and indirect impacts to water quality that may result from the project. The REF should establish how any impacts to water quality will be avoided or mitigated through design and project controls to protect and maintain the biophysical, hydrological and ecological integrity and cultural and social values of sensitive receiving waterways.</td>
<td>The REF includes assessments of the potential impacts of the proposed works on water quality, drainage, aquatic and terrestrial receiving environments and species, and cultural values. No significant impacts on any of these values and receiving environments have been identified. Refer to Sections 6.1, 6.2, 6.3, 6.7 and 6.8.</td>
</tr>
<tr>
<td></td>
<td>The REF must assess the ecological impacts associated with the proposed works in accordance with the BC Act. The project’s impacts need to be addressed in accordance with the ‘avoid, minimise and offset’ hierarchy. The site has been burnt in the January 2020 bushfires, DPIE have resources available online to assist in the assessment of these areas. If Aboriginal objects are likely to be harmed by the project, an Aboriginal Heritage Impact Permit (AHIP) will be required from the Department of Planning Industry and Environment (The Department) under the National Parks and Wildlife Act 1974.</td>
<td>The biodiversity impact assessment has been carried out in accordance with the BC Act and the EPBC Act. The safeguards included in this REF are based on the ‘avoid, minimise and offset’ hierarchy. Online material for post-fire assessment resources have been used as reference throughout the development of the biodiversity impact assessment process. Refer Sections 6.1. Two artefact scatters identified during field investigations would be impacted by the proposal. An AHIP would be sought prior to commencing construction works. Refer Section 6.7.</td>
</tr>
<tr>
<td>Department of Primary Industries (Fisheries)</td>
<td>Request to be consulted if there are changes to the proposal that encroach into Hanging Rock Creek, in order to allow plant access, that are identified as the project evolves</td>
<td>Hanging Rock Creek does not have any permanent water or defined channel within or adjacent to the construction boundaries.</td>
</tr>
<tr>
<td>Group</td>
<td>Issue raised</td>
<td>Response</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Environment Protection Authority</td>
<td>Any impacts on riparian areas should be remediated through replanting.</td>
<td>DPI Fisheries would be consulted if impacts on the Hanging Rock Creek wetland are identified in the future. Refer to Section 6.1.</td>
</tr>
<tr>
<td>Transport for NSW</td>
<td>Transport for NSW should complete an assessment of impacts on Hanging Rock Creek and the Batemans Marine Park that considers the NSW Water Quality Objectives and the ANZECC Guidelines. It should also include an assessment of the significance of these potential impacts, including consideration of the relevant ambient water quality outcomes. If the impacts are shown to be unacceptable, additional mitigation measures that prevent or minimise impacts on the receiving water quality should be considered. A high level of erosion and sedimentation control should be demonstrated.</td>
<td>The proposal would be designed to avoid impact to prominent trees and vegetation communities where possible. A revegetation plan would be prepared during detailed design to detail the revegetation and landscape work needed to maintain the integrity of the existing environment and visual character of areas impacted by the proposal. Refer to Section 6.9.</td>
</tr>
<tr>
<td>EPA</td>
<td>EPA recommends removing asbestos contaminated material and disposing at a lawful waste facility. Otherwise, encapsulation of the contaminated material within the site can be undertaken in consultation with the landowner/land manager and adjacent landowner. Transport for NSW should engage a suitably qualified, competent person, to provide advice on an appropriate encapsulation method, and where required, the person must be licenced.</td>
<td>An Asbestos Management Plan would be prepared prior to construction to identify management measures required for the proposal. The Asbestos Management Plan would be developed by a qualified, competent person in accordance with SafeWork NSW Code of Practice and in consultation with Eurobodalla Shire Council and Forestry Corporation of NSW. If asbestos material needs to be removed from site, notifications to SafeWork NSW</td>
</tr>
</tbody>
</table>
The operational management plan should ensure that intrusive maintenance workers and any person working near the encapsulation area in the future are protected. would be carried out by the appropriate licensed asbestos removal contractor. At the completion of asbestos removal, clearance certificates would be issued by the contractor confirming the effectiveness of the asbestos removal works. Refer to Section 6.4.

If a land use change is proposed, the plan would need to be put on the Section 10.7 Planning Certificate issued by Council. The certificate should also provide information on how the land may be used and restrictions on its development. Noted.

<table>
<thead>
<tr>
<th>Group</th>
<th>Issue raised</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Energy</td>
<td>Need to maintain overhead clearance requirement and distance from the electrical poles.</td>
<td>Noted. Testing and cutover of overhead electricity utilities into new infrastructure would be carried out prior to construction. Refer to Section 3.2.2 and 3.3.</td>
</tr>
<tr>
<td></td>
<td>Electrical poles have been re-established following recent bushfires, and upgraded to assist in meeting clearance requirements to the proposed road location.</td>
<td>Noted.</td>
</tr>
<tr>
<td>Optus</td>
<td>The road would cross over the underground Sydney to Melbourne Optus cable, located within the Essential Energy easement. Minimum clearance would be required between the road surface and underground cable.</td>
<td>The proposed works are not expected to impact on the underground Sydney to Melbourne Optus cable. However, if required, mechanical protection would be installed to protect the underground NBN fibre optic network lines prior to commencement of the main construction works. The need for any adjustment and/or protection of underground utilities would be determined during the detailed design stage of the proposal. Refer to Section 3.3</td>
</tr>
<tr>
<td>Group</td>
<td>Issue raised</td>
<td>Response</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Batemans Bay Chamber of Commerce</td>
<td>Concern on lack of continuous dual carriageway between the new bridge and the proposed Glenella Road roundabout.</td>
<td>The proposal includes two south bound lanes through the roundabout and a northbound bypass lane. However, works north to the Old Sawmill are outside of the scope of the proposal.</td>
</tr>
<tr>
<td></td>
<td>Concern that the roundabout would create additional congestion on the Princes Highway. The corridor regularly experiences a high volume of traffic during holiday periods with queuing extending past this location.</td>
<td>An assessment of the impacts of the proposal on traffic along the Princes Highway and local road network was prepared for this REF. The assessment concluded that the proposal would have low impacts on traffic volumes along the Princes Highway during construction. Although the Level of Service (LoS) would change to LoS C when works on the Princes Highway require a speed reduction, these impacts would be temporary and be avoided during holiday periods whenever possible. During operations, the proposal would help reduce traffic volumes along the Princes Highway to the north of the roundabout. Further, impacts to northbound traffic on the Princes Highway would be minimised by the available bypass lane. Refer to Section 6.5.</td>
</tr>
<tr>
<td>Prior Bus Service</td>
<td>Sight lines and visibility issues exist on the Princes Highway (‘Mad Mile’) at this location, particularly with motorists travelling at 90 to 100 km/h.</td>
<td>The proposed roundabout has been designed to meet the sight line design criteria. The posted speed limit on Princes Highway is intended to be reduced from 90 km/h to 70 km/h, which is more appropriate for the Princes Highway in this location. This would improve road safety and reduce the severity of crashes when compared to the existing situation. Refer to Section 3.2.</td>
</tr>
<tr>
<td></td>
<td>Motorists cannot pull over on the Princes Highway during periods of queuing, which has been an issue when emergency services wish to pass through.</td>
<td>The proposal would include an outside shoulder width of 2.5m on the Princes Highway in the northbound direction and a 2m shoulder in the southbound direction.</td>
</tr>
</tbody>
</table>
5.6 Ongoing or future consultation

5.6.1 Consultation during the public display of the REF

This REF will be placed on public exhibition for stakeholder and community comment. A range of communication engagement tools will be used in accordance with the CSEP which includes, but is not limited to:

- Stakeholder, Council and government agency briefings
- A range of communication written and digital materials to inform the community about the proposal
- Website update including methods for easily providing feedback
- Static display locations and community information sessions (where appropriate).

Submissions received during the public display would be collated and a submissions report prepared to address any issues raised by stakeholders. All submissions would be formerly considered and acknowledged and responses would be provided in the submissions report, which would be available on Transport for NSW website. Transport for NSW would inform the community if any major design changes are required.

5.6.2 Consultation during construction

Following the REF display period, Transport for NSW would continue to identify and manage issues and concerns addressed by the community during further development and construction of the proposal. The aim of ongoing communication and consultation is to provide the community with:

- Accurate and accessible information regarding activities associated with the proposal
- Information about the proposal, including construction impacts, in a timely manner
- Appropriate ways to provide comments or concerns
- A high level of responsiveness for issues and comments throughout the development and construction of the proposal.

Following determination of the REF, Transport for NSW would continue to provide updates on the progress of the proposal. To effectively manage consultation during the construction stage of the proposal a Community and Stakeholder Engagement Plan would be developed and implemented by the construction contractor.
6. Environmental assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted upon by the proposal are considered. This includes consideration of:

- Potential impacts on matters of national environmental significance under the EPBC Act
- The factors specified in the guidelines Is an EIS required? (DUAP 1995/1996) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000 and the Roads and Related Facilities EIS Guideline (DUAP 1996). The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix A.

Site-specific safeguards and management measures are provided to mitigate the identified potential impacts. Each aspect is assessed based on a study area suitable to fully understand potential impacts associated with the proposal. Each study area is defined within the relevant methodology of the environmental aspect as required.

The construction boundary area was affected by the Clyde Mountain fire that was linked to the Currowan and Badja Forest Road fire complexes which together impacted over 950,000 hectares of land during the bushfire season experienced in late 2019 and early 2020. Overall, over 5 million hectares of land were impacted across New South Wales (Department of Planning, Industry and Environment, 2020). The fire resulted in the temporary loss of dense bushland within the construction boundary as well as loss of a number of residences and industrial complexes in the surrounding area. While bushland vegetation is expected to regenerate over the following years, the timing of this regeneration will depend on a number of factors. Influencing factors would include the interaction of a range of environmental characteristics such as past and future fire intensity and extent of canopy loss, presence of unburnt vegetation, existing seedbank, seasonal rainfall and favourable climate.

This REF considers the impacts of the Clyde Mountain bushfire in relation to the proposed construction timing and has assessed the potential environmental impacts of the proposed works in the context of the long-term regeneration to pre-bushfire conditions. Impacts to the proposal with regards to the bushfire events are further explained in Sections 6.1, 6.9 and 6.10.

6.1 Biodiversity

A biodiversity assessment report has been prepared for the proposal. The assessment is provided in Appendix C and summarised in the following sections.

6.1.1 Methodology

The biodiversity study area is shown in Figure 6-1. The biodiversity assessment process consisted of the following steps:

- Background research:
  - Relevant database and spatial searches within 10 square kilometres of the proposal (November 2019) to identify records of threatened flora and fauna species, population and ecological communities listed under BC Act, EPBC Act and FM Act as well as areas of ecological significance, aquatic and terrestrial habitat features and vegetation communities
  - Aerial imagery analysis to identify spatial patterns in vegetation, land use and landscape features
  - Literature review of relevant existing studies, management plans and mapping resources.
• Habitat assessment:
  o Analysis of results from background research to determine available habitat for each threatened species, or ecological community within the biodiversity study area shown in Figure 6-1
  o Assessment of likelihood of occurrence of each threatened species, populations and ecological communities based on the presence, condition and type of habitat in the biodiversity study area, and previous records in the locality. The habitat profile for the species and any other relevant habitat information were also considered
  o Habitat assessment update to include findings from vegetation surveys and habitat components confirmation.
• Field surveys to validate the results of the background research and habitat assessment:
  o Vegetation surveys: Preliminary vegetation community mapping was conducted on 26 August 2019 to 30 August 2019, with detailed mapping completed between 22 to 24 October 2019 and 18 to 20 November 2019. Plant Community Type (PCT) allocation and vegetation integrity surveys in accordance with the Biodiversity Assessment Method (OEH, 2017) were also completed
  o Targeted flora surveys: Threatened flora surveys were conducted on 24 October 2019, between 18 and 20 November 2019, and 16 and 17 December 2019. A systematic transect approach was applied for the survey consistent with the NSW Guideline for Surveying Threatened Plants (OEH, 2016) and the Draft Survey Guidelines for Australia's Threatened Orchids (DOE, 2013)
  o Targeted fauna surveys: The survey effort included targeted diurnal, nocturnal and stag watch fauna surveys as well as camera trapping, roost and nest tree searches, Koala habitat Spot Assessment Technique (SAT) and camera trapping carried out between August 2019 and November 2019 (detailed dates for each survey can be found in Appendix C)
  o Post-fire habitat inspection: A post-fire inspection was undertaken on 22 January 2020. Data captured included:
    ▪ Percent scorch (i.e. leaf browned due to heat relative to green remaining)
    ▪ Percent consumption (proportion of leaf matter consumed by fire)
    ▪ Scorch height (where relevant).
• Assessment of potential direct, indirect and cumulative impacts on local biota
• Provision of recommended mitigation measures.
All habitat assessments were completed on the basis of the pre-fire assessment, as the biodiversity study area has the potential to recover post-fire. The fire impacts on the habitat within and surrounding the construction boundary was taken into consideration when assessing the importance of habitat removal for the significance assessments.

No Class 1 or 2 waterways are present within the biodiversity study area. Therefore, no aquatic surveys were completed.

The surveys detailed above were completed in accordance with the required guidelines and completed within the recommended timeframes. However, the following limitations were identified:
• Extremely dry conditions were experienced for the duration of the survey period between August and December 2019 which may have had the following impacts on the survey results:
  o Reduced detectability of nectarivorous birds, including swift parrot, due to the absence of typical winter / early spring eucalypt flowering events. A precautionary approach has been adopted where negative results alone are not considered evidence of low likelihood of occurrence
Reduced native diversity detectable during vegetation integrity survey plots, hence underestimation of Vegetation Integrity Scores and reduced detection of characteristic species. However, due to integrity scores exceeding thresholds for “Low” condition, this is unlikely to have a substantial impacts on survey results.

Reduced flowering and detectability of cryptic orchid species. Due to the dry conditions, flowering may be occurring at substantially lower rates. However, these surveys were only carried out after confirmation of flowering on reference sites and therefore there remains confidence that flowering individuals would have been detectable if present.

- A high incidence of false triggers and bushfires resulted in reduced camera trapping records for terrestrial mammals. A precautionary approach has been adopted assuming presence for the purposes of the impact assessment, despite the absence of detection.
- The timing of diurnal bird surveys extended a few days outside of recommended periods for the Swift Parrot (May-August). However, a substantial number of existing records in the South East Corner and the Sydney Basin between 2010 and 2019 were made during September.

Further detail of the methods employed by the assessment can be found in Section 2 of Appendix C.

### 6.1.2 Existing environment

The biodiversity study area (Figure 6-1) is located within the South Eastern Corner Basin Bioregion in the Batemans IBRA subregion, and occurs entirely within the Clyde Valley Foothills Mitchell landscape. The majority of the landscape to the south and west of the biodiversity study area, including the biodiversity study area, form part of the Mogo State Forest and are managed for timber production.

Hanging Rock Creek is an ephemeral stream located within the biodiversity study area. It comprises incised drainage lines on steep slopes and broad flowlines with no distinct channel in low-lying areas, typical of the headwaters of coastal ephemerals streams. There is one permanent wetland located on Hanging Rock Creek outside but immediately downstream from the biodiversity study area.

Terrestrial habitats within the biodiversity study area have been modified by past and current land uses associated with timber harvesting and infrastructure construction and management. Recent fires have resulted in the biodiversity study area being burnt at a high intensity resulting in the vegetation understorey, midstorey and canopy being scorched. However, fire intensity at the site is unlikely to have been sufficiently severe to prevent epicormic sprouting of most eucalypt species present. Regeneration across the majority of the biodiversity study area to a similar pre-fire state, based on structure and species composition, is likely to occur within 15 to 20 years.

Numerous hollow bearing trees were present throughout the biodiversity study area prior to the fires, with at least 111 mature trees with large and very large hollows of which the majority were located within 100 metres of drainage lines. While the fire resulted in destabilisation of large hollow bearing trees within the biodiversity study area, there are likely to be sufficient hollows remaining post-fire to allow for recolonization by fauna species.

#### Vegetation communities

Five PCTs were recorded within the biodiversity study area as shown in Figure 6-1 and Table 6-1. The PCTs are categorised into nine vegetation zones based on their condition classification. Complete recorded floristic characteristics can be found in Appendix C.

Areas of bare ground or with exotic vegetation cover were also identified as two additional zones (Zones 11 and 12). These areas comprise cleared and disturbed land supporting predominantly exotic grasses and weeds located on roadside batters with no overstorey or midstratum present. Exotic grasses and common roadside weeds identified include kikuyu grass (*Pennisetum clandestinum*), paspalum (*Paspalum dilatatum*), clovers (*Trifolium* spp.), lambs tongue (*Plantago lanceolata*), wild iris (unidentified Iridaceae).
and purpletop (Verbena bonariensis). Exotic shrubs include Paddys lucerne (Sida rhombifolia) and blackberry (Rubus anglocandicans). Couch (Cynodon dactylon) is present but not dominant.

The following two BC Act listed Endangered Ecological Communities (EEC) potentially occur in the construction boundary based on known association with PCTs identified as present:

- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Swamp Oak Floodplain Forest) (Vegetation Zone 8)
- River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions (River-Flat Eucalypt Forest) (Vegetation Zone 9).

Six EPBC Act listed threatened ecological communities were identified as potentially occurring within the biodiversity study area. Of these, two communities were confirmed to be present (refer to Figure 6-1):

- Vegetation Zone 8 – supports PCT1232: Swamp Oak Floodplain Swamp Forest, Sydney Basin Bioregion and South East Corner Bioregion in high condition. This vegetation meets the diagnostic criteria for EPBC Act listed Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland (EEC)
- Vegetation Zone 9 – supports PCT1326: Woollybutt – White Stringybark – Forest Red Gum Grassy Woodland on Coastal Lowlands, Southern Sydney Basin Bioregion and South East Corner Bioregion in high condition. This vegetation community meets the diagnostic criteria for EPBC Act listed Illawarra and South Coast Lowland Forest and Woodland (Critically Endangered Ecological Community, CEEC).

No other vegetation zones in the biodiversity study area have the potential to meet the diagnostic criteria for any EPBC Act or BC Act listed threatened ecological communities.
Table 6-1: Plant community types (Umwelt,2020)

<table>
<thead>
<tr>
<th>PCT number</th>
<th>PCT name</th>
<th>Zone</th>
<th>Condition class</th>
<th>BC Act status</th>
<th>EPBC Act status</th>
<th>Area in study area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1206</td>
<td>Spotted Gum - Blackbutt shrubby open forest on the coastal foothills, southern Sydney Basin Bioregion and northern South East Corner Bioregion</td>
<td>1</td>
<td>High</td>
<td>Not listed</td>
<td>Not listed</td>
<td>4.22</td>
</tr>
<tr>
<td>1220</td>
<td>Spotted Gum - White Stringybark - Burrawang shrubby open forest on hinterland foothills, northern South East Corner Bioregion</td>
<td>2</td>
<td>High</td>
<td>Not listed</td>
<td>Not listed</td>
<td>50.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Degraded grassland</td>
<td>Not listed</td>
<td>Not listed</td>
<td>1.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Derived grassland</td>
<td>Not listed</td>
<td>Not listed</td>
<td>6.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>Degraded forest</td>
<td>Not listed</td>
<td>Not listed</td>
<td>26.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>Plantings</td>
<td>Not listed</td>
<td>Not listed</td>
<td>1.12</td>
</tr>
<tr>
<td>877</td>
<td>Grey Myrtle dry rainforest of the Sydney Basin Bioregion and South East Corner Bioregion</td>
<td>7</td>
<td>High</td>
<td>Not listed</td>
<td>Not listed</td>
<td>0.58</td>
</tr>
<tr>
<td>1232</td>
<td>Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion</td>
<td>8</td>
<td>High</td>
<td>Swamp Oak Floodplain Forest (EEC)</td>
<td>Coastal Swamp Oak (Casuarina glauca) Forest (EEC)</td>
<td>0.50</td>
</tr>
<tr>
<td>1326</td>
<td>Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion</td>
<td>9</td>
<td>High</td>
<td>River-Flat Eucalypt Forest (EEC)</td>
<td>Illawarra and South Coast Lowland Forest and Woodland (CEEC)</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>92.25</strong></td>
</tr>
<tr>
<td>N/A</td>
<td>Roads, tracks and bare grounds</td>
<td>11</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td><strong>8.69</strong></td>
</tr>
<tr>
<td>N/A</td>
<td>Exotic vegetation in road batter</td>
<td>12</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td><strong>2.36</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>103.30</strong></td>
</tr>
</tbody>
</table>
Legend
- Study area
- Construction boundary
- Watercourse (LPI)
- Road (LPI)
- Cadastre / road corridor (TfNSW)
- Proposed road design

Vegetation Zone, PCT, Condition (Umwell)
- 1, 1206, High
- 2, 1220, High
- 3, 1220, Degraded grassland
- 4, 1220, Derived native grassland
- 5, 1220, Degraded forest
- 6, 1220, Plantings
- 7, 877, High
- 8, 1232, High (TEC)
- 9, 1326, High (TEC)
- 11, 0, Bare ground
- 12, 0, Exotic

Plant community types and vegetation types
SOUTH BATEMANS BAY LINK ROAD PROJECT
**Threatened flora**

No BC Act or EPBC Act listed threatened flora species were recorded during targeted surveys throughout suitable habitats in the biodiversity study area. The potential for occurrence of threatened flora species within the biodiversity study area is therefore considered to be low.

**Groundwater dependent ecosystems**

Groundwater dependent ecosystems (GDE) are ecosystems that require access to groundwater to meet all or some of their water requirements. Most of the biodiversity study area is mapped as having low potential for GDEs, with the exception of low lying sections of the Hanging Rock Creek catchment which have moderated to high potential to be terrestrial GDE.

The watercourse of Hanging Rock Creek was identified as a high potential aquatic GDE. The GDEs associated with the watercourse potentially consist of:

- Baseflow streams (subsurface component and surface/free-water component)
- Groundwater dependent wetlands
- Estuarine and near shore marine ecosystems.

Within the biodiversity study area, Hanging Rock Creek has an ephemeral flow and intermittent expression of surface water. No permanent pools or permanent flows of surface water were identified, this indicates the creek line does not have baseflow characteristics and is unlikely to be significantly dependent on groundwater. A permanent wetland is present on Hanging Rock Creek approximately 50 metres downstream of the biodiversity study area. Due to the limited overland flows, this wetland is identified as a high probability GDE.

According to BoM (2016) and Kuginis et al. (2012), and as indicated in Table 6-2, four of the PCTs identified within the biodiversity study area have moderate or moderate to high potential for dependence on groundwater. The likely type of groundwater dependence for each PCT has been classified as:

- Facultative proportional – Likely to be dependent in part on groundwater and may be modified by changes in groundwater attributes (e.g. in species composition) but is unlikely to be destroyed by them. Likely to be moderately reliant on groundwater particularly during times of water stress
- Facultative opportunistic – May use groundwater where available during times of water stress but likely to be dependent chiefly on rainfall.

However, the dominant community in the construction boundary is PCT 1220 which has a low potential for groundwater dependence. PCT 1220 is likely to be classified as shallow rooted (vadophytic) vegetation as this community occurs on ridges and slopes associated with well drained soils and likely disconnected from localised groundwater systems. The low potential GDEs would be classified either as non-dependent ecosystems or as facultative-opportunistic GDEs with only minor interaction with groundwater. There is no data on the GDE atlas for subterranean GDEs in the region. Apart from the subsurface component of the streams discussed in relation to subterranean Rock Creek, no other shallow subterranean GDEs are likely to occur in the biodiversity study area.

Table 6-2: Potential for terrestrial groundwater dependant ecosystems

<table>
<thead>
<tr>
<th>PCT number</th>
<th>PCT name</th>
<th>Potential for groundwater dependant ecosystem interaction (BoM, 2016)</th>
<th>Likely type of groundwater dependence (Kuginis et al. 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1206</td>
<td>Spotted Gum - Blackbutt shrubby open forest on the coastal foothills, southern Sydney Basin Bioregion and northern South East Corner Bioregion</td>
<td>Moderate to high</td>
<td>Facultative-proportional</td>
</tr>
</tbody>
</table>
### Significant weeds

Records of key weed species listed under the NSW *Biosecurity Act 2015* or identified as Weeds of National Environmental Significance (WONS) recorded in the biodiversity study area are summarised in Table 6-3 below. Due to the high level of disturbance and presence of a range of exotic species, the Old Sawmill site has been identified as a weed zone as shown in Figure 6-2. Boneseed observed within the biodiversity study area, has a control order duty under the *Biosecurity Act 2015*. Based on the field surveys, control measures to manage the spread of Boneseed have been undertaken recently.

#### Table 6-3: Significant weeds

<table>
<thead>
<tr>
<th>Species name</th>
<th>Common name</th>
<th>National status</th>
<th><strong>NSW Biosecurity Act 2015 Status</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Rubus anglocandicans</em></td>
<td>Blackberry</td>
<td>WONS</td>
<td>General Biosecurity Duty</td>
</tr>
<tr>
<td><em>Senna septemtrionalis</em></td>
<td>Arsenic bush</td>
<td>Nil</td>
<td>General Biosecurity Duty</td>
</tr>
<tr>
<td><em>Chrysanthemoides monilifera subsp. monilifera</em></td>
<td>Boneseed</td>
<td>WONS</td>
<td>General Biosecurity Duty</td>
</tr>
<tr>
<td><em>Solanum mauritianum</em></td>
<td>Wild tobacco bush</td>
<td>Nil</td>
<td>General Biosecurity Duty</td>
</tr>
<tr>
<td><em>Asparagus aethiopicus</em></td>
<td>Ground asparagus</td>
<td>WONS</td>
<td>General Biosecurity Duty</td>
</tr>
<tr>
<td>Species name</td>
<td>Common name</td>
<td>National status</td>
<td>NSW Biosecurity Act 2015 Status</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>-----------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Prohibition on Dealings</td>
</tr>
</tbody>
</table>
Weeds identified within study area

SOUTH BATEMANS BAY LINK ROAD PROJECT

Legend
- Study area
- Construction boundary
- Watercourse (LPI)
- Access track centreline
- Cadastre / road corridor (TfNSW)
- Proposed road design
- Ancillary site
- Weed zone (Umwelt)

Weed record (Umwelt)
- Arsenic bush
- Asparagus fern
- Blackberry
- Boneseed
- Common climbing-aloë
- Coral tree
- Paddy's lucerne
- Wild tobacco bush

FIGURE 6-2
1:8,500 Scale at A4

LATTAS POINT ROAD

GLENELLAROAD

PRINCES HIGHWAY

THERIDGE ROAD

CRANBROOK ROAD

HANGING ROCK CREEK

ALBATROSS ROAD

HERON ROAD

Weeds identified within study area

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-03-31 | Project: 8202006301
Coordinate System: GDA 1994 MGA Zone 56
Map: 8202006301-GS-081-REF_Weeds.mxd  01
Aerial imagery supplied by Nearmap (September, 2019)
**Threatened and migratory fauna**

Of the BC Act and EPBC Act listed threatened species identified as having potential to occur within the biodiversity study area (complete list available in Appendix C), species listed on Table 6-4 were identified as having a moderate or greater potential of occurrence. These include:

- Twenty BC Act listed threatened species
- Five EPBC Act listed threatened species
- Three EPBC Act listed migratory species.

While records of the “Greater Glider of the Eurobodalla Region” threatened population were identified through database searches, this population is bounded in the north by Moruya River and consequently is not present in the landscape surrounding the biodiversity study area.

No threatened populations are likely to occur within the biodiversity study area.

**Table 6-4: Threatened species likely to present in the construction boundary**

<table>
<thead>
<tr>
<th>Name</th>
<th>BC Act Status</th>
<th>EBPC Act Status</th>
<th>Likelihood of occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gang gang cockatoo (Callocephalon fimbriatum)</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
</tr>
<tr>
<td>Glossy black-cockatoo (Calyptorhynchus lathami)</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
</tr>
<tr>
<td>Varied sittella (Daphoenositta chrysoptera)</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
</tr>
<tr>
<td>Little lorikeet (Glossopsitta pusilla)</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
</tr>
<tr>
<td>Swift parrot (Lathamus discolor)</td>
<td>E</td>
<td>CE</td>
<td>Moderate</td>
</tr>
<tr>
<td>Square-tailed kite (Lophoictinia isura)</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
</tr>
<tr>
<td>Powerful owl (Ninox strenua)</td>
<td>V</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>Masked owl (Ninox strenua)</td>
<td>V</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>Sooty owl (Ninox strenua)</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
</tr>
<tr>
<td>Large-eared pied bat (Chalinolobus dwyeri)</td>
<td>V</td>
<td>V</td>
<td>Moderate</td>
</tr>
<tr>
<td>Spotted-tailed quoll (Dasyurus maculatus)</td>
<td>V</td>
<td>E</td>
<td>Moderate</td>
</tr>
<tr>
<td>Eastern false pipistrelle (Falsistrellus tasmaniensis)</td>
<td>V</td>
<td>-</td>
<td>High</td>
</tr>
<tr>
<td>Southern brown bandicoot (Isoodon obesus obesus)</td>
<td>E</td>
<td>E</td>
<td>Moderate</td>
</tr>
<tr>
<td>Large bent-winged bat (Miniopterus orianae oceanensis)</td>
<td>E</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>Eastern coastal free-tail bat (Micronomus norfolkensis)</td>
<td>V</td>
<td>-</td>
<td>High</td>
</tr>
<tr>
<td>Black-faced monarch (Monarcha melanopsis)</td>
<td>-</td>
<td>Mig</td>
<td>Moderate</td>
</tr>
<tr>
<td>Satin flycatcher (Myiagra cyanoleuca)</td>
<td>-</td>
<td>Mig</td>
<td>Moderate</td>
</tr>
<tr>
<td>Southern myotis (Myotis macropus)</td>
<td>V</td>
<td>-</td>
<td>Moderate</td>
</tr>
<tr>
<td>Yellow-bellied glider (Petaurus australis)</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
</tr>
<tr>
<td>Grey-headed flying-fox (Pteropus poliocephalus)</td>
<td>V</td>
<td>V</td>
<td>High</td>
</tr>
<tr>
<td>Yellow-bellied sheathtail-bat (Saccolaimus flaviventris)</td>
<td>V</td>
<td>-</td>
<td>High</td>
</tr>
</tbody>
</table>
### Wildlife connectivity

There are no listed habitat corridors in the region. However, local and regional connectivity of native vegetation and creek/gully corridors are present in the biodiversity study area. Connectivity to the west is likely only to be present for mobile species such as birds that can move quickly across open spaces. There are connectivity barriers within the biodiversity study area which hinder the east-west movement of most terrestrial fauna species, as well as arboreal species such as gliders with restricted flight ranges. Existing connectivity barriers include the Princes Highway, power easements, access tracks and residential housing.

Hanging Rock Creek and associated riparian vegetation provides connectivity to modified habitats in the north comprising the landscaped golf course and contained waterbodies. The creek is also mapped as Key Fish Habitat which drains through the golf course and into estuarine habitats of the Clyde River.

### 6.1.3 Potential impacts

#### Construction

The construction of the proposal would result in the following direct and indirect impacts to biodiversity:

- Clearing of up to 22.68 hectares of native vegetation belonging to two PCTs:
  - PCT1206 Spotted Gum - Blackbutt shrubby open forest on the coastal foothills, southern Sydney Basin Bioregion and northern South East Corner Bioregion
  - PCT1220 Spotted Gum - White Stringybark - Burrawang shrubby open forest on hinterland foothills northern South East Corner Bioregion.

- Disturbance or direct removal of an additional 1.34 ha of non-native vegetation and 7.15 ha of bare ground, sealed and gravel road surfaces

- Removal of threatened fauna habitat which includes:
  - Up to 15.95 ha of glossy black cockatoo breeding habitat
  - Up to 7.69 ha of sooty owl breeding habitat
  - Up to 21.79 ha of native vegetation for ecosystem credit species
- Up to 72 hollow bearing trees, which are potential habitat for a range of threatened hollow dependent fauna.

- Potential mortality of local fauna
- Potential mobilisation of sediment, dust and containments from spills
- Temporary changes in environmental conditions such as hydrology, drainage, noise, light and wind
- Potential invasion and spread of weeds and diseases.

These impacts are discussed in further detail in the sections below. The identified impacts to local biodiversity would be minimised through the implementation of the mitigation measures presented in Section 6.1.5.

**Removal of native vegetation**

The proposal would require the clearing of up to 22.68 hectares of native woody vegetation and exotic grasslands and 1.34 hectares of exotic vegetation for the construction boundary and the establishment of ancillary sites. The maximum extent of native vegetation to be cleared for each PCT and vegetation zone is summarised in Table 6-5. Options to reduce removal of vegetation would be investigated during the detailed design and construction planning.

Table 6-5 assumes that all the vegetation within the construction boundary would be cleared or affected by construction works and is a worst case estimate. For example, the establishment of access tracks would account for up to 1.2 hectares of the total native vegetation to be cleared. However, existing tracks may be able to be used with only minor trimming and clearing following a constructability assessment.

During the preliminary design phase, the construction boundary was refined to avoid impacts on vegetation in sheltered gullies in Hanging Rock Creek catchment, in areas likely to be of particular importance as habitat for sooty owl and yellow-bellied glider. Where possible, the total extent of native vegetation to be cleared would be further reduced through refinement of the footprint during detailed design and construction planning.

No BC Act or EPBC Act listed threatened ecological communities would be directly impacted by the construction of the proposal.

**Removal of threatened species habitat**

The primary impact of the proposal would be the result of removing up to 22.68 ha of native vegetation that provides foraging, and in some cases breeding, habitat for twenty BC Act listed threatened fauna species, five EPBC Act listed threatened fauna species and three EPBC Act listed migratory species. Table 6-6 summarises potential level of impact on habitat for these species.

The removal of open forest habitats would reduce the availability and range of food resources such as seeds, nectar, pollen, lerps, gum / resin, and invertebrates attracted to these resources. The loss of tree and shrub species with different bark types and structural layers may also reduce foraging habitat, including prey species for threatened fauna such as varied sittella, square-tailed kite, forest owls and gliders.

All native vegetation likely to be disturbed within the construction boundary has been heavily impacted by the recent high intensity bushfire. This assessment has been prepared on the basis of the assumption that native vegetation will regenerate across the biodiversity study area. Impacts of the proposal are not substantially changed as a result of the fire, as no parts of the biodiversity study area support unburnt or less intensively burnt vegetation likely to be important as a seed source for natural regeneration of the landscape.

Depending on fire survival rates, up to 72 hollow bearing trees would be removed for construction of the proposal. While not all hollow bearing trees were mapped in the biodiversity study area outside the construction boundary, a total of 111 trees supporting large or very large hollows were identified throughout the biodiversity study area. This indicates that a large number of hollow bearing trees with a wide range of sizes are present in the biodiversity study area, including in areas outside of the construction boundary.
<table>
<thead>
<tr>
<th>PCT number</th>
<th>PCT name</th>
<th>Zone</th>
<th>Condition class</th>
<th>BC Act status</th>
<th>EPBC Act status</th>
<th>Area in study area (ha)</th>
<th>Area in construction boundary (ha)</th>
<th>Area in operational boundary (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1206</td>
<td>Spotted Gum - Blackbutt shrubby open forest on the coastal foothills, southern Sydney Basin Bioregion and northern South East Corner Bioregion</td>
<td>1</td>
<td>High</td>
<td>Not listed</td>
<td>Not listed</td>
<td>4.22</td>
<td>0.37</td>
<td>0.16</td>
</tr>
<tr>
<td>1220</td>
<td>Spotted Gum - White Stringybark -Burrawang shrubby open forest on hinterland foothills, northern South East Corner Bioregion</td>
<td>2</td>
<td>High</td>
<td>Not listed</td>
<td>Not listed</td>
<td>50.19</td>
<td>13.25</td>
<td>8.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Degraded grassland</td>
<td>Not listed</td>
<td>Not listed</td>
<td>1.96</td>
<td>1.95</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Derived grassland</td>
<td>Not listed</td>
<td>Not listed</td>
<td>6.90</td>
<td>3.89</td>
<td>1.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>Degraded forest</td>
<td>Not listed</td>
<td>Not listed</td>
<td>26.17</td>
<td>2.33</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>Plantings</td>
<td>Not listed</td>
<td>Not listed</td>
<td>1.12</td>
<td>0.89</td>
<td>0.66</td>
</tr>
<tr>
<td>877</td>
<td>Grey Myrtle dry rainforest of the Sydney Basin Bioregion and South East Corner Bioregion</td>
<td>7</td>
<td>High</td>
<td>Not listed</td>
<td>Not listed</td>
<td>0.58</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>1232</td>
<td>Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion</td>
<td>8</td>
<td>High</td>
<td>Swamp Oak Floodplain Forest (EEC)</td>
<td>Coastal Swamp Oak (Casuarina glauca) Forest (EEC)</td>
<td>0.50</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>1326</td>
<td>Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion</td>
<td>9</td>
<td>High</td>
<td>River-Flat Eucalypt Forest (EEC)</td>
<td>Illawarra and South Coast Lowland Forest and Woodland (CEEC)</td>
<td>0.61</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>92.25</strong></td>
<td><strong>22.68</strong></td>
<td><strong>10.48</strong></td>
</tr>
<tr>
<td>PCT number</td>
<td>PCT name</td>
<td>Zone</td>
<td>Condition class</td>
<td>BC Act status</td>
<td>EPBC Act status</td>
<td>Area in study area (ha)</td>
<td>Area in construction boundary (ha)</td>
<td>Area in operational boundary (ha)</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------</td>
<td>------</td>
<td>-----------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>-------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>N/A</td>
<td>Roads, tracks and bare grounds</td>
<td>11</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>8.69</td>
<td>7.15</td>
<td>3.95</td>
</tr>
<tr>
<td>N/A</td>
<td>Exotic vegetation in road batter</td>
<td>12</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2.36</td>
<td>1.34</td>
<td>1.22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>103.30</strong></td>
<td><strong>31.17</strong></td>
<td><strong>15.65</strong></td>
</tr>
</tbody>
</table>

Table 6-6: Potential impacts on threatened fauna (Umwelt, 2020)

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Common Name</th>
<th>BC Act status</th>
<th>EPBC Act status</th>
<th>Likelihood of occurrence</th>
<th>Habitat in study area (ha)</th>
<th>Habitat in construction boundary (ha)</th>
<th>Habitat in operational boundary (ha)</th>
<th>Likely significant impact?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callocephalon fimbriatum</td>
<td>gang gang cockatoo</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Calyptorhynchus lathami</td>
<td>glossy black-cockatoo</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Daphoenositta chrysoptera</td>
<td>varied sittella</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Glossopsitta pusilla</td>
<td>little lorikeet</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Lathamus discolor</td>
<td>swift parrot</td>
<td>E</td>
<td>CE</td>
<td>Moderate</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Lophoictinia isura</td>
<td>square-tailed kite</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
<td>92.25</td>
<td>22.68</td>
<td>15.65</td>
<td>No</td>
</tr>
<tr>
<td>Ninox strenua</td>
<td>powerful owl</td>
<td>V</td>
<td>-</td>
<td>Moderate</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Tyto novaehollandiae</td>
<td>masked owl</td>
<td>V</td>
<td>-</td>
<td>Moderate</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Tyto tenebricosa</td>
<td>sooty owl</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
<td>28.29 (B)</td>
<td>7.69 (B)</td>
<td>8.38 (F)</td>
<td>No</td>
</tr>
<tr>
<td>Scientific name</td>
<td>Common Name</td>
<td>BC Act status</td>
<td>EPBC Act status</td>
<td>Likelihood of occurrence</td>
<td>Habitat in study area (ha)</td>
<td>Habitat in construction boundary (ha)</td>
<td>Habitat in operational boundary (ha)</td>
<td>Likely significant impact?</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>--------------------------</td>
<td>---------------------------</td>
<td>----------------------------------------</td>
<td>-------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Monarcha melanopsis</td>
<td>black-faced monarch</td>
<td>-</td>
<td>Mi</td>
<td>Moderate</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Myiagra cyanoleuca</td>
<td>satin flycatcher</td>
<td>-</td>
<td>Mi</td>
<td>Moderate</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td>Rhipidura rufifrons</td>
<td>rufous fantail</td>
<td>-</td>
<td>Mi</td>
<td>Recorded</td>
<td>82.27</td>
<td>15.95</td>
<td>8.38</td>
<td>No</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chalinolobus dwyeri</td>
<td>large-eared pied bat</td>
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<td>V</td>
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<td>15.95</td>
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<td>15.95</td>
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<tr>
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<td>Isoodon obesulus obesulus</td>
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<tr>
<td>Scientific name</td>
<td>Common Name</td>
<td>BC Act status</td>
<td>EPBC Act status</td>
<td>Likelihood of occurrence</td>
<td>Habitat in study area (ha)</td>
<td>Habitat in construction boundary (ha)</td>
<td>Habitat in operational boundary (ha)</td>
<td>Likely significant impact?</td>
</tr>
<tr>
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</tbody>
</table>

*V= Vulnerable, E=Endangered, CE = Critically Endangered, Mi = Migratory; B= Breeding, F= Foraging*
Hollow abundance and distribution within the biodiversity study area is likely to be consistent with surrounding areas of Mogo State Forest. Removal of hollow bearing trees for construction is therefore not likely to have a significant impact on the overall abundance of hollows in the surrounding habitat areas.

Injury and mortality of both threatened and non-threatened fauna could occur during construction activities associated with the proposal such as vegetation removal and movement of machinery and plant to, from and in the biodiversity study area construction boundary. The level of mortality of both non-threatened and threatened species of bird, bat, mammal and large reptiles is likely to be very low with the implementation of the mitigation measures outlined in Section 6.1.5.

Temporary barrier effects may increase as a result of widening of existing access tracks during construction. The impact of increased barrier effects is likely to be minimal due to the presence of existing tracks and disturbance of adjacent areas by timber harvesting.

Prior to the fires, fallen logs (dead wood) and woody debris were a common habitat feature in open forest and degraded forest (Zones 1, 2 and 5). Surviving fallen timber is likely to be important for providing shelter and foraging opportunities for threatened fauna such as the southern brown bandicoot and spotted tailed quoll as well as non-threatened fauna as the biodiversity study area recovers from the fire. Fallen logs found during clearing works would be retained where possible and be either moved into adjacent areas outside the clearing limits or stockpiled for later placement as part of the site rehabilitation plan in accordance with Roads and Maritime Services Biodiversity Guidelines Guide 5: Re-use of woody debris and bushrock.

No threatened flora species are likely to be present within the construction boundary and consequently no threatened flora habitat is likely to be disturbed.

No threatened aquatic species, populations and communities have been recorded or are considered likely to occur within the construction boundary.

**Impacts on groundwater dependent ecosystems**

One potential aquatic GDE, Hanging Rock Creek, was identified in the construction boundary. In this location, Hanging Rock Creek comprises a broad indistinct ephemeral flowline dependent on surface runoff without permanent pools and consequently no aquatic GDE is present. Construction activities would involve minor works associated with existing access tracks and do not involve activities likely to have a high risk of modifying groundwater flows through extraction, changes to surface water penetration or groundwater movement. Hence, direct or indirect impacts on GDEs are unlikely to occur as a result of construction activities.

**Aquatic habitat impacts**

No direct impacts to aquatic biodiversity are likely to occur as a result of the proposal. The construction of the proposal may result in minor alterations to hydrology and surface flows in the construction boundary due to changes in landform resulting from cut and fill works. Due to the steep nature of the terrain, the proposal is not likely to result in substantial changes to surface water accumulation and flooding in the surrounding environment.

Potential indirect impacts to turbidity may occur due an increase in erosion and sedimentation (further discussed in Sections 6.2 and 6.3). Mulch used from landscaping and construction environmental controls could result in tannins leachate entering waterways. The likelihood of such impacts is considered low.

**Noise, light and vibration**

While the construction phases of the proposal may cause temporary disturbance to animals, the impact from noise emissions are likely to be localised close to the construction boundary (up to 100 metres) and are not likely to have a significant, long-term impact on wildlife populations.
Invasion and spread of weeds, pathogens and pests

Weeds, pathogens and pests have the potential to be introduced during construction as a result of soil and plant material disturbance. Five priority weed species were identified in the construction boundary, including Boneseed which has a control order duty under the Biosecurity Act 2015.

Three pathogens are considered likely to be present within the construction boundary and are listed as Key Threatening Processes:

- Amphibian chytrid fungus (*Batrachochytrium dendrobatidis*)
- Phytophthora root rott fungus (*Phytophthora cinnamomi*)
- Exotic rust fungi of the order Pucciniales (myrtle rust).

Weed and pathogen management measures would be implemented in accordance with the Transport for NSW Biodiversity Guidelines.

A range of exotic pests’ species are present or likely to occur in the construction boundary due to urban environments located near the area, these include:

- European red fox (*Vulpes vulpes*)
- Cats (*Felix catus*)
- Rabbit (*Oryctolagus cuniculus*)
- Black rat (*Rattus rattus*)
- House mouse (*Mus musculus*).

The proposal is unlikely to introduce these species to any new location where they are currently absent. Although exotic pest species already present may benefit from vegetation clearing associated with the proposal, the habitat to be removed is unlikely to have a significant impact on the availability of resources such as nesting hollows and foraging trees.

**Operation**

The proposal would have the potential for the following additional impacts to biodiversity during the operation of the proposal:

- Edge effects on adjacent vegetation
- Injury and mortality of fauna
- Increased habitat fragmentation and loss of wildlife fragmentation
- Invasion and spread of weeds, pathogens and pests
- Increased light and noise impacts from traffic and road lighting.

**Wildlife connectivity and habitat fragmentation**

The proposal would require the removal of up to 22.68 hectares of native vegetation. The increased road width, embankments and sealed road surface has the potential to reduce opportunities for fauna with limited dispersal capability, or that are unlikely to move through exposed unvegetated areas, to safely disperse in or out of Hanging Rock Creek Catchment into areas of Mogo State Forest to the south. This is likely to increase the isolation of less mobile fauna species present in habitat located in Hanging Rock Creek catchment.

Following the 2019–2020 fires, it is unlikely that yellow-bellied glider persist in the biodiversity study area due to the absence of unburnt patches or areas burnt at low or moderate intensity. Barriers formed by the proposal may reduce the potential for re-colonisation of the habitat patch in Hanging Rock Creek following the fires. The proposal is therefore unlikely to result in fragmentation and isolation such that populations of large gliders in the broader landscape are placed at risk. However, follow up surveys may be warranted to determine whether large threatened gliders persists in habitat in Hanging Rock Creek catchment following
the fires and to assess the importance of maintaining connectivity for family groups persisting in this area for recovery of glider populations in the landscape.

The proposal would not substantially increase habitat fragmentation such that habitat connectivity would be significantly affected for any fauna species.

**Edge effects on native vegetation and habitat**

Linear infrastructure such as roads allow for more sunlight and wind to enter the edge of forested habitats. These effects can penetrate up to 150 metres into a forested community that would result in more dense vegetation. Edge effects associated with a more defined interface between the road and nearby areas of habitat are likely to comprise:

- Altered soil moisture conditions
- Altered light conditions such as reduced-shading and artificial lighting
- Increased noise and vibration during both construction and operation.

Fragmentation would increase existing edge effects, reducing the suitability of habitat next to the alignment (generally within 20 metres). The majority of the vegetation affected is already subject to some edge effects, as a result of the existing roads, powerline easement and other disturbance. The increase in edge effects created by the proposal is unlikely to be significant.

**Noise, light and vibration**

The proposal would be likely to result in increased vehicle noise and vibration in areas adjacent to the operational boundary resulting from increased traffic. Permanent road lighting would be installed at the proposed roundabout and associated approaches at the north-western end of the proposal, and potentially at the intersection between Glenella Road and The Ridge Road at the eastern end of the proposal. Temporary lighting impacts from vehicle movement along the Princes Highway or Glenella Road are unlikely to change significantly as a result of the proposal.

The areas potentially affected by light spill at the proposed roundabout extend along Glenella Road to the powerline easement. Habitats adjacent to these approaches are disturbed and fragmented by existing alignments of the Princes Highway, Glenella Road and the powerline easement to the east. Disturbance-sensitive species are already likely to avoid areas to be impacted.

Direct impact of lights spill from proposed road lighting at the intersection between Glenella Road and The Ridge Road are likely to be minimal. Affected areas are unlikely to permanently support species sensitive to light disturbance and the area of occupation of such species is unlikely to substantially change.

Measures to minimise light spill from permanent road lighting at both intersections would be considered during the detailed design phase. The proposal is not anticipated to result in any significant increase in the impact of noise, light or vibration on threatened fauna.

**Conclusion on significance of impacts**

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

The proposal is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act 1999.
6.1.4 Biodiversity offsets

Subject to vegetation clearing minimisation efforts, preparation of an offsets strategy would be required in accordance with the Guideline for Biodiversity Offsets (Roads and Maritime, 2016). Based on the current impacts within the construction boundary, the following offset may be required:

- 15.94 ha of glossy black cockatoo breeding habitat (determined in accordance with the BAM)
- 7.69 ha of sooty owl breeding habitat (determined in accordance with the BAM)
- 21.79 ha of habitat for ecosystem credit species.

The offsets strategy may include retiring credits, retiring credits under the variation rules, paying into the Biodiversity Conservation Fund or progressing Stewardship Site Agreements on suitable properties in accordance with Roads and Maritime Biodiversity Offset Guidelines (Roads and Maritime, 2016).

6.1.5 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD01 – Biodiversity</td>
<td>A Flora and Fauna Management Plan will be prepared in accordance with Transport for NSW's Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011) and implemented as part of the CEMP. It will include, but not be limited to: Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • A strategy to minimise clearing of vegetation and hollow-bearing trees • Pre-clearing survey requirements • Procedures for handling fauna • Protocols to manage weeds and pathogens.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Clause 4.8 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>BD02 – Native vegetation removal</td>
<td>Native vegetation clearing will be minimised through detailed design. Vegetation clearing limit drawings will be developed to minimise vegetation clearing outside of the operational boundary and be in accordance with Transport for NSW Specification G40 Clearing and Grubbing. Construction</td>
<td>Transport for NSW</td>
<td>Detailed design / pre-construction</td>
<td>Clause 3 of Transport for NSW Specification G40 Clearing and Grubbing</td>
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<tr>
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<td>Timing</td>
<td>Reference</td>
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<tr>
<td>BD03 – Native vegetation removal</td>
<td>Efforts will be made to retain vegetation not subject to timber harvesting along drainage lines confirmed to support yellow-bellied glider and potential sooty owl breeding habitat near Hanging Rock Creek.</td>
<td>Transport for NSW/ contractor</td>
<td>Detailed design / pre-construction</td>
<td>Clause 2.4 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
<tr>
<td>BD04 – Hollow bearing tree removal</td>
<td>Pre-clearing surveys will be undertaken in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011). Hollow-bearing trees to be retained will be identified and marked during the pre-clearing survey. Habitat trees requiring staged-clearing will also be marked during the pre-clearing survey.</td>
<td>Contactor</td>
<td>Construction</td>
<td>Clause 2.4 of Transport for NSW Specification G40 Clearing and Grubbing</td>
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<tr>
<td>BD05 – Hollow bearing tree removal</td>
<td>Where possible, clearing of trees with large or very large hollows would be undertaken outside the breeding season for glossy black cockatoo and sooty owl (i.e. April to August). Where this is not possible, searches for active nests would be undertaken and clearing of active nests would be avoided.</td>
<td>Contactor</td>
<td>Construction</td>
<td>Clause 2.4 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
<tr>
<td>BD07 – Habitat removal</td>
<td>Fallen logs will be retained where possible and be either moved into adjacent areas outside the clearing limit but within the construction boundary or stockpiled for later placement as part of the site rehabilitation</td>
<td>Contactor</td>
<td>Construction</td>
<td>Clause 2.2 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
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<td>Responsibility</td>
<td>Timing</td>
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</table>
| BD08 – Habitat removal               | A nest box strategy would be developed and implemented targeting tree-roosting microbats, arboreal mammals, little lorikeet, forest owls and glossy black cockatoo to offset hollows suitable for these species to be removed. The strategy would:  
• Include a new survey of surviving hollow bearing trees that would be removed for construction.  
• Be developed in accordance with *Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011)  
• Investigate alternative approaches to offset loss of large and very large hollow bearing trees for forest owls and glossy black cockatoos. | Transport for NSW/contractor   | Detailed Design/Pre-construction | *Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA projects* |
<p>| BD09 – Habitat removal               | If residual impacts exceed threshold for offsetting cleared native vegetation or threatened species habitat, a biodiversity offsets strategy will be prepared in accordance with Transport for NSW Biodiversity Offset Guidelines (Roads and Maritime 2016) during detailed design. | Transport for NSW     | Detailed Design             | <em>Biodiversity Offset Guidelines (Roads and Maritime, 2016)</em>                                   |
| BD10 – Fragmentation of identified habitat corridors | A survey to determine whether yellow-bellied gliders persist in the Hanging Rock Creek catchment following the 2019 – 2020 fires will be carried out in spring/summer and in accordance with Survey Guidelines for Australia’s Threatened Mammals (Commonwealth of Australia, 2011). | Transport for NSW     | Detailed design             | <em>Survey Guidelines for Australia’s Threatened Mammals (Commonwealth of Australia, 2011)</em>       |
| BD11 – Fragmentation of identified habitat corridors | A connectivity strategy will be prepared if yellow-bellied glider individuals persist in Hanging Rock Creek catchment. | Transport for NSW     | Detailed design             | <em>Draft Wildlife Connectivity Guidelines for Road Projects (RTA, 2011)</em>                        |</p>
<table>
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<tr>
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</table>
| BD12 – Fragmentation of identified habitat corridors                    | Measures that would be investigated include:  
  - Retention of trees in the verges at a maximum of 30 metres apart  
  - Installation of glider poles or rope bridges in a suitable location along Glenella Road.                                                                 | Contractor      | Construction     |                                                                           |
<p>| BD13 – Exclusion zones                                                  | Any connectivity measures to be implemented would be installed under the supervision of an experienced ecologist.                                                                                                     | Contractor      | Pre-construction   | Clause 4.8 of Transport for NSW Specification G36 Environment Protection |
| BD15 – Injury and mortality of fauna                                   | All site staff will be inducted about the location and purpose of the exclusion zones.                                                                                                                                   | Contractor      | Construction     |                                                                           |
| BD16 – Light spill impacts                                              | Minimising road-kill will be considered in the detailed design of the road and associated infrastructure (e.g. culverts and landscaping).                                                                                 | Transport for NSW | Detailed design   |                                                                           |
| BD17 – Light spill impacts                                              | The extent of road lighting along the intersection approaches will be minimised without compromising road user safety.                                                                                                     | Transport for NSW | Detailed design   | Transport for NSW Specification R151 Street lighting                     |
| BD18 – Invasion and spread of weeds                                     | The use of smart street lighting will be investigated during detailed design as a way to minimise light spill impacts.                                                                                                     | Transport for NSW | Detailed design   | Transport for NSW Specification R151 Street lighting                     |
|                                                                         | Weed species will be managed in accordance with the South East Regional Strategic Weed Management Plan (LLS, 2018), species specific weed                                                                                        | Contractor      | Construction     | Clause 4.8 of Transport for NSW Specification G36                        |</p>
<table>
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<th>Responsibility</th>
<th>Timing</th>
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</thead>
<tbody>
<tr>
<td>control programs implemented by Eurobodalla Shire Council (ESC, 2020) and Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011).</td>
<td>Contractor Construction</td>
<td>Contractor</td>
<td>Construction</td>
<td>Environment Protection</td>
</tr>
</tbody>
</table>
6.2 Drainage and flooding

A drainage and flooding assessment report has been prepared for the proposal. This assessment is provided in Appendix D and summarised in the sections below.

6.2.1 Methodology

The drainage and flooding study area consists of a broader environmental area to gain an in-depth understanding of the flooding and drainage impacts the proposal may have to the surrounding environment. The assessment was carried based on the 20 percent concept design, previous flood and geotechnical studies and detailed ground survey of the proposed alignment by Transport for NSW dated 06 January 2020. Aerial Laser Survey (ALS) tiles were used to examine existing contours and determine catchment areas.

The assessment also includes results from a site visit, conducted on 15 October 2019, to visually identify key areas of the proposal and characterise likely impacts of the proposal on flood and drainage patterns, and water quality.

Qualitative analysis models were used to identify areas of concern and any further detailed assessment that may be required.

An approximate estimate of the 1 per cent annual exceedance probability (AEP) flow at each transverse drainage location was estimated using XPRafts (Ver 11.0, Innovyze, 2018) and combined with guidelines in the Australian Rainfall and Runoff – A Guide to Flood Estimation (ARR)(Geoscience Australia, 2019). Rainfall losses were adopted from the Willing & Partners (1989) study.

A hydraulic model was not considered necessary as the proposed alignments are located within the upper reaches of the catchment area, significantly elevated above any nearby watercourses and historically recorded flood levels.

6.2.2 Existing environment

The proposal lies upon a ridgeline east of Round Hill and traverses the north-eastern slopes of Round Hill, with different sections of the construction boundary draining into three different creeks shown in Figure 6-3 which include:

- Hanging Rock Creek
- McLeod’s Creek
- Deep Creek.

McLeod’s Creek and Deep Creek form part of the Clyde River Catchment and are located approximately 700 metres and 1.2 kilometres (measured along drainage lines) away from the construction boundary respectively. The lower extents of these creeks are identified as Coastal Wetlands under the State Environmental Planning Policy (Coastal Management) 2018. The Clyde River catchment is approximately 1723 km² (DPIE, 2020) and is largely undeveloped discharging to the sea. Hanging Rock Creek forms its own catchment draining east towards Batemans Bay. The Joes Creek catchment is located immediately south of the Hanging Rock Creek catchment. The Joes Creek catchment captures flows from the existing Glenella Road alignment beyond the construction boundary.
The Princes Highway primarily drains west into McLeod’s Creek, with small portions draining east into Hanging Rock Creek. Most of the proposal would drain entirely into the Hanging Rock Creek catchment with a small portion of the proposed Lattas Point Road ancillary site draining into the Deep Creek. Potential widening of the Princes Highway north of the proposed roundabout may interact with minor drainage to the west of the Princes Highway to McLeod’s Creek. Hanging Rock Creek flows in a south to north direction to the east of the proposal and the Batemans Bay CBD. Inflows from upslope catchment are minor as the Princes Highway follows the ridge line between the two catchments as shown in Figure 6-3. The Princes Highway has a total of four culverts that currently traverse the road alignment at an east to west direction.

Glenella Road currently has minimal formalised drainage infrastructure, with the majority of upslope catchment flows traversing the road into the Hanging Rock Creek. Four pipe culverts of 375mm diameter are spaced approximately evenly along the existing Glenella Road, within the proposed work extents. The three proposed ancillary sites have no formal drainage infrastructure.

Groundwater data for the construction boundary is limited. The geotechnical investigations conducted by Transport for NSW did not encountered any groundwater along the alignment to a depth of 1.2 metres indicating a deep water table at the site. This is in line with the site features and location, which is characterised by steep slopes and is at the top of the catchment.

The proposal is contained within the upper-most reaches of their relevant catchment areas, upon a steep ridgeline and slope with grades varying between 20 to 30 per cent. These topographical characteristics as well as the lack of historical flooding in the vicinity of the proposal indicate a low probability of any flooding occurring within the construction boundary.

The ancillary facilitates are also not considered to be at risk of flooding due to similarly characterised locations. The lowest extents of the access tracks near Hanging Rock Creek vary in elevation between 10 and 20 metres. Minor localised inundation at the bottom of these tracks may be possible in extreme weather events.

### 6.2.3 Potential impacts

**Construction**

Uncontrolled drainage from the proposal during construction could pose a risk to surrounding water systems and catchments. As the proposal is constructed, the topography and required earthworks would lead to changes in drainage patterns from the site until construction is completed. Combined with the gradual increase in impervious areas as the construction progresses, this can result in temporary re-distribution and/or re-routing of the existing drainage flows and subsequent issues at the proposal.

Construction of the proposal would require the removal of four existing pipe culverts on Glenella Road, to be replaced with new pipes and culverts. Removal of these culverts could exacerbate any drainage issues both on and off site should a storm event occur prior to the installation of proposed new drainage infrastructure.

Access tracks may need to be widened and adjusted to allow the use of construction plant and equipment. Existing access tracks include an existing drainage line crossing. Adjustments to this crossing and installation of any additional drainage required due to the widening of the tracks would be carried out in accordance with the Technical Guideline – Temporary Stormwater Drainage for Road Construction to minimise impacts on drainage within the construction boundary.

Flooding is not anticipated to occur at the site due to the steep topography and location at the top of the catchment system. In the unlikely event flooding does occur at the site during the construction phase, damage to uncompleted works could be considerable with potential risk to the safety of equipment and personnel. These risks would be managed through the Emergency Management Plan developed as part of the CEMP.
Due to the marginal scale of the works involved during construction, the minimal change in road alignment at the site and the temporary nature of the construction phase, no measurable impacts to flooding downstream of the site are anticipated as a result of this proposal during construction.

**Operation**

During operation, the increase in impervious area from the proposal would result in an increase in stormwater runoff frequency, flow rate, flow volume and flow velocity. The drainage design would be further developed during detailed design to cater for this increased flows.

No measurable impacts on flooding are anticipated as a result of the operation of the proposal. The design would be further developed during detailed design to minimise the risk of aquaplaning.

### 6.2.4 Safeguards and management measures

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<tr>
<th>Impact</th>
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<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF01 - Drainage elements</td>
<td>Management of drainage during construction would be carried out in accordance with Technical Guideline – Temporary Stormwater Drainage for Road Construction, the Bluebook and Transport for NSW Specifications G38 - Soil and Water Management and R11 - Stormwater Drainage.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Transport for NSW Specifications G38 and R11</td>
</tr>
<tr>
<td>DF02 – Aquaplaning risk</td>
<td>An assessment will be undertaken to ensure the risk of aquaplaning is minimised.</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS351 – Road Design</td>
</tr>
</tbody>
</table>
6.3 Water quality and erosion

A water quality assessment and an erosion and sedimentation management report (ESMR) have been prepared for the proposal. These assessments are provided in Appendix D and Appendix G respectively, and summarised in the sections below.

6.3.1 Methodology

The water quality assessment was informed by:

- Site visits conducted in October 2019 by an environmental specialist and a certified soil conservationist
- Aerial Laser Survey (ALS) tiles were used to examine existing contours and determine catchment areas
- Analysis of a water quality report completed for nearby Joes Creek prepared by WBM Oceanics Australia (2004).

The methodology for undertaking the assessment involved:

- Identification of the surrounding catchments within the construction boundary and the potential erosion hazard in each sub-catchment
- Identification of potential pollutant sources that may impact water quality of receiving environments during construction and operations
- Determining site constraints that might limit the feasibility to implement erosion and sediment control measures as defined by Volumes 1 and 2D of the NSW Blue Book (Landcom, 2004 and DECC, 2008)
- Identification of sensitive receiving environments that would receive stormwater discharge from the proposal during construction and operations
- Identifying potential measures for erosion and sediment control that may be required
- Calculating the potential soil loss for each catchment as detailed in Volumes 1 and 2D of the NSW Blue Book (Landcom, 2004 and DECC, 2008)
- Assessing the feasibility for installing, operating and maintaining different erosion and sediment controls during construction.

6.3.2 Existing environment

Nearby sensitive receiving environments include:

- Hanging Rock Creek wetland, located about 500 metres from the construction boundary
- The lower extents of both McLeod’s Creek and Deep Creek, located approximately 700 metres and 1.2 kilometres (measured along drainage lines) away from the construction boundary respectively, are identified as Coastal Wetlands under the State Environmental Planning Policy (Coastal Management) 2018
- Batemans Marine Park located about 500 metres to the north-west and two kilometres to the north-east of the construction boundary.

Most of the proposal would drain into Hanging Rock Creek, highlighting Hanging Rock Creek and its surrounding catchment to be of primary concern for the proposal. No water quality data or modelling for Hanging Rock Creek is available. However, the upper extents of the Hanging Rock Creek and Joes Creek catchments are in close proximity to each other and share similar steep topography (slope gradient 20 per cent to 30 per cent) and forested conditions. In the absence of directly relevant information, Hanging Rock Creek can also be expected to have generally good water quality in the upper extents of the creek and
catchment. Downstream water quality in Hanging Rock Creek is likely to be of worse condition, due to the immediately adjacent golf course and industrial park which may produce high nutrient runoff.

A water quality study undertaken by WBM Oceanics Australia in 2004 for Joes Creek concluded that the creek appeared to have high water quality with no widespread anoxic conditions but that it is susceptible to die-off due to filamentous algae in the creek which enables anoxic conditions to establish.

The topography characterised by mostly steep slopes and complex landforms significantly increase the risk of erosion on disturbed ground.

Key soil characteristics that may affect the risk of erosion and sedimentation impacts on water quality include:

- Soils are strongly acidic across the entire construction boundary
- Soils are generally shallow, with limited topsoil resources
- Soils have extensive rock outcrop and shallow bedrock
- Soils have low fertility and low water holding capacity.

### 6.3.3 Potential impacts

**Construction**

The steep topography of the construction boundary increases the risk of impact to water quality where raw materials are stockpiled, hardstand areas are created or where natural surfaces are stripped and exposed.

Construction activities associated with the highest risk to water quality include:

- Stripping vegetation and topsoil, including the removal of riparian vegetation
- Stockpiling topsoil, excavated material, vegetation waste and other construction materials
- Earthworks movements, haul roads and lay down yard boundaries including vehicle and plant movements on exposed surfaces
- Culverts and drainage outlets
- Pavement removal
- Management of concrete curing and washout water
- Oil, fuels and other chemical spills and leaks from vehicles, plant and equipment, incorrect storage or incorrect usage
- Tannin leachate from re-use of mulch for erosion and sedimentation control and from mulch stockpiles.

The potential impacts to water quality during the construction of the proposal would include:

- Erosion and sedimentation that may result in sediment-laden runoff flows into the Hanging Rock Creek catchment
- Pollution of water from construction activities, construction materials and spills of liquids such as diesel, machinery oils and unleaded petrol
- Increased levels of turbidity, nutrients, metals and other pollutants, transported via sediment reducing overall water quality at receiving environments
- Potential for pH change in receiving waters from alkaline runoff from concrete curing and washout bays.

There are severe topographical constraints to constructing sediment basins, so alternative measures may need to be implemented in locations where a basin is theoretically required to manage soil loss but cannot be built. Erosion and sedimentation controls would be further investigated during detailed design.
An assessment of impacts on Hanging Rock Creek and the Batemans Marine Park that considers the NSW Water Quality Objectives and the ANZECC Guidelines would be completed during detailed design.

Due to the deep water table (refer to Section 6.2.2), it is unlikely that the construction of the proposal would have any impacts on groundwater.

**Operation**

During the operation of the proposal, the potential impacts on water quality could include:

- Pollutants such as heavy metals, hydrocarbons, gross pollutants and nutrients accumulating on the new road surface from passing traffic, atmospheric deposition and wind deposition. These pollutants may get washed off by stormwater runoff and transported to the downstream riverine system and into the bay.

- Large spills of hazardous substances from traffic incidents involving vehicles carrying hazardous substances. The spilt substances can enter the drainage system or the creek lines and find their way into the bay.

- The proposed road drainage is likely to concentrate stormwater flows to specific discharge locations along the road alignment. The steep inclines associated with the proposal area exacerbate the risk of accelerating flows and causing erosion along drainage pathways leading to increased sediment loads in stormwater. Suitable scour protection and energy dissipation measures would be incorporated into the detailed design to ensure the longevity of drainage infrastructure and prevent erosion.

The need for and options for use of bio-filtration swales to reduce water quality impacts on sensitive receiving environments would be investigated during detailed design. Bio-filtration swales would also provide capacity for improved spill containment should spills occur during operation.

### 6.3.4 Safeguard and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>WQ01 – Water quality</td>
<td>A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will:</td>
<td>Contractor</td>
<td>Detailed design / pre-</td>
<td>Clause 2.1 of Transport for NSW Specification G38 Soil and Water Management</td>
</tr>
<tr>
<td></td>
<td>• Identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction</td>
<td></td>
<td>construction</td>
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<td></td>
<td>• Include a tannin leachate management protocol in accordance with Roads and Maritime’s Environmental Direction – Management of Tannins from Vegetation Mulch (Roads and Maritime, 2012)</td>
<td></td>
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<tr>
<td></td>
<td>• Include a pre-rainfall procedure.</td>
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</tr>
<tr>
<td>Erosion and sedimentation</td>
<td>Progressive site specific Erosion and Sediment Control Plans (ESCP) will be prepared in accordance with the Blue Book by a Certified Professional in Erosion and Sediment Control (CPESC).</td>
<td>Contractor</td>
<td>Detailed / Pre-</td>
<td>Clause 2.2 of Transport for NSW Specification G38 Soil and Water Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>construction</td>
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<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
<td>Reference</td>
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<tr>
<td>Erosion and sedimentation</td>
<td>Progressive rehabilitation will be carried out during construction, whereby rehabilitation will commence as soon as practicable after works are completed in any area. Where feasible, work would be staged to reduce soil erosion risk.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 3.1 of Transport for NSW Specification G38 Soil and Water Management</td>
</tr>
<tr>
<td>Erosion and sedimentation</td>
<td>Surface water diversions will be installed in accordance with the erosion and sedimentation control plan (ESCP) prior to construction commencing.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 2.2 of Transport for NSW Specification G38 Soil and Water Management</td>
</tr>
<tr>
<td>Operational water quality</td>
<td>The need for and options for use of biofiltration swales to reduce water quality impacts on sensitive receiving environments will be investigated during detailed design.</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS311 Water Quality</td>
</tr>
<tr>
<td>Scour protection</td>
<td>Adequate and suitable scour protection measures will be incorporated into the drainage detailed design to prevent the erosion and subsequent pollutant loading of watercourses and drainage channels in accordance with Roads and Maritime Procedure for Selecting Treatment Strategies to Control Road Runoff (2003).</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS371 Water Quality</td>
</tr>
<tr>
<td>Operational water quality</td>
<td>An assessment of impacts during construction on Hanging Rock Creek and the Batemans Marine Park that considers the NSW Water Quality Objectives and the ANZECC Guidelines will be completed during detailed design.</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS311 Water Quality</td>
</tr>
</tbody>
</table>
6.4 Soils and contaminated land

A geotechnical factual report (Roads and Maritime, 2019), preliminary site investigation (PSI) and a
detailed site investigation (DSI) have been prepared for the proposal. The PSI and DSI assessment are
provided in Appendix E and Appendix F respectively.

6.4.1 Methodology

Soils within the construction boundary were assessed by undertaking a PSI within the whole boundary,
with a DSI undertaken specifically for the Old Sawmill site due to a history of known contamination within
this area. The purpose of these assessments was to determine if the site is impacted or potentially
impacted by contamination that would present a constraint to the proposal and to identify mitigation and
management measures to be implemented.

Contamination investigations included:

- Desktop site history study including reviews of public records, registers and reports
- Site walkover by environmental scientists
- Collection of three samples of potential asbestos containing material at two locations during walkover
- Development and implementation of a sampling analysis plan for the Old Sawmill site which included:
  - Excavation of 32 test pits using an excavator
  - Collection of soil samples at regular intervals
  - Field screening of soil samples using a photo-ionisation detector (PID)
  - Gauging of the three previously installed groundwater wells.
- Analysis of samples against a suite of contaminants of potential concern at a National Association of
  Testing Authorities (NATA) accredited laboratory.

The characterisation of site soils throughout this process generally involved the review of public data sets
including the NSW Statewide Seamless Geology, the Great Soil Group Classification and the Australian
Soil Classification datasets. The information from these datasets was then supplemented with additional
information from intrusive investigations in the old landfill in the south-east of site and geotechnical
investigations across the construction boundary.

Figure 6-4 shows the DSI study area for site investigations, location of samples taken during walkover and
areas of concern.

6.4.2 Existing environment

Geology and soils

The Ulladulla 1:250,000 Geological Series Sheet S1 56-13 (Geological Survey of NSW, 1966) indicates
that the geology of the construction boundary is mainly Ordovician siltstone, sandstone, claystone, and
quartzite. The construction boundary is bounded by Cambrian Wagonga beds of chert, conglomerate,
agglomerate, slate, sandstone, and phyllite to the east, and Quaternary Alluvium gravel, swamp deposits
and sand dunes to the north.

The construction boundary is characterised by light brown sandy loam topsoils up to 100 millimetres in
deepth which is underlain by light yellowish brown sandy clay loam subsoil up to 500 millimetres deep. The
embankments along Glenella Road may be prone to scouring and slope creep (where rock and soil move
slowly down the slope). The potential for erosion and sedimentation to occur would be high, due to the
steep gradients and highly erodible nature of the soils likely to be present. Recent fires have substantially reduced understory and vegetation cover resulting in large areas of bare ground, this would influence erosion risk during the construction of the proposal. During field investigations, soil samples were collected and tested to determine soil conditions along the construction boundary. A summary of the soil characteristics for the proposal is shown in Table 6-7.

Soils were generally found to be a mixture of fill or reworked materials in areas of human impact (i.e. roads and the Old Sawmill) or natural residual soils overlying a shallow bedrock which was consistent with the mapped geology.

Table 6-7: Soil characteristics (interpretations based on Hazelton and Murphy, 2016).

<table>
<thead>
<tr>
<th>Soil characteristic</th>
<th>Soil conditions in the construction boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil profile description</td>
<td>Light brown sandy loam topsoil (to 100 mm depth) and light yellowish brown sandy clay loam subsoil (to 500 mm depth – varies according to rock)</td>
</tr>
<tr>
<td>Soil field texture</td>
<td>Sandy loam to sandy clay loam</td>
</tr>
<tr>
<td>Soil pH</td>
<td>5.24 (strongly acidic)</td>
</tr>
<tr>
<td>Salinity (EC)</td>
<td>1.632 (non-saline)</td>
</tr>
<tr>
<td>Emerson Aggregate Test</td>
<td>Class 5 (non-dispersive)</td>
</tr>
</tbody>
</table>

The soils in the proposal are characterised by:

- Strongly acidic pH, which can be a significant constraint for revegetation following construction without effective amelioration with lime
- Generally shallow depths, with limited topsoil resources
- Extensive rock outcrop and shallow bedrock
- Low fertility and low water holding capacity.

**Acid Sulfate Soils**

Acid Sulfate Soil Risk Mapping (DLWC, 1997) did not identify the construction boundary as having a risk of acid sulfate soils (confirmed via the NSW Government eSpade portal, 2019). The closest mapped occurrence of potential acid sulfate soils (PASS) is about one kilometre north of the construction boundary. Site observations did not identify any landscape indicators that suggest acid sulfate soils might be present within the construction boundary.

**Contaminated Land**

There are five areas of environmental concern which have higher potential contamination risk within the construction boundary (Figure 6-4):

- A historic uncontrolled landfill located in the south-eastern corner of the proposal. The landfill was remediated by Eurobodalla Shire Council but has been identified as having asbestos containing materials
- The former sawmill (the Old Sawmill site) which has been identified as containing areas with asbestos material and a small section contaminated with hydrocarbons
- Illegal tipping along site roads and access tracks, particularly along Glenella Road
- Uncontrolled filling along Glenella Road and near the Old Sawmill site which may have resulted in the emplacement of contaminated fill materials
- A potential asbestos cement water pipe which traverses the site near the Old Sawmill site.
**Table 6-8: Areas of environmental concern and contamination sources**

<table>
<thead>
<tr>
<th>Source ID</th>
<th>Contaminant source</th>
<th>Impacted media</th>
<th>Contaminants of potential concern</th>
<th>Potential receptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>S01</td>
<td>Historical landfilling south-eastern corner of site</td>
<td>Soil vapour / air</td>
<td>Methane, carbon dioxide</td>
<td>Future site workers during occupation of temporary site structures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surface and ground water</td>
<td>Metals, PAH, TRH, BTEX, Phenols, OCP, OPP, PCB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soils</td>
<td>Asbestos, metals, PAH, TRH, BTEX, Phenols, OCP, OPP, PCB</td>
<td></td>
</tr>
<tr>
<td>S02</td>
<td>Old Sawmill and associated activities</td>
<td>Surface and ground water</td>
<td>Metals, PAH, TRH, BTEX, Phenols, OCP, OPP, PCB</td>
<td>Ecological receptors within Mogo State Forest.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soils</td>
<td>Asbestos, metals, PAH, TRH, BTEX, Phenols, OCP, OPP, PCB</td>
<td>Future site workers during excavation and construction.</td>
</tr>
<tr>
<td>S03</td>
<td>Illegal tipping along road and forestry tracks</td>
<td>Surface soils</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S04</td>
<td>Uncontrolled and imported fill materials including under site roads</td>
<td>Soils</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S05</td>
<td>Potential asbestos cement material in water pipe</td>
<td>Soils</td>
<td>Asbestos</td>
<td>Future site workers</td>
</tr>
</tbody>
</table>

PAH – Polycyclic aromatic hydrocarbons  
TRH – Total recoverable hydrocarbons  
BTEX – Benzene, toluene, ethylbenzene and xylene  
OCP – Organochlorine pesticides  
OPP – Organophosphorous pesticides  
PCB – Polychlorinated biphenyls
Areas of environmental concern

SOUTH BATEMANS BAY LINK ROAD PROJECT

Legend
- Construction boundary
- DSI study area (Coffey)
- Watercourse (LPI)
- Access track centreline
- Ancillary site

Contaminant sources
- S01 - Historical landfilling south-eastern corner of site
- S02 - Old Sawmill and associated activities
- S03 - Illegal tipping along road and forestry tracks
- S04 - Uncontrolled and imported fill materials including under site roads
- S05 - Potential asbestos cement material water pipe
The Old Sawmill site is owned by the Forestry Corporation of NSW and it is located at 225 Princes Highway in Batemans Bay, about 500 metres north of the existing intersection with Glenella Road and the Princes Highway. It occupies approximately 3.5 hectares. The site is characterised by a mixture of gravel and bitumen surfaced areas and surrounded by a two-metre-high fence.

The site had a derelict site office, potentially contained asbestos in the building fabric, which was burnt down in recent bushfires. Bonded asbestos damaged by fire can become friable in nature, such as in instances where the fibre cement sheeting has been shattered.

An underground storage tank (UST) located at the northern end of the site office was decommissioned in-situ using concrete slurry in 2014.

Soil tests done in 2014 found fill containing timber fragments, sawdust, wire, ash, plastic, sands, gravels and metals in most locations across the site and isolated concentrations of Total Recoverable Hydrocarbons (TRH) which exceeded the adopted human health criteria at one location. With the exception of asbestos, sampling undertaken by Coffey in 2019 (Appendix F) did not identify concentrations of CoPC in soil which exceeded the adopted health criteria. The 2019 soil test found, however, that several samples taken beneath a concrete slab for a former site structure had concentrations of TRH which exceeded the adopted Ecological Screening Level (ESL).

<table>
<thead>
<tr>
<th>Contamination Source</th>
<th>Contaminants of Concern</th>
<th>Plausible Exposure Pathways</th>
<th>Receptors</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC1: Impacts arising from historical use as sawmill</td>
<td>TRH, BTEX, PAH, Heavy Metals, OCP, OPP, PCB, VHC and Asbestos</td>
<td>Inhalation of soil and dusts, Ingestion of soil, Dermal contact with soil, Infiltration and groundwater migration</td>
<td>Construction workers, Future site users, Ecological receptors including aquatic receptors</td>
<td>Results from sampling and investigation during 2019 did not identify contaminants in exceedance of adopted commercial / industrial human health and ecological screening criteria. However, sampling was able to further constrain high concentration TRH (C_{16}-C_{34}) impacts (identified in 2014) as being located beneath a concrete slab for a former site structure centrally located within the Old Sawmill compound. Potential for impacts may arise if sub-slab soils are disturbed.</td>
</tr>
<tr>
<td>AEC2: Fill materials of unknown quality present across sawmill site</td>
<td>TRH, BTEX, PAH, Heavy Metals, OCP, OPP, PCB and Asbestos</td>
<td>Inhalation of soil and dusts, Ingestion of soil, Dermal contact, Infiltration and groundwater migration</td>
<td>Construction workers, Future site users, Ecological receptors including</td>
<td>Significant quantities of fill materials were noted across the Old Sawmill site. However, analysis for CoPC identified a single sample with an exceedance of ecological screening criteria for copper. Potential for impacts from contamination in fill are low but</td>
</tr>
<tr>
<td>Contamination Source</td>
<td>Contaminants of Concern</td>
<td>Plausible Exposure Pathways</td>
<td>Receptors</td>
<td>Discussion</td>
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<tr>
<td>AEC3: Impacts to soil and groundwater attributed to abandoned diesel UST</td>
<td>TRH, BTEX, PAH and lead</td>
<td>Inhalation of soil and dusts, Ingestion of soil, Dermal contact, Infiltration and groundwater migration</td>
<td>Construction workers, Future site users, Ecological receptors including aquatic receptors</td>
<td>Previous reports indicate that the UST was decommissioned in-situ in 2014 by backfilling with concrete slurry and soil sampling from areas around the tank have not indicated any TRH contamination in soil. Groundwater was not encountered onsite in 2019 within three wells installed to a depth of approximately 10 m. Based on the available information potential impacts from the abandoned UST are low and would likely only require management if the UST is to be removed.</td>
</tr>
<tr>
<td>AEC4: Contamination arising from fire damage to former buildings, poor demolition practices or deterioration of former structures containing hazardous building materials within the fabric</td>
<td>Asbestos and lead</td>
<td>Inhalation of soil and dusts, Ingestion of soil</td>
<td>Construction workers, Future site users</td>
<td>Soils analysis has not identified lead in surface soils at levels that would present a risk to future site users. Two asbestos fibre cement fragments were identified on the surface during the 2019 investigation, while a remnant site structure (former site office) was observed to have asbestos fibre cement sheeting cladding. This structure was destroyed during the 2019/2020 bushfires which impacted the site, potentially creating a friable asbestos risk. As a result of these items, asbestos may present a constraint to the proposed site use that would require possible remediation and/or management.</td>
</tr>
</tbody>
</table>

TRH - Total Recoverable Hydrocarbons  
BTEX – Benzene, Toluene, Ethylbenzene, Xylene  
OCP – Organochlorine Pesticides  
PCB – Polychlorinated Byphenyls  
PFAS – Per and Polyfluorinated substances.  
PAH – Polycyclic Aromatic Hydrocarbons  
OPP – Organophosphorous Pesticides  
VHC – Volatile Halogenated Compounds
6.4.3 Potential impacts

Construction activities would involve the use of plant and equipment, excavation works potentially uncovering areas of unknown contaminated land and temporary stockpiling of cleared vegetation. Potential impacts on soils include:

- Contamination from vehicle wash down areas
- Contamination from the incorrect management of vehicle refuelling
- Contamination from the incorrect storage of fuel, chemical and material storage
- Tannin leachate from clearing, mulching and stockpiling (if any) impacting biological oxygen demand in receiving waters
- Excavation and disturbance of existing contaminated material.

The most significant contamination risk within the site that would require consideration and management during site establishment and construction is asbestos material. Further investigations would be carried out prior to construction to determine the presence of friable and non-friable asbestos and required management measures. An Asbestos Management Plan (AMP) would be prepared, informed by an investigation by a qualified, competent person. The AMP would be developed in accordance with SafeWork NSW Code of Practice and in consultation with Eurobodalla Shire Council and Forestry Corporation of NSW.

If asbestos material needs to be removed from site, notifications to SafeWork NSW would be carried out by an appropriate licensed asbestos removal contractor. At the completion of the asbestos removal, clearance certificates would be issued by the contractor confirming the effectiveness of asbestos removal works.

Potential for impacts from construction may arise if sub-slab soils are disturbed during construction of the ancillary compound. However, no excavation below current levels is proposed for the Old Sawmill or former landfill (S01 and S02). If excavation is required at the Old Sawmill site, the location of the identified TRH impacts and the UST would be considered and management measures requirements determined.

Operation

Accidental spillage of hazardous materials or dangerous goods, without appropriate containment, could pass into the drainage system and impact receiving waterways and ecosystems during operation of the proposal.

The likelihood of a potential spill of hazardous substances such as fuels and oils from traffic incidents would be reduced because of the proposed speed reduction on the Princes Highway and improved road design standards across the proposal.

The local topography would be changed through the upgrade of the local road network. The proposal would require excavation of about 40,000 to 50,000 cubic metres along the road alignment. Excavation works would generally occur in areas adjacent to the existing alignment and therefore would not substantially alter local topography. The embankment on the southern approach to the Princes Highway and retaining walls along Glenella Road would result in minor changes to the local topography.

6.4.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE01 – Asbestos contamination</td>
<td>Further investigations would be carried out prior to construction to determine the presence of</td>
<td>Transport for NSW / Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Transport for NSW Specification</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
<td>Reference</td>
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</tr>
<tr>
<td>SE02 – Asbestos contamination</td>
<td>friable and non-friable asbestos and required management measures.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>G36 Environment Protection</td>
</tr>
<tr>
<td></td>
<td>An Asbestos Management Plan will be prepared in accordance with the SafeWork NSW Code of Practice. The plan will include, but not be limited to:</td>
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<tr>
<td></td>
<td>• A map showing the location of asbestos containing material</td>
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<td></td>
<td>• An assessment of options for management of asbestos</td>
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<td></td>
<td>• Potential locations suitable for onsite encapsulation within the road formation</td>
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<tr>
<td></td>
<td>• Approvals, regulatory, environmental and consultation requirements for onsite encapsulation</td>
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<tr>
<td></td>
<td>• Measures to ensure the safety of site personnel and local communities during construction.</td>
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<tr>
<td>SE03 – Asbestos contamination</td>
<td>Consultation with the EPA, Eurobodalla Shire Council and Forestry Corporation of NSW will be carried out during the development of the Asbestos Management Plan.</td>
<td>Transport for NSW / Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>SE04 – Asbestos contamination</td>
<td>An unexpected finds procedure for contaminated land will be prepared as part of the CEMP.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>SE05 – Accidental spill</td>
<td>An emergency spill plan will be prepared in accordance with relevant EPA guidelines. The plan will include measures to be implemented in the event of a spill, including location of spill</td>
<td>Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
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</tr>
<tr>
<td>kits, initial response and containment, notification of emergency services and relevant authorities (including Transport for NSW and EPA officers).</td>
<td></td>
<td></td>
<td></td>
<td>Environment Protection</td>
</tr>
<tr>
<td>SE06 – Known contaminated land</td>
<td>If soils in the area where the Underground Storage Tanks (UST) is located are to be excavated or a structure built over top, further investigation will be carried out to ascertain the structural integrity of the UST and environmental management requirements to develop a suitable treatment. If removal of UST is necessary, it will be done in accordance with the applicable Underground Petroleum Storage System regulations.</td>
<td>Transport for NSW/Contractor</td>
<td>Detailed design/pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>SE07 – Known contaminated land</td>
<td>Remediation requirements for the hydrocarbon hotspot identified beneath the building slab will be investigated if the concrete slab is to be removed at the Old Sawmill site.</td>
<td>Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>

Other safeguards and management measures that would address soil and contamination impacts are identified in Section 6.3.
6.5 Traffic and transport

A traffic and transport assessment has been prepared for the proposal. The assessment is provided in Appendix H and summarised in the following sections.

6.5.1 Methodology

The traffic and transport study area (traffic study area) encompasses the broader road network to comprehensively understand the traffic impacts on the Batemans Bay CBD and the southern coastal villages. The traffic study area is shown in Figure 6-5. The traffic study area includes key roads and intersections where the traffic conditions (such as volume, delay or performance) may change as a result of the proposal.

The assessment methodology included:

- Collation and review of existing traffic data from Transport for NSW from sources including TRACKS, SCATS, automatic tube counts, permanent traffic counters and TomTom speed data
- Review of existing and future conditions taking into account different users of the transport network such as private vehicle, freight, public transport, pedestrians and cyclists.
- Analysis of historic crash data to understand current crash rate and trends in the traffic study area
- Development of a strategic traffic model, for a geographic area extending from Long Beach to Moruya, to inform the assessment of the scenarios summarised in Table 6-10.
- Assessment of the performance of the surrounding road network within the traffic study area using TRACKS and SIDRA modelling, to understand key operational characteristics such as the travel time, delays, level of service, and environmental capacity
- Assessment of impacts to pedestrians, cyclists, public transport, private vehicle and freight on the transport network:
  - During construction of the proposal
  - During operations in years 2026 and 2036, based on the scenarios assessed below.

Table 6-10: Key intersections

<table>
<thead>
<tr>
<th>Modelled scenario</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base scenario 2019</td>
<td>Road network without proposal, AM and PM peak hours</td>
</tr>
<tr>
<td>Do minimum 2026</td>
<td>Road network including committed upgrades (such as the bridge) but without the proposal, AM and PM peak hours</td>
</tr>
<tr>
<td>Proposal 2026</td>
<td>Road network including committed upgrades (such as the bridge) and with the proposal, AM and PM peak hours</td>
</tr>
<tr>
<td>Do minimum 2036</td>
<td>Road network including committed upgrades (such as the bridge) but without the proposal, AM and PM peak hours</td>
</tr>
<tr>
<td>Proposal 2036</td>
<td>Road network including committed upgrades (such as the bridge) and with the proposal, AM and PM peak hours</td>
</tr>
</tbody>
</table>
6.5.2 Existing environment

Road network and hierarchy

Key roads within the traffic study area include:

- Princes Highway – The Princes Highway is a state controlled major arterial road between Sydney and Victoria following the eastern coastline of New South Wales. It has posted speed limits ranging between 70 km/h and 90 km/h through the traffic study area. The Princes Highway between Batemans Bay Bridge and the Old Princes Highway is mostly an undivided single lane carriageway in both the northbound and southbound direction. Between the Old Princes Highway and Lattas Point Road, it consists of two southbound lanes and one northbound lane. The intersections along the Princes Highway within the traffic study area are either four-way signals or three-way priority controlled, with auxiliary right turn lanes.

- Beach Road – Beach Road is a regional road that travels through the CBD of Batemans Bay. It forms part of the north-south coastal corridor between Batehaven and Surf Beach, with a posted speed limit of 50 km/h within the CBD and 60km/h for the remainder. Beach Road between Batemans Bay and Batehaven is an undivided four lane road (two lanes in each direction). From Batehaven to Surf Beach, Beach Road is an undivided two lane road (one lane in each direction). A shared pedestrian and cycle path is provided between the CBD and Corrigans Beach Reserve (just south of the Beach Road / George Bass Drive intersection). Beyond this, a footpath is provided on one side in some locations.

- Glenella Road – Glenella Road was recently upgraded between George Bass Drive and Heron Road, and is the first stage of the South Batemans Bay Link Road. The road extends approximately 250 metres to the west of Heron Road. North-west of this, Glenella Road continues as an unsealed dirt road and connects to the Princes Highway, but is only accessible from The Ridge Road due to a barrier placed on the road to the west of Heron Road. This unsealed section of road was formally also part of The Ridge Road. The upgraded section of Glenella Road is undivided with one lane in each direction and a short westbound overtaking lane between Curtis Road and Heron Road. There is no footpath on either side of Glenella Road.

- Heron Road – Heron Road is a local road consisting of a two-way two-lane road connecting Glenella Road and Country Club Drive. It currently services a residential catchment, with informal on-street parking and no footpaths. Heron Road was extended from Catalina to intersect with Glenella Road at a priority intersection in 2018.

- The Ridge Road – The Ridge Road is an unsealed dirt road. It connects from Glenella Road and continues further south, connecting onto Tallgums Way at Surf Beach and surrounding fire trails.

- George Bass Drive – George Bass Drive is a major local road, which forms part of the north-south inland corridor between Batehaven to Surf Beach. George Bass Drive between Beach Road and Glenella Road has a posted speed limit of 60 km/h and is an undivided road with one southbound lane and one northbound lane. George Bass Drive between Glenella Road and Sunshine Bay Road has a posted speed limit of 80 km/h and is an undivided road with two southbound lanes and two northbound lanes.

- Country Club Drive – Country Club Drive is a two-way two-lane road which services a residential catchment between Beach Road and Heron Road. It has a posted speed limit of 50 km/h, with a footpath on one-side at its eastern end.

- Cranbrook Road – Cranbrook Road is a two-way two-lane local road connecting the Princes Highway to an industrial precinct, located south-west of Batemans Bay CBD. It has a posted speed limit of 50 km/h, with on-street parking, however no footpaths.
**Key Intersections**

Key intersections within the traffic study area are summarised in Table 6-11 below.

Table 6-11: Key intersections

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Suburb</th>
<th>Current Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Princes Highway / Beach Road</td>
<td>Batemans Bay, 2536</td>
<td>Traffic Signals</td>
</tr>
<tr>
<td>Beach Road / Perry Street</td>
<td>Batemans Bay, 2536</td>
<td>Roundabout</td>
</tr>
<tr>
<td>Beach Road / Old Princes Highway</td>
<td>Batemans Bay, 2536</td>
<td>Traffic Signals</td>
</tr>
<tr>
<td>Beach Road / Country Club Drive</td>
<td>Catalina, 2536</td>
<td>Traffic Signals</td>
</tr>
<tr>
<td>Beach Road / George Bass Drive</td>
<td>Surf Beach, 2536</td>
<td>Traffic Signals</td>
</tr>
<tr>
<td>George Bass Drive / Glenella Road</td>
<td>Batehaven, 2536</td>
<td>Roundabout</td>
</tr>
<tr>
<td>Glenella Road / Heron Road</td>
<td>Catalina, 2536</td>
<td>Priority Controlled</td>
</tr>
<tr>
<td>Princes Highway / Glenella Road</td>
<td>Batemans Bay, 2536</td>
<td>Priority Controlled</td>
</tr>
<tr>
<td>Princes Highway / Cranbrook Road</td>
<td>Batemans Bay, 2536</td>
<td>Traffic Signals</td>
</tr>
</tbody>
</table>

**Public transport**

Public transport within Batemans Bay is provided by buses and coaches, which cater for local and regional travel. As a regional transport hub Batemans Bay provides coach services to regional destinations, and local bus services.

Coach services on the following routes connect Batemans Bay to the surrounding regional destinations including global gateway cities (Canberra, Sydney, Melbourne) and satellite cities (Wollongong) as well as smaller towns and centres:

- Canberra (interchange with train) to Narooma via Batemans Bay
- Bomaderry (interchange with train) to Eden via Batemans Bay
- Batemans Bay to Bairnsdale (interchange with train)
- Melbourne to Sydney via Batemans Bay.

The Princes Highway is a strategic bus corridor, used by frequent bus services that connect major regional centres. The routes which public transport serves in the traffic study area includes:

- Route 857 – Batemans Bay to Long Beach (loop) via Surfside and Malneys Beach
- Route 860 – Batemans Bay to Moruya via Surf Beach and Broulee
- Route 861 – Batemans Bay to Sunshine Bay (loop) via Catalina and Batehaven.

Service frequency is generally low, with services operating every one to two hours in daytime off-peak, with additional services during peak times. Services don’t operate after 6 pm or before 7 am on weekdays and only two or three daytime services are provided for each route on weekend days.
Active transport network

The formal walking and cycling infrastructure through, and adjacent to, the traffic study area is generally either footpaths or shared paths. The majority of George Bass Drive does not have dedicated cycling facilities but is described by the Transport for NSW Cycleway Finder as having moderately difficult on-road cycling conditions. Mountain bike tracks were identified from a community based mapping system called Trailforks, which plots commonly used trails. The main trails have been identified throughout the forest areas around Deep Creek Dam and Batemans Bay. The Tinnie Track trail extends into the southern part of the traffic study area near The Ridge Road.

Parking

The traffic study area contains a mix of on-street car parking and off-street formal car parks, with the majority of parking available being unrestricted (i.e. no time limits). However, there are no parking facilities within the construction boundary.

Freight network

The current freight network in the traffic study area has limitations and route restrictions based on vehicle mass and axle group category. Within the traffic study area, route restrictions include:

- Princes Highway: Approved for use by heavy vehicles up to a 23 metre B-double and vehicles up to 4.6 metres high. 25/26 metre B-double and all higher mass limit vehicles (short combination and B-double) are not allowed
- Beach Road: Approved for use by heavy vehicles up to a 19 metre B-double between Princes Highway and the service station just south of Joes Creek only. 23 metre and larger B-doubles, and all higher mass limit vehicles (short combination and B-double), are not allowed
- All other roads: Not approved for 19 metre B-doubles or larger heavy vehicles.

Currently, short combination and B-double higher mass limit vehicles are not allowed on the Princes Highway south of the Clyde River at Batemans Bay, but are allowed north of the Clyde River. The Batemans Bay Bridge project, currently under construction, involves the replacement of the existing lifting bridge over the river with a new four-lane bridge compliant with current Australian Standards for design loading. It is expected that once the new bridge is open, the higher mass limit route restrictions would be revised by Transport for NSW and HML vehicles would be allowed on the Princes Highway through the traffic study area. The Princes Highway upgrade program also proposes to provide for PBS 2B, performance standard 2B (30 metres B-doubles) along the highway in the future.

Existing road network performance

The existing road network performance within the traffic study area has been extracted and reviewed from the TRACKS model. The Level of Service (LoS) is a key indicator used to measure the existing road network performance within the traffic study area. LoS is a summary statistic that provides an indicator of the performance of a road or intersection in a network. The LoS of a link is determined by the ratio of the traffic volume using the link to the theoretical capacity of the link (called the v/c ratio\(^1\)). Table 6-12 provides the expected traffic conditions (speed and manoeuvrability) under each LoS classification.

Review of environmental factors

South Batemans Bay Link Road

Table 6-12: LoS descriptions for link performance (Austroads, 2017)

<table>
<thead>
<tr>
<th>Level of service</th>
<th>Volume / capacity (V/C) ratio</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70 km/hr</td>
<td>90 km/hr</td>
</tr>
<tr>
<td>A</td>
<td>&lt; 0.26</td>
<td>&lt; 0.30</td>
</tr>
<tr>
<td>B</td>
<td>0.26 – 0.41</td>
<td>0.30 – 0.47</td>
</tr>
<tr>
<td>C</td>
<td>0.41 – 0.59</td>
<td>0.47 – 0.68</td>
</tr>
<tr>
<td>D</td>
<td>0.59 – 0.81</td>
<td>0.68 – 0.89</td>
</tr>
<tr>
<td>E</td>
<td>0.81 – 1.00</td>
<td>0.89 – 1.00</td>
</tr>
<tr>
<td>F</td>
<td>&gt;1.00</td>
<td>&gt;1.00</td>
</tr>
</tbody>
</table>

Table 6-13 below shows the LoS for key roads, and roads likely to be affected by the proposal, for the base year (2019) scenario. The results indicate that the key road links are currently operating acceptably with spare capacity in the base year scenario.

Table 6-13: Base year (2019) LoS for key links

<table>
<thead>
<tr>
<th>Link</th>
<th>Capacity (veh/hr)</th>
<th>Non-holiday period</th>
<th>Holiday period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM peak</td>
<td>PM peak</td>
<td>PM peak</td>
</tr>
<tr>
<td>Princes Highway (north of the proposal)</td>
<td>3600</td>
<td>0.27 (A)</td>
<td>0.26 (A)</td>
</tr>
<tr>
<td>Princes Highway (south of the proposal)</td>
<td>3600</td>
<td>0.27 (A)</td>
<td>0.26 (A)</td>
</tr>
<tr>
<td>The proposal – Glenella Road (west of Heron Road)</td>
<td>1800</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glenella Road (east of Heron Road)</td>
<td>1800</td>
<td>0.01 (A)</td>
<td>0.01 (A)</td>
</tr>
<tr>
<td>George Bass Drive (south of Glenella Road)</td>
<td>3600</td>
<td>0.35 (B)</td>
<td>0.37 (B)</td>
</tr>
</tbody>
</table>
A crash data analysis has been undertaken using crash data provided by Transport for NSW. This crash data was provided for Princes Highway and Cranbrook Road, in proximity to the proposal. A total of 29 crashes were recorded for a five-year period between 1 October 2013 and 30 September 2018. The majority of crashes recorded occurred on the bends along the Princes Highway travelling north and south of the proposal connection. One crash occurring along the Princes Highway resulted in a serious injury due to vehicle losing control and hitting an embankment. On Beach Road, the most common crashes involved collisions at intersections and rear end collisions. Throughout the traffic study area, there does not appear to be a crash trend based on the data.

**Existing intersection analysis**

Intersection analysis for the proposal was undertaken as part of the traffic and transport assessment. Table 6-14 shows the LoS categories accepted for intersections in NSW from *Traffic Modelling Guidelines* (Roads and Maritime, 2013). In urban areas, the capacity of a road network can be largely determined by the capacity of the controlling intersections.

Table 6-14: Level of service criteria for intersections

<table>
<thead>
<tr>
<th>LoS</th>
<th>Level of service description</th>
<th>Critical delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Good operation</td>
<td>Less than 14 seconds</td>
</tr>
<tr>
<td>B</td>
<td>Good with acceptable delays and spare capacity</td>
<td>15 to 28 seconds</td>
</tr>
<tr>
<td>C</td>
<td>Satisfactory operation</td>
<td>29 to 42 seconds</td>
</tr>
<tr>
<td>D</td>
<td>Near capacity</td>
<td>43 to 56 seconds</td>
</tr>
<tr>
<td>E</td>
<td>At capacity</td>
<td>57 to 70 seconds</td>
</tr>
<tr>
<td>F</td>
<td>Capacity exceeded</td>
<td>More than 70 seconds</td>
</tr>
</tbody>
</table>

Intersections operating at LoS C or better are considered satisfactory. LoS D indicates that the intersection is approaching capacity and an accident study may be required. LoS E indicates the intersection is at capacity and is generally unsuitable for non-signalised intersections. LoS F indicates that the intersection is failing and requires additional capacity.

Table 6-15 summarises the SIDRA model results for the key intersections within the traffic study area. The results are presented for the typical weekday AM and PM peaks, and for the holiday peak PM period and demonstrate that there are capacity issues at the intersection of Beach Road/ Old Princes Highway, which can result in queuing that extends into the roundabout at Beach Road / Perry Street, creating congestion in the town centre. Queueing on Orient Street (N) also obstructs some parking spaces and car park entry/exit points.
Table 6-15: 2019 base case SIDRA model results

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Type</th>
<th>DoS</th>
<th>Delay (s)</th>
<th>LoS</th>
<th>Queue (m)</th>
<th>DoS</th>
<th>Delay (s)</th>
<th>LoS</th>
<th>Queue (m)</th>
<th>DoS</th>
<th>Delay (s)</th>
<th>LoS</th>
<th>Queue (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Princes Highway / Beach Road</td>
<td>S</td>
<td>0.523</td>
<td>34.0</td>
<td>C</td>
<td>105.4</td>
<td>0.626</td>
<td>35.3</td>
<td>C</td>
<td>78.4</td>
<td>0.585</td>
<td>41.0</td>
<td>C</td>
<td>121.0</td>
</tr>
<tr>
<td>Beach Road / Perry Street</td>
<td>RB</td>
<td>0.252</td>
<td>9.5</td>
<td>A</td>
<td>11.1</td>
<td>0.369</td>
<td>10.4</td>
<td>A</td>
<td>18.4</td>
<td>0.471</td>
<td>11.5</td>
<td>A</td>
<td>26.2</td>
</tr>
<tr>
<td>Beach Road / Old Princes Highway *</td>
<td>S</td>
<td>0.864</td>
<td>43.1</td>
<td>D</td>
<td>121.0</td>
<td>0.965</td>
<td>52.0</td>
<td>D</td>
<td>165.3</td>
<td>1.055</td>
<td>72.4</td>
<td>F</td>
<td>260.3</td>
</tr>
<tr>
<td>Beach Road / Country Club Drive / Catlin Avenue</td>
<td>S</td>
<td>0.464</td>
<td>15.1</td>
<td>B</td>
<td>59.3</td>
<td>0.555</td>
<td>14.0</td>
<td>A</td>
<td>93.5</td>
<td>0.677</td>
<td>16.7</td>
<td>B</td>
<td>169.1</td>
</tr>
<tr>
<td>Beach Road / George Bass Drive</td>
<td>S</td>
<td>0.493</td>
<td>34.2</td>
<td>C</td>
<td>70.5</td>
<td>0.627</td>
<td>32.0</td>
<td>C</td>
<td>88.3</td>
<td>0.780</td>
<td>35.2</td>
<td>C</td>
<td>120.8</td>
</tr>
<tr>
<td>George Bass Drive / Glenella Road</td>
<td>RB</td>
<td>0.139</td>
<td>10.6</td>
<td>A</td>
<td>5.0</td>
<td>0.110</td>
<td>10.1</td>
<td>A</td>
<td>4.0</td>
<td>0.144</td>
<td>10.3</td>
<td>A</td>
<td>6.0</td>
</tr>
<tr>
<td>Princes Highway / Cranbrook Road *</td>
<td>S</td>
<td>0.929</td>
<td>26.9</td>
<td>B</td>
<td>60.5</td>
<td>0.579</td>
<td>23.2</td>
<td>B</td>
<td>52.6</td>
<td>0.445</td>
<td>27.5</td>
<td>B</td>
<td>81.0</td>
</tr>
</tbody>
</table>

Intersection type: S = signalised, RB = roundabout.
For signalised intersections, LoS is based on the weighted average delay of all approaches. For unsignalised intersections, LoS is based on the maximum delay of all approaches. Queue length is reported based on the 95th percentile queue for the worst approach.
* Results for Princes Highway / Cranbrook Road and Beach Road / Old Princes Highway are based on SCATS volumes.
6.5.3 Potential impacts

**Construction**

Construction of the proposed works is expected to commence in 2022 and be completed in 2023. Construction of the proposal would generate both light and heavy vehicle movements. The works would result in temporary traffic delays throughout the duration of the construction of the proposal. Potential impacts during construction would be managed through a Traffic Management Plan (TMP) that would be implemented as part of the CEMP.

Vehicle movements associated with construction would include:

- Delivery of construction materials (heavy vehicles)
- Spoil removal (heavy vehicles)
- Importation of fill material for earthworks (heavy vehicles)
- Delivery and removal of construction equipment and machinery (heavy vehicles)
- Workers travelling to, from and within the proposal’s construction boundary (light vehicles).

Access to the site for construction vehicles would be via the Princes Highway, through the Old Sawmill ancillary site, or via Glenella Road. Employee vehicles would be parked at ancillary sites.

The construction traffic impact is assessed according to the percentage increase in traffic caused during the construction phase relative to the baseline volume. The following thresholds were adopted for the construction traffic impact assessment:

- Low impact: Less than five per cent increase during construction
- Medium impact: Five to 20 per cent increase during construction
- High impact: Greater than 20 per cent increase during construction.

Table 6-16 summarises the increase in traffic volumes on key roads affected by the construction of the proposal, in comparison to the baseline traffic volumes in 2022.

Increases in traffic on other roads would be negligible as truck traffic is assumed to follow pre-defined routes. A peak increase of 305 vehicles from 2022 baseline traffic volumes is expected to occur upon commencement of construction on sections of the Princes Highway both north and south of the construction boundary. The impact on Princes Highway and Beach Road is expected to be low.

Glenella Road is expected to be used by vehicles travelling between the proposal site and the Council waste management facility at Surf Beach. Traffic volumes on Glenella Road are currently low as it only provides access to a small number of residences. While the proportional increase in traffic volumes on this road is medium, the construction traffic represents an up to 50 vehicles per day increase, which is not considered to be detrimental to the operation or safety of the road.

Glenella Road between Heron Road and the Princes Highway is proposed to be closed for the duration of construction of the proposal. Signage would be installed to re-direct road users from accessing Glenella Road from the Princes Highway and east of Heron Road. A Road Occupancy Licence (ROL) would be obtained prior to road or lane closures. Beach Road would experience low impacts during construction. Vehicle traffic is expected increase by 85 vehicles per day due to workers accessing the site and vehicles travelling to the Surf Beach Waste facility to dispose of waste generated from the proposal.
The addition of construction vehicles and speed reductions can impact the LoS on road links. LoS is estimated based on traffic density (vehicles per kilometre per lane), which is dependent on the traffic flow and average speed. The levels of impact on LoS are categorised as follows:

- Low impact: no change in LoS
- Medium impact: one level change in LoS
- High impact: two or more level change in LoS.

The speed limit on the Princes Highway through the work zone would typically be either 60 or 80 kilometres per hour, however during some specific tasks it may be reduced to 40 kilometres per hour for short-term periods. Where the speed limit is 60 or 80 kilometres per hour, the impact on vehicles would be low to moderate compared to current conditions. When the speed limit is reduced to 40 kilometres per hour, the impact will be high in that drivers will perceive a significant change from the normal operation in terms of speed and traffic density.

Table 6-17 summarises the construction impact on LoS for Glenella Road and the Princes Highway, under the worst case 40 kilometres per hour scenario. Although the impact on the Princes Highway is considered high because of the degree of change, LoS C remains an acceptable performance level during normal circumstances and the speed would only be reduced to this extent for short periods, during construction of the roundabout.

**Public transport**

Daily regional coach services operate along Princes Highway through the traffic study area in both directions. These coach services may be impacted by construction activities such as lane closures. However, the impact is expected to be minimal. The impact to other local bus services within the traffic study area is expected to be minimal as the volume of construction traffic on local roads is low.

**Active transport**

No footpaths or cycle lanes exist within the construction boundary. The Tinnie Track trail for mountain biking extends into the southern part of the traffic study area near The Ridge Road. Fencing and signage would be required to stop pedestrians, cyclists and trail users from entering the construction boundary at key access points. Posting community notifications of trail closures or changes during the construction period would likely reduce the impact of the disruption. The overall impact on active transport is minimal.
Table 6-17: Construction traffic impacts on LoS

<table>
<thead>
<tr>
<th>Road</th>
<th>2022 baseline</th>
<th>2022 construction</th>
<th>Impact level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Peak hour volume (veh/hr/ln)</td>
<td>Baseline speed limit (km/hr)</td>
<td>LoS</td>
</tr>
<tr>
<td>Princes Highway</td>
<td>485</td>
<td>90</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glenella Road</td>
<td>10</td>
<td>50</td>
<td>A</td>
</tr>
</tbody>
</table>

The peak hour volume was taken as the higher of the AM and PM peak period directional volumes.
**Operation**

The operational impacts of the proposal were assessed for network operation and intersection operation as detailed below. Other operational impacts for network connectivity, public transport, active transport and crash risk were also considered.

**Network operation impacts**

Traffic volumes are expected to reduce on Beach Road and Country Club Drive with the introduction of the South Batemans Bay Link Road. The most significant decrease in traffic volumes is over Joes Creek (north of Country Club Drive). The proposal also reduces traffic volumes within residential streets used as short cuts, such as South Street and Bavarde Avenue. These reductions are achieved by the proposal as it provides an alternative route between Princes Highway and Beach Road.

Heron Road and Glenella Road would experience an increase in traffic volume as a result of the diversion of traffic as a result of the proposal.

Figures 6-6 and 6-7 summarise the traffic volumes on key links in 2026 and 2036 for the Do Minimum and Proposal PM scenarios. AM and holiday peaks are provided in Appendix H.
Legend
- Traffic study area
- Construction boundary
- Watercourse (LPI)
- Centroid connectors

Volume differences
- less than -175
- -175 to -140
- -140 to -105
- -105 to -70
- -70 to -35
- -35 to 0
- 0 to 40
- 40 to 80
- 80 to 120
- 120 to 160
- 160 to 200
- 200 plus

Modelled volumes

PM differences 2026 volumes

FIGURE 6-6
1:25,000 Scale at A4
SOUTH BATEMANS BAY LINK ROAD PROJECT

Map Produced by APAC (SEQ T&T)
Date: 2020-2-27 | Project: 8202006301
Coordinate System: GDA94 / MGA zone 56
Map: 8202006301-GS-042-TRAFFIC_PM26Opt1Diff.qgz 02
Aerial imagery supplied by Nearmap (September, 2019)
Roads derived from TRACKS model
Traffic study area

Construction boundary

Watercourse (LPI)

Centroid connectors

Volume differences

less than -175
-175 to -140
-140 to -105
-105 to -70
-70 to -35
-35 to 0
0 to 40
40 to 80
80 to 120
120 to 160
160 to 200
200 plus

Modelled volumes

Legend

PM differences 2036 volumes

FIGURE 6-7

1:25,000 Scale at A4

SOUTH BATEMANS BAY LINK ROAD PROJECT

Map Produced by APAC (SEQ T&T)

Date: 2020-2-27 | Project: 8202006301

Coordinate System: GDA94 / MGA zone 56

Map: 8202006301-GS-048-TRAFFIC_PM36Opt1Diff.qgz 02

Aerial imagery supplied by Nearmap (September, 2019)

Roads derived from TRACKS model

25 vph

+616.0%

2036 Proposal vph

585 vph

180 vph

1135 vph

1130 vph

-0.7%

+204.0%

-8.2%

1180 vph

+4.0%

25 vph

75 vph

+616.0%

+12.5%

-8.2%

+204.0%

2036 Base vph

2036 Proposal vph

Percent change
Intersection operation impacts

The operational impacts of the proposal on intersection performance and LoS is summarised in Figure 6-8 for the AM peak, PM peak and holiday peak periods under 2026 and 2036 forecast demands, with and without the proposal.

Princes Highway / Beach Road is expected to continue to operate at LoS C up to 2036 for normal weekday and holiday periods in all scenarios. During holiday peak periods maximum queue length is expected to reduce in 2036 when compared to the Do Minimum scenario.

The Beach Road / Perry Street performance of the roundabout would be impacted from queue spillback from the Princes Highway / Beach Road Intersection during AM and PM peaks for 2026 and 2036. Queueing from the Beach Road / Old Princes Highway intersection also reaches the roundabout from the other direction. This queue is expected to be 164 metres by 2036 which would cause delays to all approaches and may induce gridlock. With the proposal, queuing decreases at these neighbouring intersections improving traffic flow at this location.

In the normal weekday AM peak, the performance of Beach Road / George Bass Drive is expected to remain at LoS C up to 2036. The 2036 PM peak period would operate at LoS D under the do minimum scenario. The intersection performance improves with the introduction of the proposal, continuing to perform at LoS C up to 2036 in both the AM and PM peak periods.

In the AM peak, the performance of Beach Road / Old Princes Highway is expected to deteriorate from LoS D in 2019 to LoS F by 2026. The average delay experienced by vehicles at this intersection during the 2036 AM peak would be 161 seconds under the Do Minimum scenario. With the proposal, the average delay would decrease to 139 seconds. In the PM peak, the performance is also expected to decline from LoS D in 2019 to LoS F by 2026. The performance of this intersection would experience similar trends in the holiday peak, where the average delay experienced by vehicles would reduce under The Proposal scenario compared to the Do Minimum, however would still operate at LoS F.

The analysis undertaken indicates that forecast traffic growth on the network is likely to result in several intersections operating over capacity in the Do Minimum scenario (without any upgrade or travel demand management interventions). The traffic analysis of The Proposal scenario indicates that the South Batemans Bay Link Road would reduce queuing and delay at several intersections and that would be free flow conditions along the new road.

As the proposal provides additional connectivity and improves network accessibility, it is likely that as users become familiar with the network, more vehicles may shift routes to Glenella Road (the proposal) to avoid congestion at intersections in the CBD and there would be further improvements in the performance of intersections on the network than is currently predicted.

The assessment of intersection performance during the operation of the proposal is further detailed in Section 6.2 of Appendix H.
Figure 6-8: Intersection performance
Freight network

The roundabout is designed for 26 metre B-doubles for movements on the Princes Highway in the north-south direction, Glenella Road is designed for a 19 metre semi-trailer. The proposal provides additional connectivity for the freight network and is flexible to accommodate larger vehicles in preparation for future upgrades to the Princes Highway.

Public transport

While the impact of the proposal on the existing public transport services is not considered to be significant, there is potential for the public transport network to benefit from the new road link through improved route options. This could increase the bus service catchment or improve travel time for routes servicing existing catchments. The public transport services are considered to remain largely unchanged when compared to the existing situation.

Active transport

The proposal would reduce traffic volumes along Beach Road. This would contribute towards improved amenity for pedestrians and cyclists using the shared path along Beach Road for travel or recreation. The proposal would also improve road shoulders along Glenella Road to the Princes Highway improving safety for cyclists that might use this road.

6.5.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
</table>
| TT01 – Traffic and transport | A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP in accordance with the Transport for NSW Traffic Control at Work Sites Manual (Roads and Maritime 2018) and QA Specification G10 Traffic Management (2019). The TMP will include:  
  - Confirmation of haulage routes  
  - Site specific traffic control measures (including signage) to manage and regulate traffic movement  
  - Requirements and methods to consult and inform the local community and other stakeholders of impacts on the local road network and active transport options  
  - Identification of access to construction sites including entry and exit locations  
  - A response plan for any construction traffic incident  
  - Measures to minimise traffic conflict and congestion that may occur due to the cumulative | Contractor | Pre-construction | Clause 2.2 of Transport for NSW Specification G10 Traffic Management |
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
</table>
|                        | increase in construction vehicle traffic
g. Monitoring, review and amendment mechanisms.                                                                                                                                                                      |                        |            |                                                                           |
| TT02 – Traffic and transport | Transport for NSW will consult with Eurobodalla Shire Council, Forestry Corporation of NSW and emergency services to ensure planned road and lane closures do not impact their activities.                                      | Transport for NSW      | Construction|                                                                           |
| TT03 – Traffic and transport | A suitable signage strategy will be developed to inform drivers of road network changes and closures, including impacts on bike trails.                                                                                   | Transport for NSW/ Contractor | Pre-construction/construction | Clause 3 of Transport for NSW Specification G10 Traffic Management          |
| TT04 – Traffic and transport | Road users, local communities and the freight industry will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays as a result of construction activities.                             | Transport for NSW / Contractor | Construction | Transport for NSW Specification G10 Traffic Management                   |
6.6 Noise and vibration

A noise and vibration assessment has been prepared for the proposal. The assessment is provided in Appendix I and summarised in the following sections.

6.6.1 Methodology

The noise and vibration assessment was prepared in accordance with:

- Road Noise Policy (DECCW 2011) (RNP)
- Interim Noise Construction Guideline (DECC, 2009) (INCG)
- At-Receiver Noise Treatment Guideline (Draft) (Roads and Maritime 2017) (ARNTG)
- Noise Criteria Guideline (Roads and Maritime 2015) (NCG)
- Noise Mitigation Guideline (Roads and Maritime 2015) (NMG)
- Noise Model Validation Guideline (Roads and Maritime 2018) (NMVG)
- Environmental Noise Management Manual (Roads and Traffic Authority 2001) (ENMM)

Noise monitoring

Unattended noise monitoring was undertaken between 6 and 20 November 2019 to characterise the existing noise environment. Noise monitoring equipment was installed at four locations near the construction boundary as shown in Figure 6-9.

The data were gathered over a period of typical traffic movement outside of school holidays. During the initial installation of the noise monitoring equipment, it was observed that traffic control (for surveyors) was in place with reduced speed zones along the Princes Highway (from 6 November 2019). As a result, noise monitoring was extended from 13 November 2019 to 20 November 2019 to ensure sufficient data had been recorded.

Noise modelling

Noise impacts on sensitive receivers from construction activities during and outside recommended standard construction hours have been assessed. 3D noise modelling software (SoundPLAN 8.1) was used to predict road traffic noise levels for the design year (2033) for comparison with the appropriate assessment criteria in accordance with the NCG. Where exceedances were predicted, suitable mitigation measures were determined in accordance with the NMG. The assessment provides a detailed analysis of the noise levels at each sensitive receiver location and compares them with the relevant construction noise management levels during and outside standard construction hours.

As shown in Figure 6-9, the noise and vibration study area consists of three noise catchment areas (NCAs) containing 10 sub-catchments where construction impacts are likely to be similar. The construction assessment only considers the impacts of construction noise generated within the construction boundary during five phases of construction:

- Phase 1 – Utility relocation
- Phase 2 – Clearing and grubbing
- Phase 3 – Earthworks and drainage
- Phase 4 – Retaining wall and batter stabilisation
- Phase 5 – Road pavement and intersection construction.
Logger

SOUTH BATEMANS BAY LINK ROAD PROJECT

Legend
- Construction boundary
- Logger location
- Watercourse (LPI)
- Primary Road (LPI)
- NCA boundary
- Proposed road design
- State Forest (LPI, 2017)
- NPWS Reserve (LPI, 2017)
- Council completed alignment SBBLR Stage 1

FIGURE 6-9
1:14,000 Scale at A4
Further details on construction phases and the plant and equipment assumed to be used in each phase can be found in Appendix I.

Stage 1 of the South Batemans Bay Link Road has been closed to the west of Heron Road, since its construction was completed by the Eurobodalla Shire Council. The proposal would enable the opening of Stage 1 to connect to the Princes Highway. The operational assessment therefore considered both Stages 1 and 2 to assess traffic noise impacts after the proposal is completed. Transition zone criteria were assessed and found not to apply to any receiver within 600 metres of the proposal.

Modelled traffic noise scenarios for operation were established in accordance with NCG guidelines and the model verified by comparing predicted to measured noise levels. Modelled scenarios for this assessment are provided in Table 6-18 below.

Existing traffic volumes were obtained from a Trans Traffic Survey carried out between 6 and 20 November 2019. Traffic volume predictions used are based on the Traffic and Transport Assessment (Appendix H). The predicted traffic volumes were provided for the year 2023 and 2033 as hourly volumes. These volumes were analysed to determine 15 and 9-hour traffic volumes to correlate with calculating $L_{A_{eq}}$ 15 hour and $L_{A_{eq}}$ 9 hour noise levels.

Table 6-18: Modelled scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Year</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2019</td>
<td>Existing situation – model verification</td>
<td>Road traffic noise model based on pre-existing road alignments and surveyed traffic volumes for the year 2019</td>
</tr>
<tr>
<td>2</td>
<td>2023</td>
<td>Build - year of opening</td>
<td>Predicted 2023 traffic volumes with the proposal roads and adjoining roads (i.e. Princes Highway, Heron Road and George Bass Drive).</td>
</tr>
<tr>
<td>3</td>
<td>2023</td>
<td>No build - year of opening</td>
<td>Predicted no build 2023 traffic volumes and pre-existing road alignments (i.e year 2023 model if the proposal were not to go ahead)</td>
</tr>
<tr>
<td>4</td>
<td>2033</td>
<td>Build - 10 years after opening</td>
<td>Predicted 2033 traffic volumes with the roads included in the proposal as well as adjoining roads (i.e. Princes Highway, Heron Road and George Bass Drive).</td>
</tr>
<tr>
<td>5</td>
<td>2033</td>
<td>No build - 10 years after opening</td>
<td>Predicted no build 2033 traffic volumes and pre-existing road alignments (i.e. year 2033 model if the project were not to go ahead)</td>
</tr>
</tbody>
</table>

Results were then assessed against noise criteria to determine if there were any resulting increases in road traffic noise at nearby receivers and sensitive receivers that would require consideration of noise mitigation due to impacts from the proposal.
Noise levels

Noise levels are reported in A-weighted decibel levels, known as dB(A). dB(A) denotes a single-number sound pressure level that includes a frequency weighting (“A-weighting”) to reflect the subjective loudness of sound level. The frequency of a sound affects its perceived loudness. Human hearing is less sensitive at low and very high frequencies, and so the A-weighting is used to account for this effect. Some typical dB(A) levels are shown in Figure 6-10 adjacent.

Construction noise assessment

The INCG was used to develop the construction noise criteria identified in Table 6-19. The INCG recommends noise management levels (NML) to reduce the likelihood of noise impacts arising from construction activities, for work during standard construction hours:

- The ‘noise affected level’ represents the point above which there may be some community reaction to noise. The noise affected level is calculated by adding 10 dB(A) to the rating background level
- The ‘highly noise affected level’ represents the point above which there may be strong community reaction to noise. The INCG specifies that the highly noise affected level is 75 dB(A).

For any works outside recommended standard construction hours:

- A strong justification would typically be required
- The proponent should apply all feasible and reasonable work practices to meet the noise affected level
- Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

The CNVG stipulates sleep disturbance distances for various plant and construction scenarios. Receivers located within these distances are at risk of sleep disturbance. The sleep distances are based on achieving a construction noise impact of 65 dBA LA_{Max} or less at a façade with an open window.

Operational road traffic noise assessment

The road traffic noise criteria used to determine the design benchmark is shown in Table 6-19 below and is based on:

- RNP – The policy provides definitions of the functional class of the road under consideration
- NCG – Noise criteria are assigned to sensitive receivers using the NCG. The NCG provides guidance on how to apply the NSW RNP.
Table 6-19: Road traffic noise criteria

<table>
<thead>
<tr>
<th>Applicable assessment criteria</th>
<th>Assessment criteria, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day (7am-10pm)</td>
</tr>
<tr>
<td>Residential receivers</td>
<td></td>
</tr>
<tr>
<td>Target Noise Criteria –</td>
<td>L&lt;sub&gt;Aeq&lt;/sub&gt; (15 hour) 60 (external)</td>
</tr>
<tr>
<td>Redeveloped and Existing Roads</td>
<td></td>
</tr>
<tr>
<td>Target Noise Criteria – New Roads</td>
<td>L&lt;sub&gt;Aeq&lt;/sub&gt; (15 hour) 55 (external)</td>
</tr>
<tr>
<td>Relative Increase Criteria</td>
<td></td>
</tr>
<tr>
<td>(1) Significant Increase Criteria</td>
<td>Design year “no build” (road traffic) noise level + 12.0 dBA</td>
</tr>
<tr>
<td>(2) Acute Criteria</td>
<td></td>
</tr>
<tr>
<td>Sleep Disturbance Criteria</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Notes:
(1) This applies when the no build noise levels for that year are predicted to be exceeded.
(2) This applies to predicted impacts from proposal only for the year of opening.

Human comfort criteria (vibration)
The human comfort criteria were determined by considering the Assessing Vibration: A Technical Guideline and British Standard (BS) 6472 – 1992, Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz). Typically, construction activities generate ground vibration of an intermittent nature (Table 6-20).

Table 6-20  Human comfort intermittent vibration limits

<table>
<thead>
<tr>
<th>Location</th>
<th>Assessment period</th>
<th>Preferred values</th>
<th>Maximum values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent vibration (vibration dose values, VDV, m/s&lt;sup&gt;1.75&lt;/sup&gt; 1-80Hz)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residences</td>
<td>Daytime (7am to 10pm)</td>
<td>0.20</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Night-time (10pm to 7am)</td>
<td>0.13</td>
<td>0.26</td>
</tr>
<tr>
<td>Offices, schools, educational institutions and places of worship</td>
<td>Day or night-time</td>
<td>0.40</td>
<td>0.80</td>
</tr>
</tbody>
</table>

At 0.30 mm/s, vibration might be just perceptible in residential environments for most vibration frequencies associated with construction. Vibration over 1.00 mm/s would require notice as it may cause a level of discomfort in residential environments and at 10 mm/s vibration would be likely to be intolerable for longer exposures.
**Building damage criteria**

The minimum ‘safe limit’ of vibration at low frequencies for commercial and industrial buildings is summarised in Table 6-21. The structural damage criteria are derived from the German Standard DIN 4150-3: 1999 Structural Vibration – Part 3: Effects of vibration on structures minimum safe levels of vibration at different frequencies for commercial and residential buildings.

Table 6-21: Structural building criteria (DIN 4153, 1999)

<table>
<thead>
<tr>
<th>Type of structure</th>
<th>Guideline values for vibration velocity, mm/s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 to 10 Hz</td>
</tr>
<tr>
<td>Buildings used for commercial purposes, industrial buildings and buildings of similar design</td>
<td>20</td>
</tr>
<tr>
<td>Dwellings and buildings of similar design and/or use</td>
<td>5</td>
</tr>
<tr>
<td>Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Group 1 or 2 and have intrinsic value (e.g. buildings under a preservation order)</td>
<td>3</td>
</tr>
</tbody>
</table>

**6.6.2 Existing environment**

The noise and vibration study area consists of suburban residential land to the east and southeast of the construction boundary. The proposal is primarily located within the Mogo State Forest with commercial businesses residing to the north towards Batemans Bay CBD. The proposed works would be primarily located along the existing Glenella Road corridor. Works on the Princes Highway associated with the construction of the roundabout and tie-in works to the completed part of Glenella Road (Stage 1) are also proposed. Sensitive receivers potentially affected are residential dwellings located to the north and northeast of the construction boundary within the suburb of Catalina, as well as north and south of Stage 1 of the South Batemans Bay Link Road project.

Residential dwellings near the proposal are a mix of one and two storey dwellings separated from the proposal by large tracts of state forest. The nearest residential property is located on Heron Road, 370 metres east of the construction boundary.

To determine the potential impacts of noise and vibration from the proposal, the noise sensitive receivers were divided into three NCA’s and ten sub-catchments. The three NCA’s are described below and shown in Figure 6-9:

- **NCA 1 (Albatross Road)** – Suburban residential area to the northeast of the proposal. The observed noise environment for the area is predominantly affected by distant road traffic from Glenella Road, fauna and wind turbulence through vegetation.
- **NCA 2 (Heron Road)** – Suburban residential area to the east of the proposal. The observed noise environment for the area is predominantly affected by intermittent traffic noise from Heron Road, distance traffic noise from the local road network, fauna and wind turbulence through vegetation.
- **NCA 3 (Glenella Road)** – Suburban residential area to the southeast of the proposal. The observed noise environment for the area is predominantly affected by intermittent traffic noise from Glenella Road, distant traffic noise from the local road network, fauna and wind turbulence through vegetation.
The rating background level (RBL) for each site was determined in accordance with the Noise Policy for Industry (EPA, 2017) (NSW NPI). Existing background noise levels were measured at NCA 1, NCA 2 and NCA 3. The results of the noise monitoring is presented in Table 6-22.

Table 6-22: Existing background noise levels

<table>
<thead>
<tr>
<th>Noise catchment area</th>
<th>Noise monitoring location</th>
<th>Measured road (address)</th>
<th>Measured rating background noise level, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Day 7am-6pm</td>
</tr>
<tr>
<td>NCA 1</td>
<td>2</td>
<td>66 Albatross Road, Catalina</td>
<td>33</td>
</tr>
<tr>
<td>NCA 2</td>
<td>3</td>
<td>Heron Road (83 Heron Road, Catalina)</td>
<td>33</td>
</tr>
<tr>
<td>NCA 3</td>
<td>4</td>
<td>Glenella Road (34 Jedel Drive, Catalina)</td>
<td>34</td>
</tr>
<tr>
<td>Overall RBL (applicable to all locations)</td>
<td></td>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>

Table 6-23 provides a summary of measured road traffic noise levels at monitoring locations where traffic noise was identified to be a dominant noise source. During the monitoring period, traffic volumes for Glenella Road and Heron Road carried less than 240 vehicles during the day period (7am-10pm) and less than 15 vehicles during the night period (10pm-7am). It is therefore likely that the measured noise levels for these locations were affected by contributions from other ambient noise sources.

Table 6-23: Measured road traffic noise levels

<table>
<thead>
<tr>
<th>Location</th>
<th>Measured road (address)</th>
<th>Measured noise level, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image.png" alt="Image" /></td>
<td><img src="image.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Notes:
1. Due to low traffic volumes on Glenella Road and Heron Road at night time, a measurement average which excludes periods without recorded traffic is provided for information.
2. $L_{Aeq 1 hour}$ limits do not apply to arterial, sub-arterial, or collector roads.

**Noise management levels and sleep disturbance**

Table 6-24 presents the applicable construction noise management levels and sleep disturbance limits for standard and non-standard hours based on measured rated background levels for all NCAs.
6.6.3 Potential impacts

Construction

The majority of construction work would be undertaken during standard construction hours whenever practicable. The proposal is to be constructed primarily along Glenella Road and the Princes Highway. Glenella Road traverses through heavily vegetated and steep topography that could result in the propagation of noise during construction work to surrounding sensitive receivers.

Construction generated traffic would be limited to workers’ vehicles and material transport. As per Table 6-24, residential receivers exposed to levels of construction noise above 75 dBA are considered highly noise affected with dwellings exposed to levels above the noise management level (NML) or daytime RBL +10 dBA considered noise affected.

Table 6-25 provides summary of the number of sensitive receivers that may be potentially impacted by construction during each phase on construction during standard and non-standard hours. Each floor of each exposed façade of each building is identified as a separate receiver.

Table 6-25: Predicted number of sensitive receiver locations impacted by construction noise

<table>
<thead>
<tr>
<th>Phase No.</th>
<th>Construction phase description</th>
<th>Standard hours (noise impact &gt; 45 dBA)</th>
<th>Non-standard-hours (noise impact &gt; 35 dBA)</th>
<th>Highly noise affected (noise impact &gt; 75 dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Utility relocation works</td>
<td>36</td>
<td>175</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Clearing and grubbing</td>
<td>82</td>
<td>228</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Earthworks and drainage</td>
<td>123</td>
<td>263</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Retaining wall and batter stabilisation</td>
<td>123</td>
<td>242</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Road pavement and intersection construction</td>
<td>15</td>
<td>199</td>
<td>0</td>
</tr>
</tbody>
</table>

Construction noise would be noticeable and sometimes clearly audible through different construction phases across sections of all NCAs. During standard hours, some residents located on Albatross Road would potentially experience moderately intrusive levels of noise during the construction of retaining walls and batter stabilisation. During non-standard hours, clearly audible to moderately intrusive construction noise may be experienced by some residents located along Albatross Road, Gannet Place, Heron Road and
Vista Avenue. The construction of the overall proposal would not result in any exceedances of the highly affected noise level of 75 dBA during standard construction hours during any phase of construction assessed.

Where works exceed target criteria for standard and non-standard hours of operation, mitigation measures would be employed in accordance with the CNVG (Section 7.2 of Appendix I). These may include, but are not limited to:

- Notification via letterbox or phone call
- Respite periods.

The most vibration intensive equipment expected to be used during construction of the proposal is vibratory rollers. The safe working distance for this equipment is 100 metres for human vibration response. Given that the nearest sensitive receiver is about 370 metres from the construction boundary, construction vibration impacts are expected to be minimal.

No blasting is anticipated during the construction phase of the proposal. If blasting is required, further detailed assessment would be required and a blast management plan prepared.

**Operation**

The proposal would result in both a reduction in traffic volumes on Beach Road and an increase in traffic volumes along Glenella Road. Traffic noise levels for the year 2033, ten years following completion of the proposal, are predicted to exceed the criteria at three residential locations and 1 non-residential location. These include:

- Two of the residential receivers located in close proximity to Stage 1 of the South Batemans Bay Link Road and one residential receiver on Heron Road, which are predicted to exceed the noise criteria by 1 dBA for the year 2033
- A non-residential receiver is predicted to be impacted at levels exceeding the criteria by up to 10dBA, with predicted noise levels after opening of the proposal of up to 6 dBA higher than the corresponding 'no build' predicted levels.

In accordance with the NMG, these four properties would be eligible for consideration of at-property acoustic treatments to mitigate traffic noise intrusion.

### 6.6.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
</table>
| NV01 – Noise and vibration | A Noise Management Plan (NMP) will be prepared and implemented as part of the CEMP. The NMP will generally follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and identify:  
  - All potential significant noise and vibration generating activities associated with the activity  
  - Feasible and reasonable mitigation measures to be implemented during construction | Contractor     | Pre-construction | Clause 4.6 of Transport for NSW Specification G36 Environment Protection |
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>NV02 – Noise and vibration</td>
<td>A notification and noise complaint handling procedure.</td>
<td>Contractor</td>
<td>Detailed design / pre-construction</td>
<td>Clause 4.6 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td></td>
<td>All sensitive receivers likely to be affected by construction noise, including out of hours works, will be notified at least 5 days prior to commencement of the activity. The notification will provide details of:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• The project</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• The construction period and construction hours</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Contact information for project management staff</td>
<td></td>
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<tr>
<td></td>
<td>• Complaint and incident reporting</td>
<td></td>
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<tr>
<td></td>
<td>• How to obtain further information.</td>
<td></td>
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</tr>
<tr>
<td>NV03 – Out of hours works</td>
<td>Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Any out of hours works needed would be carried out in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime 2016).</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.6 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
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</tr>
<tr>
<td>NV04 – Operational noise mitigation</td>
<td>Operational noise mitigation requirements will be reviewed during detailed design. Any necessary at-property treatments will be agreed upon and implemented in consultation with property owners and in accordance with Transport for NSW’s Noise Mitigation Guidelines.</td>
<td>Transport for NSW</td>
<td>Detailed design/construction</td>
<td>Roads and Maritime Noise Mitigation Guideline (2015).</td>
</tr>
</tbody>
</table>
6.7 Aboriginal heritage

An Aboriginal Cultural Heritage Assessment Report (CHAR) has been prepared for this proposal. The assessment is provided in Appendix J and is summarised in the following sections.

6.7.1 Methodology

The Aboriginal cultural heritage assessment and associated consultation was undertaken in accordance with the following guidelines:

- Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime 2011a) (PACHCI)
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (Department of Environment Climate Change and Water 2010)
- Guide to investigating, assessing, and reporting on Aboriginal Cultural Heritage in NSW (OEH 2011)
- Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (OEH 2010).

The methodology used for this assessment included:

- Extensive searches of the Aboriginal Heritage Information Management System (AHIMS) was carried out on the 9 April 2019, 6 August 2019 and 30 September 2019 to identify registered (known) Aboriginal sites or declared Aboriginal places within or adjacent to the heritage study area (Figure 6-11). Three previously registered AHIMS sites had been recorded within the heritage study area.
- Other registers, databases and the Eurobodalla LEP 2012 were also searched for any known Aboriginal sites in the vicinity of the heritage study area. No additional Aboriginal archaeological sites or Aboriginal heritage items were recorded on these databases within the heritage study area.
- A field survey was undertaken on 29 July 2019 with representatives from the BBLALC, MLALC and the Native Title Claimant, the South Coast People. Subsequent to the field survey, BBLALC provided a cultural heritage survey report to Transport for NSW in accordance with the PACHCI. The survey identified one Artefact Scatter (South Batemans Bay Link Road AFT 1) and one Potential Archaeological Deposit (South Batemans Bay Link Road PAD 1).
- Archaeological test excavations were carried out by Kelleher Nightingale Consulting and field representatives of registered Aboriginal parties in January 2020 at the AFT1 and PAD1 locations. The test excavations were used to confirm the level of significance of the site and to identify potential management measures.
- Consultation with Aboriginal parties was carried out as described in Section 5.3 and in accordance with Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (OEH 2010).
- The two cultural heritage sites were assessed for their significance based upon the principles of the Australia ICOMOS Burra Charter, 1999 (Australia ICOMOS 1999) and found to be of low archaeological significance (Appendix J).
Removed due to cultural sensitivity
6.7.2 Existing environment

Archaeological heritage

Three previously registered AHIMS sites were recorded within the heritage study area. All three sites were open context artefact sites which had been destroyed in accordance with a previous NPWS Section 90 Consent to Destroy and Permit to Salvage and are no longer extant. The field survey identified one Artefact Scatter (South Batemans Bay Link Road AFT 1) and one Potential Archaeological Deposit (South Batemans Bay Link Road PAD 1) (Figure 6-11). Both the artefact scatter and PAD area were identified on crest landforms along the Graveyard Spur ridgeline descending south to north across the heritage study area.

The results of the archaeological survey corresponded with the results of previous archaeological investigations within and in the vicinity of the construction boundary, which indicated that the ridgelines and crests across the heritage study area may have functioned as pathways between the coast and inland regions.

The archaeological test excavation identified the presence of a low density archaeological deposit at both sites and the PAD 1 was confirmed as an artefact scatter and renamed South Batemans Bay Link Road AFT 2. These Aboriginal archaeological sites were found to exhibit low archaeological significance.

Aboriginal objects recovered from the test program are considered to be part of the wider spread of archaeological material associated with transitory Aboriginal landscape use of the Graveyard Spur ridgeline, but in and of themselves are only a remnant deposit and do not offer additional scientific information related to Aboriginal landscape activity within the heritage study area.

Cultural heritage

The heritage study area as described in Appendix J is located within a region that was important to and intensively used by Aboriginal people in the past. Members of the contemporary Aboriginal community continue to experience connection with the local area through cultural and family associations.

Oral history and the archaeological record give insight into the many thousands of years of history of Aboriginal people’s occupation of the Batemans Bay region. As would be expected in such a resource rich area the early European records give an impression of a well-populated region. Prior to the intrusion of Europeans, Aboriginal people in the region lived in small residence groups of around fifteen to twenty people, associated into larger groups of perhaps seventy to a hundred people. Aboriginal people of the region were closely connected through ceremonial cycles, trade networks and kinship to communities north to Sydney, south to Victoria and west up onto the tablelands and alps. Patterns of movement along the coast and between the coast and the Monaro hinterlands existed long before European arrival in the area and were associated with resource sharing (e.g. whale meat, fish flushes, bogong moths), for ceremonial purposes, including initiation and warfare, and for trade and marriage exchange.

In more recent times Hanging Rock and Joes Creek, located to the east of the heritage study area and the southern side of Batemans Bay township, were particularly important places of residence, recreation and resource well into the second half of the twentieth century.

The cultural heritage survey reports received from BBLALC, MLALC and the Native Title Claimant generally indicated that the heritage study area had been subject to extensive land use disturbance and that no significant Aboriginal cultural heritage features of value had been identified within it.
6.7.3 Potential impacts

Construction

The entirety of the area within the construction boundary would be impacted to some degree by construction and associated works. The construction of the proposal would directly impact the South Batemans Bay Link Road AFT 2 as a result of the construction of the proposed roundabout.

Refinements to the design and the construction boundary have resulted in a reduction on the level of impact to South Batemans Bay Link Road AFT 1. Table 6-26 summarises the expected level of impact and consequences of harm.

Table 6-26: Aboriginal heritage sites within the construction boundary

<table>
<thead>
<tr>
<th>Site Name</th>
<th>AHIMS ID</th>
<th>Description</th>
<th>Significance</th>
<th>Type / Degree of Harm</th>
<th>Consequence of Harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Batemans Bay Link Road AFT 1</td>
<td>TBC</td>
<td>Low density surface artefacts and subsurface deposit dispersed across bench landform on ridgeline spur</td>
<td>Low</td>
<td>Direct / Partial</td>
<td>Total loss of value</td>
</tr>
<tr>
<td>South Batemans Bay Link Road AFT 2</td>
<td>TBC</td>
<td>Low density subsurface deposit dispersed across crest landform on ridgeline spur</td>
<td>Low</td>
<td>Direct / Total</td>
<td>Total loss of value</td>
</tr>
</tbody>
</table>

An Aboriginal Heritage Impact Permit (AHIP) would be required for the proposal under Section 90 of the *National Parks and Wildlife Act 1974*. Should any unidentified Aboriginal heritage items be discovered during construction, works near the find would cease and *Transport for NSW’s Unexpected Heritage Items – Heritage Procedure 02* (Roads and Maritime 2015) would be followed.

The remaining areas within the construction boundary are not expected to impact upon any known Aboriginal Heritage items or areas where potential items may be present.

Operation

No further impacts to Aboriginal heritage would occur during operation of the proposal.

6.7.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>AH01 – Aboriginal heritage</td>
<td>An Aboriginal Heritage Management Plan (AHMP) will be prepared in accordance with the Procedure for Aboriginal cultural heritage consultation and investigation (Roads and Maritime)</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td><em>Clause 4.9 of Transport for NSW Specification G36 Environment Protection</em></td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
<td>Reference</td>
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<td>--------------------------------</td>
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<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2012) and <em>Standard Management Procedure - Unexpected Heritage Items</em> (Roads and Maritime 2015). It will provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The AHMP will also include considerations based on recommendations made during the Aboriginal Cultural Engagement Day regarding communication methods.</td>
<td>Transport for NSW/ Contractor</td>
<td>Detail design/ pre-construction</td>
<td>Clause 4.9 of Transport for NSW Specification G36 Environment Protection</td>
<td></td>
</tr>
<tr>
<td>AH02 – AHIP</td>
<td>An Aboriginal heritage impact permit (AHIP) will be sought for the construction boundary.</td>
<td>Transport for NSW</td>
<td>Detail design/ pre-construction</td>
<td>Clause 4.9 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>AH03 – Aboriginal heritage</td>
<td>Artefacts recovered during test excavations will be re-buried at a suitable location in consultation with the Aboriginal community.</td>
<td>Transport for NSW</td>
<td>Detail design/ pre-construction</td>
<td>Clause 4.9 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>AH04 – Unexpected finds</td>
<td><em>The Standard Management Procedure - Unexpected Heritage Items</em> (Roads and Maritime 2015) will be followed in the event that an unknown or potential Aboriginal object, including skeletal remains, is found during construction.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.9 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>
6.8 Non-Aboriginal heritage

A Preliminary Historical Archaeological Assessment (PHAA) was completed as part of the non-Aboriginal heritage impact assessment. The PHAA is provided in Appendix K and summarised in the sections below.

6.8.1 Methodology

The study area of the PHAA consisted of the area within the construction boundary. The assessment was prepared in accordance with the International Council on Monuments and Sites (ICOMOS) and the Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance, 2013 (Burra Charter), the practices and guidelines of the Biodiversity and Conservation Division of DPIE, the Eurobodalla LEP and the Batemans Bay Regional Centre Development Control Plan 2011. The assessment methodology included:

- A review of documentary sources and field investigations to identify any potential recorded or unrecorded historical heritage items and assess the potential for any new unrecorded historical heritage items located within the construction boundary. This review included: Inspection of title documents, Crown plans and historical aerial images available through NSW Department of Lands and research undertaken through the National Library of Australia, NSW State Library, NSW State Archives and the Eurobodalla Shire Council Local Studies Collection
- Field inspection carried out on 15 October 2019
- A search of available local, state, national and world heritage registers, to confirm the likely presence of non-Aboriginal heritage values within the Batemans Bay area, including the construction boundary
- Assessment of archaeological potential based on the anticipated likelihood for the survival of buried structural fabric and cultural deposits as well as an estimation of archaeological integrity
- Assessment of cultural significance of items found to have moderate archaeological potential based on the Heritage Council's Assessing Significance for Historical Archaeological Sites and 'Relics' (2009) seven criteria
- Recommendations for management and mitigation measures in line with statutory requirements.

6.8.2 Existing environment

**Historic context of the region**

The first Europeans to pass through the Batemans Bay area by land were survivors from the shipwreck of the Sydney Cove, who reached the banks of the Clyde River on 16 April 1797. However, it was not until 1841 that the subdivision of Batemans Bay began. European settlement of the Batemans Bay region increased from the 1820s onwards.

Vegetation clearing for the construction of roads between Cooks River and Batemans Bay commenced in 1841. In 1874, it was noted that a great deal of development had occurred with the town including the presence of a store, sawmill, railway with iron rails, extensive raised wharf for loading timber, another sawmill on the opposite side of the river, a schoolhouse and a public house. By 1890, the area had an approximate population of 250 people.

In the 20th century, Batemans Bay grew as a regional centre largely due to it being the closest seaside town to the new national capital Canberra, becoming a popular holiday destination particularly for Canberra residents. As such, tourism is now the most important industry for the Batemans Bay economy. The demise of coastal shipping in the early 1950s and the South Coast’s subsequent reliance on road transport led to the construction of the Batemans Bay Bridge in 1956. While forestry activities continue in the State Forests
surrounding Batemans Bay, the last sawmill located in the area closed in 2012. Oyster farming, however, remains a significant and growing industry to this day.

**Proposal area**

Following the settlement and establishment of the town of Batemans Bay in the early 1840s, the land comprising the construction boundary remained undeveloped. The proposal is located within the Mogo State Forest, which was established during the 19th century. The earliest development within the construction boundary was the construction of a road that stretched from Batemans Bay to Moruya in the late 1860s following the first survey of the township in 1859. This road eventually became part of the Princes Highway in the late 1920s. The formation of the Princes Highway 1920 by the Main Roads Board consolidated several parallel roads into a single route between Sydney and Victoria resulting in an increase of people travelling through the area.

A search of the Eurobodalla LEP, NSW State heritage database and the Australian heritage database found no heritage items listed within or adjacent to the construction boundary. A copy of the NSW State heritage database search is found in Appendix K.

There is low to nil potential for any other archaeological remains to be present in the construction boundary due to the lack of documented historical occupation of the location.

**Old Sawmill site**

In 1964, Jack Malloy established the timber sawmill (Old Sawmill) site in the northern portion of the construction boundary which was eventually acquired in 2005 by Boral Timber Pty Ltd. In 2012, the sawmill ceased operations due a combination of the site requiring upgrades and a slowdown in the economy in Batemans Bay.

The Old Sawmill site is not listed on the State Heritage Register (SHR) and is not subject to any other statutory heritage registers listings and orders.

There has been no occupation within the construction boundary since a fire burnt down the sawmill between 2011 and 2013, and the 2019-20 bushfires further damaged the structures that remained at the site. Although the fires are likely to have impacted upon any archaeological remains of the former timber mill, there is potential for structural remains, including footings of buildings, to still be present. Any archaeological remains that may be present are however not considered to be of heritage significance.

These potential remains are unlikely to provide any additional information that is not already known regarding the operations of the Old Sawmill site in Batemans Bay as well as functions and processes of timber mills in NSW operating from the mid-20th century onwards. As such, the archaeological remains found within the construction boundary are not considered to meet the Heritage Significance Criteria at either a State or local level.

### 6.8.3 Potential impacts

**Construction**

There are no registered heritage items within the construction boundary. An assessment of significance was completed for the Old Sawmill site and concluded that it does not meet Heritage Significance Criteria at either a State or local level.

Most of the construction boundary has been found to have low archaeological potential. As such, the proposal is unlikely to impact upon any historic archaeological relics of heritage significance. In the event that historic archaeological relics are found during the construction of the proposal, all works in the

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**South Batemans Bay Link Road**

**Review of environmental factors**
immediate vicinity would cease immediately and the Biodiversity and Conservation Division of DPIE would be notified in accordance with Section 146 of the *NSW Heritage Act 1977*. A qualified archaeologist would be contacted to assess the potential relic and consult with DPIE regarding the most appropriate course of action.

*Operations*

The operation of the proposal would not result in any impacts to any known non-Aboriginal heritage items.

6.8.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA01 – Non-Aboriginal heritage</td>
<td><em>The Standard Management Procedure - Unexpected Heritage Items</em> (Roads and Maritime 2015) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.10 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>
6.9 Landscape character and visual impact

A landscape character and visual impact assessment has been prepared for the proposal (Appendix L) and summarised in the following section.

6.9.1 Methodology

The landscape character and visual study area (landscape study area) consisted of land located within an approximate 4 kilometre radius of the construction boundary. The methodology used to undertake the assessment included:

- Review all background documentation and supporting material
- Undertake inspections on 15 October 2019 and 28 January 2020. Levels of visual sensitivity, visual catchments, views and magnitude of change were identified during the first inspection. Changes to the landscape due to the 2019/2020 bushfires were assessed during the second inspection
- Undertake contextual analysis of the existing conditions
- Determine sensitivity levels based on the contextual analysis. To do this a typical hierarchy of sensitivity was assumed. Residential and recreational areas were considered to have higher sensitivity to change compared to industrial or employment areas. Views from roads were considered to have high sensitivity if they were close to the construction boundary or if the views were on an axis to the site
- Prepare visual catchment diagrams to indicate land within the locality of the site from which the proposal would be visible. The visual catchment was defined either by topographical features, waterscape, built form and/or vegetative screening. Separate visual catchment diagrams were generated at radii of 2 kilometres and 5 kilometres from the proposal using Light Detection and Ranging Data (LIDAR) data and Geographical Information System (GIS) software
- Identify representative critical viewpoint locations within the identified visual catchment that may potentially be impacted by the proposal with regard to visual quality
- Assess the potential visual impacts of the proposal with respect to the sensitivity of the viewpoint and the magnitude of the change generated by the proposal. The level of sensitivity and magnitude were then combined to determine the overall level of impact for both the landscape character and visual aspects (Table 6-27). This assessment was carried out in a series of timeframes to mirror likely conditions as the local bushland regenerates during construction and operation of the proposal, where it is assumed the landscape character of the fire damaged bushland will return to a condition close to its pre-fire character over time. The timeframes used were: immediately post-fire, three to five years post-fire and five to fifteen years post-fire (full regeneration expected to be achieved within 20 years)
- Identify mitigation measures to address any unacceptable impacts on views that may result from implementation of the proposal in its current form.

The assessment was undertaken in accordance with the following Transport for NSW guidelines:

- Guidelines for landscape character and visual impact assessment No. EIA-N04 - Version 2.1 (Roads and Maritime 2018)
- Landscape Design Guidelines (Roads and Maritime 2018)
- Beyond the Pavement (Roads and Maritime 2014).
6.9.2 Existing environment

Landscape context

The landscape surrounding Batemans Bay is of considerable natural beauty and boasts pristine beaches, National Park bushland, wetlands and the Clyde River. This natural environment setting strongly contributes to the overall visual quality and identity of the Batemans Bay urban centre and its environs.

The proposal sits within a bushland setting with no appreciable urban component. In the broader context, the proposal is located to the west of Batemans Bay town centre and its suburban surrounds.

During late 2019 and early 2020, Australia experienced a severe bushfire season with fires across several states. New South Wales was one of the largest areas impacted. Within the landscape study area, the fire resulted in the temporary loss of dense bushland as well as loss of a number of residences and industrial complexes. Figure 6-12 shows diagrammatically how the bushland is expected to regenerated over the 15 years following the 2019-2020 bushfires. More detailed images including the topography of the area are provided in Appendix L.

The pre-fire bushland presented as a typical south coast indigenous bushland environment, dominated by tall (30-60 metres) and mid height (10-20 metres) trees and a variable density of understorey. Disturbance by historical logging and other human activities has varied the integrity of the forest but from a landscape character perspective the landscape study area was generally presented as intact indigenous bushland.

With respect to views, the forest provided a relatively dense vegetation cover that screened out views towards the proposal when in the line of view.

Immediately after the fires, nearly all of the grasses, shrubs and small tree coverage are absent with the only exception of the fire resistant Burrawang (*Macrozamia communis*) stumps which survived and were already showing leaf buds three weeks after the fire. The landscape character has changed dramatically with all of the fire affected bushland being drastically depleted but the forest still provides some level of visual screen through the remaining burnt tree trunks and the lattice of branches in the canopy.

Subject to rainfall levels, vegetation regrowth will be significant over the three to five years’ timeframe, with 100 percent of the grass and most shrub vegetation expected to naturally regenerate. Shrub cover is likely to exceed that occurring prior to the fire.

The intensity of the fires makes it hard to accurately predict the level of regeneration of large tree species but it is likely that between 90 per cent and 100 per cent of the canopy will recover within five to fifteen years. In that timeframe it is expected that the upper canopy will have recovered enough to provide a high level of screening and present as a dense bushland backdrop. The complete assessment is available in Appendix L.
Figure 6-12: Diagrammatic cross-section illustrating bushland regeneration over time (not to scale)
**Landscape character**

Fourteen distinct landscape character zones have been identified (Figure 6-13) based on a combination of land use, topography and built form. These zones have been categorised into the following groups:

- **General** – A zone within the locality of the proposal that does not have direct visibility or exposure to the construction boundary
- **Receiver** – A zone that has direct visibility or exposure to the construction boundary
- **Proposed works** – A zone that forms part of the construction boundary.

Table 6-28 summarises the level of sensitivity for each zone, where the sensitivity value refers to the qualities the character zone and how sensitive the existing character of the setting is to the proposed changes.

**Table 6-28: Landscape character zone assessment summary (pre-fire condition)**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Sensitivity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zone A – Clyde River Inlet</strong></td>
<td><strong>High</strong></td>
<td>The Clyde River waterway is a natural visual element of high scenic value. It is a critical contributing element to the local landscape character of Batemans Bay and users of the waterway would have a high expectation that views to and from this zone would remain of high quality.</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zone B – Wetlands</strong></td>
<td><strong>High</strong></td>
<td>The local wetlands are natural visual elements in the locality. Views to and from the wetlands will be highly sensitive to change.</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zone C – The Promenade</strong></td>
<td><strong>High</strong></td>
<td>The promenade is a popular destination for locals and visitors alike and is a place where people would go specifically to enjoy the view.</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zone D - Batemans Bay CBD</strong></td>
<td><strong>High</strong></td>
<td>The CBD, which is wedged between the promenade and the residential area to the south, provides a critical function for tourism, hospitality and retail, and attracts large numbers of people, especially during the holiday periods.</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zone E – Batemans Bay Residential Area</strong></td>
<td><strong>High</strong></td>
<td>Residential land uses are sensitive to any change of its character.</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zone F – North Shore Residential Area</strong></td>
<td><strong>High</strong></td>
<td>Residential land uses are sensitive to any change of its character.</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone</td>
<td>Sensitivity</td>
<td></td>
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<tr>
<td>------</td>
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<td></td>
</tr>
<tr>
<td>Zone G – North Shore Foreshore</td>
<td><strong>High</strong> – This zone is considered highly sensitive due to its scenic value and recreational importance to locals and visitors alike. The foreshore is a critical element of the local landscape character of Batemans Bay and users would expect that views to and from the zone would remain of high quality.</td>
<td></td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone H – Batemans Bay Golf Course</td>
<td><strong>Moderate</strong> – The golf course is a recreation facility principally used for formalised recreation. However, the nature of golf courses is such that their visual quality is important. Golfers and visitors would have an expectation that existing quality views to and from the course would be protected.</td>
<td></td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone I – Sport Facilities and Public Pools</td>
<td><strong>Moderate</strong> – As this zone is predominately used for recreation purposes it is less susceptible to change. Users are less likely to visit specifically to enjoy the view.</td>
<td></td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone J – Bushland (intact)</td>
<td><strong>High</strong> – This bushland forms the backdrop of numerous vantage points throughout Batemans Bay and is considered a pristine natural environment. As a result, it is highly sensitive to change.</td>
<td></td>
</tr>
<tr>
<td>Zone category: Proposed works</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone K – Easements</td>
<td><strong>Low</strong> – The sensitivity of this character zone is low due to the cleared open corridor and the nature of its land use. The land is highly modified and it is unlikely that users would be significantly impacted by any change to its character.</td>
<td></td>
</tr>
<tr>
<td>Zone category: Proposed works</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone L – Major road corridors</td>
<td><strong>Moderate</strong> – This zone is predominately used for transport and consists of major road corridors with 1-2 lanes in both directions. Users are less likely to visit specifically to enjoy the view.</td>
<td></td>
</tr>
<tr>
<td>Zone category: Proposed works</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone M – Industrial / large scale commercial</td>
<td><strong>Low</strong> – The sensitivity of this character zone is low due to the nature of its land use and the fact that it is already highly modified. It is unlikely users would be significantly impacted by any change to its character</td>
<td></td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone N – Deep Creek Dam</td>
<td><strong>High</strong> – The sensitivity of this character zone is high due to its scenic and recreational value of the area.</td>
<td></td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 6-13: Landscape character zones (not to scale)
The 2019/2020 bushfires have changed the following landscape character of zones due to loss of bushland and houses:

- Intact bushland and their residential verges (zone J)
- Easements (zone K)
- Major road corridors (zone L)
- The Deep Creek Dam (zone N).

Table 6-29 provides a summary description of the bushfire impacted landscape character zones immediately post-fire.

Table 6-29: Landscape character zone summary assessment table – immediately post-fire

<table>
<thead>
<tr>
<th>Zone</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone J – Intact bushland and their residential verges</td>
<td><strong>High</strong> – Declining to medium post-fire and returning to high as the bushland regenerates. Viewers would be substantially affected by the impacts of the fires on landscape character but it can be assumed that their impressions would be tempered by the knowledge that the bushland will regenerate.</td>
</tr>
<tr>
<td>Zone K – Easements</td>
<td><strong>Low</strong> – The bushland on the verges of the easement borders have been impacted by the fires. Changes to the natural environment of the easement would have low impact to the landscape character as it would not be experienced by viewers.</td>
</tr>
<tr>
<td>Zone M – Major road corridors</td>
<td><strong>Moderate</strong> – Roads were not substantially impacted by the fires; viewers would not be substantially impacted by changes in this zone as the landscape character will rehabilitate to pre-fire conditions relatively soon given the scale of the bushfire effects.</td>
</tr>
<tr>
<td>Zone N - Deep Creek Dam</td>
<td><strong>High</strong> - Similar to Zone J</td>
</tr>
</tbody>
</table>

**Critical viewpoints**

The following seven viewpoints within a 2 kilometre radius were selected to assess the visual impacts of the proposal on sensitive visual receivers (Figure 6-14).

1. Catalina Country Club Golf Course (near hole number 19 looking southwest towards site)
2. Northern end of Vista Avenue (from the street outside house number 2 looking southwest towards site)
3. Southern end of Vista Ave (from the street outside house number 111 looking west / southwest towards site)
4. Gannet Place (outside house number 7 looking west / southwest towards site)
5. Easement lookout (looking north over site)
6. Princes Highway (north bound - adjacent to southern site works area)
7. Clyde Mitsubishi / Batemans Bay Cemetery (looking south along easement towards site).

Generally, most of the landscape character zones and viewpoints had a moderate to high sensitivity to the surrounding visual landscape due to the high scenic values of the estuary, its foreshore and the vegetated surrounding hills, and the close proximity of residential, commercial and tourist areas to the proposal.
Figure 6-14: Selected viewpoints plan (within 2km radius)
In addition to the seven viewpoints listed above, typical views (up to 5 kilometres radius) from recreational areas on Batemans Bay north shore were also included to allow the visual impact from these areas to be qualitatively assessed. Views towards the site from the north shore have been identified as highly sensitive due to the scenic value and recreational importance of this zone.

6.9.3 Potential impacts

Construction

Visual impacts associated with the construction of the proposal would mainly be the result of vegetation clearing, earthworks, intersection upgrade works and the presence of plant and equipment. Assuming that construction of the proposal occurs over a one to two year period, beginning approximately two years after the 2019/2020 fires, it is likely that the landscape would be in a state of recovery during the construction. However, due to the scale and intensity of the fires it is not clear how long the landscape recovery will take, how extensive (whether it will be uniform or whether some areas will recover quicker than others) and how complete the recovery to its original condition will be.

As such, the following two scenarios have been considered to assess potential impacts during construction of the proposal:

- Scenario A – Assuming no or little regeneration of the bushland during the construction period
- Scenario B – Assuming an evolving visual environment as the depleted bushland regenerates over the construction period.

These scenarios have been illustrated from viewpoints 2, 3 and 4 in topographically accurate sections available in Appendix L. In both scenarios, the upper canopy of vegetation would be the main screening element in close to moderate distant views to the construction site. From viewpoint 2, there is an existing tract of bushland between the viewpoint and the construction site that has not been impacted by the fires. This intact bushland would substantially screen views towards the construction site from this viewpoint regardless of the level of regeneration of the fire affected bushland. Viewpoints 3 and 4, however, do not benefit from undamaged bushland in the line of view to the construction boundary and thus have direct views to the construction site in the post-fire condition. The condition of the upper canopy would have a significant influence on the level of visibility of the construction site in these views.

The visual impact of the proposal has been assessed from each identified viewpoint (Table 6-30).

Table 6-30: Summary of impacts on viewpoint during construction

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Sensitivity of view</th>
<th>Magnitude of change</th>
<th>Overall visual impact rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewpoint 1 - Catalina Country Club Golf Course</td>
<td>Low</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Viewpoint 2 - Vista Avenue (northern end)</td>
<td>High</td>
<td>Moderate</td>
<td>High-Moderate</td>
</tr>
<tr>
<td>Viewpoint 3 - Vista Avenue (southern end)</td>
<td>High</td>
<td>Moderate</td>
<td>High-Moderate</td>
</tr>
<tr>
<td>Viewpoint 4 – Gannet Place</td>
<td>High</td>
<td>Moderate</td>
<td>High-Moderate</td>
</tr>
<tr>
<td>Viewpoint 5 – High point of easement</td>
<td>Moderate</td>
<td>High</td>
<td>High-Moderate</td>
</tr>
</tbody>
</table>
**Viewpoints**

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Sensitivity of view</th>
<th>Magnitude of change</th>
<th>Overall visual impact rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewpoint 6 – Princes Highway (north bound - adjacent to southern site works area)</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate - Low</td>
</tr>
<tr>
<td>Viewpoint 7 – Clyde Mitsubishi / Batemans Bay Cemetery</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate - Low</td>
</tr>
<tr>
<td>North shore views</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Operation**

While the proposal would be built on an established road corridor, it would impact on most landscape character zones to some degree. To determine the degree of impact, the assessment for operations was completed for two time periods:

- Three to five years post-fire event
- Ten to fifteen years post-fire event.

It is expected that in three to five years post-fire, although still dramatically depleted, the regenerating bushland would provide some level of visual screen. However, the density of the vegetation and canopy cover would remain less than the pre-fire conditions. The screening properties of the vegetation in the three to five-year timeframe would be significantly less than pre-fire conditions and the proposed new road would be expected to be somewhat more visible in these views in comparison to pre-fire conditions. The proposal would be a small component of these views and the regenerated bushland would remain the dominant visual element.

The bushland surrounding the proposal site is likely to be close to its pre-fire character in the ten to fifteen-year post-fire timeframe, with 90 to 100 per cent of the canopy recovered and a high level of visual screening. A precautionary approach was adopted and the higher of the two ratings was adopted as an overall impact rating.

**Landscape character**

The landscape character impact of the proposal would have moderate impact to the landscape character zone E (Batemans Bay Residential Area) due to the removal of vegetation. A number of residences in this zone would have their panoramic views affected, influencing the sense of place in a small way. For most of this zone, however, the proposal would have a limited impact. Landscape character zone J (Intact bushland and residential verges) would have a moderate impact as the vegetation within the construction boundary would be removed for the proposal. A summary of impacts for each landscape character zone in the pre-fire conditions is summarised in Table 6-31 below with further assessment provided in Appendix L.

Table 6-31: Landscape character impact summary assessment table – pre fire

<table>
<thead>
<tr>
<th>Landscape Character Zone</th>
<th>Sensitivity Level</th>
<th>Magnitude Of Change</th>
<th>Landscape Character Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone A – Clyde River Inlet</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape Character Zone</td>
<td>Sensitivity Level</td>
<td>Magnitude Of Change</td>
<td>Landscape Character Impact</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------</td>
<td>---------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Zone B – Wetlands</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone C – The Promenade</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone D – Batemans Bay CBD</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone E – Batemans Bay Residential Area</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone F – North Shore Residential Area</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone G – North Shore Foreshore</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone H – Batemans Bay Golf Course</td>
<td>Moderate</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: Receiver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone I – Sport Facilities and Public Pools</td>
<td>Moderate</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone J – Bushland (intact)</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Zone category: Proposed works</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone K – Easements</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Zone category: Proposed works</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone L - Major road corridors</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate-Low</td>
</tr>
<tr>
<td>Zone category: Proposed works</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone M – Industrial / large scale commercial</td>
<td>Low</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: General)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone N – Deep Creek Dam</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Zone category: General</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Impacts on landscape character in post-fire conditions have been assessed for the three zones identified as changed due to impacts of the fire event (Zones J, K and M) discussed in Section 6.9.2. For these zones, commentary on the likely impacts of the proposal has been made in Appendix L and summarised in
Table 6-32 below. The proposal would have a moderate impact on Zone J if conditions were to be similar to the post-fire landscape character as the road would constitute a new built element in the highly sensitive bushland landscape. However, due to the fact that it would constitute a small element in the vast regenerating bushland landscape, its impact on the character of the bushland zone is considered to be moderate.

Table 6-32: Landscape character impact assessment table – post fire

<table>
<thead>
<tr>
<th>Landscape Character Zone</th>
<th>Sensitivity Level – post fire</th>
<th>Magnitude Of Change – post fire</th>
<th>Landscape Character Impact – post fire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone J – Intact bushland and their residential verges, Zone category: Proposed works</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Zone K – Easements &amp; major road corridors, Zone category: Proposed works</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Zone L – Major road corridors, Zone category: Proposed works</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Zone N – Deep Creek Dam, Zone category: General</td>
<td>High</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Viewpoints

The viewpoints from residential areas (viewpoints 2, 3, 4 and 5) have been identified as having moderate visual impact during the operation of the proposal as shown in Table 6-33. This is partly due to the current degraded state of the bushland surrounding the site as a result of the fires but also due to the level of visibility of the proposal and its verges. Notwithstanding this, the proposal would be a small component of these views and the regenerated bushland would remain the dominant visual element. The remaining viewpoints were identified to experience low to negligible impacts.

Table 6-33: Impacts on viewpoint during operation

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Sensitivity of view</th>
<th>Magnitude of change</th>
<th>Overall visual impact rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewpoint 1 - Catalina Country Club Golf Course</td>
<td>Low</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Viewpoint 2 - Vista Avenue (northern end)</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Viewpoint 3 - Vista Avenue (southern end)</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
### Viewpoints and Sensitivity

<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Sensitivity of view</th>
<th>Magnitude of change</th>
<th>Overall visual impact rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewpoint 4 – Gannet Place</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Viewpoint 5 – High point of easement</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Viewpoint 6 – Princes Highway (north bound - adjacent to southern site works area)</td>
<td>Low</td>
<td>Moderate</td>
<td>Low - moderate</td>
</tr>
<tr>
<td>Viewpoint 7 – Clyde Mitsubishi / Batemans Bay Cemetery</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>North shore views</td>
<td>High</td>
<td>Negligible</td>
<td>Low</td>
</tr>
</tbody>
</table>

### 6.9.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
</table>
| LC01 – Landscape character and visual impact                           | A revegetation plan would be prepared to detail the revegetation and landscape work needed to maintain the integrity of the existing environment and visual character of areas impacted by the proposal. The plan will include:  
  • Location and identification of existing vegetation and proposed landscaped areas, including species to be used  
  • Built elements including retaining walls and batters  
  • Fixtures such as lighting and signs  
  • A procedure for monitoring and maintaining landscaped or rehabilitated areas.                                                          | Transport for NSW/Contractor        | Detailed design / pre-construction      | Transport for NSW Specification R179 Landscape Planting |
<p>| LC02 – Landscape character and visual impact                           | Where removal of existing trees is unavoidable, new tree plantings will be considered for inclusion in the revegetation plan at appropriate locations.                                                                            | Transport for NSW                  | Detailed design/ construction             | Transport for NSW Specification R179 Landscape Planting |
| LC03 – Retention of existing vegetation                                | The proposal will be designed to avoid impact to prominent trees and vegetation communities where possible. Water quality structures and drainage lines                                                                 | Transport for NSW                  | Detailed design                           | Transport for NSW Specification G36                      |</p>
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC04 – Retention of existing vegetation</td>
<td>Retaining walls will be designed to minimise the construction footprint and removal of existing vegetation, where possible. Consideration would be given to screen planting below walls and the use of visually recessive materials to minimise the visual dominance of retaining walls.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Transport for NSW Specifications PS351 and R55</td>
</tr>
<tr>
<td>LC05 – Integration of earthworks</td>
<td>Cut/fill batters will be softly integrated through landscaping. The potential visual impact of the earthworks will be minimised by careful design that integrates with adjoining landforms.</td>
<td>Transport for NSW/ Contractor</td>
<td>Detailed design/construction</td>
<td></td>
</tr>
<tr>
<td>LC06 – Hard works colour and materiality</td>
<td>Colours and materiality of all hard works used in the design will be carefully considered. This includes retaining wall structures. Materiality will reflect existing character to help the proposal and associated works blend in with the surrounding environment. Colours of any proposed hardscape/built elements will be chosen with the intention to reduce visual contrast where possible.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
</tbody>
</table>
6.10 Property and land use

6.10.1 Methodology

Land zoning from Eurobodalla LEP and land use from Australian Bureau of Statistics (ABS) were reviewed to understand the existing land use of the construction boundary and adjoining areas.

6.10.2 Existing environment

Land within the construction boundary that belong to the Mogo State Forest are managed by the Forestry Corporation of NSW and zoned as RU3 – Forestry under Eurobodalla LEP. Areas along and adjacent to the Princes Highway and Glenella Road are within existing local and State road reserves, managed by Eurobodalla Shire Council and Transport for NSW.

Land use for the construction boundary is shown in Figure 6-15. The construction boundary would be primarily constructed in land defined by the Australian Bureau of Statistics (ABS) as parkland with a small portion of land at the intersection of Glenella and Heron Road defined as residential land.

The construction boundary area has been historically impacted by the construction and operation of the Princes Highway, forestry and the creation of cleared easements for the installation of overhead transmission lines. Historic land clearing is also associated with the construction and operation of the Old Sawmill site and scattered access tracks throughout the construction boundary used by the Forestry Corporation of NSW.

6.10.3 Potential impacts

Construction

No private land acquisition or adjustments would be required for the construction of the proposal.

Most of the construction boundary encompasses existing local and State road reserves, managed by Eurobodalla Shire Council and Transport for NSW, and would not require any land acquisition or changes to land use during construction.

Part of the proposal is located within the Mogo State Forest, which is managed by the Forestry Corporation of NSW. As part of preliminary stakeholder engagement, the Forestry Corporation of NSW have noted that access to the construction boundary is unlikely to be required for timber harvesting or other forestry management purposes for the foreseeable future. Whether this continues to be the case during construction would be confirmed during detailed design through consultation with the Forestry Corporation of NSW.

Three sites have been identified for use as temporary construction ancillary facilities for the proposal and were chosen to maximise the use of existing infrastructure, access and vacant land. Existing access tracks may be widened to accommodate construction vehicles. No new access tracks are proposed to be cleared. All access tracks and other State Forest areas used during construction would be returned to their original conditions or as agreed with the Forestry Corporation of NSW. Once construction is complete, ancillary facilities would be appropriately dismantled and returned to their original condition.

A Forestry Permit would be required prior to construction to account for the use of Mogo State Forest areas. This would include the Old Sawmill site, the Lattas Point Road site, access tracks and any other areas outside of the road corridor required for construction within the State Forest.
Overall, construction impacts to land use would be short-term and only comprise minor impacts for recreational and forest management land uses.

**Operation**

While Transport for NSW would seek to minimise operational land use impacts through detailed design, some sections of Mogo State Forest may need to be rezoned as part of the road reserve as described in Section 3.6 and may require revocation. A Deed of Agreement for Early Access (DAEA) would be prepared prior to construction, and be accompanied by a memorandum of understanding (MOU) for acquiring State Forest land for the new road corridor on completion of the proposal.

The operation of the proposal would have the potential to shape further land use changes and development of the coastal settlements between Catalina and Malua Bay. It would provide a more direct connection between the industrial lands at Cranbrook Road and the currently undeveloped Surf Beach employment lands. The proposal would facilitate greater access to the Mogo State Forest allowing for an increased use of recreational parkland and forestry uses.

### 6.10.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL01 – Forestry Permit</td>
<td>A Forestry Permit will be sought prior to construction for access to the Mogo State Forest land located within the construction boundary.</td>
<td>Transport for NSW</td>
<td>Pre-construction</td>
<td>Clause 3.7 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>PL02 – Property acquisition</td>
<td>Should revocation of State Forest land be required, provisions of the Forestry Act 2012 would be followed. The Forestry Corporation of NSW would be consulted as soon as possible after land requiring revocation is confirmed during detailed design.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
</tbody>
</table>
6.11 Socio-economic

A socio-economic impact assessment (SEIA) has been prepared for the proposal (Appendix M) and is summarised in the following section.

6.11.1 Methodology

The SEIA study area comprises geographical communities that have the potential to experience changes to their existing socio-economic conditions (shown in Figure 6-16) as a result of the proposal. The preparation of the SEIA included the following methodology:

- Confirming the level of SEIA required by the Environmental Impact Assessment Practice Note – Socio-economic assessment (EIA-N05)
- Identification of the SEIA study area
- Scoping and identification of the range of issues of concern relevant to the socio-economic environment of the proposal and the nature of the likely potential impact of the proposal
- Review of other technical reports prepared for this REF
- Analysis of existing studies and data sources, such as those available from Council and the Australian Bureau of Statistics (ABS)
- A survey of land uses and businesses located in key neighbourhood and village centres within the study in November 2019
- Business surveys and stakeholder consultations within the SEIA, including stakeholder interviews, Transport for NSW drop-in sessions and other avenues
- Description and analysis of the existing socio-economic environment of the proposal to provide an understanding of the potentially affected groups or communities and benefits associated with the proposal
- Qualitative assessment of potential changes to existing socio-economic conditions during operation and construction of the proposal
- Development of recommendations for mitigation measures and management strategies to enhance the proposals positive benefits and avoid, manage or mitigate its potential negative socio-economic impacts.

6.11.2 Existing environment

The total population of the SEIA study area was estimated to be 16,485 people in June 2018, which is an increase of 441 people from the 2016 Census. The statistical information relevant to the socio-economic profile of the SEIA study area include:

- A slow population growth rate between the 2011 and 2016 Census of 0.8 per cent in the LGA and 0.4 per cent in the SEIA study area per annum (p.a.) which can be attributed to the age structure and migration profile of the area. The population growth rate for the period between 2001 and 2006 was notably higher at 1.1 per cent in the LGA and 1.8 per cent in the SEIA study area indicating that there is long-term variations in the growth rate
- About a third of the SEIA study area residents are aged 65 and over, which is significantly higher than the NSW average and has been growing in recent years suggesting the area is a popular retirement location
- The Eurobodalla LGA, particularly Batemans Bay, is well established as a domestic tourism destination and a desirable location for ‘weekender’ homes. Thirty eight per cent of property owners have their principal address outside of the Eurobodalla Shire and 31 per cent of dwellings are not permanently occupied
In peak summer periods the population of the Eurobodalla Shire LGA can more than triple to between 120,000 and 140,000 people.

The employment profile within the SEIA study area reflects the major industries of the Eurobodalla Shire LGA, which include retail trade (15.7 per cent), health care and social assistance (14.2 per cent), accommodation and food services (11.9 per cent) and construction (10.3 per cent).

Key business and industry

Batemans Bay is the main local and regional retail, service and commercial hub within the Eurobodalla Shire LGA and is a focal point for tourists visiting the wider region. It is a key socio-economic hub for the ‘Far South Coast’ functional economic region (FER).

As of June 2018, there were 1,183 businesses recorded within the SEIA study area. This comprises 40.5 per cent of the 2,919 businesses within Eurobodalla Shire LGA. Sixty per cent of all businesses registered in the Eurobodalla LGA are located outside of a commercial or industrial zone. The majority of businesses in the SEIA study area are small business, employing few, if any, staff and having low revenue turnover.

Tourism

The Eurobodalla Shire LGA’s success as a destination for domestic tourism is well established, particularly for Australian Capital Territory (ACT) residents. As a popular tourist destination, the SEIA study area’s population increases substantially during holiday periods as demonstrated in 2018 when 1.38 million people visited the LGA. The SEIA study area is the main destination within the Eurobodalla Shire LGA for both day visitors and overnight visitors, receiving 62 per cent of day visitors and 46 per cent of overnight visitors. This equates to around 377,000 domestic overnight visitors and 330,000 domestic day visitors each year.

Tourism in the Eurobodalla Shire LGA is heavily car dependent, with 97 percent of domestic overnight visitors, 99 per cent of daytrip visitors and 91 per cent of international visitors self-driving. In 2018/19 the main source markets for domestic overnight visitors came from Canberra (25 per cent), Sydney (23 per cent) and other parts of the South Coast (13 per cent). Day trip visitors in 2018/19 came from other parts of the South Coast (56 per cent), Canberra (25 per cent) and Capital Country (8 per cent).

Tourism is the Shire’s largest industry and is an important driver of business activity in the LGA and SEIA study area. Tourism is worth over $405 million yearly and supports around 25 per cent of the workforce, with further indirect ‘flow-on’ effects. Tourism represents 14 per cent of the Eurobodalla Shire LGA’s Gross Regional Product.

Forestry

The proposal is located within Mogo State Forest, including the Old Sawmill site, which is expected to be used as an ancillary facility during construction. Although the area remained densely vegetated until the 2019/20 fires, it has a long history of forestry activity since Mogo State Forest was gazetted in 1917. Activities carried out within State Forests are generally managed in accordance with the Forestry Corporation of NSW’s system, which classifies State Forest land as one of eight categories referred to as Forest Management Zones (FMZ).

The construction boundary includes areas mapped as Special Management (Zone 2), Special Prescription (Zone 3), General Management (Zone 4) and non-Forestry use.

Other industries

Industrial lands are located about 300 metres north-west from the construction boundary at Cranbrook Road where the largest location for manufacturing and warehousing is found in Batemans Bay. Eurobodalla Shire Council has identified a shortage of employment land and limited potential for the expansion in either Batemans Bay or in Moruya. Land in Surf Beach (known as Surf Beach Innovation Park Precinct) is the closest development site to the regional centre which would enable efficient business operations from
Batemans Bay. The Surf Beach Innovation Park Precinct currently contains a landfill waste depot and a sewerage treatment plant, with the remainder of the site covered by bushland. The site has about 13 hectares available for employment land, with early investigations identifying potential for up to 500 new jobs for Stage 1 and 2 release areas. Its development timeframe is unknown.

**Access and travel behavior**

The SEIA study area is a car dependent locality, with 76.4 per cent of the workforce using a car to travel to work (compared to 64 per cent in NSW and 73 per cent in the South Coast region). Few households are without access to a vehicle, with 94 per cent of households in the SEIA study area owning a car. The high personal vehicle usage is attributed to a perceived lack of public transport amongst the community which results in only 1.5 per cent of the workforce travelling to work via public transport. Active transport accounts for 3.7 per cent of work-related commuter trips.

**Stakeholder groups**

Interviews with community group and stakeholder representatives highlighted:

- Their love for Batemans Bay, its natural beauty and coastal lifestyle
- The key influence of tourism on all aspects of Batemans Bay and the SEIA study area
- The importance of retirement economically and socially
- Local car dependence, and the perception that public transport is limited
- Congestion and a lack of parking were common issues in the CBD, most of the year. Significant congestion is experienced during the peak holiday season, with some residents avoiding the CBD during this time (altering the patterns of daily life). Some stakeholders felt that that the proposal was not linked to these issues
- There were mixed views on the strength of the local economy, with some viewing it as strong but a majority feeling it was in slow decline.

The stakeholders interviewed expressed positive views about the proposal being needed as:

- Infrastructure must keep up with growth and improve traffic flows along Beach Road and accessibility
- It would benefit people travelling south from coastal towns and those accessing Batemans Bay High School.

**Local businesses**

Businesses surveyed expected that the proposal would have minimal influence on their business, neither positive nor negative. Instead, the benefits of the proposal to Batemans Bay more generally were noted. Over half thought that, by providing better access and mobility, the proposal may lead to increased trade as well as improved safety and amenity. Concerns relating to current traffic congestion and limited parking availability within Batemans Bay CBD were reported to impact business operations, particularly during the holiday season.

Concerns were raised about the potential impact of construction if it was not managed appropriately. This was based on respondents' lived experience of construction-induced congestion/delays resulting from previous transport upgrades in the area. Although the beach side neighbourhood centres are more walkable, all of the businesses interviewed have car dependent trade areas regardless of their location. Tourism and visitation was an important source of trade for all businesses interviewed, at least doubling the volume of daily trade for the majority of respondents. The tourism peak was experienced differently by type of business, but typically occurred between October and April, focussed particularly on the Christmas and Easter weeks.
Figure 6-16: Socio-economic impact assessment study area
6.11.3 Potential impacts

Construction

During construction there would likely be:

- No direct or indirect loss of businesses from property acquisition
- No direct change to amenity experienced by businesses in the SEIA study area
- No change in parking arrangements for any business in the SEIA study area
- No direct or indirect change to patronage, amenity or accessibility of any tourism attraction or feature within the SEIA study area, or for any associated business (such as tourist accommodation).

Businesses, industry and tourism

There would be increased expenditure and employment related to construction of the proposal. Benefits include direct employment and expenditure associated with construction activities, and indirect benefits for employment and expenditure through the provision of the goods and services required for construction. Increased spending by the construction workforce at businesses in the SEIA study area would be potentially substantial for businesses in the Batehaven centre due to its proximity, ease of access, and pleasant break-time amenity. The expenditure is predicted to be about $600,000 during the construction period, providing benefits to local businesses in the SEIA study area.

On-site construction works are proposed to start in 2022 and be completed in 2023. The construction period would overlap with at least one peak tourism period. Works would be planned to avoid any substantial impacts on traffic during peak holiday periods and weekends when most tourism influx occurs.

Residential noise amenity

Noise amenity impacts during construction would be negligible. No residential properties are predicted to be ‘Highly Noise Affected’. Some works may cause short-term exceedance or be moderately intrusive and construction vibration impacts are expected to be minimal. Mitigation measures for these impacts can be found in Section 6.6.

Traffic, access and connectivity

Access to Glenella Road would be closed to the public between the Princes Highway and Heron Road, with potential temporary lane closures and speed limit reductions on the Princes Highway during works associated with the proposed roundabout. Beach Road and other routes are expected to have negligible impacts from construction activities.

Impacts on movement patterns would likely be negligible. Princes Highway would retain an acceptable service operation level during construction works, with temporary speed reduction and lane closures during some of the works. Minor delays along the Princes Highway may be experienced during the construction of the roundabout. However, this is not expected to substantially impact road users, public transport, freight efficiency, residents or businesses in the SEIA study area, or regional coach services.

Mitigation measures for these potential impacts are outlined in Section 6.5.

Community, social infrastructure and recreation

There is no social infrastructure located within the construction boundary. Public access to the Round Hill Lookout fire tower and utilities infrastructure would not be maintained during construction, but reinstated upon completion. The proposal would include utility adjustment or relocation as necessary to ensure minimal or no disruption to utility services.

Formal and informal tracks would not be accessible within the construction boundary during construction. Given the number of quality alternative trails in the Mogo State Forest, this impact is of low significance. There would be a reduction of the overall amenity experienced by bushwalkers using trails in the vicinity of
the construction boundary. This may reduce their enjoyment of natural areas, but it is of negligible impact due to the relative duration of the construction works, most of the works being within the road reserve, and the availability of alternative walking routes.

Any residents who recreationally walk or jog along Glenella Road would be temporarily affected by the roads closure.

The construction of the proposal would not impact community values of the SEIA study area or result in the displacement of local populations.

**Operation**

With the connection to the Princes Highway, Glenella Road would provide an alternative route into Batemans Bay from the coastal settlements between Catalina and Malua Bay. This change is expected to:

- Improve overall road and freight transport connectivity and accessibility
- Improve travel times
- Improve worker and customer accessibility
- Leading to enhanced economic productivity.

This would benefit residents, workers, tourists and local business.

**Businesses, industry and tourism**

Tourism, a key driver of the SEIA study area economy, would benefit from the proposal over the long term, particularly during peak seasons. Traffic conditions of the Princes Highway especially from the north, are important in maintaining and even increasing the share of the tourism market captured in the Shire. The proposal would result in improved access from coastal areas such as Batehaven and Sunshine Bay to Canberra and Sydney.

The freight network in the SEIA study area currently has restricted access for high productivity freight vehicles due to road design constraints. These missing links and ‘last-mile’ challenges hamper local economic productivity. By providing one of these links, the proposal would contribute to the delivery of a freight network that supports State and regional economic growth by improving efficiency for freight accessing the proposed Surf Beach employment lands and servicing coastal villages further to the south. It would also improve transport connections to key markets. By providing a direct connection between the Cranbrook Road and Surf Beach industrial lands, the proposal would better connect supply chains, enable efficient business operations and improve economic productivity. Council has identified that the proposal is key to stimulating and servicing about $800 million of future development. This includes up to 500 new jobs at the Surf Beach Innovation Park Precinct.

Following construction of the proposal, forestry operations would not be impacted and would operate as normal via existing forestry trails.

There would be no direct or indirect loss of businesses from property acquisition. There would be no direct change to amenity experienced by businesses. During operation, there would be amenity improvements for business located along parts of Beach Road and in the CBD due to decreased congestion, particularly during peak times. There would be no change in parking arrangements for any business in the SEIA study area.

Business would benefit somewhat, principally during peak periods, from reduced travel delays to their deliveries, and in the ability of clients to keep on-time appointments. During peak periods businesses on Beach Road may find that their trade area increases due to faster travel times and local trade being stimulated by an easier and less congested shopping environment.

There are a few businesses located between the Princes Highway and the intersection of Glenella Road with George Bass Drive which could be considered to have a higher sensitivity to any loss of passing trade.
These businesses are two restaurants, six accommodation facilities (three are to the north of Bavarde Avenue close to the marina), one tourist attraction (Birdland Animal Park) and one service station.

A small number of businesses may therefore experience a downturn in trade initially; however, these would be expected to recover over time.

**Residential noise amenity**

Only three residential and one non-residential properties would be affected by operational noise and be eligible for consideration of at-property noise mitigation treatments. There is therefore negligible potential for adverse noise amenity impacts upon the socio-economic environment.

**Traffic, access and connectivity**

The proposal would result in a decrease in traffic movement along local residential streets currently used as short cut between Beach Road and the Princes Highway and Cranbrook Road industrial precinct together with some benefit to easing traffic congestion in the Batemans Bay CBD.

The proposal would connect to Heron Road, altering the movement patterns of residents who live on this road and who may utilise Glenella Road to access the Princes Highway. This would result in minor impacts to a small number of dwellings. Any alteration to resident’s enjoyment of their property and lifestyle is expected to be of low significance and would abate over time.

The proposal would reduce the speed limit on the Princes Highway from 90 km/h to 70 km/h as vehicles approach the new roundabout. This has the potential to improve the road safety and crash consequences when compared to the existing situation.

Public transport services would remain unchanged, however, the proposal offers opportunities for improvements to service routes if required.

Access and travel times for emergency services, in particular the ambulance station on George Bass Drive, would be positively influenced by reduced congestion and the opening of an additional route between the Princes Highway and coastal settlements.

**Community, social infrastructure and recreation**

The proposal would contribute to efficiency, safety and access objectives by reducing the number of heavy vehicles passing along Beach Road, through the Batemans Bay CBD and its adjacent areas. The resulting safety and amenity improvements for the local community would include a potential reduction in noise, improvements in air quality, and removal of the visual presence of heavy vehicles. This would benefit residents, local businesses, visitors and tourists.

The proposal would include a 2-metre-wide shoulder along the length of Glenella Road that would allow cyclists and pedestrians to safely use the road alignment.

There is no social infrastructure located within or adjacent to the construction boundary and there would be no impacts on recreational mountain bike or bushwalk trails during operations.

The proposal would not adversely impact the character or integrity of the Eurobodalla Shire’s towns or villages, or the area’s environmental values. It would support and reinforce Batemans Bay role as a regional centre under the NSW State Infrastructure Strategy 2018-2038, providing an improved connection and connectivity from its coastal hinterland. Consultation identified strong community dissatisfaction with the existing infrastructure capacity, particularly traffic congestion in the CBD and at peak times along Beach Road. The proposal would provide an improvement in access and transport infrastructure capacity sought by the community.
## 6.11.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
</table>
| **SE01 – Community and stakeholder engagement** | A Community and Stakeholder Engagement Plan (CSEP) would be prepared as part of the CEMP. The CSEP will include (as a minimum):  
- A process to carry out regular and ongoing engagement with the community  
- A list of stakeholders to be consulted or informed, including local residents, regional highway users, Mogo State Forest recreational users, tourists, and local businesses  
- A complaints management procedure.  
- A process for ongoing communications with the Forestry Corporation of NSW to ensure the proposal does not result in disruption of their forest management activities. | Transport for NSW / Contractor | Pre-construction | Community Involvement and Communications Resource Manual (RTA, 2008). Clause 3.7 of Transport for NSW Specification G36 Environment Protection |
| **SE02 – Traffic closure** | Any traffic closure and delays of the Princes Highway would be planned to minimise impacts on the local community, freight, businesses and commercial operators using the roads. | Transport for NSW / Contractor | Pre-construction / construction | Transport for NSW Specification G10 Traffic Management |
| **SE03 – Recreational users** | Community hubs such as Trailforks would be notified of the changes to trail access within the Mogo State Forest during construction to assist in reducing the number of impacted users. | Transport for NSW / Contractor | Pre-construction / construction | Clause 3.7 of Transport for NSW Specification G36 Environment Protection |
6.12 Waste management

Transport for NSW is committed to ensuring the responsible management and reuse of waste within the construction boundary in accordance with the Waste Avoidance and Resource Recovery Act 2001. The Act aims to encourage the most efficient use of resources and reduce environmental harm in accordance with the principles of ecologically sustainable development and to adhere to the following resource management hierarchy:

- Avoidance of unnecessary resource consumption
- Resource recovery (including reuse, reprocessing, recycling and energy recovery)
- Disposal.

By adopting the above principles, Transport for NSW would aim to efficiently reduce resource use, reduce costs and reduce environmental harm in accordance with the principles of ecologically sustainable development, as outlined in Section 8.2 of this REF.

6.12.1 Potential impacts

Construction

The proposal has the potential to generate waste streams from the following activities:

- Vegetation clearing which includes native, exotic and noxious species
- Earthworks from the construction of the roundabout intersection and along the Glenella Road alignment, including the removal top soil and rock for road widening
- Establishment of ancillary facilities
- Utility adjustments.

The waste streams likely to be generated during the construction of the proposal include:

- Excess spoil – Material generated by the proposal would be reused on site in areas of fill whenever possible
- Green waste – Generated from clearing of vegetation, green waste would be reused where possible as mulch or sent to a composting facility. Noxious weeds would be separated from native green waste
- Excess material - Materials that cannot be reused in the proposal such as excess concrete and form work for retaining walls
- General waste – Generated from site compounds and offices and includes lunch packaging, portable toilets, packaging, etc.
- Waste water – Mainly from concrete washout
- Chemicals, oils, grease and other liquid wastes used for plant and equipment maintenance and operation
- Roadside materials including fencing, guard posts, traffic signage, etc.
- Redundant erosion and sediment controls.

All waste generated by construction activities would be managed in accordance with the POEO Act, POEO (Waste) Regulation 2014, Waste Avoidance and Resource Recovery Act 2001 and applicable resource recovery orders and exemptions. Encapsulation of potential contaminated waste material is considered and explained in Section 6.4.
The potential to reuse all materials would be further investigated during detailed design and construction planning. Unsuitable fill material and all other waste streams would be classified in accordance with the NSW EPA Waste Classification Guidelines (2014) and disposed of at an appropriately licenced facility. Final waste classification would be carried out once the volumes of waste requiring offsite disposal during construction are confirmed.

Improper management and handling of stockpiled materials may lead to the need to dispose of materials that would otherwise be able to be reused during construction. Stockpiled materials would be kept separate where possible to maximise potential for reuse.

**Operation**

No impacts to waste would occur as a result of the operation of the proposal.

### 6.12.2 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
</table>
| WM01 – Waste management general | A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:  
• Measures to avoid and minimise waste associated with the proposal  
• Classification of waste streams 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 of waste  
• Monitoring, record keeping and reporting requirements. | Contractor | Pre-construction | Technical Guide - Management of road construction and maintenance wastes (Roads and Maritime 2016)  
Clause 4.11 of Transport for NSW Specification G36 Environment Protection |
<p>| WM02 – Waste management general | All wastes will be managed and disposed of in accordance with the POEO Act and POEO (Waste) regulation. | Contractor | Construction | Clause 4.11 of Transport for NSW Specification G36 Environment Protection |
| WM03 – Waste management general | Appropriate portable toilets or pump out facilities will be provided for construction site workers and sewage will be disposed of | Contractor | Construction | Clause 4.11 of Transport for NSW Specification G36 Environment Protection |</p>
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>WM04 – Waste management general</td>
<td>Site inductions will include waste management and disposal requirements and facilities.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM05 – Excess material disposal</td>
<td>Where relevant, waste material required to be disposed off-site will be recorded through a section 143 (S.143; 3A) notice.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM06 – Fill material</td>
<td>Any additional fill material required will be sourced from appropriately licensed facilities and/or other construction projects wherever possible. Additional fill material will be sourced and verified as suitable for use in accordance with relevant EPA and Transport for NSW guidelines.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM07 – Material reuse</td>
<td>Excavated material will be reused on site where feasible and suitable for the intended reuse. Where excavated material cannot be used on site, opportunities for reuse on nearby projects will be investigated.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM08 – Green waste</td>
<td>Where possible and suitable for use, cleared vegetation will be used as mulch or coarse woody debris for site erosion and sedimentation controls or rehabilitation.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM09 – Waste disposal</td>
<td>All waste and excess excavated material will be disposed of at an appropriately licensed facility.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>
### 6.13 Air Quality

#### 6.13.1 Methodology

Air quality criteria used to assess potential adverse air quality impacts of the proposal were derived from the *NSW Annual Compliance Report 2016: National Environment Protection (Ambient Air Quality) Measure* (OEH 2018). The DPIE provides assessment criteria for:

- Total suspended particles
- Particulate matter (PM$_{10}$ and PM$_{2.5}$)
- Deposited dust.

Air Quality criteria in the *NSW Annual Compliance Report 2016: National Environment Protection (Ambient Air Quality) Measure* are summarised in Table 6-34 below.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Period</th>
<th>Maximum Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>8 hour rolling average</td>
<td>9.0 ppm</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO$_2$)</td>
<td>1 hour average</td>
<td>0.120 ppm</td>
</tr>
<tr>
<td></td>
<td>1 year average</td>
<td>0.030 ppm</td>
</tr>
<tr>
<td>Particulate Matter (PM$_{10}$)</td>
<td>1 hour average</td>
<td>50.0 µg/m$^3$</td>
</tr>
<tr>
<td></td>
<td>1 year average</td>
<td>25.0 µg/m$^3$</td>
</tr>
<tr>
<td>Particulate Matter (PM$_{2.5}$)</td>
<td>1 hour average</td>
<td>25.0 µg/m$^3$</td>
</tr>
<tr>
<td></td>
<td>1 year average</td>
<td>8.0 µg/m$^3$</td>
</tr>
</tbody>
</table>

The DPIE installed an air quality monitoring station in Batemans Bay during the bushfire emergency to record and report hourly values for PM$_{10}$, PM$_{2.5}$ and Total Suspended Particles (TSP). Post-fire data was used to assess the air quality of the existing environment against the above criteria. No other air quality data is available for Batemans Bay.

Sensitive receivers are assessed based on known or future locations where people are likely to work or reside. This includes but is not limited to dwellings, schools, hospitals, offices or public recreational areas.

Climate data for the construction boundary was obtained from the Bureau of Meteorology station located at the Catalina Country Club at Batemans Bay (station number 069134).
6.13.2 Existing environment

The proposal is surrounded by natural vegetation and local air quality is typical of an arterial road within a semi-rural environment.

Motor vehicles on the Princes Highway and the surrounding road network are a dominant local source of air pollutant emissions. Higher emissions would be experienced during periods of traffic congestion (see Section 6.5). Other sources of air pollutant emissions would include rural activities from the Mogo State Forest (e.g. controlled back burning and forestry activities).

The closest sensitive receivers are located 370 metres east of the proposal on Heron Road and 500 metres east of the Old Sawmill site, along Albatross Road. Other potential sensitive receivers are located along Glenella Road and Yarrabee Drive.

**Particulate matter**

Data from the monitoring station installed by DPIE at Batemans Bay in late 2019 show air quality at Batemans Bay in February 2020 for Particulate Matter (PM) complied with the NEPM 2016 Annual compliance report criteria, which include:

- PM$_{10}$ – 1 hour average in February 2020 29.5 µg/m$^3$
- PM$_{2.5}$ – 1 hour average in February 2020 6.5 µg/m$^3$.

**Climate**

Climate data for the locality is shown in Table 6-35 below and is summarised as follows:

- Annual mean rainfall of 916.8 millimetres per year, with February receiving the highest average
- Annual mean maximum temperature of 21.8 degrees Celsius, with the warmest months being December through to February
- Annual mean minimum temperature of 10 degrees Celsius, with the coolest months being June through to August.

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Mean annual rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean rainfall (mm)</td>
<td>87.1</td>
<td>96.2</td>
<td>78.0</td>
<td>63.5</td>
<td>55.6</td>
<td>79.0</td>
<td>41.2</td>
<td>65.3</td>
<td>57.0</td>
<td>88.1</td>
<td>95.1</td>
<td>74.4</td>
<td>916.8</td>
</tr>
<tr>
<td>Mean no of days with rain &gt;1mm</td>
<td>8.7</td>
<td>8.7</td>
<td>7.7</td>
<td>6.4</td>
<td>5.1</td>
<td>5.7</td>
<td>4.7</td>
<td>4.8</td>
<td>6.9</td>
<td>7.9</td>
<td>9.1</td>
<td>9.0</td>
<td>84.7</td>
</tr>
<tr>
<td>Mean maximum temperature (°C)</td>
<td>26.1</td>
<td>25.6</td>
<td>24.6</td>
<td>22.4</td>
<td>19.9</td>
<td>17.4</td>
<td>17.1</td>
<td>18.2</td>
<td>20.5</td>
<td>22.1</td>
<td>23.1</td>
<td>24.8</td>
<td>21.8</td>
</tr>
<tr>
<td>Mean minimum temperature (°C)</td>
<td>15.8</td>
<td>15.9</td>
<td>14.1</td>
<td>10.6</td>
<td>7.1</td>
<td>5.3</td>
<td>3.7</td>
<td>4.5</td>
<td>7.1</td>
<td>9.7</td>
<td>12.2</td>
<td>14.3</td>
<td>10.0</td>
</tr>
</tbody>
</table>
6.13.3 Potential impacts

**Construction**

Construction of the proposal may have short-term localised impacts on air quality as a result of:

- Clearing and grubbing of vegetation along Glenella Road and the Princes Highway
- Creation of airborne dust and particulate matter as a result of earthworks within the construction boundary, this may be further escalated in dry and windy weather conditions
- Road pavement and intersection construction
- Line marking of roadwork
- Transport and management of soil and other materials entering and exiting the construction boundary
- Exhaust fumes from construction vehicles and motor vehicles
- Stripping, stockpiling and management of top soil and other material at the ancillary sites.

The use of plant and equipment, and motor vehicles using the Princes Highway and Glenella Road would have the potential to impact local air quality. The most significant pollutants produced from motor vehicles are:

- Carbon Monoxide (CO)
- Nitrogen Dioxide (NO$_2$)
- Particulate matter (PM$_{10}$ and PM$_{2.5}$).

During construction, the generation of dust would be the predominant impact on air quality for the proposal. Dust may adversely impact nearby sensitive receivers on Glenella Road and Albatross Road. Air quality impacts as a result of dust generation are considered to be minor as they would be limited to the construction phase only and would be minimised through the implementation of the safeguards and management measures outlined in Section 6.13.4.

The plant and equipment used throughout the construction of the proposal (refer to Section 3.3) would emit exhaust fumes whilst in operation. Adverse impacts to air quality would be limited to the duration of the construction phase of the proposal. Odour impacts may arise from line marking for road users passing by the Princes Highway or residents on Glenella Road and Albatross Road. This would be temporary, with no long-term odour impacts being anticipated from the construction of the proposal. The operation of plant and equipment would be undertaken so local air quality criteria is below the exceedance criteria detailed Table 6-34 above.

Overall, impacts to air quality during the construction of the proposal would be short-term and have the potential to cause only minor adverse effects. Safeguards and mitigation measures specified in Section 6.13.4 would be applied to minimise any impacts on air quality.

**Operation**

The operation of the proposal would result in increased road use along Glenella Road and Heron Road (south of Albatross Road). Glenella Road would have a higher capacity for road users than its current condition that could potentially result in further vehicle emissions and reduced air quality in the immediate area. Based on traffic counts and projections for 2023 and 2033, it is anticipated that changes to air quality along Glenella Road would be negligible.

The proposal would contribute to reduced congestion within the Batemans Bay CBD along Beach Road and in other local roads, in turn contributing to reduced levels of emissions at most times, particularly during peak holiday periods.
The proposal would remove the constraints for over height and higher mass limit vehicles associated with the existing Glenella Road. This would contribute to reducing emissions at a regional level associated with these types of vehicles using alternative routes.

### 6.13.4 Safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental safeguards</th>
<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
</table>
| AQ01 – Air quality | Air quality management measures will be included in the CEMP, including:  
- Identification of potential risks/impacts due to the work/activities as dust generation activities  
- Management measures to minimise risk of dust generation  
- A process for monitoring and supressing dust generation on-site  
- A process for altering management measures as required and reprogramming construction activities if the safeguards and management measures do not adequately restrict dust generation. | Contractor      | Pre-construction/construction | Clause 4.4 of Transport for NSW Specification G36 Environment Protection |
| AQ02 – Dust emissions | Work will cease when levels of visible airborne dust become excessive and cannot be suppressed with standard dust suppression methods. | Contractor      | Construction               | Clause 4.4 of Transport for NSW Specification G36 Environment Protection |
| AQ03 – Dust emissions | Stockpiled materials will be covered, stabilised or stored in areas not subject to high wind. | Contractor      | Construction               | Clause 4.4 of Transport for NSW Specification G36 Environment Protection |
| AQ04 – Dust emissions | All truck loads will be covered when transporting material to and from the site. | Contractor      | Construction               | Clause 4.4 of Transport for NSW Specification G36 Environment Protection |
6.14 Climate change and sustainability

Climate change is the long-term change in weather patterns such as temperature, humidity and rainfall that have been worsened by human activities. The release of carbon dioxide (CO₂) due to human activities including the burning of fossil fuels and land clearing has increased the concentration of atmospheric CO₂ and resulted in the greenhouse gas effect. The greenhouse gas effect results in warmer temperatures, changes in rainfall averages and rising sea levels.

To address the impacts of climate change, Transport for NSW is committed to ensuring socially and environmentally beneficial transport outcomes by embedding sustainable initiatives into transport infrastructure projects. Currently, Transport for NSW operates under the following sustainability guidelines:

- Environmental Sustainability Strategy 2019-2023: This strategy builds on State Government plans and policies to form targets and key initiatives across 10 focus areas to improve sustainability across road and maritime assets in NSW. Areas of focus include minimising carbon emissions and improving biodiversity outcomes, with specific targets and initiatives to achieve those targets.
- Transport for NSW Sustainable Design Guidelines Version 4.0: These design guidelines aim to minimise environmental impacts resulting from transport infrastructure delivery and develop a climate resilient transport network with reduced lifecycle costs. The guidelines contain reporting requirements and compulsory sustainability requirements for projects.
- Transport for NSW Climate Risk Assessment Guidelines: These guidelines focus on asset lifecycles and aim to incorporate climate resilience into the transport networks. Guidance is also provided for the purposes of carrying out a Climate Risk Assessment (CRA).

These guidelines operate under the umbrella of the NSW Government Climate Change Policy Framework which outlines long-term objectives to achieve net-zero emissions by 2050 and to make New South Wales more resilient to a changing climate.

6.14.1 Existing environment

Changes in climate have the potential to impact existing and new road infrastructure. The NSW and ACT Regional Climate Change Modelling project (NARClIM) was undertaken by the OEH (now Biodiversity and Conservation Division, Department of Planning, Industry and Environment) on behalf of the NSW and ACT Governments in 2014 for two time periods defined as:

- 2020 to 2039 – the near future
- 2060 to 2079 – the far future.

The study included over 100 climate variables such as temperature, rainfall and wind. The study provides summary of the climate change projections for the South East Tableland Region of NSW and outlines the key characteristics of the region where the proposal is located. As shown in Table 6-36 below, the projected climate change for the near future for the South East and Tableland region would likely include an increase in both minimum and maximum temperatures in all seasons, with the summer season predicted to have the greatest increase.

Rainfall volume fluctuations are likely to increase in the summer and autumn seasons, but the region is likely to experience an overall reduction of rainfall in the spring season. The combination of increases in minimum and maximum temperatures with the reduction in rainfall would result in drier conditions that may increase the risk of bushfires occurring in the South East and Tableland Region of NSW.
Table 6-36: Project climate change in South East and Tablelands region for the near future (2020-2039) (AdaptNSW 2014)

<table>
<thead>
<tr>
<th>Season</th>
<th>Minimum Temperatures</th>
<th>Maximum Temperatures</th>
<th>Mean days with Temperature &gt;35°C</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>0.80°C warmer</td>
<td>1.00°C warmer</td>
<td>2.1</td>
<td>-18% to +20%</td>
</tr>
<tr>
<td>Autumn</td>
<td>0.60°C warmer</td>
<td>0.60°C warmer</td>
<td>0.1</td>
<td>-12% to +38%</td>
</tr>
<tr>
<td>Winter</td>
<td>0.45°C warmer</td>
<td>0.45°C warmer</td>
<td>0</td>
<td>-12% to 10%</td>
</tr>
<tr>
<td>Spring</td>
<td>0.60°C warmer</td>
<td>0.70°C warmer</td>
<td>0.2</td>
<td>-1% to 17%</td>
</tr>
</tbody>
</table>

6.14.2 Potential impacts

**Construction**

The construction of the proposal would result in the generation of greenhouse gas emissions through:

- Vegetation removal along the proposal reducing the carbon sequestration capacity of the local environment
- The decomposition of green waste and mulch, releasing carbon dioxide
- Direct emissions of carbon dioxide, methane and nitrous oxide from the use plant and equipment emitting exhaust fumes
- Usage of electricity from fossil fuels
- Use of materials that have high embodied energy content such as concrete.

The removal of vegetation, use of plant and equipment and construction materials would contribute most to emissions generated during construction. However, the potential increase in greenhouse gas emissions during the construction of the proposal would be relatively minor when compared to current emissions from traffic across the network.

**Operation**

During operation, the proposal may alleviate vehicle emissions through increased efficiency of the road network, reducing congestion and travel times. Although traffic growth in the region may result in an increase in vehicle emissions, this trend would not be a consequence of the operation of the proposal.

Street lighting used during the operation of the proposal would result in emissions from power generation used to supply electricity to the street lights. Smart street lighting would be investigated during detailed design (refer to section 6.1.4). If found feasible, this safeguard would have the added benefit of reducing emissions from electricity use during operation of the proposal.

There would be minimal emissions generated during maintenance activities along the proposal.

The proposal would also provide an alternative route for evacuation during emergencies that may be linked to climate change, therefore increasing the adaptive capacity and resilience of local communities.
# 6.14.3 Safeguards and management measures

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<tr>
<th>Impact</th>
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<th>Responsibility</th>
<th>Timing</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC01 – Greenhouse gas emissions</td>
<td>The use of alternative fuels and power sources for construction plant and equipment will be investigated and implemented, where appropriate.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC02 – Greenhouse gas emissions</td>
<td>Energy efficiency and related carbon emissions will be considered in the selection of vehicle and plant equipment.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC03 – Sustainability</td>
<td>Equipment will be serviced to ensure they are operating efficiently and all non-road diesel plant and equipment used for construction will comply with relevant EU or US EPA emissions standards.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC04 – Sustainability</td>
<td>Where possible, materials will be delivered as full loads and local suppliers will be used.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC05 – Sustainability</td>
<td>Plant used intermittently will be shut down when not in use.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC06 – Sustainability</td>
<td>The use of recycled aggregates in road pavement and surfacing (including crushed concrete, granulated blast furnace slag, glass, slate waste and fly ash) will be investigated during detailed design.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Clause 4.11 of Transport for NSWSpecification G36 Environment Protection</td>
</tr>
<tr>
<td>CC07 – Sustainability</td>
<td>Energy efficient LED light bulbs will be used for street lighting where allowed.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Transport for NSW Specification R151 Street lighting</td>
</tr>
<tr>
<td>CC08 – Sustainability</td>
<td>Risks associated with climate change, such as increased bushfire risk in the surrounding environment, will be considered during detailed design development.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
<tr>
<td>CC09 – Sustainability</td>
<td>Relevant targets established in Roads and Maritime Environment Sustainability Strategy 2019-2023 will be considered during detailed design development.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
</tbody>
</table>
6.15 Cumulative impacts

6.15.1 Projects the near the proposal

**South Batemans Bay Link Road**

The proposal is the second stage to complete the South Batemans Bay Link Road project. In early 2019, Eurobodalla Shire Council completed construction of the first stage of the South Batemans Bay Link Road between George Bass Drive and Heron Road, east of the Princes Highway. The section between Heron Road and just east of The Ridge Road was also completed in 2019 but has remained closed to traffic moving. The proposal would complete this connection through to the Princes Highway.

**Major projects**

Two major Transport for NSW projects have been identified within proximity of the proposal:

- Batemans Bay Bridge Replacement – The Batemans Bay Bridge replacement includes a new four lane bridge (two lanes each direction) and demolition of the existing bridge. The new bridge would improve access to Batemans Bay and surrounding areas, allow access for larger trucks, reduce traffic delays and improve the Kings Highway / Princes Highway intersection. The bridge is currently under construction and is expected to be completed in early 2023.
- Nelligen Bridge replacement – Transport for NSW is replacing the existing Kings Highway bridge over the Clyde River at Nelligen with a new bridge and road approaches. Utility works are currently underway with construction to commence afterwards and an expected completion date of the bridge in 2023.

These major projects and potential impacts are further described in Table 6-37 below.

**Local development**

A review of the Eurobodalla Shire Council Major projects and works website was undertaken on 21 January 2020 to identify developments within the Eurobodalla LGA planned for completion in the near future. These include:

- Beach Road safety upgrade – The upgrade of Beach Road between Miller Street and Golf Links Drive is intended to create safer travel for road users. The project includes extending the median islands to reduce the risk of rear-end collisions by preventing motorists from turning right in/out of driveways. A central median island will extend from the existing median near Miller Street and continue south to connect with the concrete island adjacent to the right turn bay into the Club Catalina car park. Along this section of Beach Road driveway access will be restricted to left-in/left-out only. The works are expected to be completed by 2021.
- Glenella Road residential subdivision – A DA approved subdivision for 66 residential dwellings is proposed at 152 Glenella Road, Catalina NSW located immediately east of the proposal construction boundary, confirmation of the commencement of construction works has not been determined.

These developments and potential impacts are further described in Table 6-38 below. Construction of a number of smaller scale projects (e.g. new homes or adjustments to existing properties) may occur in the local area, these small scale projects are expected to be relatively minor and not impact the proposal, any additional large scale projects proposed to be constructed during the same time as the proposal would assess the cumulative impacts of this proposal during their environmental approval processes.
## 6.15.2 Potential impacts

### Table 6-37: Major projects near the proposal

<table>
<thead>
<tr>
<th>Project</th>
<th>Construction impacts</th>
<th>Operational impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batemans Bay Bridge</td>
<td>The bridge is about 3 kilometres away from the proposal. Potential cumulative impacts on traffic could result from construction related vehicles using the local road network and traffic delays due to temporary lane closures and speed limit reductions. The TMP would include measures to communicate with the Batemans Bay Bridge project team as to reduce potential cumulative traffic impacts as much as possible. The construction of Batemans Bay Bridge also required clearing 0.52 Ha of Spotted Gum - Blackbutt shrubby open forest on the coastal foothills, southern Sydney Basin Bioregion and northern South East Corner Bioregion. Cumulatively with the proposal, this would account for up to 0.89 Ha of this PCT. This plant community is not associated with any threatened ecological communities under the BC and EPBC Act. Management measures in Section 6.1 are considered to be sufficient to minimise impacts on fauna habitat associated with this PCT. The Batemans Bay Bridge is located within the Batemans Marine Park, to which Hanging Rock Creek discharges. Potential cumulative impacts from sediment-laden runoff during construction on the water quality of the marine park may occur. However, given the distance from the proposal, they are considered unlikely and mitigation measures included in Section 6.3 are considered sufficient to minimise this risk.</td>
<td>The cumulative operational impact of the bridge with the proposal would ease congestion on the Princes Highway and deliver safer and reliable travel through the Batemans Bay CBD and Eurobodalla LGA. Cumulative changes to other environmental features such as the noise environment are minor and considered to result in likely negligible cumulative impacts. Landscaping works and plantings for the two projects incorporate native species that would contribute to improved biodiversity values along these sections of the Princes Highway. Cumulative operational impacts on water quality of the Batemans Marine Park from increased impervious surfaces may occur during operations. However, given the distance from the proposal, this is considered unlikely and the mitigation measures in Section 6.3 are considered to be sufficient to minimise this risk.</td>
</tr>
<tr>
<td>Nelligen Bridge</td>
<td>Nelligen Bridge is about 10 kilometres north west of Batemans Bay and consequently cumulative impacts on local air, water, noise, biodiversity, heritage and other aspects would be limited. The only aspect where cumulative impacts could be experienced as a result of both projects being under construction would be traffic impacts from construction. The TMP would include measures to communicate with the Nelligen Bridge project team as to reduce potential cumulative traffic impacts as much as possible.</td>
<td>Negligible operational impacts are expected due to the location of the bridge respective to the proposal and difference in the nature of operational impacts.</td>
</tr>
</tbody>
</table>
### Table 6-38: Local developments near the proposal

<table>
<thead>
<tr>
<th>Project</th>
<th>Construction impacts</th>
<th>Operational impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beach Road Safety Upgrade</strong></td>
<td>Due to the expected likely completion of the works before the commencement of construction of the proposal, no cumulative construction impacts would be expected.</td>
<td>The upgrade along Beach Road in addition to the proposal would provide greater connectivity, access and safety to the Batemans Bay CBD. The objectives of the upgrade shares similarities to the aims of the proposal.</td>
</tr>
<tr>
<td><strong>Glenella Road residential subdivision</strong></td>
<td>The commencement date for construction is yet to be determined for the subdivision. As such, potential cumulative impacts are currently unknown. The proposed development should consider the proposal in their assessment of the cumulative during the environmental approval process.</td>
<td>The operational impact of the residential development could see an increase in road traffic volumes along Glenella Road. Predicted traffic models for the proposal would not result in further delays to travel time. LoS modelling indicated that there is no noticeable change in the proposal should the proposed subdivision commence. Glenella Road is still considered to have spare capacity for additional traffic capacity should the subdivision become operational.</td>
</tr>
</tbody>
</table>

### 6.15.3 Safeguards and management measures

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<tr>
<th>Impact</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CM01 – Cumulative impacts</td>
<td>Ongoing coordination and consultation will be undertaken with the contractors from the Nelligen and Batemans Bay bridge replacement projects to ensure cumulative traffic impacts are appropriately assessed and managed, particularly during peak holiday periods.</td>
<td>Transport for NSW / Contractor</td>
<td>Pre-construction/construction</td>
<td>Transport for NSW Specification G10 Traffic Management</td>
</tr>
<tr>
<td>CM02 – Cumulative impacts</td>
<td>The CEMP will be revised to consider potential cumulative impacts from surrounding development activities as they become known.</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
<td>Clause 3 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>
7. Environmental management

7.1 Environmental management plans

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

A CEMP would be prepared to describe the safeguards and management measures identified. The CEMP would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The CEMP would be prepared prior to construction of the proposal and would be reviewed and endorsed by the Transport for NSW Environment Officer prior to the commencement of any on-site works. The CEMP would 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, QA Specification G10 – Traffic Management, and Transport for NSW environmental guidelines.
7.2 Summary of safeguards and management measures

Environmental safeguards and management measures outlined in this REF would be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards and management measures would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in Table 7-1.

Table 7-1: Summary of safeguards and management measures

<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Environmental safeguards</th>
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<th>Timing</th>
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<tbody>
<tr>
<td>GEN1</td>
<td>General – Minimise environmental impacts during construction</td>
<td>A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of construction. As a minimum, the CEMP will address the following: • any requirements associated with statutory approvals • details of how the proposal will implement the identified safeguards outlined in the REF • issue-specific environmental management plans • roles and responsibilities • communication requirements • induction and training requirements • procedures for monitoring and evaluating environmental performance, and for corrective action • reporting requirements and record-keeping • procedures for emergency and incident management • procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.</td>
<td>Contractor / Transport for NSW</td>
<td>Pre-construction / construction</td>
<td>Clause 3 of Transport for NSW Specification G36 Environment Protection</td>
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<tr>
<td>No.</td>
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</table>
| GEN2| General – Bushfire risk | A bushfire risk management plan will be developed and implemented by the contractor as part of the CEMP to prevent, mitigate and respond to the risk of bushfire. The procedures contained within would include as a minimum:  
  - Waste (including vegetation) will not be burned on site  
  - Smoking will only be permitted within designated areas  
  - Specific procedures for ongoing fire risk assessment and response  
  - The location of firefighting equipment  
  - An evacuation plan.                                           | Contractor          | Pre-construction / construction | Clause 4.5 of Transport for NSW Specification G36 Environment Protection |
| GEN3| General - Notification  | All businesses, residential properties and other key stakeholders (eg schools, local councils) affected by the activity will be notified at least five days prior to commencement of the construction activity.                                              | Contractor / Transport for NSW | Pre-construction / construction | Clause 3.7 of Transport for NSW Specification G36 Environment Protection |
| GEN4| General – Environmental awareness | All personnel working on site will receive training to ensure awareness of the environment protection requirements to be implemented during the construction of the proposal. This will include up-front site induction and regular “toolbox” style briefings.  
  Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include:  
  - Areas of Aboriginal heritage sensitivity  
  - Areas of threatened species habitat  
  - Other identified environmentally sensitive areas.                   | Contractor / Transport for NSW project manager | Pre-construction / detailed design | Clause 4.9 of Transport for NSW Specification G36 Environment Protection |
| BD01| Biodiversity             | A Flora and Fauna Management Plan will be prepared in accordance with Transport for NSW’s *Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects* (RTA 2011) and implemented as part of the CEMP. It will include, but not be limited to:  
  - Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas  
  - A strategy to minimise clearing of vegetation and hollow-bearing trees                                                    | Contractor          | Pre-construction             | Clause 4.8 of Transport for NSW Specification G36 Environment Protection |
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<th>Reference</th>
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</thead>
<tbody>
<tr>
<td>BD02</td>
<td>Native vegetation removal</td>
<td>Native vegetation clearing will be minimised through detailed design. Vegetation clearing limit drawings will be developed to minimise vegetation clearing outside of the operational boundary and be in accordance with Transport for NSW Specification G40 Clearing and Grubbing. Construction drawings will include clearing limits, environmental no-go zones, and hollow bearing trees to be retained and to be marked prior to clearing.</td>
<td>Transport for NSW</td>
<td>Detailed design / pre-construction</td>
<td>Clause 3 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
<tr>
<td>BD03</td>
<td>Native vegetation removal</td>
<td>Efforts will be made to retain vegetation not subject to timber harvesting along drainage lines confirmed to support yellow-bellied glider and potential sooty owl breeding habitat near Hanging Rock Creek.</td>
<td>Transport for NSW/contractor</td>
<td>Detailed design / pre-construction</td>
<td>Clause 2.4 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
<tr>
<td>BD04</td>
<td>Hollow bearing tree removal</td>
<td>Pre-clearing surveys will be undertaken in accordance with <em>Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</em> (RTA 2011). Hollow-bearing trees to be retained will be identified and marked during the pre-clearing survey. Habitat trees requiring staged-clearing will also be marked during the pre-clearing survey.</td>
<td>Contactor</td>
<td>Construction</td>
<td>Clause 2.4 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
<tr>
<td>BD05</td>
<td>Hollow bearing tree removal</td>
<td>Where possible, clearing of trees with large or very large hollows would be undertaken outside the breeding season for glossy black cockatoo and sooty owl (i.e. April to August). Where this is not possible, searches for active nests would be undertaken and clearing of active nests would be avoided.</td>
<td>Contactor</td>
<td>Construction</td>
<td>Clause 2.4 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
<tr>
<td>BD06</td>
<td>Habitat removal</td>
<td>Vegetation removal will be undertaken in accordance with <em>Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</em> (RTA 2011).</td>
<td>Contactor</td>
<td>Construction</td>
<td>Clause 2.4 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
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<tr>
<td>BD07</td>
<td>Habitat removal</td>
<td>Fallen logs will be retained where possible and be either moved into adjacent areas outside the clearing limit but within the construction boundary or stockpiled for later placement as part of the site rehabilitation plan in accordance with <em>Guide 5: Re-use of woody debris and bushrock</em>.</td>
<td>Contactor</td>
<td>Construction</td>
<td>Clause 2.2 of Transport for NSW Specification G40 Clearing and Grubbing</td>
</tr>
</tbody>
</table>
| BD08 | Habitat removal                | A nest box strategy would be developed and implemented targeting tree-roosting microbats, arboreal mammals, little lorikeet, forest owls and glossy black cockatoo to offset hollows suitable for these species to be removed. The strategy would:  
  - Include a new survey of surviving hollow bearing trees that would be removed for construction.  
  - Be developed in accordance with *Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011)  
  - Investigate alternative approaches to offset loss of large and very large hollow bearing trees for forest owls and glossy black cockatoos. | Transport for NSW/contractor | Detailed Design/Pre-construction | Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA projects |
| BD09 | Habitat removal                | If residual impacts exceed threshold for offsetting cleared native vegetation or threatened species habitat, a biodiversity offsets strategy will be prepared in accordance with Transport for NSW Biodiversity Offset Guidelines (Roads and Maritime, 2016) during detailed design. | Transport for NSW       | Detailed Design            | Biodiversity Offset Guidelines (Roads and Maritime, 2016)                 |
| BD10 | Fragmentation of identified habitat corridors | A survey to determine whether yellow-bellied gliders persist in the Hanging Rock Creek catchment following the 2019 – 2020 fires will be carried out in spring/summer and in accordance with Survey Guidelines for Australia’s Threatened Mammals (Commonwealth of Australia, 2011). | Transport for NSW       | Detailed design            | Survey Guidelines for Australia’s Threatened Mammals (Commonwealth of Australia, 2011) |
| BD11 | Fragmentation of identified habitat corridors | A connectivity strategy will be prepared if yellow-bellied glider individuals persist in Hanging Rock Creek catchment. Measures that would be investigated include:  
  - Retention of trees in the verges at a maximum of 30 metres apart  
  - Installation of glider poles or rope bridges in a suitable location along Glenella Road. | Transport for NSW       | Detailed design            | Draft Wildlife Connectivity Guidelines for Road Projects (RTA, 2011)       |
<table>
<thead>
<tr>
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<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD12</td>
<td>Fragmentation of identified habitat corridors</td>
<td>Any connectivity measures to be implemented would be installed under the supervision of an experienced ecologist.</td>
<td>Contractor</td>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>BD14</td>
<td>Exclusion zones</td>
<td>All site staff will be inducted about the location and purpose of the exclusion zones.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.8 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>BD15</td>
<td>Injury and mortality of fauna</td>
<td>Minimising road-kill will be considered in the detailed design of the road and associated infrastructure (e.g. culverts and landscaping).</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
<tr>
<td>BD16</td>
<td>Light spill impacts</td>
<td>The extent of road lighting along the intersection approaches will be minimised without compromising road user safety.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Transport for NSW Specification R151 Street lighting</td>
</tr>
<tr>
<td>BD17</td>
<td>Light spill impacts</td>
<td>The use of smart street lighting will be investigated during detailed design as a way to minimise light spill impacts.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Transport for NSW Specification R151 Street lighting</td>
</tr>
<tr>
<td>BD18</td>
<td>Invasion and spread of weeds</td>
<td>Weed species will be managed in accordance with the South East Regional Strategic Weed Management Plan (LLS, 2018), species specific weed control programs implemented by Eurobodalla Shire Council (ESC, 2020) and Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011).</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.8 of Transport for NSW Specification G36 Environment Protection</td>
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<tr>
<td>DF01</td>
<td>Drainage elements</td>
<td>Management of drainage during construction would be carried out in accordance with Technical Guideline – Temporary Stormwater Drainage for Road Construction, the Bluebook and Roads and Maritime Specifications G38 - <em>Soil and Water Management</em> and R11 - <em>Stormwater Drainage</em>.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Transport for NSW Specifications G38 and R11</td>
</tr>
<tr>
<td>DF02</td>
<td>Aquaplaning risk</td>
<td>An assessment will be undertaken to ensure the risk of aquaplaning is minimised.</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS351 – Road Design</td>
</tr>
</tbody>
</table>
| WQ01 | Water quality | A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will:  
- Identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction  
- Include a tannin leachate management protocol in accordance with Roads and Maritime’ Environmental Direction – Management of Tannins from Vegetation Mulch (Roads and Maritime 2012)  
Include a pre-rainfall procedure. | Contractor | Detailed design / pre-construction | Clause 2.1 of Transport for NSW Specification G38 Soil and Water Management |
<p>| WQ02 | Erosion and sedimentation | Progressive site specific Erosion and Sediment Control Plans (ESCP) will be prepared in accordance with the Blue Book by a Certified Professional in Erosion and Sediment Control (CPESC). | Contractor | Detailed design / Pre-construction | Clause 2.2 of Transport for NSW Specification G38 Soil and Water Management |
| WQ03 | Erosion and sedimentation | Progressive rehabilitation will be carried out during construction, whereby rehabilitation will commence as soon as practicable after works are completed in any area. Where feasible, work would be staged to reduce soil erosion risk. | Contractor | Construction | Clause 3.1 of Transport for NSW Specification G38 |</p>
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<tr>
<td>WQ04</td>
<td>Erosion and sedimentation</td>
<td>Surface water diversions will be installed in accordance with the erosion and sedimentation control plan (ESCP) prior to construction commencing.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 2.2 of Transport for NSW Specification G38 Soil and Water Management</td>
</tr>
<tr>
<td>WQ05</td>
<td>Operational water quality</td>
<td>The need for and options for use of bio-filtration swales to reduce water quality impacts on sensitive receiving environments will be investigated during detailed design.</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS311 Water Quality</td>
</tr>
<tr>
<td>WQ06</td>
<td>Scour protection</td>
<td>Adequate and suitable scour protection measures will be incorporated into the drainage detailed design to prevent the erosion and subsequent pollutant loading of watercourses and drainage channels in accordance with <em>Roads and Maritime Procedure for Selecting Treatment Strategies to Control Road Runoff</em> (2003).</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS371 Water Quality</td>
</tr>
<tr>
<td>WQ07</td>
<td>Operational water quality</td>
<td>An assessment of impacts during construction on Hanging Rock Creek and the Batemans Marine Park that considers the NSW Water Quality Objectives and the ANZECC Guidelines will be completed during detailed design.</td>
<td>Transport for NSW</td>
<td>Detailed Design</td>
<td>Transport for NSW Specification PS311 Water Quality</td>
</tr>
<tr>
<td>SE01</td>
<td>Asbestos contamination</td>
<td>Further investigations would be carried out prior to construction to determine the presence of friable and non-friable asbestos and required management measures.</td>
<td>Transport for NSW / Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>
| SE02 | Asbestos contamination     | An Asbestos Management Plan will be prepared in accordance with the SafeWork NSW Code of Practice. The plan will include, but not be limited to:  
  • A map showing the location of asbestos containing material  
  • An assessment of options for management of asbestos  
  • Potential locations suitable for onsite encapsulation within the road formation | Contractor           | Pre-construction | Clause 4.2 of Transport for NSW Specification G36 Environment Protection |
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<td></td>
<td></td>
<td>• Approvals, regulatory, environmental and consultation requirements for onsite encapsulation</td>
<td>Transport for NSW / Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
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<td>Measures to ensure the safety of site personnel and local communities during construction.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
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<td>Consultation with the EPA, Eurobodalla Shire Council and Forestry Corporation of NSW will be carried out during the development of the Asbestos Management Plan.</td>
<td>Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
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<td>An unexpected finds procedure for contaminated land will be prepared as part of the CEMP.</td>
<td>Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
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<td>An emergency spill plan will be prepared in accordance with relevant EPA guidelines. The plan will include measures to be implemented in the event of a spill, including location of spill kits, initial response and containment, notification of emergency services and relevant authorities (including Transport for NSW and EPA officers).</td>
<td>Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
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<td>If soils in the area where the Underground Storage Tanks (UST) is located are to be excavated or a structure built over top, further investigation will be carried out to ascertain the structural integrity of the UST and environmental management requirements to develop a suitable treatment. If removal of UST is necessary, it will be done in accordance with the applicable Underground Petroleum Storage System regulations.</td>
<td>Transport for NSW / Contractor</td>
<td>Detailed design/pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
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<td>Remediation requirements for the hydrocarbon hotspot identified beneath the building slab will be investigated if the concrete slab is to be removed at the Old Sawmill site.</td>
<td>Contractor</td>
<td>Detailed design / Pre-construction</td>
<td>Clause 4.2 of Transport for NSW Specification G36 Environment Protection</td>
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| TT01| Traffic and transport         | A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP in accordance with the Transport for NSW Traffic Control at Work Sites Manual (Roads and Maritime 2018) and QA Specification G10 Traffic Management (2019). The TMP will include:  
  • Confirmation of haulage routes  
  • Site specific traffic control measures (including signage) to manage and regulate traffic movement  
  • Requirements and methods to consult and inform the local community and other stakeholders of impacts on the local road network and active transport options  
  • Identification of access to construction sites including entry and exit locations  
  • A response plan for any construction traffic incident  
  • Measures to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic Monitoring, review and amendment mechanisms. | Contractor           | Pre-construction | Clause 2.2 of Transport for NSW Specification G10 Traffic Management |
<p>| TT02| Traffic and transport         | Transport for NSW will consult with Eurobodalla Shire Council, Forestry Corporation of NSW and emergency services to ensure planned road and lane closures to not impact their activities. | Transport for NSW    | Construction      |                                                                            |
| TT03| Traffic and transport         | A suitable signage strategy will be developed to inform drivers of road network changes and closures, including impacts on bike trails.                                                                                      | Transport for NSW/ Contractor | Pre-construction/ construction | Clause 3 of Transport for NSW Specification G10 Traffic Management |
| TT04| Traffic and transport         | Road users, local communities and the freight industry will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays as a result of construction activities. | Transport for NSW / Contractor | Construction      | Transport for NSW Specification G10 Traffic Management                   |</p>
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| NV01| Noise and vibration | A Noise Management Plan (NMP) will be prepared and implemented as part of the CEMP. The NMP will generally follow the approach in the Interim *Construction Noise Guideline* (ICNG) (DECC, 2009) and identify:  
   • All potential significant noise and vibration generating activities associated with the activity  
   • Feasible and reasonable mitigation measures to be implemented during construction  
   A notification and noise complaint handling procedure. | Contractor      | Pre-construction | Clause 4.6 of Transport for NSW Specification G36 Environment Protection |
| NV02| Noise and vibration | All sensitive receivers likely to be affected by construction noise, including out of hours works, will be notified at least 5 days prior to commencement of the activity. The notification will provide details of:  
   • The project  
   • The construction period and construction hours  
   • Contact information for project management staff  
   • Complaint and incident reporting  
   How to obtain further information. | Contractor      | Detailed design / pre-construction | Clause 4.6 of Transport for NSW Specification G36 Environment Protection |
<p>| NV03| Out of hours works   | Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Any out of hours works needed would be carried out in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime 2016). | Contractor      | Construction  | Clause 4.6 of Transport for NSW Specification G36 Environment Protection |
| NV04| Operational noise    | Operational noise mitigation requirements will be reviewed during detailed design. Any necessary at-property treatments will be agreed upon and implemented in consultation with property owners and in accordance with Transport for NSW’s Noise Mitigation Guidelines. | Transport for NSW | Detailed design/ construction | Roads and Maritime Noise Mitigation Guideline (2015). |
| AH01| Aboriginal heritage | An Aboriginal Heritage Management Plan (AHMP) will be prepared in accordance with the <em>Procedure for Aboriginal cultural heritage consultation and investigation</em> (Roads and Maritime 2012) and <em>Standard Management Procedure - Unexpected Heritage Items</em> (Roads and Maritime 2015). It will provide specific guidance on measures and controls to be implemented for | Contractor      | Pre-construction | Clause 4.9 of Transport for NSW Specification G36 Environment Protection |</p>
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<td>managing impacts on Aboriginal heritage. The AHMP will also include considerations based on recommendations made during the Aboriginal Cultural Engagement Day regarding communication methods.</td>
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<tr>
<td>AH02</td>
<td>AHIP</td>
<td>An Aboriginal heritage impact permit (AHIP) will be sought for the construction boundary.</td>
<td>Transport for NSW/Contractor</td>
<td>Detail design/ pre-construction</td>
<td>Clause 4.9 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>AH03</td>
<td>Aboriginal heritage</td>
<td>Artefacts recovered during test excavations will be re-buried at a suitable location in consultation with the Aboriginal community.</td>
<td>Transport for NSW</td>
<td>Detail design/ pre-construction</td>
<td></td>
</tr>
<tr>
<td>AH04</td>
<td>Unexpected finds</td>
<td>The Standard Management Procedure - Unexpected Heritage Items (Roads and Maritime 2015) will be followed in the event that an unknown or potential Aboriginal object, including skeletal remains, is found during construction.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.9 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>NA01</td>
<td>Non-Aboriginal heritage</td>
<td>The Standard Management Procedure - Unexpected Heritage Items (Roads and Maritime 2015) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.10 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>
| LC01 | Landscape character and visual impact | A revegetation plan would be prepared to detail the revegetation and landscape work needed to maintain the integrity of the existing environment and visual character of areas impacted by the proposal. The plan will include:  
  - Location and identification of existing vegetation and proposed landscaped areas, including species to be used  
  - Built elements including retaining walls and batters  
  - Fixtures such as lighting and signs | Transport for NSW/Contractor | Detailed design / pre-construction | Transport for NSW Specification R179 Landscape Planting |
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<tr>
<td>LC02</td>
<td>Landscape character and visual impact</td>
<td>Where removal of existing trees is unavoidable, new tree plantings will be considered for inclusion in the revegetation plan at appropriate locations.</td>
<td>Transport for NSW</td>
<td>Detailed design/construction</td>
<td>Transport for NSW Specification R179 Landscape Planting</td>
</tr>
<tr>
<td>LC03</td>
<td>Retention of existing vegetation</td>
<td>The proposal will be designed to avoid impact to prominent trees and vegetation communities where possible. Water quality structures and drainage lines would be designed to avoid existing vegetation where possible.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>LC04</td>
<td>Retention of existing vegetation</td>
<td>Retaining walls will be designed to minimise the construction footprint and removal of existing vegetation, where possible. Consideration would be given to screen planting below walls and the use of visually recessive materials to minimise the visual dominance of retaining walls.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Transport for NSW Specifications PS351 and R55</td>
</tr>
<tr>
<td>LC05</td>
<td>Integration of earthworks</td>
<td>Cut/fill batters will be softly integrated through landscaping. The potential visual impact of the earthworks will be minimised by careful design that integrates with adjoining landforms.</td>
<td>Transport for NSW/Contractor</td>
<td>Detailed design/construction</td>
<td></td>
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<tr>
<td>LC06</td>
<td>Hard works colour and materiality</td>
<td>Colours and materiality of all hard works used in the design will be carefully considered. This includes retaining wall structures. Materiality will reflect existing character to help the proposal and associated works blend in with the surrounding environment. Colours of any proposed hardscape/built elements will be chosen with the intention to reduce visual contrast where possible.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
<tr>
<td>PL01</td>
<td>Forestry Permit</td>
<td>A Forestry Permit will be sought prior to construction for access to the Mogo State Forest land located within the construction boundary.</td>
<td>Transport for NSW</td>
<td>Pre-construction</td>
<td>Clause 3.7 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>PL02</td>
<td>Property acquisition</td>
<td>Should revocation of State Forest land be required, provisions of the Forestry Act 2012 would be followed. The Forestry Corporation of NSW would be</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
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<td>consult as soon as possible after land requiring revocation is confirmed during detailed design.</td>
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<tr>
<td>SE01</td>
<td>Community and stakeholder engagement</td>
<td>A Community and Stakeholder Engagement Plan (CSEP) would be prepared as part of the CEMP. The CSEP will include (as a minimum):</td>
<td>Transport for NSW / Contractor</td>
<td>Pre-construction</td>
<td>Community Involvement and Communications Resource Manual (RTA, 2008).</td>
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<td></td>
<td></td>
<td>• A process to carry out regular and ongoing engagement with the community</td>
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<td></td>
<td>Clause 3.7 of Transport for NSW Specification G36 Environment Protection</td>
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<td>• A list of stakeholders to be consulted or informed, including local residents, regional highway users, Mogo State Forest recreational users, tourists, and local businesses</td>
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<td>• A complaints management procedure.</td>
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<td>A process for ongoing communications with the Forestry Corporation of NSW to ensure the proposal does not result in disruption of their forest management activities.</td>
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<tr>
<td>SE02</td>
<td>Traffic closure</td>
<td>Any traffic closure and delays of the Princes Highway would be planned to minimise impacts on the local community, freight, businesses and commercial operators using the roads.</td>
<td>Transport for NSW / Contractor</td>
<td>Pre-construction / construction</td>
<td>Transport for NSW Specification G10 Traffic Management</td>
</tr>
<tr>
<td>SE03</td>
<td>Recreational users</td>
<td>Community hubs such as Trailforks would be notified of the changes to trail access within the Mogo State Forest during construction to assist in reducing the number of impacted users.</td>
<td>Transport for NSW / Contractor</td>
<td>Pre-construction / construction</td>
<td>Clause 3.7 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM01</td>
<td>Waste management general</td>
<td>A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Technical Guide - Management of road construction and maintenance wastes (Roads and Maritime 2016)</td>
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<td>• Measures to avoid and minimise waste associated with the proposal</td>
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<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
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<td></td>
<td></td>
<td>• Classification of waste streams and management options (re-use, recycle, stockpile, disposal)</td>
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<td>• Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions</td>
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<td>• Procedures for storage, transport and disposal of waste</td>
<td>Contractor</td>
<td>Construction</td>
<td>Specification G36 Environment Protection</td>
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<td>• Monitoring, record keeping and reporting requirements.</td>
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<tr>
<td>WM02</td>
<td>Waste management general</td>
<td>All wastes will be managed and disposed of in accordance with the POEO Act and POEO (Waste) regulation.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM03</td>
<td>Waste management general</td>
<td>Appropriate portable toilets or pump out facilities will be provided for construction site workers and sewage will be disposed of appropriately and in accordance with relevant legislation.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM04</td>
<td>Waste management general</td>
<td>Site inductions will include waste management and disposal requirements and facilities.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM05</td>
<td>Excess material disposal</td>
<td>Where relevant, waste material required to be disposed off-site will be recorded through a section 143 (S.143; 3A) notice.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM06</td>
<td>Fill material</td>
<td>Any additional fill material required will be sourced from appropriately licensed facilities and/or other construction projects wherever possible. Additional fill material will be sourced and verified as suitable for use in accordance with relevant EPA and Transport for NSW guidelines.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM07</td>
<td>Material reuse</td>
<td>Excavated material will be reused on site where feasible and suitable for the intended reuse. Where excavated material cannot be used on site, opportunities for reuse on nearby projects will be investigated.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
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<td>WM08</td>
<td>Green waste</td>
<td>Where possible and suitable for use, cleared vegetation will be used as mulch or coarse woody debris for site erosion and sedimentation controls or rehabilitation.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>WM09</td>
<td>Waste disposal</td>
<td>All waste and excess excavated material will be disposed of at an appropriately licensed facility.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>AQ01</td>
<td>Air quality</td>
<td>Air quality management measures will be included in the CEMP, including: • Identification of potential risks/impacts due to the work/activities as dust generation activities • Management measures to minimise risk of dust generation • A process for monitoring and suppressing dust generation on-site A process for altering management measures as required and reprogramming construction activities if the safeguards and management measures do not adequately restrict dust generation.</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>AQ02</td>
<td>Dust emissions</td>
<td>Work will cease when levels of visible airborne dust become excessive and cannot be suppressed with standard dust suppression methods.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>AQ03</td>
<td>Dust emissions</td>
<td>Stockpiled materials will be covered, stabilised or stored in areas not subject to high wind.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
<td>Reference</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AQ04</td>
<td>Dust emissions</td>
<td>All truck loads will be covered when transporting material to and from the site.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC01</td>
<td>Greenhouse gas emissions</td>
<td>The use of alternative fuels and power sources for construction plant and equipment will be investigated and implemented, where appropriate.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC02</td>
<td>Greenhouse gas emissions</td>
<td>Energy efficiency and related carbon emissions will be considered in the selection of vehicle and plant equipment.</td>
<td>Contractor</td>
<td>Pre-construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC03</td>
<td>Sustainability</td>
<td>Equipment will be serviced to ensure they are operating efficiently and all non-road diesel plant and equipment used for construction will comply with relevant EU or US EPA emissions standards.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Clause 4.4 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC04</td>
<td>Sustainability</td>
<td>Where possible, materials will be delivered as full loads and local suppliers will be used.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC05</td>
<td>Sustainability</td>
<td>Plant used intermittently will be shut down when not in use.</td>
<td>Contractor</td>
<td>Construction</td>
<td>Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>No.</td>
<td>Impact</td>
<td>Environmental safeguards</td>
<td>Responsibility</td>
<td>Timing</td>
<td>Reference</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
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<td>----------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>CC06</td>
<td>Sustainability</td>
<td>The use of recycled aggregates in road pavement and surfacing (including crushed concrete, granulated blast furnace slag, glass, slate waste and fly ash) will be investigated during detailed design.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Clause 4.11 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
<tr>
<td>CC07</td>
<td>Sustainability</td>
<td>Energy efficient LED light bulbs will be used for street lighting where allowed.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td>Transport for NSW Specification R151 Street lighting</td>
</tr>
<tr>
<td>CC08</td>
<td>Sustainability</td>
<td>Risks associated with climate change, such as increased bushfire risk in the surrounding environment, will be considered during detailed design development.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
<tr>
<td>CC09</td>
<td>Sustainability</td>
<td>Relevant targets established in Roads and Maritime Environment Sustainability Strategy 2019-2023 will be considered during detailed design development.</td>
<td>Transport for NSW</td>
<td>Detailed design</td>
<td></td>
</tr>
<tr>
<td>CM01</td>
<td>Cumulative impacts</td>
<td>Ongoing coordination and consultation will be undertaken with the contractors from the Nelligen and Batemans Bay bridge replacement projects to ensure cumulative traffic impacts are appropriately assessed and managed, particularly during peak holiday periods.</td>
<td>Transport for NSW / Contractor</td>
<td>Pre-construction/construction</td>
<td>Transport for NSW Specification G10 Traffic Management</td>
</tr>
<tr>
<td>CM02</td>
<td>Cumulative impacts</td>
<td>The CEMP will be revised to consider potential cumulative impacts from surrounding development activities as they become known.</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
<td>Clause 3 of Transport for NSW Specification G36 Environment Protection</td>
</tr>
</tbody>
</table>
## 7.3 Licensing and approvals

The following licences and approval are required prior to the timing defined in Table 7-2.

Table 7-2: Summary of licensing and approvals required

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Requirement</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Protection of the Environment Operations Act 1997 (s43)</em></td>
<td>Environmental Protection Licence for Schedule 1 activities (road construction) under the POEO Act from the EPA.</td>
<td>Prior to start of the activity.</td>
</tr>
<tr>
<td><em>Forestry Act 2012 (Division 2, Part 4)</em></td>
<td>Licence to remove trees or forest materials from a State Forest, timber reserve or flora reserve from the Forestry Corporation of NSW.</td>
<td>Prior to removing trees or forest materials from Mogo State Forest.</td>
</tr>
<tr>
<td><em>Forestry Act 2012 (Division 2, Part 4)</em></td>
<td>Some of the land affected by the proposal may require revocation of the State Forest status and acquisition from the Forestry Corporation of NSW in accordance with the provisions of the <em>Forestry Act 2012</em>. This would result in a DAEA being prepared and an MOU for acquiring State Forest land.</td>
<td>MOU and DAEA would be drafted prior to commencement of construction. Revocation, if required would be carried out after completion of construction works.</td>
</tr>
<tr>
<td><em>National Parks and Wildlife Act 1974 (s90)</em></td>
<td>Aboriginal heritage impact permit from the Chief Executive of Biodiversity and Conservation Division, DPIE.</td>
<td>Prior to start of the activity.</td>
</tr>
</tbody>
</table>
8. Conclusion

8.1 Justification of the REF proposal

The REF proposal is considered to be consistent with a number of Commonwealth and NSW strategies and plans which include:

- Princes Highway Corridor Strategy, Australian Government
- State Infrastructure Strategy 2018-2038: Building Momentum
- NSW Future Transport Strategy 2056
- South East and Tableland Regional Plan 2036
- NSW Freight and Ports Plan 2019-2023
- NSW Road Safety Plan 2021
- Tourism and Transport Plan
- NSW South Coast Marine Tourism Strategy
- Transport for NSW, Connecting to the future, Our 10 Year Blueprint.

The proposal is considered to be an important upgrade to the area of Batemans Bay as it would improve network connectivity by providing a safe and efficient connection between the Princes Highway and the South Batemans Bay Link Road project.

The proposal would provide a safe and efficient intersection between the Princes Highway and Glenella Road that would improve travel times and access to areas south of Batemans Bay and allow for increase freight access and productivity in the Batemans Bay CBD, southern coastal villages and proposed Surf Beach employment lands. The proposal would also improve the traffic and pedestrian amenity in the Batemans Bay CBD by enhancing the attractiveness and sustainability of the liveability and amenity of Batemans Bay. Safety for pedestrians and cyclists would be improved by the proposal.

The proposal would ease congestion in the Batemans Bay CBD, particularly along Beach Road, by providing a safe and efficient alternative access to the southern coastal villages. The proposal would provide long term socio-economic benefit to the area of Batemans Bay and the greater Eurobodalla LGA as it is expected to improve the performance of several key intersections.

In the holiday PM peak, three of the six intersections assessed would operate at LoS D or worse by 2036 and cause knock-on impacts to adjacent intersections. In 2036, the proposal would carry over 2,400 vehicles per day and draw trips away from residential streets that are currently used as a local road (alternative) shortcut to the Beach Road. The proposal results in improvement to the performance of the intersections assessed, reducing the average delay and maximum queue lengths along several key intersections and would support heavy vehicle movements to and from destinations such as the Eurobodalla Waste Management facility at Surf Beach and the Cranbrook Road industrial area south of the Batemans Bay CBD.
Table 8.2 Objects of the EP&A Act

Table 8-1 provides a summary of the REF proposal against the objects of the EP&A Act.

<table>
<thead>
<tr>
<th>Object</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.</td>
<td>The proposal has been designed to maximise material reuse and benefits to the community while minimising adverse environmental impacts. The proposal would improve the efficiency of traffic movements along the Princes Highway and Beach Road and provide an alternative route through Glenella Road. A range of safeguards and management measures have been identified to minimise environmental impacts associated with the proposal.</td>
</tr>
<tr>
<td>1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.</td>
<td>The principles of ecologically sustainable development are at the core of the environmental assessment and management measures included in section 6 and are further addressed in Sections 8.2.1 to 8.2.4.</td>
</tr>
<tr>
<td>1.3(c) To promote the orderly and economic use and development of land.</td>
<td>The proposal would facilitate further land use development in Batemans Bay CBD and the southern coastal villages to support residential property and employment growth as well as increase freight productivity for heavy vehicles accessing these areas.</td>
</tr>
<tr>
<td>1.3(d) To promote the delivery and maintenance of affordable housing.</td>
<td>Not relevant to the proposal.</td>
</tr>
<tr>
<td>1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.</td>
<td>Potential impacts on the environment are assessed in Section 6. Impacts on threatened and non-threatened biota are discussed in Section 6.1. Removal of native vegetation would be minimised during detailed design and construction planning. Safeguards in Section 6.1.5 would be implemented to protect the environment by avoiding and minimising potential environmental impacts on biodiversity.</td>
</tr>
<tr>
<td>1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).</td>
<td>Potential impacts on Aboriginal and non-Aboriginal cultural heritage are discussed in Sections 6.7 and 6.8. The proposal would directly impact on two Aboriginal heritage items. The proposal would not have any likely impacts on non-Aboriginal cultural heritage. Impacts on cultural heritage would be minimised through the implementation of safeguards and mitigation measures included in Sections 6.7.4 and 6.8.4. Training would be provided to site personnel to promote a culture of sustainable management of cultural heritage.</td>
</tr>
</tbody>
</table>
### Object | Comment
--- | ---
1.3(g) To promote good design and amenity of the built environment. | Landscape character and visual impacts are discussed in Section 6.9. Assessment and mitigation of impacts have been developed in accordance with the key urban design objectives and principles, including those outlined in Transport for NSW Beyond the Pavement Urban Design Policy Procedures and Design Principles.

1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants. | Not relevant to the proposal.

1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State. | The Stage 1 of the South Batemans Bay Link Road project was completed by Council in 2019. The proposal would complete the South Batemans Bay Link Road and showcases sharing of responsibility for environmental planning and assessment between the State and local government.

1.3(j) To provide increased opportunity for community participation in environmental planning and assessment. | The proposal underwent a community and stakeholder consultation process in accordance with the provisions of the EP&A Act. Community involvement and participation is discussed in Section 5.

### 8.2.1 The precautionary principle

This principle states "if there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation". A series of options were considered and assessed for the proposal to determine the most cost effective and efficient alignment that would also reduce the risk of serious and irreversible environmental impacts. A number of safeguards have been proposed to avoid and minimise potential impacts. These safeguards would be implemented during design development and construction of the proposal.

A CEMP would be prepared before construction starts to ensure the proposal achieves a high-level of environmental performance during construction.

### 8.2.2 Intergenerational equity

The principle states: “the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations”.

The REF proposal would not result in any impacts that are likely to adversely impact on the health, diversity or productivity of the environment for future generations. The completion of the South Batemans Bay Link Road project would improve the long-term connectivity of the Southern Batemans Bay suburbs to the Princes Highway and would ease maximum queue lengths and congestion in the Batemans Bay for peak holiday periods.
8.2.3 Conservation of biological diversity and ecological integrity

This principle states the “diversity of genes, species, populations and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival”.

A thorough assessment of the existing local environment was undertaken to identify, avoid, mitigate and manage any potential impacts of the proposal on biodiversity. The proposed works would result in the clearing of up to 22.68 hectares of native vegetation. These impacts to biodiversity are considered to be a worst case estimate and would be minimised through detailed design, improved construction methodology and implementation of the safeguards outlined in this REF.

An assessment of significance has been prepared for potentially affected threatened species, populations and ecological communities listed under the BC Act and EPBC Act. The assessment concluded the proposal would not result in a significant impact on threatened biota.

The proposal would not have a significant impact on biological diversity and ecological integrity.

A biodiversity assessment and site-specific safeguards are provided in Section 6.1. Biodiversity offsets requirements are discussed in Section 6.1.4.

8.2.4 Improved valuation, pricing and incentive mechanisms

This principle requires “costs to the environment should be factored into the economic costs of a project”.

The REF has examined the environmental consequences of the proposal and identified safeguards and management measures to avoid, minimise, mitigate and manage the potential for adverse environmental impacts. These safeguards would result in an increase in capital and operating cost of the proposal to Transport for NSW.

The concept design of the proposal has been developed with the objective to minimise environmental impacts on the surrounding environment.

8.3 Conclusion

The proposed South Batemans Bay Link Road located along the Princes Highway and Glenella Road at Batemans Bay is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

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

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the project objectives but would still result in some impacts on biodiversity, noise, Aboriginal heritage, water quality, land use, waste management, air quality and climate change. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also reduce pressure on the existing Beach Road / Princes Highway intersection, ease congestion in the Batemans Bay CBD and allow future traffic growth in the region.

On balance, the proposal is considered justified and the following conclusions are made.
**Significance of impact under NSW legislation**

The proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

**Significance of impact under Australian legislation**

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

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

Cassy Baxter
Senior Environmental Scientist
Cardno (NSW/ACT) Pty Ltd
Date: 22/04/2020

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

Erika Garbayo
Project Development Officer
Regional Project Office | Technical and Project Services
Date: 22/04/2020
10. References


Burra Charter 2013, Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance

DECC 2009, Interim Noise Construction Guideline

DECCW 2011, Road Noise Policy

Department of Environment Climate Change and Water 2010, Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales

DLWC 1997, Acid Sulfate Soil Risk Mapping

Geological Survey of NSW 1966, The Ulladulla 1:250,000 Geological Series Sheet S1 56-13


NSW Department of Environment and Climate Change 2008a, Managing Urban Stormwater Soils and Construction: Volume 2D Main Road Construction.


NSW Government 1979, NSW Environmental Planning and Assessment Act 1979


NSW Government 2000a, NSW Environmental Planning and Assessment Regulation 2000.


NSW Government 2014, Marine Estate Management Act 2014


NSW Statewide Seamless Geology 2019, the Great Soil Group Classification and the Australian Soil Classification datasets

OEH 2010, Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010

OEH 2011, Guide to investigating, assessing, and reporting on Aboriginal Cultural Heritage in NSW

Roads and Maritime 2011a, Procedure for Aboriginal Cultural Heritage Consultation and Investigation

Roads and Maritime 2015, Noise Criteria Guideline

Roads and Maritime 2015, Noise Mitigation Guideline

Roads and Maritime 2016, Construction Noise and Vibration Guideline

Roads and Maritime 2017, At-Receiver Noise Treatment Guideline

Roads and Maritime 2018, Guidelines for landscape character and visual impact assessment No. EIA-N04

Roads and Maritime 2018, Noise Model Validation Guideline

Roads and Maritime 2019, South Batemans Bay Link Road: Geotechnical factual report.

Roads and Maritime, 2011, Environmental Impact Assessment Practice Note: Biodiversity Assessment (EIA-N06).

### Terms and acronyms used in this REF

<table>
<thead>
<tr>
<th>Term / Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AusLink</td>
<td>Mechanism to facilitate cooperative transport planning and funding by Commonwealth and state and territory jurisdictions</td>
</tr>
<tr>
<td>BC Act</td>
<td><em>Biodiversity Conservation Act 2016 (NSW).</em></td>
</tr>
<tr>
<td>BTEX</td>
<td>Benzene, toluene, ethylbenzene and xylene</td>
</tr>
<tr>
<td>CEMP</td>
<td>Construction environmental management plan</td>
</tr>
<tr>
<td>CM SEPP</td>
<td>State Environmental Planning Policy (Coastal Management) 2018</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental impact assessment</td>
</tr>
<tr>
<td>EP&amp;A Act</td>
<td><em>Environmental Planning and Assessment Act 1979 (NSW).</em> Provides the legislative framework for land use planning and development assessment in NSW</td>
</tr>
<tr>
<td>ESD</td>
<td>Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased</td>
</tr>
<tr>
<td>FM Act</td>
<td><em>Fisheries Management Act 1994 (NSW)</em></td>
</tr>
<tr>
<td>Heritage Act</td>
<td><em>Heritage Act 1977 (NSW)</em></td>
</tr>
<tr>
<td>ISEPP</td>
<td>State Environmental Planning Policy (Infrastructure) 2007</td>
</tr>
<tr>
<td>LALC</td>
<td>Local Aboriginal Land Council</td>
</tr>
<tr>
<td>LoS</td>
<td>Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.</td>
</tr>
<tr>
<td>MNES</td>
<td>Matters of national environmental significance under the Commonwealth <em>Environment Protection and Biodiversity Conservation Act 1999.</em></td>
</tr>
<tr>
<td>NPW Act</td>
<td><em>National Parks and Wildlife Act 1974 (NSW)</em></td>
</tr>
<tr>
<td>OCP</td>
<td>Organochlorine pesticides</td>
</tr>
<tr>
<td>OPP</td>
<td>Organophosphorous pesticides</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>PAH</td>
<td>Polycyclic aromatic hydrocarbons</td>
</tr>
<tr>
<td>PCB</td>
<td>Polychlorinated biphenyls</td>
</tr>
<tr>
<td>PFAS</td>
<td>Per and Polyfluorinated substances</td>
</tr>
<tr>
<td>QA Specifications</td>
<td>Specifications developed by Transport for NSW Services for use with road work and bridge work contracts let by Transport for NSW Services.</td>
</tr>
<tr>
<td>Transport for NSW</td>
<td>NSW Transport for NSW Services</td>
</tr>
<tr>
<td>VHC</td>
<td>Volatile Halogenated Compounds</td>
</tr>
</tbody>
</table>
Appendix A
Consideration of clause 228(2) factors and matters of national environmental significance and Commonwealth land
Clause 228(2) Checklist

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

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Any environmental impact on a community?</td>
<td>Short-term negative</td>
</tr>
<tr>
<td>The construction of the proposal would have impacts on the community in the form of noise from plant and equipment, potential traffic of light and heavy vehicles, emissions from construction plant and equipment and reduction in visual amenity. These impacts would be minimised and managed through the safeguards described in Section 7. Potential adverse impacts to the community during operations would be associated with noise and air emissions from increased traffic volumes in some localities. However, the scale of these impacts has been assessed to be minor. It is considered that the long-term social benefits provided by reduced congestion in the Batemans Bay CBD and the facilitation for land use development in the south coast would outweigh environmental impacts.</td>
<td>Long-term positive</td>
</tr>
<tr>
<td>b) Any transformation of a locality?</td>
<td>Minor short-term negative Nil</td>
</tr>
<tr>
<td>The proposal would include the construction of a new roundabout on the Princes Highway, an upgrade of the existing Glenella Road to a two-lane paved road between the new roundabout on the Princes Highway and Glenella Road to the east of The Ridge Road. Construction works would introduce short-term changes to the locality associated with construction activities and temporary use of areas for works. The proposal is located within or directly adjacent to the existing road corridor and as such is not considered to substantially transform the locality. Urban design would form part of the detailed design and potential visual impacts would be managed through adopting the management measures and safeguards as listed in Chapter 7.</td>
<td></td>
</tr>
</tbody>
</table>
c) Any environmental impact on the ecosystems of the locality?

The construction of the proposal would result in the removal of up to 22.68 hectares of native vegetation which contains:

- 15.95 ha of breeding habitat for glossy black cockatoo (listed as vulnerable under the BC Act)
- 7.69 ha of breeding habitat for sooty owl (listed as vulnerable under the BC Act)
- 21.79 ha of ecosystem credit species habitat
- Up to 72 hollow bearing trees
- No threatened ecological communities
- No threatened flora species habitat
- No Class 1 or Class 2 watercourses or watercourses that would be likely to provide habitat for threatened aquatic species.

During the operation, the proposal would increase habitat fragmentation and edge effects caused by existing infrastructure (i.e. existing roads and utilities easement).

The proposal has been assessed as not likely to significantly impact threatened species, populations or ecological communities listed under the BC Act or EPBC Act. This assessment included considerations of the effects of the recent Clyde Mountain bushfire which affected approximately 84,000 ha of land within Eurobodalla Shire.

Impacts on biodiversity would be minimised through the implementation of management and mitigation measures identified in this REF. Biodiversity offsets may be required in accordance with Roads and Maritime Guideline for Biodiversity Offsets.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>c) Any environmental impact on the ecosystems of the locality?</td>
<td>Short-term negative</td>
</tr>
</tbody>
</table>

Minor long-term negative

Short-term negative

Medium-term negative

d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?

During construction, there would be a minor reduction in the aesthetic quality of the locality due to the removal of vegetation, changed road conditions along Glenella Road and Princes Highway. Short-term impacts during construction would be minimised and managed through the implementation of safeguards outlined in Section 7.

During operations, the effects of vegetation removal carried out during construction would be mitigated through landscaping and revegetation but plantings would take 10-15 years to reach maturity.
<table>
<thead>
<tr>
<th>Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</td>
<td>Long-term negative</td>
</tr>
<tr>
<td>The construction of the proposal would impact on up to two Aboriginal sites containing artefact scatters that were identified during field investigations. These sites have been assessed as having low archaeological significance. An Aboriginal Heritage Impact Permit (AHIP) would be sought for impacts on these sites and any unknown items potentially impacted by the proposal. No further impacts to Aboriginal and non-Aboriginal heritage would occur during operation of the proposal.</td>
<td>Nil</td>
</tr>
<tr>
<td>f) Any impact on the habitat of protected fauna (within the meaning of the <em>National Parks and Wildlife Act 1974</em>)?</td>
<td>Minor long-term negative</td>
</tr>
<tr>
<td>The construction of the proposal would require the removal of up to: • 15.95 ha of breeding habitat for glossy black cockatoo (listed as vulnerable under the BC Act) • 7.69 ha of breeding habitat for sooty owl (listed as vulnerable under the BC Act) • 21.79 ha of ecosystem credit species habitat • 72 hollow bearing trees, potential habitat for a number of hollow-dependent threatened fauna. This would reduce the availability and range of food resources such as seeds, nectar, pollen, lerps, gum / resin, and invertebrates attracted to these resources. However, the proposal is surrounded by vast areas of similar habitat and is therefore unlikely to have significant impacts on the availability of habitat for threatened and non-threatened species within the locality. During operations, the increased road width, embankments and sealed road character has the potential to reduce opportunities for fauna with limited dispersal capability or that are unlikely to move through exposed unvegetated areas to safely disperse in or out of Hanging Rock Creek Catchment into areas of Mogo State Forest to the south. This is likely to increase the isolation of less mobile fauna species present in habitat located in Hanging Rock Creek catchment. However, the proposal would not substantially increase habitat fragmentation such that habitat connectivity would be affected for any fauna species. The proposal would also increase existing edge effects, light spill and noise in areas adjacent to the road, reducing the suitability of habitat next to the alignment (generally within 20 metres). The majority of the vegetation affected is already subject to some edge effects, as a result of the existing roads, powerline easement and other disturbance. The increase in edge effects created by the proposal is unlikely to be significant. Measures to reduce these effects during construction and operations are included in Section 7.</td>
<td>Minor long-term negative</td>
</tr>
<tr>
<td>Factor</td>
<td>Impact</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</td>
<td>Nil</td>
</tr>
<tr>
<td>The construction of the proposal would result in the removal of up to 22.68 Ha of native vegetation, which is habitat to a large number of species. However, the proposal has been assessed as not likely to significantly impact threatened species, populations or ecological communities listed under the BC Act or EPBC Act and would not result in the endangering of any species.</td>
<td>Nil</td>
</tr>
<tr>
<td>During operations, the proposal would increase existing edge effects, light spill and noise. These impacts may affect fauna behaviour causing animals to retreat from favourable habitat near noise and light sources, reducing time spent feeding and resulting in energy depletion, disrupting calling required for reproduction and lower likelihood of survival and reproduction. However, it is likely that most animal species within the construction boundary and surrounds are already habituated to these impacts. The proposal is not anticipated to result in any significant increase in the impact of noise, light or vibration on species to a point where it would endanger their survival.</td>
<td>Minor long-term negative</td>
</tr>
<tr>
<td>h) Any long-term effects on the environment?</td>
<td>Minor long-term negative</td>
</tr>
<tr>
<td>The construction of the proposal would result in the removal of up to 22.68 hectares of native vegetation and the complete or partial destruction of two Aboriginal heritage sites. The long-term impacts of these effects would be minimised through the implementation of safeguards outlined in Section 7.</td>
<td>Minor long-term negative</td>
</tr>
<tr>
<td>There would be some long-term operational impacts on local biodiversity due to edge effects and habitat fragmentation. The increase in impervious surfaces has the potential to have long-term effects on water quality of nearby creeks from vehicles using the road. These effects would be further assessed and minimised through detailed design and construction planning as outlined in Section 7.</td>
<td>Minor long-term negative</td>
</tr>
<tr>
<td>i) Any degradation of the quality of the environment?</td>
<td>Short-term negative</td>
</tr>
<tr>
<td>The proposal has the potential to degrade the quality of the environment via accidental spills, erosion and sedimentation and vegetation removal during construction. These impacts would be minimised through the implementation of safeguards outlined in Section 7.</td>
<td>Short-term negative</td>
</tr>
<tr>
<td>During operations, disturbed areas would be revegetated in accordance with a revegetation plan. The need for operational water quality devices would be investigated and determined during detailed design. If required, measures would be implemented to ensure there is no degradation of the quality of the environment.</td>
<td>Nil</td>
</tr>
<tr>
<td>Factor</td>
<td>Impact</td>
</tr>
<tr>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>j) Any risk to the safety of the environment?</td>
<td>Nil Long-term positive</td>
</tr>
<tr>
<td>There would be no impacts to the safety of the environment during construction. Once operational, the proposal would improve traffic safety within the area through the proposed speed reduction and new roundabout at the intersection of the Princes Highway and Glenella Road. It would also reduce traffic and heavy vehicles on other local roads that are more transited by pedestrian and cyclist, therefore reducing safety risks to these vulnerable road users.</td>
<td></td>
</tr>
<tr>
<td>k) Any reduction in the range of beneficial uses of the environment?</td>
<td>Nil Nil</td>
</tr>
<tr>
<td>The forested area within the construction boundary would be closed to the public and the Forestry Corporation of NSW. However, the surrounding areas within the Mogo State Forest provide sufficient options for these users so there is no reduction on the range of beneficial uses of the local environment when considered in context. The operation of proposal is not likely to result in any reduction in the range of beneficial uses of the environment.</td>
<td></td>
</tr>
<tr>
<td>l) Any pollution of the environment?</td>
<td>Short-term negative Nil</td>
</tr>
<tr>
<td>There is the potential for accidental spills of chemicals during the construction period which could affect surrounding land. Erosion and sedimentation could result in negative impacts on water quality of nearby creeks during construction of the proposal. Reduction of local air quality may also occur due to dust and plant emissions generated during construction. The risk of these impacts occurring would be minimised through the implementation of safeguards in Section 7. The proposal would result in an increase in impervious surfaces, which has the potential to have effects on water quality of nearby creeks from vehicles using the road. Spills could also occur during operations. The need for operational water quality devices would be investigated and determined during detailed design. If required, measures would be implemented to ensure potential pollution impacts from the operation of the road are managed adequately.</td>
<td></td>
</tr>
<tr>
<td>m) Any environmental problems associated with the disposal of waste?</td>
<td>Nil Nil</td>
</tr>
<tr>
<td>During construction, waste would be managed in accordance with the resource management hierarchy principles outlined in the <em>Waste Avoidance and Resource Recovery Act 2001</em>. It is not anticipated that there would be issues encountered with the disposal of waste. There would be no impacts associated with waste disposal during operation of the proposal.</td>
<td></td>
</tr>
<tr>
<td>Factor</td>
<td>Impact</td>
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<tr>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</td>
<td>Nil</td>
</tr>
<tr>
<td>All resources required would not be in short supply and would be readily available. There are no expected impacts during construction or operations on the demand of resources that would be likely to become in short supply.</td>
<td></td>
</tr>
<tr>
<td>o) Any cumulative environmental effect with other existing or likely future activities?</td>
<td>Shor-term negative</td>
</tr>
<tr>
<td>The construction of the proposal would overlap with at least two other nearby bridge projects. There is potential for cumulative traffic, noise, biodiversity and water quality impacts. Safeguards outlined in Section 7 would be implemented to minimise the risk of cumulative impacts during construction. During operations, the proposal together with other upgrade projects along the Princes Highway and Kings Highway would be expected to collectively contribute to improved travel times, access and road safety.</td>
<td>Long-term positive</td>
</tr>
<tr>
<td>p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</td>
<td>Nil</td>
</tr>
<tr>
<td>The proposal is located outside of mapped coastal environments and its contribution to greenhouse gas emissions would be minimal during construction. Therefore, there would be no impacts on coastal processes or hazards during construction. During operations, the proposal would provide an alternative route for coastal areas vulnerable to coastal processes and hazards, including those under projected climate change conditions. This would increase their adaptive capacity and resilience.</td>
<td>Long-term positive</td>
</tr>
</tbody>
</table>
Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act 1999, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Agriculture, Water and the Environment.

A referral is not required for proposed actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. Impacts on these matters are still assessed as part of the REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Any impact on a World Heritage property?</td>
<td>Nil</td>
</tr>
<tr>
<td>There are no World Heritage properties within or near the proposal area. There would be no World Heritage properties impacted by the proposal</td>
<td></td>
</tr>
<tr>
<td>b) Any impact on a National Heritage place?</td>
<td>Nil</td>
</tr>
<tr>
<td>There are no National Heritage places within or near the proposal area. There would be no negative impact to a National Heritage Places by the proposal.</td>
<td></td>
</tr>
<tr>
<td>c) Any impact on a wetland of international importance?</td>
<td>Nil</td>
</tr>
<tr>
<td>There are no wetlands of international importance within or near the construction boundary. There would be no impact to wetlands of international importance by the proposal.</td>
<td></td>
</tr>
<tr>
<td>d) Any impact on a listed threatened species or communities?</td>
<td>Minor long-term negative</td>
</tr>
<tr>
<td>The construction of the proposal would require the removal of up to:</td>
<td></td>
</tr>
<tr>
<td>• 22.68 ha of native vegetation</td>
<td></td>
</tr>
<tr>
<td>• 72 hollow bearing trees.</td>
<td></td>
</tr>
<tr>
<td>This vegetation is potential habitat for five EPBC-listed threatened fauna species. This would reduce the availability and range of food resources such as seeds, nectar, pollen, lerps, gum/resin, and invertebrates attracted to these resources. However, the proposal is surrounded by vast areas of similar habitat and is therefore unlikely to have significant impacts on the availability of habitat for threatened and non-threatened species within the locality.</td>
<td></td>
</tr>
<tr>
<td>During operations, the increased road width, embankments and sealed road character has the potential to reduce opportunities for fauna with limited dispersal capability or that are unlikely to move through exposed unvegetated areas to safely disperse in or out of Hanging Rock Creek Catchment into areas of Mogo State Forest to the south. This is likely to increase the isolation of less mobile fauna species present in habitat located in the Hanging Rock Creek catchment. However, the proposal would not substantially increase habitat fragmentation such that habitat connectivity would be affected for any fauna species.</td>
<td></td>
</tr>
<tr>
<td>The proposal would also increase existing edge effects, light spill and noise in areas adjacent to the road, reducing the suitability of habitat next to the</td>
<td></td>
</tr>
</tbody>
</table>
alignment (generally within 20 metres). The majority of the vegetation affected is already subject to some edge effects, as a result of the existing roads, power easement and other disturbance. The increase in edge effects created by the proposal is unlikely to be significant.

Measures to reduce these effects during construction and operations are included in Section 7.

The proposal has been assessed as not likely to significantly impact threatened species, populations or ecological communities listed under the EPBC Act. There would be no impacts on EPBC-listed threatened populations, flora species or ecological communities.

e) Any impacts on listed migratory species?

Three EPBC Act listed migratory species have been identified as having moderate or higher potential to occur within the construction boundary:

- Black-faced monarch (*Monarcha melanopsis*)
- Satin flycatcher (*Myiagra cyanoleuca*)
- Rufous fantail (*Rhipidura rufifrons*).

The construction boundary does not support any important habitat for these species, as similar and higher quality habitat is extensively distributed throughout the landscape to the south, west and north of the construction boundary. The proposal has been assessed as not likely to significantly impact migratory species listed under the EPBC Act.

There would be no impacts on these migratory species during operations of the proposal.

f) Any impact on a Commonwealth marine area?

There are no Commonwealth marine areas within or near the proposal. There would be no impact to Commonwealth marine areas by the proposal.

h) Additionally, any impact (direct or indirect) on the environment of Commonwealth land?

The proposal does not involve a nuclear action.

The proposal would not impact Commonwealth land.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>alignment (generally within 20 metres). The majority of the vegetation affected is already subject to some edge effects, as a result of the existing roads, power easement and other disturbance. The increase in edge effects created by the proposal is unlikely to be significant. Measures to reduce these effects during construction and operations are included in Section 7. The proposal has been assessed as not likely to significantly impact threatened species, populations or ecological communities listed under the EPBC Act. There would be no impacts on EPBC-listed threatened populations, flora species or ecological communities.</td>
<td>Nil</td>
</tr>
<tr>
<td>e) Any impacts on listed migratory species? Three EPBC Act listed migratory species have been identified as having moderate or higher potential to occur within the construction boundary: Black-faced monarch (<em>Monarcha melanopsis</em>) Satin flycatcher (<em>Myiagra cyanoleuca</em>) Rufous fantail (<em>Rhipidura rufifrons</em>). The construction boundary does not support any important habitat for these species, as similar and higher quality habitat is extensively distributed throughout the landscape to the south, west and north of the construction boundary. The proposal has been assessed as not likely to significantly impact migratory species listed under the EPBC Act. There would be no impacts on these migratory species during operations of the proposal.</td>
<td>Nil</td>
</tr>
<tr>
<td>f) Any impact on a Commonwealth marine area? There are no Commonwealth marine areas within or near the proposal. There would be no impact to Commonwealth marine areas by the proposal.</td>
<td>Nil</td>
</tr>
<tr>
<td>g) Does the proposal involve a nuclear action (including uranium mining)? The proposal does not involve a nuclear action.</td>
<td>Nil</td>
</tr>
<tr>
<td>h) Additionally, any impact (direct or indirect) on the environment of Commonwealth land? There is no Commonwealth land within or near the proposal. The proposal would not impact Commonwealth land.</td>
<td>Nil</td>
</tr>
</tbody>
</table>
Appendix B
Statutory consultation checklists
## Infrastructure SEPP

### Certain development types

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

### Development within the Coastal Zone

<table>
<thead>
<tr>
<th>Issue</th>
<th>Description</th>
<th>Yes / No</th>
<th>If ‘yes’ consult with</th>
<th>ISEPP clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development with impacts on certain land within the coastal zone</td>
<td>Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?</td>
<td>No</td>
<td></td>
<td>ISEPP cl. 15A</td>
</tr>
</tbody>
</table>


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

### Council related infrastructure or services

<table>
<thead>
<tr>
<th>Issue</th>
<th>Potential impact</th>
<th>Yes / No</th>
<th>If ‘yes’ consult with</th>
<th>ISEPP clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stormwater</td>
<td>Are the works likely to have a <em>substantial</em> impact on the stormwater management services which are provided by council?</td>
<td>No</td>
<td></td>
<td>ISEPP cl.13(1)(a)</td>
</tr>
<tr>
<td>Traffic</td>
<td>Are the works likely to generate traffic to an extent that will <em>strain</em> the capacity of the existing road system in a local government area?</td>
<td>Yes</td>
<td>Eurobodalla Shire Council</td>
<td>ISEPP cl.13(1)(b)</td>
</tr>
<tr>
<td>Sewerage system</td>
<td>Will the works involve connection to a council owned sewerage system? If so, will this connection have a <em>substantial</em> impact on the capacity of any part of the system?</td>
<td>No</td>
<td></td>
<td>ISEPP cl.13(1)(c)</td>
</tr>
</tbody>
</table>
### South Batemans Bay Link Road

#### Review of environmental factors

<table>
<thead>
<tr>
<th>Issue</th>
<th>Potential impact</th>
<th>Yes / No</th>
<th>If ‘yes’ consult with</th>
<th>ISEPP clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water usage</td>
<td>Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?</td>
<td>No</td>
<td></td>
<td>ISEPP cl.13(1)(d)</td>
</tr>
<tr>
<td>Temporary structures</td>
<td>Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?</td>
<td>Yes</td>
<td>Eurobodalla Shire Council</td>
<td>ISEPP cl.13(1)(e)</td>
</tr>
<tr>
<td>Road &amp; footpath excavation</td>
<td>Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?</td>
<td>Yes</td>
<td>Eurobodalla Shire Council</td>
<td>ISEPP cl.13(1)(f)</td>
</tr>
</tbody>
</table>

#### Local heritage items

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

#### Flood liable land

<table>
<thead>
<tr>
<th>Issue</th>
<th>Potential impact</th>
<th>Yes / No</th>
<th>If ‘yes’ consult with</th>
<th>ISEPP clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood liable land</td>
<td>Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?</td>
<td>No</td>
<td></td>
<td>ISEPP cl.15</td>
</tr>
<tr>
<td>Flood liable land</td>
<td>Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance</td>
<td>No</td>
<td></td>
<td>ISEPP cl.15AA</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Issue</th>
<th>Potential impact</th>
<th>Yes / No</th>
<th>If ‘yes’ consult with</th>
<th>ISEPP clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>National parks and reserves</td>
<td>Are the works adjacent to a national park or nature reserve, or other area reserved under the National Parks and Wildlife Act 1974, or on land acquired under that Act?</td>
<td>No</td>
<td>ISEPP cl.16(2)(a)</td>
<td></td>
</tr>
<tr>
<td>National parks and reserves</td>
<td>Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?</td>
<td>No</td>
<td>ISEPP cl. 16(2)(b)</td>
<td></td>
</tr>
<tr>
<td>Aquatic reserves</td>
<td>Are the works adjacent to an aquatic reserve or a marine park declared under the Marine Estate Management Act 2014?</td>
<td>No</td>
<td>ISEPP cl.16(2)(c)</td>
<td></td>
</tr>
<tr>
<td>Sydney Harbour foreshore</td>
<td>Are the works in the Sydney Harbour Foreshore Area as defined by the Sydney Harbour Foreshore Authority Act 1998?</td>
<td>No</td>
<td>ISEPP cl.16(2)(d)</td>
<td></td>
</tr>
<tr>
<td>Bush fire prone land</td>
<td>Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?</td>
<td>No</td>
<td>ISEPP cl.16(2)(f)</td>
<td></td>
</tr>
<tr>
<td>Artificial light</td>
<td>Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)</td>
<td>No</td>
<td>ISEPP cl.16(2)(g)</td>
<td></td>
</tr>
<tr>
<td>Defence communications buffer land</td>
<td>Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011.)</td>
<td>No</td>
<td>ISEPP cl. 16(2)(h)</td>
<td></td>
</tr>
<tr>
<td>Mine subsidence land</td>
<td>Are the works on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961?</td>
<td>No</td>
<td>ISEPP cl. 16(2)(i)</td>
<td></td>
</tr>
</tbody>
</table>
### Growth Centres SEPP

<table>
<thead>
<tr>
<th>Issue</th>
<th>Potential impact</th>
<th>Yes / No</th>
<th>If ‘yes’ consult with</th>
<th>ISEPP clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing native vegetation</td>
<td>Do the works involve clearing native vegetation (as defined in the <em>Local Land Services Act 2013</em>) on land that is not <strong>subject land</strong> (as defined in cl 17 of schedule 7 of the <em>Threatened Species Conservation Act 1995</em>)?</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C
Biodiversity assessment report
Appendix D

Water quality, hydrology and flooding assessment report
Appendix E
Phase 1 contaminated lands investigation
Appendix F
Phase 2 Old Sawmill site detailed site investigation
Appendix G
Erosion and sedimentation management report
Appendix H
Traffic and transport assessment report
Appendix I
Noise and vibration assessment report
Appendix J
Aboriginal heritage assessment report
Appendix K
Preliminary Historical Archaeological Assessment
Appendix L
Landscape character and visual impact assessment report
Appendix M
Socio-economic and business impact assessment report