

Oxley Highway Interchange Upgrade

Review of Environmental Factors

August 2025



Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which the proposal is located.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.





Executive summary

The proposal

Transport for NSW (Transport) proposes to upgrade the Oxley Highway and Pacific Highway interchange at Port Macquarie (the proposal). Key features of the proposal include:

- Adding an approach lane to the roundabout on the southbound exit ramp
- Adding an approach lane to the roundabout on the northbound exit ramp
- For the southbound ramps, adding a slip lane for eastbound and southbound vehicles
- Adding two lanes westbound from the roundabout, including re-line marking the existing bridge to have two lanes westbound
- Extension of existing culverts
- Removal of about 2.73 hectares of native vegetation
- Streetlighting upgrade
- Installation of traffic control signals on all approaches to the roundabout.

The intent is to construct the works in two stages. Works on the northbound exit ramp, the western side of the interchange and installation of traffic control signals on the roundabout are proposed to be constructed as the first stage. Stage two of the proposal includes construction of slip lanes on the north-eastern and south-eastern corners and the duplication of the southbound exit ramp.

Construction of the proposal would require temporary lane closures and implementation of access gates and turnarounds during construction.

Construction of stage one is expected to commence in mid-2026 and would take around 24 months to complete.

Need for the proposal

The proposal is required to improve peak hour travel speed at the interchange, improve safety and provide a road transport network which supports future travel demands.

The proposal forms part of the Oxley Highway Future Growth Program which starts at Hastings River Drive in Port Macquarie and continues to Billabong Drive 200 metres west of the Oxley Highway Interchange.

Proposal objectives

The objectives of the proposal are:

- Improve road safety by reducing likelihood serious road crashes
- Increase network capacity to accommodate forecast traffic growth
- Increase road transport efficiency, productivity and reliability
- Provide a road transport network which facilitates access to regional growth centres surrounding Port Macquarie
- Maximise the safety outcomes from any investment and reduce the crash rate for all user groups along the corridor in pursuit of the NSW Government Vision "Towards Zero".

Options considered

The proposal was considered in response to Port Macquarie's high population growth and the strong reliance on the surrounding road network. Transport have prepared an options assessment for the proposal (along with other proposed upgrades along the Oxley Highway) which provided an overview of the potential options of the proposal. A 'do nothing' option and one upgrade option was evaluated for the proposal. The do nothing is not considered viable by Transport. The upgrade option involving partial upgrade features plus slip lanes for southbound exit from and entry onto the Pacific Highway was considered more favourable in terms of road safety and road network performance, and as such was selected as the preferred option.

Statutory and planning framework

The proposal is for a road that is to be delivered by Transport and can therefore be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979*. Development consent from council is not required.

Community and stakeholder consultation

Transport commenced consultation with the community in April 2021 with a "Have your say" consultation. A Community and Stakeholder Engagement Plan has been prepared and is being implemented.

Consultation with the NSW State Emergency Service (NSW SES) was undertaken to meet the requirements of section 2.13 of SEPP (Transport and Infrastructure). The proposal appears to have minimal risk to SES operations.

Environmental impacts

The main environmental impacts of the proposal are:

Biodiversity

The proposal would result in the removal of about 2.73 hectares of native vegetation (PCT 827 – 'Flooded Gum – Tallowwood - Brush Box moist open forest of the coastal ranges of the North Coast'). The remainder of the vegetation proposed for removal (4.9 ha) comprises exotic grassland and a small farm dam.

Primary feed tree species for the Koala occur within the study area. The proposal site is unlikely to support resident koalas due to its narrow configuration and small size, but may be used for movement and dispersal through the landscape given its connectivity with other, larger patches of suitable habitat.

Vegetation at the proposal site is potential habitat for nine other threatened fauna species, including three microbat species, three frog species and two bird species. Assessments of significance have been completed for the Koala and these threatened fauna species due to their potential to occur within the proposal site and potentially impacted by the proposal.

Mitigation measures have been recommended to minimise the impacts on biodiversity values.

Targeted frog surveys have been completed for the Green and Golden Bell Frog, Wallum Froglet and Green-thighed Frog given the occurrence of records within the locality and potential habitat within the proposal site.

The proposal triggers the need for biodiversity offsets as per the Transport *Guidelines for Biodiversity Offsets* (Transport for NSW 2022) for impacts on 2.73 hectares of potential Koala habitat.

The proposal is unlikely to result in a significant impact on any threatened species, populations or ecological communities listed under the TSC Act or FM Act, pursuant to s.5A of the EP&A Act.

Noise and vibration

A construction and operational noise and vibration assessment was completed for the proposal. The main source of noise at the proposal site is from traffic along the Pacific Motorway and Oxley Highway. A combination of unattended and operator attended noise monitoring was carried out at three locations considered representative of the most sensitive receivers surrounding the proposal site.

Predicted results indicate that noise associated with the construction of the proposal is expected to impact on nearby sensitive receivers when work is undertaken outside of standard hours.

Construction noise and vibration impacts can be mitigated through the implementation of a range of safeguards and management measures, the details of which are to be documented within a construction noise and vibration management plan.

Vibration from construction activities may be perceptible at commercial receivers located within 50 metres of the works, however these vibration levels can generally be tolerated if prior warning and explanation is provided.

The relative increase in operational road traffic noise levels associated with the interchange due to the upgrade are predicted to be less than 1 dB which is a negligible increase.

Aboriginal Cultural Heritage

Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI) was completed for the proposal.

Construction of the proposal was assessed as being unlikely to have an impact on Aboriginal heritage. Potential impacts would be mitigated through the steps outlined in the Transport *Unexpected Heritage Items, Heritage Procedure 2022*.

Operation of the proposal is not expected to impact Aboriginal heritage.

Justification and conclusion

The proposed upgrade of the Oxley Highway and Pacific Highway interchange at Port Macquarie, NSW 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.

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 proposal objectives but would still result in some impacts on biodiversity and noise. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also reduce travel times and improve safety. On balance the proposal is considered justified and the following conclusions are made.

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.

Display of the review of environmental factors

This REF is on display for comment between **Tuesday 5 August and Monday 1 September 2025**. You can access the documents in the following ways:

Internet

The documents are available as pdf files on the Transport website at transport.nsw.gov.au/oxleyinterchange.

Printed copies

The documents can be viewed at the following locations:

- Port Macquarie Hastings Council Customer Service offices:
 - Port Macquarie - 17 Burrawan Street, Port Macquarie NSW 2444
 - Wauchope – 49 High Street, Wauchope NSW 2446
 - Laurieton – 9 Laurie Street, Laurieton NSW 2443
- Wauchope Library - 53 High St, Wauchope NSW 2446.

Copies by request

Printed and electronic copies are available on request. Please note there may be a charge for hard copies or USB. To obtain a printed or electronic copy, please email OxleyInterchange@transport.nsw.gov.au.

Staffed displays

The project team will be available at the below community information sessions:

- Monday 11 August 2025, 4:00 pm to 6:00 pm
Sovereign Place Town Centre, 15 Chancellors Dr, Thrumster NSW 2444
- Tuesday 12 August 2025, 10:00 am to 12:00 pm
Wauchope Library, 53 High St, Wauchope NSW 2446.

How can I make a submission?

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

Have Your Say via transport.nsw.gov.au/oxleyinterchange

Email: OxleyInterchange@transport.nsw.gov.au

Post: Oxley Interchange Upgrade, PO Box 576, Grafton, NSW 2460

Submissions must be received by midnight Monday 1 September 2025. Submissions will be managed in accordance with the [Transport for NSW Privacy Statement](#). A copy can be made available upon request.

What happens next?

Transport will collate and consider the submissions received during public display of the REF.

After this consideration, Transport will determine whether or not the proposal should proceed as proposed and will inform the community and stakeholders of this decision.

If the proposal is determined to proceed, Transport will continue to consult with the community and stakeholders prior to and during construction.

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1. Introduction

This chapter introduces the proposal and provides context for the environmental assessment. In introducing the proposal, the objectives and proposal development history are detailed and the purpose of the report provided.

1.1 Proposal identification

Transport proposes to upgrade the Oxley Highway and Pacific Highway interchange at Port Macquarie (the proposal). Key features of the proposal include:

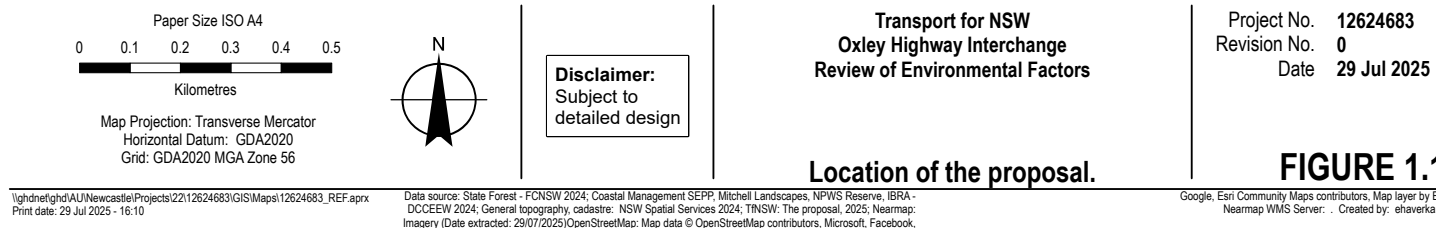
- Adding an approach lane to the roundabout on the southbound exit ramp
- Adding an approach lane to the roundabout on the northbound exit ramp
- For the south bound ramps, adding a slip lane for eastbound and southbound vehicles
- Adding two lanes westbound from the roundabout, including re-line marking the existing bridge to have two lanes westbound
- Extension of existing culverts
- Removal of about 2.73 hectares of native vegetation
- Streetlighting upgrade
- Installation of traffic control signals on all approaches to the roundabout.

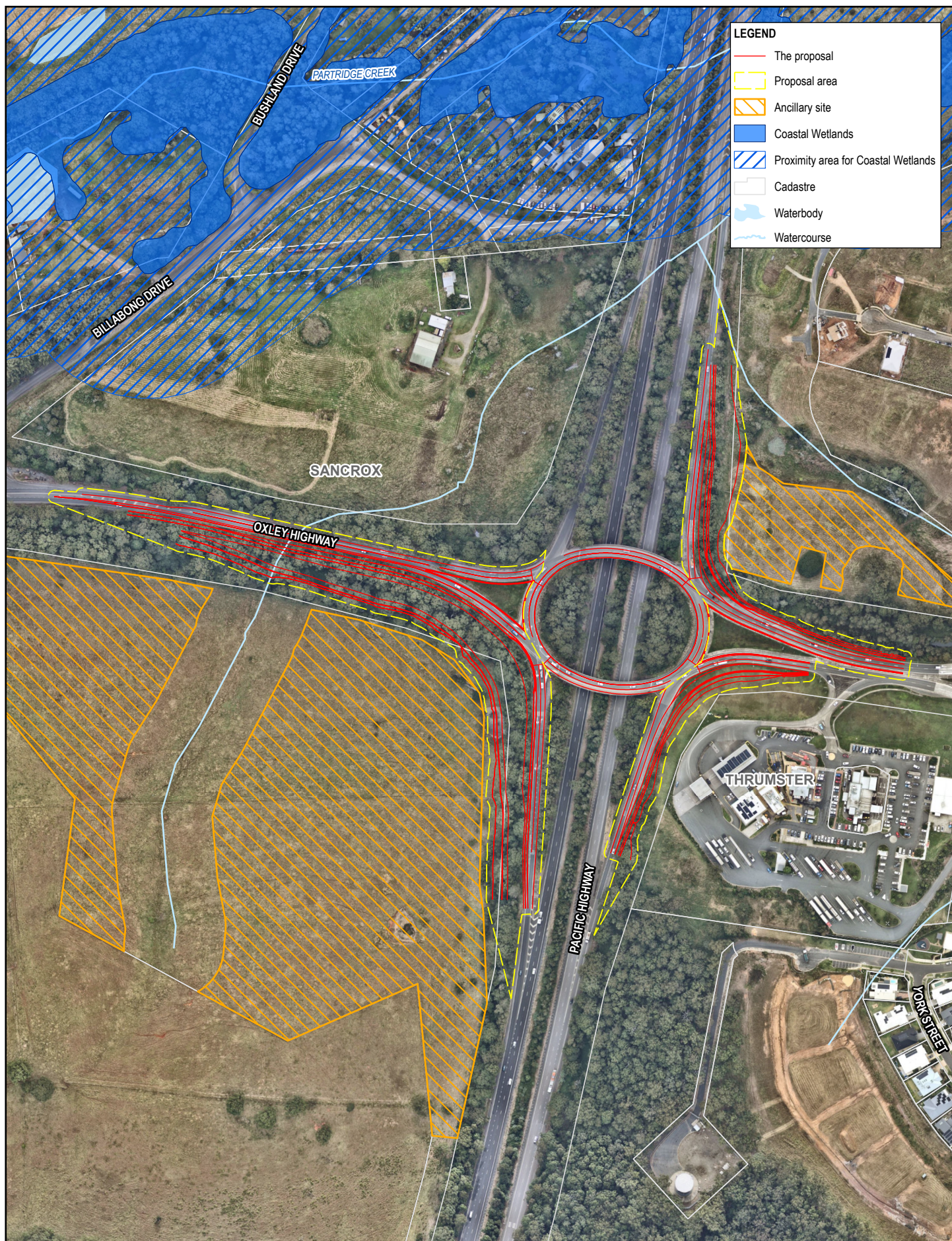
The proposal forms part of the Oxley Highway Future Growth Program which starts at Hastings River Drive in Port Macquarie and continues to Billabong Drive 200 metres west of the Oxley Highway Interchange.

The vision of the proposal is to deliver a safe, reliable, efficient, and connected network for all transport users which facilitates the growth and development of Port Macquarie.

The location of the proposal is shown in Figure 1.1 and an overview of the proposal is provided in Figure 2.1. Section 3 describes the proposal in more detail.

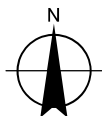
Construction of stage one of the proposal (if approved) would commence in mid-2026 and expected to be completed between 18 to 24 months.





Paper Size ISO A4
0 20 40 60 80 100
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56



Disclaimer:
Subject to
detailed design

Transport for NSW
Oxley Highway Interchange
Review of Environmental Factors

Project No. 12624683
Revision No. 0
Date 29 Jul 2025

The proposal

FIGURE 1.2

1.2 Purpose of the report

This review of environmental factors (REF) has been prepared by GHD Pty Ltd (GHD) on behalf of Transport [Northern Region]. For the purposes of these works, Transport is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (NSW)* (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 Section 171 of the *Environmental Planning and Assessment Regulation 2021*, the factors in *Guidelines for Division 5.1 assessments*, (DPE 2022), *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 (Commonwealth)* (EPBC Act).

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

- Section 5.5 of the EP&A Act including that Transport 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 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, 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 <https://www.awe.gov.au/environment/epbc> EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and if 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 and the need, subject to the EPBC Act strategic assessment approval, to make a referral to the Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a decision by the Commonwealth Minister for the Environment and Water on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

This chapter 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

The vision of the proposal is to deliver a safe, reliable, efficient and connected network for all transport users which facilitates the growth and development of Port Macquarie.

Oxley Highway Draft Corridor Strategy

The Oxley Highway Draft Corridor Strategy (NSW Government, 2016) identifies the vision for the Oxley Highway over the next 20 years as including:

- A safer route for all road users with the safe systems approach adopted
- A more productive route for freight
- An accessible, efficient and reliable route with improved network efficiency between Port Macquarie
- Supportive of regional growth and development in growing urban centres along the corridor.

NSW Future Transport Strategy 2056

The NSW Future Transport Strategy 2056 (Transport for NSW, 2018) outlines a framework to address transport challenges in NSW over 40 years to 2056. It integrates planning for roads, freight and all other modes of transport and sets out initiatives, solutions and actions to meet NSW transport challenges. Upgrading the Oxley Highway interchange aligns with this Strategy by supporting the regional outcomes relating to movement, access to Port Macquarie and safety improvements at intersections.

Regional NSW Services and Infrastructure Plan

The Regional NSW Services and Infrastructure Plan (Transport for NSW, 2018) is the NSW Government's blueprint for transport in regional NSW from now until 2056 and outlines the vision and customer outcomes that the government will use to go about its detailed transport planning in each region and also support its future decision making. Upgrades to the Oxley Highway are identified as an initiative for investigation over the 0-10 year timeframe. These improvements are identified supporting movements on this key east-west corridor including improving road safety, travel times and reliability (Transport for NSW 2021a). The proposal is consistent with this plan.

Road Safety Plan 2026

The Road Safety Plan 2026 (Transport for NSW, 2023) outlines how the NSW Government will work towards the State Priority Target of reducing fatalities by 30 per cent by 2030 (compared to average annual fatalities over 2018–2020). It also aligns the Towards Zero vision with Future Transport 2050, which aims to have a NSW transport network with zero trauma by 2050.

The proposal is consistent with the directions set out in Road Safety Plan 2026 because it would improve safety through intersection improvements and the implementation of contemporary design standards (Transport for NSW, 2023).

Tourism and Transport Plan

The Tourism and Transport Plan (Transport for NSW, 2018) recognises the connection between transport and tourism and identifies the potential to support and enhance existing tourism as well as create new economic development opportunities. The proposal is consistent with the outcomes of this plan relating to greater access to more of NSW.

NSW Freight and Ports Plan 2018-2023

The NSW Freight and Ports Plan, Transport for NSW, 2018 is aligned with NSW Future Transport Strategy 2056 and has the aim of providing a network to move goods in an efficient, safe and environmentally sustainable manner, providing successful outcomes for communities and industry. One of the objectives of the plan is to ensure safe, efficient and sustainable freight access to places.

Another objective of the plan is to increase access for freight across the road and rail network. There is an opportunity to contribute to a transport network where goods move efficiently to their market by providing additional capacity on the Oxley Highway at the subject location, addressing current and forecast congestion issues on the network (Transport for NSW 2021). The proposal supports this objective.

North Coast Regional Plan 2041

The North Coast Regional Plan (Transport for NSW 2022) is a strategy for guiding land use planning decisions for the North Coast region. The plan includes goals and actions to protect the regions coastline and natural environment, create more jobs, deliver vibrant communities and provide greater housing choices.

The plan identifies Port Macquarie as a regional city and emphasises the need to manage and support growth. The Oxley Highway is identified as an important inter-regional and intraregional transport connection.

Transport for NSW Reconciliation Action Plan 2022-2025

The Reconciliation Action plan (RAP) aims to achieve the following:

- Embed reconciliation across Transport by increasing cultural capabilities, and leveraging scale as a large NSW Government agency to support economic empowerment through employment and engaging Aboriginal and Torres Strait Islander businesses to deliver transport services to the people of NSW
- Recognise and value the importance of connecting to Country
- Incorporate local Aboriginal and Torres Strait Islander knowledge, cultures, art, and heritage into the places Transport creates
- Work collaboratively with Aboriginal and Torres Strait Islander peoples within Transport's organisation and the communities to amplify their voices and seek their knowledge and wisdom to guide us through the pathway to reconciliation.

The proposal demonstrates alignment with these objectives through the inclusion of Aboriginal stakeholder consultation, see Section 5.2.

2.2 Limitations of existing infrastructure

The existing Oxley Highway and Pacific Highway Interchange is operating as an uncontrolled part single lane / part two lane roundabout. This performance of the interchange does not meet the traffic performance needs of the location resulting in poor traffic performance, safety issues and congestion for current and future road users. This intersection was identified as a major pinch point within the Options Report (Transport for NSW 2021a) including the on and off ramps for the Pacific Highway and adjacent intersection at Billabong Drive.

2.3 Proposal objectives and development criteria

The proposal forms part of the Oxley Highway Future Growth Program which starts at Hastings River Drive in Port Macquarie and continues to Billabong Drive 200 metres west of the Oxley Highway Interchange.

2.3.1 Proposal objectives

The objectives of the proposal include:

- Improve road safety by reducing the likelihood of serious road crashes
- Increase network capacity to accommodate forecast traffic growth
- Increase road transport efficiency, productivity and reliability
- Provide a road transport network which facilitates access to regional growth centres surrounding Port Macquarie.

2.3.2 Development criteria

The development criteria for the proposal include:

- Customer Journey - Minimise impacts to customer journeys through the implementation of the program and engage with impacted customers

- Program Integration - Enhance investment on the corridor through program integration by balancing the safety, traffic and asset performance objectives
- Amenity - Seek opportunities to address the active transport needs of cyclist, pedestrians and public transport users in key towns and regional centres
- Asset durability - Provide durable assets which ensure the reliability of customer journeys and minimises maintenance burden
- Property Impacts - Minimise property impacts through the program and engage with affected landholders
- Environment - Minimise and balance impacts to the natural environment and incorporate environmental aspects.

2.3.3 Urban design objectives

The Oxley Highway Draft Corridor Strategy (NSW Government, 2016) identifies that it is important that any major road projects on Oxley Highway adopt urban design principles that ensure that the road contributes to the landscape around it rather than detracting from it. Transport updated its urban design policy Beyond the pavement in 2023. The objective of the policy is to systematically incorporate urban design thinking into road and maritime infrastructure projects resulting in improved design quality and increased customer satisfaction. The proposal, as would other infrastructure projects on the Oxley Highway will need to follow the policy to ensure design objectives are achieved. Specific urban design objectives for this proposal would be developed during detailed design and in consultation with Port Macquarie – Hastings Council.

2.4 Alternatives and options considered

2.4.1 Methodology for selection of preferred option

The following sections describe the options that have been considered and assessed over the development of the proposal. Transport have prepared an options assessment for the proposal which provided an overview of the potential options of the proposal. The preferred option was selected based on a 'best to worst' rating of the proposal against the following criteria:

- Road safety
- Constructability
- Road network performance
- Wayfinding
- Environmental
- Whole of life cost.

A 'do nothing' option and one upgrade option was evaluated for the proposal.

2.4.2 Identified options

Do nothing

The 'do nothing' option would mean that the interchange would not be upgraded and would continue operating at current capacity. The current road is operating at 70 percent of the posted speed, has safety concerns and does not support the forecast future travel demands associated with major developments.

The do nothing is not considered viable by Transport.

Upgrade of the existing interchange – Option 1

This option would involve the partial upgrade of features plus slip lanes for southbound entry and northbound exit. Key features of this option would include:

- Additional lane on the Pacific Highway northbound off ramp
- Additional lane on the Pacific Highway southbound off ramp
- Additional lane westbound at the interchange and on the Oxley Highway westbound approach to Billabong Drive.

An overview of this option is presented in Figure 2.1.



Figure 2.1: Option 1 overview

2.4.3 Analysis of options

As discussed in Section 2.4.2, six issues were identified as criteria to compare the two options. The findings of the multi-criteria assessment is presented in Table 2.1.

Table 2.1: Options analysis

| Issue | Do nothing | Option 1 |
|---------------------------------|--|--|
| Road safety | The existing infrastructure at the interchange will be maintained. Crash history for the interchange between 2015 to 2019 indicated 12 crashes occurred, of which four resulted in moderate injuries and two resulted in serious injuries. | The additional lanes entering the interchange are expected to reduce traffic congestion and make the interchange safer for road users. |
| Constructability | No work is required beyond routine maintenance. | Construction would span a period of approximately 24 to 36 months. Issues associated with construction of the proposal such as traffic management are considered manageable. |
| Road network performance | The existing interchange would not address current performance issues, which are expected to increase in the future. Average delay times are expected to be 84 seconds in the morning and 104 seconds in the afternoon peak by 2036 (Bitzios Consulting, 2021). | Option 1 would allow for better performance in the medium to long-term following construction. Average delay times with the proposed upgrades are expected to be 41 seconds in the morning and 43 seconds in the afternoon peak by 2036 (Bitzios Consulting, 2021). |
| Wayfinding | Wayfinding would continue as per the current arrangement. | The upgraded interchange would not substantially alter the wayfinding for motorists. |
| Environmental | No work is required beyond routine maintenance. | Removal of vegetation would be required to complete this option. The presence of construction equipment and activities also increases the risks of a chemical/fuel spill. |
| Whole of life costs | No work is required beyond routine maintenance. | Costs would be greater due to additional road pavement maintenance. |

2.5 Preferred option

The 'do-nothing' option was considered more favourable in terms of constructability, environmental impacts and whole of life costs due to existing conditions being maintained.

Option 1 was significantly more favourable in terms of road safety and road network performance, and as such was selected as the preferred option. Environmental impacts was regarded as the largest issue generated by the proposal. These impacts are assessed in this REF and would be managed by the measures provided in Section 7.2.

Both options were considered similar in regard to wayfinding.

2.6 Design refinements

A traffic modelling addendum was prepared for the proposal in 2024 to the Interchange Assessment Reporting (Bitzios Ref: P6136.001T Oxley Highway Interchange Options Modelling Addendum).

The purpose of this traffic modelling addendum was to determine the appropriate design of the intersection upgrade at the Pacific Highway/Oxley Highway Interchange in the years 2028 and 2038. The traffic modelling addendum refined the proposal into two stages:

Stage one works:

- Upgrade the Oxley Highway with an additional lane from the interchange westbound towards Billabong Drive
- Upgrade the roundabout to two lanes
- Southbound off-ramp duplication
- Northbound off-ramp duplication
- Traffic Signals
- Streetlighting Upgrade.

Stage two works:

- Southeast corner on-ramp slip lane
- Northeast corner off-ramp slip lane.

3. Description of the proposal

This chapter 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

Transport proposes to upgrade the Oxley Highway and Pacific Highway interchange at Port Macquarie (the proposal). The proposal is shown in Figure 3.1. Finalisation of the staging will be confirmed during detailed design and pre-construction phase.

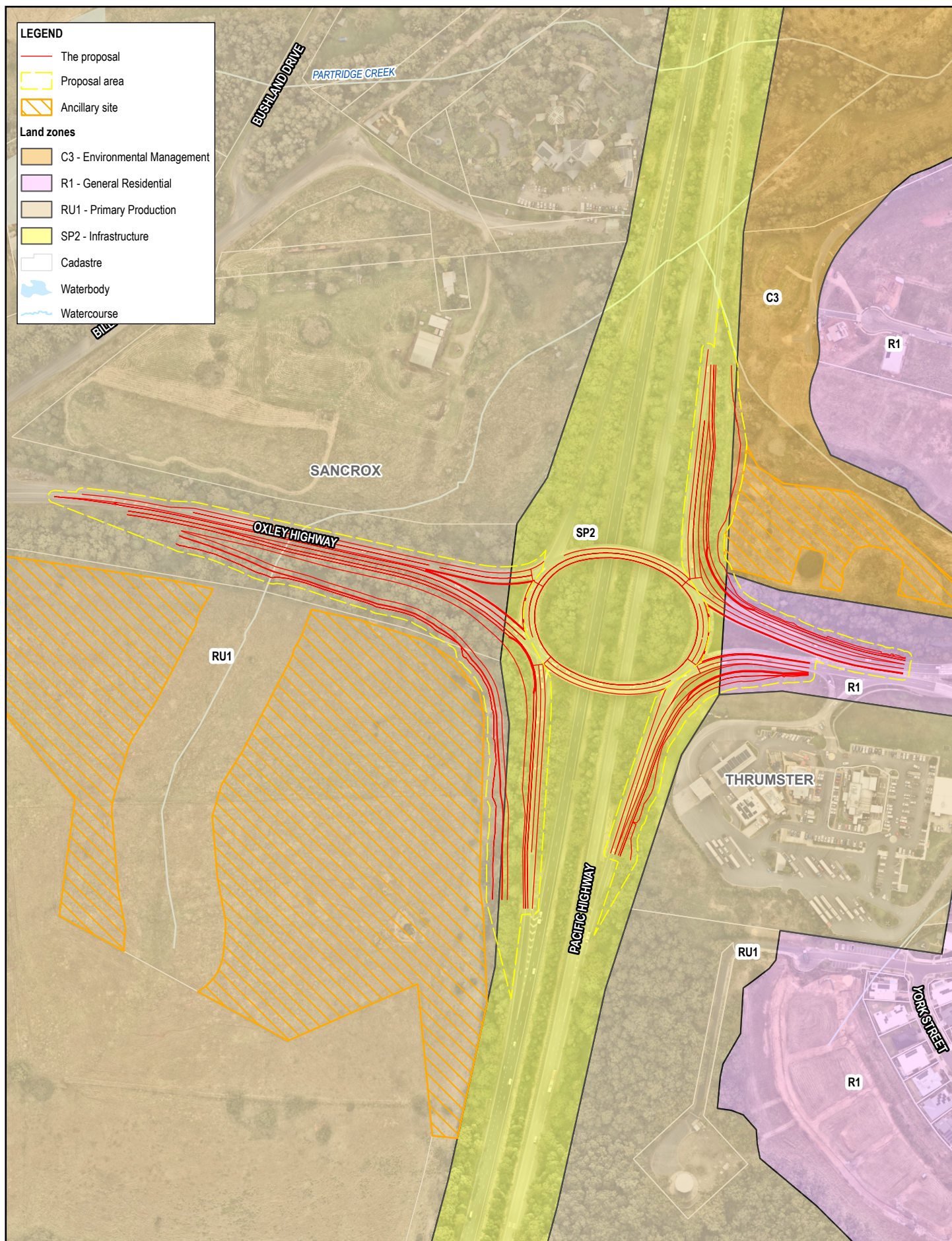
Key features of the proposal would include:

STAGE ONE

- Adding an approach lane to the roundabout on the northbound exit ramp
- Linemarking to change the roundabout to a two-lane roundabout
- Installation of traffic control signals on all approaches to the roundabout
- Relocation of power poles and lines
- Removal of about 2.73 hectares of native vegetation
- Extension of culverts
- Ancillary construction facilities.

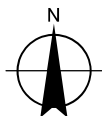
STAGE TWO

- Adding an approach lane to the roundabout on the southbound exit ramp
- For the southbound ramps, adding a slip lane for eastbound and southbound vehicles.



Paper Size ISO A4
0 20 40 60 80 100
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56



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Oxley Highway Interchange
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Key features of the proposal

FIGURE 3.1

3.2 Design

Concept design plans are provided in Appendix C and Figure 3.1. The concept design would be further refined during the detailed design phase.

3.2.1 Design criteria

The concept design was prepared in accordance with the following standards:

- Austroads Guide to Road Design 2021
- Transport for NSW Supplement to Austroads Guide to Road Design 2023
- Road Design Guide (Various) (Agency: Various) (Date: Various)
- Road Safety Audit Process Guide (Transport for NSW) 2023
- Transport for NSW Technical Direction (TD: Various) (Date: Various)
- NSW Speed Zoning Standard 2023 (SS: Speed Zone Guidelines)
- Australian Standard (AS: Various) (Date: Various)
- Transport for NSW Supplement to Australian Standard (AS: Various) (Date: Various).

The concept design was prepared in accordance with the following criteria:

- Austroads Guide to Road Design
- Pacific Highway 110 km/h
- Oxley Highway 60 km/h.

3.2.2 Engineering constraints

Key engineering constraints for the proposal include:

- Construction access and limitations
- Availability of suitable access points to the local road network as there is steep terrain, poor sight distance on local roads and adjacent to a high-speed motorway
- Existing bridge structures
- Existing utilities and associated structures
- Substantial amount of engineered fill would be required for the southbound exit ramp. Aiming to achieve a 1.5 to 1 batter and not impact on the property the north-eastern quadrant of the interchange
- Obtaining road occupancy licence for staging of works and maintaining network capacity.

3.3 Construction activities

3.3.1 Work methodology

The proposed construction sequence is as follows:

- Mobilisation and site establishment
- Establish construction compound/s and stockpile sites, install any required fencing and erosion and sedimentation controls in accordance with Managing Urban Stormwater: Soils and construction - Volume 1, 4th edition (the 'Blue Book', Landcom 2004)
- Remove trees using a chainsaw and/or excavator and grabber attachment that removes the trunk and stump
- Corridor clearing. Removed vegetation would be mulched immediately and either used in the same location for use on batters or mounded for sediment and erosion control or removed from the proposal site

- Implement traffic control as required in accordance with the Traffic Control at Worksites Manual (Transport for NSW 2022) and AS 1742.3-2009 – Manual of uniform traffic control devices
- Relocate power poles, remove redundant poles and install underground electricity and telecommunications connections
- Bulk earthworks
- Construct table drains and cross drains
- Road paving
- Installation of streetlighting
- Installation of traffic control signals
- Line marking, barrier and signage installation
- Driveway treatment where required for impacted properties
- Revegetation
- Site de-mobilisation and removal of all waste, equipment and other materials.

Construction methodology and sequence would be confirmed by the construction contractor in consultation with Transport.

An early works construction program may be undertaken that could include some of the above activities including but not limited to vegetation clearing, utilities relocation, site establishment and/or temporary roadworks to allow construction traffic accesses. Additional activities that would benefit the project may be identified during detailed design or by the construction contractor that may be undertaken as early works.

3.3.2 Construction workforce

It is anticipated that a workforce of about 35 full time equivalent construction and site management personnel would be required during construction.

3.3.3 Construction hours and duration

Works would take place during standard construction hours (7.00 am to 6.00 pm Monday to Friday and 8.00 am to 1.00 pm Saturday). No work would be undertaken on Sundays or public holidays.

Due to the high volume of traffic much of the construction will need to be undertaken at night or outside standard construction hours. Out of hours works will be required for specific construction activities to meet safety needs, to comply with the requirements of the Traffic Control at Worksites manual and to minimise significant impacts on the travelling public. These would be undertaken in accordance with the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) and *Construction Noise and Vibration Guideline* (Transport for NSW 2023).

The works are estimated to commence in mid-2026 once all relevant approvals are in place and are expected to be completed in 18 to 24 months.

The works may be staged to reduce the length of time that works impact on road users. The project may be staged to incorporate scope reductions or increases depending on available funding at the time of construction or changes to the surrounding environment or developments on the adjoining properties. Any amendments will be addressed during the detailed design phase and would be assessed against this REF for consistency. If works are not consistent additional environmental assessments will be undertaken and approvals obtained as required.

3.3.4 Plant and equipment

Plant and equipment anticipated to be required during construction of the proposal include but not limited to:

- Excavator with grabber attachment
- Tub Grinder or woodchipper
- Chainsaws
- Grader

- Compaction roller
- Low loader semi-trailer for machinery transport
- Truck and dogs
- Water cart
- Cranes
- Asphalt pavers
- Bitumen sprayers and tankers
- Guardrail driving units
- Light vehicles
- Hand tools.

Equipment to be utilised would be determined during construction planning.

3.3.5 Earthworks

Material used in the fill embankments and road surface for the proposal would be sourced from earthworks and imported products from local quarries or reused from other works sites. Cut/fill volumes would be confirmed during detailed design.

3.3.6 Source and quantity of materials

Imported materials would be sourced from Transport pre-qualified commercial suppliers in nearby areas, wherever possible. The final source and quantity of materials would be confirmed during detailed design.

3.3.7 Traffic management and access

The proposal site is at the intersection of the Oxley Highway and the Pacific Highway.

The speed limit of the proposal site is 60 km/h to the east of the interchange and 90 km/h to the west towards Billabong Drive. The exit ramps off the Pacific Highway are posted at 60 km/h. The speed limit of the Pacific Highway, passing underneath the Oxley Highway is 110 km/h. Construction speed limits (typically 40 km/h) would apply to the proposal site, leading to temporary travel delays for motorists.

Construction traffic is expected to predominantly come from the north and south via the Pacific Highway. Some construction traffic would also come from the west along the Oxley Highway from Wauchope.

The traffic generated by construction activities is expected to vary depending upon the stage of construction, however estimated construction traffic volumes for the construction program is as follows:

- Light vehicles – about 40 vehicles per day
- Heavy vehicles – about 10 vehicles per day on average, but with peak of 25 per day.

Specific traffic management controls would be required to maintain traffic access and worker safety. A Traffic Management Plan would be developed for construction of the proposal which would detail traffic management and access safeguard measures for safe passage of motorists during the construction of the proposal and would be tailored to the specific construction methodology that is adopted. It would also detail access routes for construction traffic.

3.4 Ancillary facilities

Temporary construction compounds are shown in Figure 3.1.

All compounds would be located on already cleared areas. Use and access would be approved by landowners prior to construction commencing.

The number and location of compounds is indicative and stockpile sites and ancillary sites with final site layouts and access arrangements will be determined by the contractor prior to construction. Due to the limited earthworks for the proposal, the need for stockpiling would be minimal.

Compounds would include as required office facilities, ablutions, stockpile areas, machinery and equipment storage, and car parking for workers. They would be appropriately fenced where required with signage outlining construction contact details and site access restrictions.

Access to the ancillary areas will be required from the Oxley Highway and potentially from John Oxley Drive, Sovereign Drive, Imperial Place and adjacent to Billabong Drive. Some temporary roadworks for the construction accesses will be required to provide safe access and use by construction traffic and road users.

An existing Transport stockpile area located approximately 3.5 kilometres west of the proposed works within the road reserve of the Oxley Highway at Spencers Cutting may be utilised. This area is approved for use as a site compound for maintenance work undertaken by Transport and includes a hardstand. No vegetation clearing would be required to operate this ancillary facility.

3.5 Public utility adjustment

Public utilities in the vicinity of the proposal include:

- Council water main
- Telstra
- Optus
- Power poles and lines.

Utilities expected to be impacted by the proposal and would need to be moved before or during construction.

3.6 Property acquisition

The proposal would impact two property owners, requiring the partial acquisition of Lot 1 DP1261690 (0.347 hectares) and Lot 1 DP1250669 (0.196 hectares) to support project delivery. In addition to partial acquisition, temporary lease agreements with the same landowners would be needed to accommodate ancillary construction facilities such as work sites, compounds, laydown areas, and parking. Properties subject to partial acquisition or temporary lease arrangements are shown in Figure 3.1.

Transport has commenced early consultation with the affected landowners. Partial land acquisition will be carried out in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.

There is no Crown land required.

Temporary occupation of land for ancillary construction activities would be formalised through negotiated lease agreements in consultation with the landowners for the duration of construction.

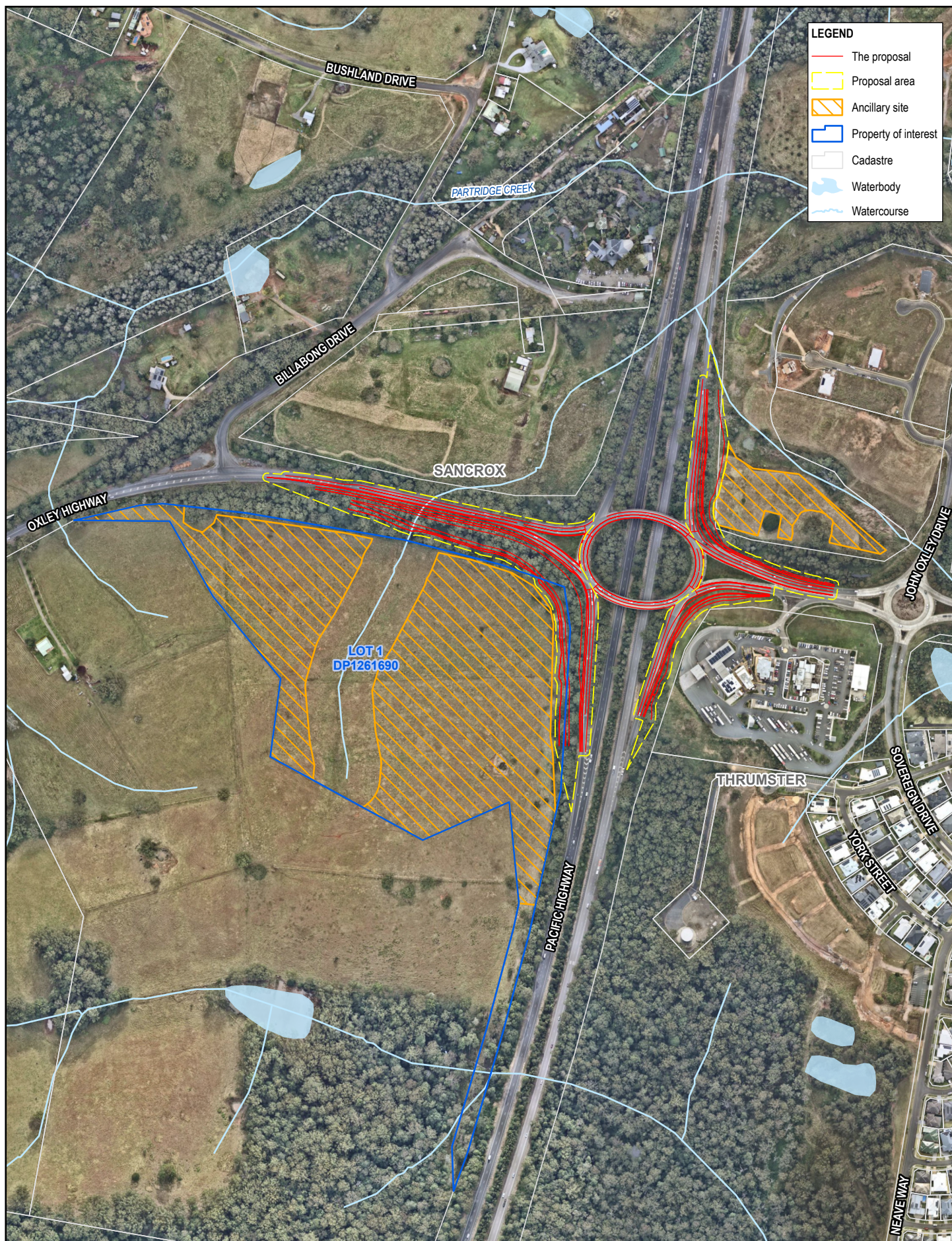
The total area required for temporary occupation to support compound site operations will be confirmed by the construction contractor during the detailed planning phase.

Details of the areas to be acquired are outlined in Table 2.1 and illustrated in Figure 3.2.

Table 3.1: Proposed property acquisition

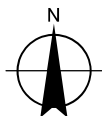
| Area ID | Description | Total area (hectares) | Acquisition type | Current owner | Lot and DP | Land use zone (LEP) |
|---------|---|-----------------------|---------------------|------------------|------------------|---------------------|
| P1 | Partial acquisitions to complete the proposal | 0.347 | Partial acquisition | Private property | Lot 1 DP 1261690 | RU1 |
| P2 | | 0.196 | Partial acquisition | Private property | Lot 1 DP1250669 | C3 |

| Area ID | Description | Total area (hectares) | Acquisition type | Current owner | Lot and DP | Land use zone (LEP) |
|---------|-------------|-----------------------|---------------------------|------------------|--------------------------------------|---------------------|
| C1 | Compound 1 | TBC | Temporary lease agreement | Private property | Lot 1 DP 1261690 Lot 2 DP 1261690 | RU1 |
| C2 | Compound 2 | TBC | Temporary lease agreement | Private property | Lot 1 DP 1261690 | RU1 |
| C3 | Compound 3 | TBC | Temporary lease agreement | Private property | Lot 1 DP 1250669 | C3 |



Paper Size ISO A4
0 30 60 90 120 150
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56



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FIGURE 3.2

4. Statutory and planning framework

This chapter provides the statutory and planning framework for the proposal and considers the provisions of relevant state environmental planning policies, local environmental plans and other legislation.

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (Transport and Infrastructure)) aims to facilitate the effective delivery of infrastructure across the State.

Section 2.109 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for “the purpose of a road or road infrastructure facilities” and is to be carried out by Transport , it can be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW). 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 (Resilience and Hazards) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Precincts – Central River City)
- State Environmental Planning Policy (Precincts – Eastern Harbour City)
- State Environmental Planning Policy (Precincts – Regional) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021.

Section 2.10 to 2.15 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by SEPP (Transport and Infrastructure) (where applicable), is discussed in chapter 5 of this REF.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

State Environmental Planning Policy (Biodiversity and Conservation) 2021 (SEPP (Biodiversity and Conservation)) makes provisions for the protection of certain biodiversity and conservation areas in NSW.

Chapter 2 of the SEPP (Biodiversity and Conservation) regulates the clearing of native vegetation in the State. The aims of this chapter are to protect the biodiversity value of trees and other vegetation across the state. Clause 2.7 of the SEPP (Biodiversity and Conservation) states that an authority to clear vegetation under this policy is not required if it is a clearing authorised under section 60(O) of the *Local Land Services Act 2013*. Section 60(O) provides an exemption for clearing under Part 5 of the EP&A Act and therefore consent is not required under the SEPP (Biodiversity and Conservation).

The clearing of native vegetation for the proposal has been further assessed in Section 6.1.

Chapter 4 of the SEPP (Biodiversity and Conservation) aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

Port Macquarie-Hastings local government area (LGA) is listed in Schedule 2 of the SEPP (Biodiversity and Conservation) therefore further consideration is required as discussed in Section 6.1.

4.1.2 Local Environmental Plans

Port Macquarie-Hastings Local Environmental Plan 2011

The proposal is located within the following zones under the LEP:

- RU1 Primary Production
- SP2 Classified Road
- R1 General Residential.

Road works are permitted with consent in these zones. However, as development consent is not required for the proposal, the consent provisions of the LEP do not apply.

Key provisions of the LEP that apply to the proposal site and adjoining areas include:

- Koala habitat
- Flood planning area.

While the development control provisions of the LEP do not apply to the proposal, the above issues as they relate to the proposal are addressed in Section 6.1.

4.2 Other relevant NSW legislation

4.2.1 Roads Act 1993

The *Roads Act 1993* (Roads Act) provides for the operation, maintenance and use of roadways in NSW including managing authorities, rites of passage and classification of roads. Section 138 of the Roads Act requires that a person must not carry out work in, on or over a public road or dig up or disturb the surface of a public road without the prior consent of the appropriate roads authority.

As both the Oxley Highway and the Pacific Highway are State Highways, Transport is responsible for the roads in the study area.

4.2.2 Crown Lands Management Act 2016

The proposal would not require works on Crown land and therefore the *Crown Lands Management Act 2016* does not apply.

4.2.3 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) lists threatened species, populations and ecological communities as well as critical habitat and key threatening processes.

Section 7.3 of the BC Act provides the test for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. If a significant impact is considered likely, an SIS or BDAR is required.

The potential presence or likely occurrence of threatened biota and potential impacts due to the proposal are addressed in Section 6.1.

4.2.4 Fisheries Management Act 1994

The objectives of the *Fisheries Management Act 1994* (FM Act) are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It lists threatened species of fish and marine vegetation, including endangered populations, ecological communities and key threatening processes. One of the objectives of the FM Act is to 'conserve key fish habitats' which includes aquatic habitats that are important to the maintenance of fish populations generally and the survival and recovery of threatened aquatic species.

Section 220ZZ of the FM Act lists the factors to be considered to determine the impact of an activity on threatened species, populations, ecological communities of fish and marine vegetation. If the proposal is likely to significantly impact on the threatened species, populations or ecological communities, then an SIS is required. No species/population/ecological community listed under Schedules 4, 4a or 5 of the FM Act are considered likely to occur within the proposal site, nor are they expected to be indirectly impacted by the proposed works. The proposal would not directly impact on aquatic habitats.

A permit is required under the FM Act for works that constitute dredging and reclamation or harm to marine vegetation. The proposed works do not fit the definitions for these activities and therefore a permit is not required.

4.2.5 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) aims to prevent the unnecessary or unwarranted destruction of relics and the active protection and conservation of relics of high cultural significance. The Act also provides for the protection of native flora and fauna. Potential impacts on native flora and fauna are discussed in Section 6.1.

No areas of National Park estate occur within or adjacent to the proposal site.

Section 86 of the Act lists offences relating to harming or desecrating Aboriginal objects. Under Section 87 of the NPW Act, a permit is required to disturb or move an Aboriginal object. Whilst under Section 90 of the NPW Act, consent is required to destroy, deface or damage an Aboriginal object or Aboriginal place. No items of Aboriginal heritage are known to occur within the proposal site (refer Section 6.6).

4.2.6 Heritage Act 1977

The Heritage Act 1977 (Heritage Act) aims to ensure that the heritage of NSW is adequately identified and conserved. It provides protection to items, such as places, buildings, works, relics, moveable objects, precincts or land that have been identified, assessed and listed on the State Heritage Register (SHR).

There are no SHR listed items within proximity of the proposal. Non-Aboriginal heritage is discussed further in Section 6.11.

4.2.7 Contaminated Land Management Act 1997

The *Contaminated Land Management Act 1997* (CLM Act) establishes a process for investigating and (where appropriate) remediating land that is considered to be contaminated. Section 59(2) of the CLM Act requires notification of contaminated sites. Section 60 of the CLM Act requires landowners to report any contamination that represents a significant risk of harm to human health or the environment to the NSW Environment Protection Authority (EPA).

Based on the findings of the preliminary site investigation completed for the proposal, the overall risk of contamination being encountered during construction and operation of the proposal is considered to be low. Further details are contained in Section 6.3.

4.2.8 Protection of Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) requires the issue of an environment protection licence (EPL) for scheduled activities (being activities listed in Schedule 1 of the Act), the issue of pollution offences, and generally the control of water, air and noise pollution and the management of wastes.

The proposal is not defined as a scheduled activity and would not require an EPL. If during detailed design the scope of works changes and triggers the requirement of an EPL, Transport would consult with the EPA and would obtain an EPL for the scheduled activity prior to works commencing.

4.2.9 Land Acquisition (Just Terms Compensation) Act 1991

The *Land Acquisition (Just Terms Compensation) Act 1991* (The Land Acquisition Act) applies to the acquisition of land (by agreement or compulsory process) by a public authority authorised to acquire the land by compulsory process. It provides a guarantee that, when a public authority requires the acquisition of land, the amount of compensation will not be less than the market value of the land. The Land Acquisition Act would apply to the acquisition of any land required for the proposal.

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 for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in chapter 6 of the REF and Appendix B and Appendix E.

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.

Potential impacts to these biodiversity matters are also considered as part of chapter 6 and Appendix E.

Findings - matters of national environmental significance

The assessment of the proposal's impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of Climate Change, Energy, the Environment and Water under the EPBC Act.

Findings - nationally-listed biodiversity matters (where the strategic assessment applies)

The assessment of the proposal's impact on nationally listed threatened species, endangered ecological communities and migratory species found that there is unlikely to be a significant impact on relevant matters of national environmental significance. Chapter 6 of the REF describes the safeguards and management measures to be applied.

4.3.2 Native Title Act 1993

The *Native Title Act 1993* (NT Act) recognises and protects native title. The NT Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions affecting native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register. Under the NT Act a future act includes proposed public infrastructure on land or waters that affects native title rights or interest.

A search of the Native Title Claims, the National Native Title Register and the Indigenous Land Use Agreements (4 March 2025) was undertaken, with no Native Title holders/claimants identified close to the proposal.

4.4 Confirmation of statutory position

The proposal is categorised as development for the purpose of a road and is being carried out by or on behalf of a public authority. Under section 2.108 of SEPP (Transport and Infrastructure) 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 is the determining authority for the proposal. This REF fulfils Transport's obligation under section 5.5 of the EP&A Act including to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

5. Consultation

Transport has drafted a Community and Stakeholder Engagement Plan (February, 2025). Consultation with Port Macquarie Hastings Council and the general community has been previously carried out in regards to development of the draft Oxley Highway Corridor Strategy (2015 - 2020) and Stage 1 Oxley Highway improvements, and it is necessary to ensure Council and the local community continue to be involved in the next phase of the proposal to determine the best options for each proposed intersection upgrade.

5.1 Community involvement

Community Display material for the proposal has been prepared by Transport and has been sent out for comment (April 2021). This is provided in Appendix D.

A strategic assessment consultation summary has been prepared by Transport (June 2021). This is provided in Appendix D.

A summary of issues raised by the community is provided below in Table 5.1.

Table 5.1: Summary of issues raised by the community

| Group | Issue raised | Response / where addressed in REF |
|-----------|--|---|
| Community | <ul style="list-style-type: none">Road design feedback/ suggestions | <ul style="list-style-type: none">Section 3.2 |
| | <ul style="list-style-type: none">Road safety | <ul style="list-style-type: none">Section 2.4 |
| | <ul style="list-style-type: none">Increased congestion on Oxley Highway | <ul style="list-style-type: none">Section 6.4 |
| | <ul style="list-style-type: none">Oxley Highway/Kings Creek Intersection - Installation of intersection traffic lights, left turning lane to Wauchope and a right turning lane to Port Macquarie | <ul style="list-style-type: none">Section 6.4 |
| | <ul style="list-style-type: none">Installation of a pedestrian footpath on eastern side of Oxley Highway from Lakes Road intersection to Lake Innes Shopping Centre | <ul style="list-style-type: none">Section 6.4 |
| | <ul style="list-style-type: none">Concerns about current conditions and maintenance of roads connected to the Oxley Highway, including Lake Road and Hastings River Drive | <ul style="list-style-type: none">Section 6.4 |
| | <ul style="list-style-type: none">The PMHC and Transport "Have your say" consultation survey (https://haveyoursay.pmhc.nsw.gov.au/integrated-transport-plan) closed 22 July 2024. The results of this survey supported the Draft Integrated Transport Plan (ITP) | <ul style="list-style-type: none">Draft Integrated Transport Plan |
| | <ul style="list-style-type: none">Proposal notifications with the community and road users were undertaken with regards to communication on the interim safety works in mid to late 2024 | <ul style="list-style-type: none">Draft Integrated Transport Plan |

5.2 Aboriginal community involvement

This proposal has followed Transport's Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI). Table 5.2 provides an outline of Transport's PACHCI stages.

Table 5.2: Summary of Transport's Procedure for Aboriginal Cultural Heritage Consultation and Investigation

| Stage | Description |
|---------|--|
| Stage 1 | Initial assessment by Transport |
| Stage 2 | Site survey and further assessment |
| Stage 3 | Formal consultation and preparation of a cultural heritage assessment report |
| Stage 4 | Implement environmental impact assessment recommendations |

A Stage 1 PACHCI was completed for the proposal by Transport's Aboriginal Cultural Heritage Officer on 27 June 2025 (refer to Appendix G). Transport's Aboriginal Cultural Heritage Officer determined that the proposal is unlikely to harm known Aboriginal objects or places, as:

- The works are proposed within the existing road corridor and areas that have been disturbed
- The proposal is unlikely to harm known Aboriginal objects or places
- The AHIMS search indicated that there are 2 recorded Aboriginal site within the vicinity of the AHIMS search area, however they have been destroyed according to the AHIMS extensive search
- The study area does contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure, however, the cultural heritage potential of the study area appears to be reduced due to the construction of the Oxley Highway, the interchange and the Pacific Highway
- There is an absence of sandstone rock outcrops likely to contain Aboriginal art.

No further stages of the PACHCI were required to be completed.

An introduction meeting was held on 16 July 2024 between Transport and the Birpai Local Aboriginal Land Council (LALC). Transport provided information to Birpai LALC about the Oxley Highway Future Growth Program and the individual projects. On 22 July 2024 Transport met with the members of Birpai LALC and delivered a presentation about the Oxley Highway Future Growth Program projects with reference to the Oxley Highway Interchange. Information about the roles of the Transport proposal team, the Aboriginal cultural heritage investigations currently undertaken the current guidance and policy documents that Transport follow were also presented.

During each of these meetings, Transport discussed and provided information regarding the 'Connecting with Country' framework document and the 'Designing with Country' discussion paper developed by the Government Architect New South Wales.

Transport will continue to engage with the Birpai LALC to understand the cultural landscape surrounding the proposal and ensure the correct themes and stories from the Birpai community are reflected within the design where possible.

Table 5.3: Issues raised through Aboriginal community consultation

| Group | Issue raised | Response / where addressed in REF |
|-------------|--|---|
| Birpai LALC | <ul style="list-style-type: none"> Need for improved road signage/wayfinding on the Oxley Highway when travelling west at the Oxley Highway Interchange and the John Oxley Drive roundabout | <ul style="list-style-type: none"> Section 6.4 |
| | <ul style="list-style-type: none"> Congestion around Wrights Road intersection | <ul style="list-style-type: none"> Section 6.4 |

Further information on Aboriginal heritage is provided in Section 6.6.

5.3 SEPP (Transport and Infrastructure) consultation

PMHC and the NSW State Emergency Service (NSW SES) have been consulted about the proposal as per the requirements of section 2.10 - 2.17 of SEPP (Transport and Infrastructure). Appendix B contains a SEPP (Transport and Infrastructure) consultation checklist that documents how SEPP (Transport and Infrastructure) consultation requirements have been considered.

Issues raised from this consultation are outlined in Table 5.4.

Table 5.4: Issues raised through SEPP (Transport and Infrastructure) consultation

| Group | Issue raised | Response / where addressed in REF |
|---------|---|--|
| PMHC | <ul style="list-style-type: none"> Watermain and sewer upgrade – Interface with PMHC design and conflicts | <ul style="list-style-type: none"> Section 3.5 |
| | <ul style="list-style-type: none"> Oxley Highway Future Growth Program | <ul style="list-style-type: none"> Ongoing meetings between Transport and PMHC regarding future works |
| NSW SES | <ul style="list-style-type: none"> Notification required if the proposal construction or operation would cause significant travel delays | <ul style="list-style-type: none"> Section 6.4.4 and Appendix D |

Ongoing consultation would occur between Transport and PMHC with regards to the proposed design, utility adjustments and the Oxley Highway Growth Program. Transport would continue to engage with NSW SES during detailed design and prior to commencement of construction when Traffic Management Plans are developed.

5.4 Government agency and stakeholder involvement

No other government agencies or stakeholders have been consulted about the proposal. Transport has undertaken initial meetings with landowners regarding acquisition and leasing. Discussions would continue throughout the detailed design and pre-construction.

5.5 Ongoing or future consultation

The REF will be placed on public exhibition for stakeholder and community comment. All comments received will be considered when finalising the proposal design. On receipt of any formal submission, an identification number will be provided for easy reference to responses in the determination report. The community would be kept informed of any further changes to the proposal resulting from this and any future consultation process.

Following the public display of the REF, all comments received would be recorded and addressed in a submissions report detailing how each issue raised would be considered in finalising the proposal design. The Submissions Report would be made available to the public on the Transport project website. An updated notification will be distributed to advise the availability of the submissions report.

If the proposal is approved, ongoing consultation activities would occur with the affected community including nearby landholders, businesses and road users during construction.

There would be consultation with the Port Macquarie Service Centre and adjacent developers prior to commencement of construction to confirm that timing would not occur simultaneously.

Ongoing communications and notifications may include:

- Community/construction updates
- Media announcements
- Live Traffic NSW updates and social media updates
- Stakeholder meetings as required
- Web page updates
- Work notification letters (as required).

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 *Guideline for Division 5.1 assessments* (DPE 2022) and as required under section 171 of the *Environmental Planning and Assessment Regulation 2021* and the *Roads and Related Facilities EIS Guideline* (DUAP 1996). The factors specified in section 171 of the *Environmental Planning and Assessment Regulation 2021* are also considered in Appendix A.
- Site-specific safeguards and management measures are provided to mitigate the identified potential impacts.

6.1 Biodiversity

This section addresses the biodiversity impacts associated with the proposal and details the safeguards and management measures proposed to mitigate these impacts.

The information presented in this section is drawn from the Oxley Highway Interchange Biodiversity Assessment (Biodiversity Assessment Report) (refer to Appendix E).

6.1.1 Methodology

Database searches and literature review

A desktop database and literature review was undertaken to identify threatened flora and fauna species, populations and ecological communities (biota) listed under the BC Act and FM Act, and MNES listed under the EPBC Act, that could be expected to occur in the locality based on previous records, known distribution ranges, and habitats present. The database searches and literature review assisted with focusing field survey techniques and effort. Biodiversity databases and existing literature and information pertaining to the study area and locality (i.e., within a 10 kilometre radius of the site) that were reviewed prior to conducting field investigations included:

- The NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW 2025a) BioNet Atlas for records of threatened species listed under the BC Act and EPBC Act that have been recorded within the locality (search conducted 20 May 2025)
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (Cwlth DCCEEW 2025a) Protected Matters Search Tool (PMST) for MNES listed under the EPBC Act that may occur in the area, as well as nationally important wetlands (search conducted 20 May 2025)
- The BioNet Vegetation Classification Database to identify plant community types (PCTs) present in the study area (NSW DCCEEW 2025c)
- Priority weed declarations for Port Macquarie-Hastings Council LGA (DPI 2021)
- Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems (BOM 2024)
- DCCEEW register of declared areas of outstanding biodiversity value (NSW DCCEEW 2025d)
- Aerial imagery of the study area
- NSW DPI Fisheries Spatial Data Portal (DPI 2024)
- Existing regional-scale vegetation mapping for the Port Macquarie LGA (VIS, 4205; DPIE 2015)
- NSW DCCEEW Atlas of Groundwater Dependent Ecosystems (NSW DCCEEW 2025e)
- Coastal management areas identified by the Resilience and Hazards SEPP 2022
- Core Koala Habitat identified by the Biodiversity and Conservation SEPP (DAWE 2022a)
- Any previous recent and relevant surveys (e.g., preliminary environmental investigation, options assessments) or studies

- Coastal Wetlands and Littoral Rainforest mapped under the SEPP (Resilience and Hazards) 2021
- PMHC Thrumster – Area 13 KPOM (PMHC 2008).

Additionally, the following documents were reviewed:

- Existing regional-scale vegetation mapping for the Port Macquarie LGA (VIS 4205, DPIE 2015)
- DPIE threatened biota profiles for descriptions of the distribution and habitat requirements of threatened biota (DPIE 2021b). This resource was used to identify the suite of threatened ecological communities (TECs) that could potentially be affected by the proposal and to inform habitat assessments
- Review of areas of Coastal Wetlands and Littoral Rainforest mapped under the SEPP (Coastal Management) 2018
- Review of wildlife corridors
- Environmental Values Review of Fernbank Creek and Sancrox Structure Plan (Niche 2020)
- Greater Sancrox Ecological Assessment (Biolink 2011)
- The annual Final Priority Assessment List of nominated species and ecological communities (TSSC 2024).

Vegetation assessment

Field surveys for the proposal focused on identification of plant community types (PCTs) present and their conservation significance. Given that clearing of the vacant properties is not proposed, rather that the proposal comprises partial clearing activities, full assessment in accordance with the NSW Biodiversity Assessment (BAM) was not undertaken. Field surveys included vegetation mapping and vegetation integrity plot surveys. No calculation of patch size or vegetation cover was necessary for the BAR.

Field survey

Field surveys in the study area were conducted by GHD ecologists on 25 May 2021 and by Niche ecologists on 19, 20, 26 April 2024. The field surveys focused on the identification of PCTs, the presence and extent of Threatened Ecological Communities (TECs) within the study area, identification and mapping of threatened species habitat, an assessment of the value of habitats present for threatened biota and tree surveys. Further details on field survey methodology can be found in Appendix E.

6.1.2 Existing environment

Flora

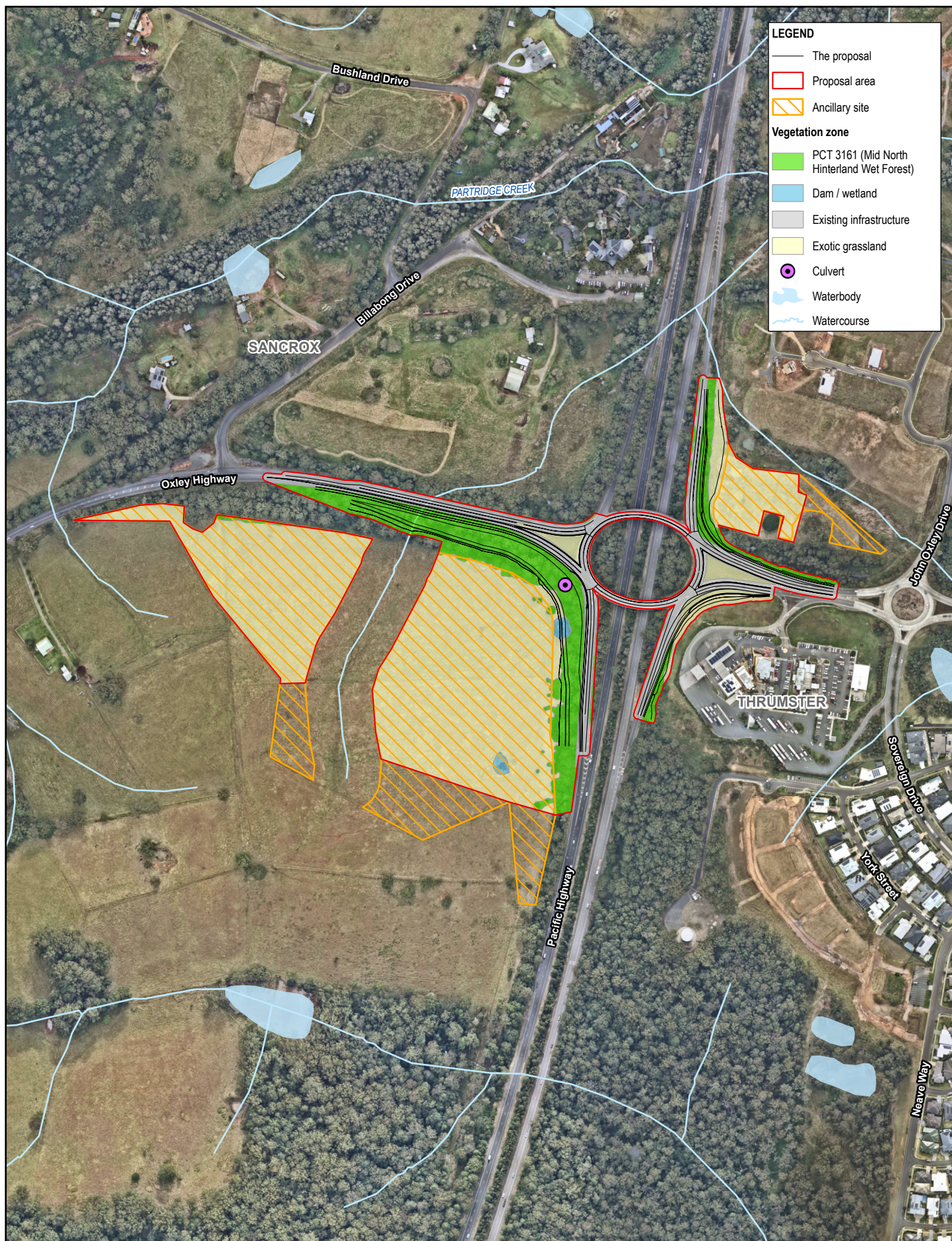
No threatened flora or ecological communities biota were recorded within the study area during the field surveys.

A total of 76 flora species were recorded within the study area, including 50 native and 26 exotic species. Appendix E contains the full list of the flora species recorded during the field survey.

Vegetation within the study area includes narrow patches of disturbed wet sclerophyll forest along the edge of the Oxley and Pacific Highways. This vegetation is comprised of a canopy layer dominated by Flooded Gum (*Eucalyptus grandis*) with occasional Turpentine (*Syncarpia glomifera*) and Tallowwood (*Eucalyptus microcorys*) over a highly disturbed mid and groundstorey dominated by a mixture of exotic and native species. Based on its structure and floristic composition, this vegetation is consistent with *PCT 3161: Mid North Hinterland Wet Forest*—the only native PCT identified within the proposal area.

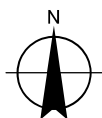
In addition to PCT 3161, two small farm dams are present, supporting a mix of native and exotic wetland vegetation. However, the vegetation associated with these dams is not consistent with any defined PCT. All remaining areas within the study area consist of exotic-dominated grassland or areas of existing infrastructure that are, again, not commensurate with a PCT. The vegetation community PCT 3161 is not associated with any TECs listed under the BC Act or the EPBC Act. Accordingly, no TECs occur within the proposal area.

The mapped extent of vegetation types is shown in Figure 6.1. The proposal is not located in a coastal wetland area or a proximity area for coastal wetlands. The proposal is also not located in littoral rainforests or in a littoral rainforest proximity area.



Paper Size ISO A4
0 50 100 150 200
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56



Disclaimer:
Subject to
detailed design

Transport for NSW
Oxley Highway Interchange
Review of Environmental Factors

Project No. 12624683
Revision No. 0
Date 29 Jul 2025

Vegetation zones and habitat

FIGURE 6.1

Fauna

No threatened fauna species were recorded within the study area during the field survey or targeted threatened frog surveys (Niche 2024; Table 6.1). Despite this, recent records (last five years) of the Koala occur on the boundary of the proposal area, within the study area and are therefore defined as 'known' as per the *Transport for NSW No Net Loss Guidelines* (NSW DCCEEW 2025a; Transport for NSW 2024), see Table 6.2.

Although surveys were conducted with reference to the Threatened Frog Survey Guidelines, suitable rainfall conditions required to effectively detect the Green-thighed Frog were not present during the survey period (DPIE 2020b). As such, surveys were not completed for this species, however, were completed for the other species listed in Table 6.1.

Table 6.1: Threatened frog surveys results

| Species name | EPBC Act | BC Act | Identification method (not recorded, assumed, recorded, expert report) | Survey effort compliant? | Results |
|-----------------------------|----------|--------|--|--------------------------|---|
| <i>Litoria brevipalmata</i> | | V | Not recorded | No | Survey effort was not undertaken due to insufficient rainfall/improper conditions |
| <i>Litoria aurea</i> | E | V | Not recorded | Yes | Not detected |
| <i>Crinia tinnula</i> | | V | Not recorded | Yes | Not detected |

Threatened species with a high likelihood of occurrence are listed in Table 6.2.

Table 6.2: Threatened fauna with a high likelihood of occurrence within proposal area

| Species name | Common name | BC Act | EPBC Act | Results/ Habitat in proposal area | Likelihood of occurrence |
|----------------------------------|--------------------|--------|----------|--|--------------------------|
| Mammals | | | | | |
| <i>Phascolarctos cinereus</i> | Koala | E | E | Forested communities in the proposal area contain suitable habitat including primary food trees for the region; Tallowwood (<i>Eucalyptus microcorys</i>) and Flooded Gum (<i>Eucalyptus grandis</i>). | High |
| Amphibians | | | | | |
| <i>Litoria brevipalmata</i> | Green-thighed Frog | V | | Both farm dams and the drainage swale are representative of suitable breeding habitat for the species. Areas of PCT 3161 and exotic grassland may offer foraging habitat. | High |
| Woodland birds | | | | | |
| <i>Daphoenositta chrysoptera</i> | Varied Sittella | V | | Proposal area contains suitable foraging habitat in eucalypt forest habitat, despite on-going disturbance. | High |

*V = Vulnerable, E = Endangered

Fauna habitats

The proposal area contains the following broad habitat types for fauna described in Table 6.3.

Table 6.3: Fauna habitat description

| Habitat | Description |
|---|--|
| Forest | Forest in the proposal site is representative of mature regrowth following historical clearing. Mature canopy trees are present, however they are generally too young to have formed hollows. Whilst the forest in the proposal site provides a range of quality fauna habitats features, the patches are limited in size and condition which would also limit the quality of the habitat for some threatened species. |
| Grasslands, dominated by exotic flora species | Several areas of exotic-dominated grassland occur in the proposal site, with few native species present. Floral structure and diversity are relatively low. Opportunistic native fauna species may be present in this habitat type on occasion and these areas may provide basking habitat for common and widespread reptile species, as well as feral animals such as cats and foxes, should they occur. |
| Aquatic systems comprised of small water bodies/ a drainage swale with associated culvert | Two water bodies are present within the proposal site, both located to the east of the Pacific Highway—one in the northern portion and one in the southern portion of the eastern site. An artificial drainage swale also occurs within this area. Habitat resources present include a sparse cover of sedges and surface water. None of these aquatic habitats is considered key fish habitat due to their isolated and ephemeral nature. |

The proposal site occurs within an Area of Regional Koala Significance (DPIE 2019) and in the Port-Macquarie Hastings Council draft Koala Plan of Management (KPoM) the proposal site has also been mapped as core koala habitat (PMHC 2018). Field assessments confirmed that two Koala feed tree species, Tallowwood (*Eucalyptus microcorys*) and Flooded Gum (*Eucalyptus grandis*) are present within the site. The locality is also known as a 'black spot' area for vehicle strikes.

The proposal site is situated within a fragmented landscape characterised by agricultural land, major road infrastructure, and adjacent residential and commercial development. Patches of native forest within the proposal area may provide habitat for dispersing fauna; however, the extent of use is likely limited to more mobile species due to the small patch sizes and surrounding disturbance. Larger intact remnants of vegetation, such as Cowarra State Forest and Lake Innes, are located within three kilometres of the study area and serve as key habitat refuges in the locality.

Given the presence of primary Koala food trees, Tallowwood (*Eucalyptus microcorys*) and Flooded Gum (*Eucalyptus grandis*), alongside numerous Koala records both within the study area and the broader locality, the vegetation has the potential to function as a corridor for the species. In particular, it may facilitate Koala movement between known core habitat areas in larger vegetated remnants nearby.

6.1.3 Potential impacts

Construction

Removal of native vegetation

The proposal would impact up to 14.21 hectares of vegetation, aquatic systems and infrastructure, which is inclusive of the compound areas. Native vegetation is representative of approximately 2.73 hectares of this area.

The proposal would remove up to 7.19 hectares of vegetation, of which about 2.73 hectares consists of PCT 827 – 'Flooded Gum - Tallowwood - Brush Box moist open forest of the coastal ranges of the North Coast'. Impacts to 2.73 hectares of PCT 827 are unable to be avoided given that this vegetation is located in the road corridor immediately adjacent to the proposed road infrastructure.

The remainder of the vegetation proposed for removal (4.9 ha) is exotic grassland and a small farm dam (Table 6.4).

Table 6.4: Impacts on vegetation

| PCT ID | Plant Community Type | BC Act Status | EPBC Act Status | Removal area (ha) |
|--------|---------------------------------|--------------------------|--------------------------|-------------------|
| 3161 | Mid North Hinterland Wet Forest | No associated listed TEC | No associated listed TEC | 2.73 |
| N/A | Exotic grassland | N/A | N/A | 9.29 |
| N/A | Dam/wetland | N/A | N/A | 0.08 |
| Total | | | | 12.09 |

Removal of threatened fauna habitat

The proposal would result in the clearing of up to 2.73 hectares of native vegetation within the proposal area, specifically affecting several patches of *PCT 3161 – Mid North Hinterland Wet Forest* that are in moderate condition. Impacts would extend across all vegetation strata, including the canopy, midstorey, and understorey. Vegetation within the proposal area includes a variety of habitat features relevant to native fauna, such as intact native vegetation with structural and floristic diversity, dense shrub layers, fallen timber, and accumulations of leaf litter. Despite the presence of anthropogenic disturbance, small areas of suitable habitat persist for multiple threatened species. Groundcover vegetation and woody debris also provide foraging resources including nectar, seeds, and invertebrate prey, particularly for bird species.

Although no roost camps or hollow-bearing trees were identified within the development footprint, feed trees suitable for species such as the Koala would be affected. Select bands of native vegetation within the proposal area maintain some connectivity to larger forested patches to the north, south and west of the study area, suggesting potential corridor value for Koalas and other less mobile fauna species. As such, vegetation removal may hinder or reduce fauna movement and dispersal. However, direct impacts on breeding habitat are considered less likely due to the fragmented and narrow nature of the remnant vegetation, situated between the Pacific and Oxley Highways.

This vegetation may also provide foraging habitat for a range of mobile, canopy-feeding fauna, including the Grey-headed Flying-fox, Varied Sittella, and several microbat species such as the East-coast Freetail Bat, Little Bentwing-bat, Southern Myotis, and Greater Broad-nosed Bat. While these species may utilise the proposal area for foraging or temporary roosting (with the exception of the cave-roosting Little Bentwing-bat), their use of the area, if present, is likely to be intermittent.

A culvert to be extended as part of the proposal offers marginal roosting habitat for microbat species. Given its limited suitability, the proposal is unlikely to result in long-term impacts to fauna that may opportunistically utilise the culvert. The two small waterbodies and drainage swale present in the proposal area are of low overall condition, ephemeral, and disconnected from other aquatic systems. Consequently, they are unlikely to provide habitat for threatened fish species. However, they may provide habitat for a variety of common or threatened frog species.

The exotic grassland within the study area may provide foraging and breeding habitat for a number of common species and for threatened Eastern Grass Owl. Although the species has been recorded within the locality (approximately five kilometres northeast near Fernbank Creek), it is unlikely to be resident in the proposal area due to the high levels of disturbance. Should the species occur temporarily, it is expected to relocate to similar habitat elsewhere in the locality that would not be affected by the proposal.

Impacts on any threatened fauna that may be present at the time of clearing would be minimised by implementing mitigation measures in Section 6.1.4

Injury and mortality

During construction, death or injury may occur to any fauna present during the clearing of trees. If birds are present but not nesting during construction, they would generally relocate from the study area to escape the disturbance. Species that take longer to disperse, such as the Koala, are of particular risk given their known presence within and around the study area and the difficulty in detecting the species when high in the canopy. Displaced individuals would be vulnerable to predation since they would be disturbed in daylight hours and would experience increased energy costs, increased risk of predation and increased competition for resources.

Mitigation measures for reducing the risk of injury or mortality to fauna as a result of the proposal are detailed in Section 6.1.4.

Indirect impacts

The proposal has the potential to temporarily affect the use of the study area by fauna as a result of vegetation and tree clearing, and increased disturbance during construction. The use of machinery may temporarily deter some fauna species from using habitat in the study area during construction.

The proposal has the potential to result in the edge effects, the introduction and spread of weeds, pests and pathogens, aquatic disturbance, impacts associated with noise, light, dust and vibration and the potential for vehicle strikes.

Wildlife connectivity and habitat fragmentation

The proposal would result in the removal of up to 2.73 hectares of native vegetation commensurate with PCT 3161. The habitats that would be directly impacted are in moderate condition and support the structural and floristic diversity to support a number of species in the locality. Given the small size of the impacted patches and the extent of surrounding disturbance, this habitat is likely to function as transitional habitat for a range of species.

Populations that rely on this vegetation for travel (including arboreal mammals, small ground-dwelling mammals and reptiles) may be impacted by the proposal, however, the complete isolation of populations is not anticipated.

Operation

The operational phase of the proposal is unlikely to result in new impacts that the study area is not currently subjected to from the highly trafficked roadway adjacent, notably fauna injury from vehicle strike.

Assessment of Significance

A likelihood of occurrence assessment identified three BC Act listed fauna species, the Varied Sittella (*Daphoenositta chrysoptera*), Koala (*Phascolarctos cinereus*) and Green-thighed Frog (*Litoria brevipalmata*), with a high likelihood of occurrence within the proposal area, see Appendix F.

An assessment of significance pursuant to Section 7.3 of the BC Act, concluded that the proposal is unlikely to have a significant impact on the above species.

A likelihood of occurrence assessment identified a single EPBC Act listed fauna species, the Koala (*Phascolarctos cinereus*), that has a high likelihood of occurrence within the proposal area. An Assessment of Significance for the Koala was undertaken in accordance with the EPBC Act Policy Statement ‘Matters of National Environmental Significance: Significant impact guidelines 1.1’ (DotE 2013) was reviewed when determining if a significant impact is likely on MNES. The EPBC Act significance assessments concluded that the proposal is unlikely to have a significant impact on the Koala.

Conclusion on significance of impacts

The proposal is not likely to significantly impact threatened species or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act, 2016* or *Fisheries Management Act 1994* and therefore a *Species Impact Statement* or Biodiversity Development Assessment Report is not required.

The proposal is not likely to significantly impact threatened species, ecological communities or migratory species, within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*.

6.1.4 Safeguards and management measures

Table 6.5: Biodiversity safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|--------------|--|----------------|------------------------------------|--|
| Biodiversity | <p>A Flora and Fauna Management Plan will be prepared in accordance with Transport's <i>Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects</i> (Transport for NSW, 2024) and implemented as part of the CEMP. It will include, but not be limited to:</p> <ul style="list-style-type: none">plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas | Contractor | Detailed design / Pre-construction | Transport's <i>Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects</i> (Transport for NSW, 2024) |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|------------------------------|---|----------------|------------------|-----------|
| | <ul style="list-style-type: none"> requirements set out in the Landscape Design Guideline (Transport for NSW 2023) pre-clearing survey requirements procedures for unexpected threatened species finds and fauna handling procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013) Protocols to manage weeds and pathogens. | | | |
| General | Ensure all workers are provided with an environmental induction before starting work on-site. This would include information on the ecological values of the study area and measures to be implemented to protect biodiversity. | Contractor | Pre-construction | BAR |
| Removal of native vegetation | Native vegetation removal will be minimised through detailed design. | Transport | Detailed design | BAR |
| | Pre-clearing surveys will be undertaken in accordance with <i>Guide 1: Pre-clearing process</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects</i> (Transport for NSW, 2024). | Contractor | Construction | BAR |
| | Vegetation removal will be undertaken in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects</i> (Transport for NSW, 2024). | Contractor | Construction | BAR |
| | Native vegetation will be re-established, where applicable, in accordance with <i>Guide 3: Re-establishment of native vegetation</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects</i> (Transport for NSW, 2024). | Contractor | Construction | BAR |
| | The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects</i> (Transport for NSW, 2024) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the study area. | Contractor | Construction | BAR |
| | A policy-based tree replacement would be required as an environmental safeguard in the updated REF as per <i>Transport for NSW No Net loss Guidelines</i> (2024). | Transport | Construction | BAR |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|--|--|----------------|----------------------------------|-----------|
| Removal of threatened fauna habitat and habitat features | Habitat removal will be minimised through detailed design. | Transport | Detailed design | BAR |
| | Habitat removal will be undertaken in accordance with <i>Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects (Transport for NSW, 2024)</i> . | Contractor | Construction | BAR |
| | Habitat will be replaced or re-instated in accordance with <i>Guide 5: Re-use of woody debris and bushrock</i> and <i>Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects (Transport for NSW 2024)</i> . | Contractor | Construction | BAR |
| Removal of habitat and potential movement corridor for the Koala | Minimise habitat loss, where possible, in the final design | Transport | Detailed design | BAR |
| | Delineate retained native vegetation with no-go zone fencing. | Contractor | Construction | BAR |
| | Reduce vehicle strike risk through the installation of Koala exclusion fencing and wildlife signage, where appropriate. | Transport | Detailed Design and construction | BAR |
| | Minimise light and noise impacts through the retention of forested vegetated buffers where possible; limit night works during breeding season (September through to February). | Transport | Detailed Design | BAR |
| Aquatic impacts | Aquatic habitat will be protected in accordance with <i>Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Transport for NSW 2024)</i> and Section 3.3.2 Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013 (DPI (Fisheries NSW) 2013). | Contractor | Construction | BAR |
| Injury and mortality of fauna | Fauna will be managed in accordance with <i>Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects (Transport for NSW 2024)</i> . | Contractor | Construction | BAR |
| Edge effects on adjacent native vegetation and habitat | Exclusion zones will be set up at the limit of clearing in accordance with <i>Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects (Transport for NSW 2024)</i> . | Contractor | Construction | BAR |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|----------------|-----------------|-----------|
| Invasion and spread of weeds | Weed species will be managed in accordance with <i>Guide 6: Weed management</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects</i> (Transport for NSW 2024). | Contractor | Construction | BAR |
| Invasion and spread of pathogens and disease | Pathogens will be managed in accordance with <i>Guide 2: Exclusion zones</i> of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects</i> (Transport for NSW 2024). | Contractor | Construction | BAR |
| Exceedance of Transport's no net loss guideline | Prepare a biodiversity offset strategy in line with <i>Transport's No Net Loss Guidelines</i> (Transport for NSW 2024). | Transport | Detailed Design | BAR |

6.1.5 Biodiversity offsets

The Transport Biodiversity Offset Guidelines under the Transport Biodiversity Policy (Transport for NSW 2022) outlines a number of thresholds that trigger the need for biodiversity offsets. Consideration of these thresholds has determined that the impacts of the proposal trigger the need for offsetting due to:

- The clearing of approximately 2.73 hectares of Koala habitat
- The clearing of >1 hectares of 3161: Mid North Hinterland Wet Forest, which contains primary Koala feed tree species (PMHC 2008)
- Potential cumulative impacts to nationally listed threatened species and communities.

6.2 Water, hydrology and flooding

6.2.1 Methodology

The following methodology was completed to assess water, hydrology and flooding factors of the proposal site:

- Review of public reports and databases
- Review of LEP flood planning maps to identify flood planning areas and extent of probable maximum flood
- Review of Council flood policy to identify relevant policy relating to flood planning levels within the proposed site
- Review relevant estuary and floodplain management studies and plans.

6.2.2 Existing environment

Surface water

The proposal contains one mapped surface water feature which is an intermittently flowing drainage line located between the existing roundabout and Billabong Drive. This drainage line forms a tributary of Partridge Creek, which is part of the Hastings River catchment.

The Hastings River catchment is composed of two major rivers, the Hastings and the Camden Haven. The proposal is located in the Hastings River catchment. The Hastings River headwaters rise in the Great Dividing Range south west of Kemps Pinnacle and flows south east through a coastal floodplain to Port Macquarie where it meets the Pacific Ocean.

The Hastings River catchment is generally in good condition. Riparian vegetation within the catchment is moderately disturbed, with human impacts being more prevalent towards the coast. Water quality of the Hastings River system is generally adequate, with the poorest quality water being within the tidal limits of the river system. Indicators of poor water quality were identified as low dissolved oxygen levels and high nutrient concentrations. Water quality is impacted by high density of rural settlement and impacts generated by changed run-off conditions caused by land clearing, agricultural use, human settlement, and recreation (Ryder et al, 2017).

Water quality within the intermittently flowing drain mentioned above may be impacted by contaminants (e.g. hydrocarbons, heavy metals) associated with run-off from adjacent roads.

Groundwater

The proposal is located within the Hastings Unregulated and Alluvial Water Source. The long-term annual extraction limit for this area is 1,727 ML annually. A review of the WaterNSW real time data portal on 28 May 2025 identified two groundwater bores within 500 metres of the proposal which were:

- GW303747: Private bore located north west of the proposal. Established for domestic and stock purposes drilled to a final depth of 27 metres. Standing water level was recorded at 5 metres below ground level. Water bearing zones were between 21 and 21.5 metres.
- GW302143: Located south west of the proposal. Established for stock and domestic purposes drilled to a final depth of 26 metres. Standing water level was recorded at eight metres below ground level. Water bearing zones were between 9 to 12 metres and 20 to 22 metres.

Flooding

A review of the flood mapping in the Port Macquarie – Hastings LEP indicated the proposal site is within the Flood Planning Area and/or the Probable Maximum Flood (PMF). This is defined as the 100-year ARI Flood Level plus an allowance for climate change, plus an allowance for 500 millimetres of freeboard. The tributary of Partridge Creek to the west of the interchange is not mapped in this area.

The Hastings River Flood Study, undertaken in 2006, did not map the proposal site within the floodway, flood storage or flood fringe areas for 100-year ARI floods. Recent updates to the flood study which more accurately represent conditions in the area mapped the site outside the predicted 100-year ARI flood extent. The updated models did not identify the study area to be within the floodway, flood storage or flood fringe areas for the 100-year ARI flood (Advisian, 2018).

The updated flood study also contains some predictive models based on likely impacts of climate change. The proposal generally falls outside of the scenarios presented in the study. The north east portion of the proposal was mapped as potentially being inundated if sea level rise was above 900 millimetres and a peak maximal flood event occurred (Advisian, 2018).

6.2.3 Potential impacts

Construction

Water Quality

It is proposed that water for construction purposes would be obtained from the local water supply network. The amount of water that would be required during construction is unknown at this stage and would depend on material sources and methodologies applied by the contractor.

Construction activities have the potential to impact on water quality within local receiving waters. The main potential impacts relate to soil disturbance, which represent a risk to surface water quality, and run-off during construction. These include sediment laded water and soil nutrients (including construction water) resulting from earthworks including:

- Removal of vegetation
- Exposure of soils leading to erosion
- Excavations during construction of new road
- Cutting and filling of areas
- Construction vehicle movement over unsealed surfaces
- Construction dust settling in drainage lines
- Spills of fuels or chemicals

- Leaks of hydraulic fluid from plant
- Water from vehicle wash downs or concrete washouts
- Water containing biological contaminants such as nutrients and bacteria from site toilets and taps
- Tannin runoff from cleared vegetation.

Impacts to surface water quality are considered to be low as the proposal area does not contain permanent and/or major water bodies. There is potential for a range of pollutants to enter waterways, particularly during high rain events and when work is being undertaken between the interchange and Billabong Drive near the intermittently flowing drainage line.

Excavations would not be required below a depth of five metres, and therefore based on the available data, groundwater is not expected to be encountered. A spill or leak of fuels/chemicals may impact local groundwater if the contaminant infiltrated through the soil layer. Spill risk would be managed during the construction period. Impacts to groundwater are otherwise considered negligible.

Flooding

The proposal site is generally outside the PMF event as defined by the LEP, except for the north east corner of the site and a portion of Compound 3. While this is mapped as being within the PMF by the LEP, the road is built up from ground level which would increase its resistance to flooding. Construction of the proposal may require work in or around the intermittent drainage line. Flows (if present) within the tributary would be impacted by the presence of construction equipment within the waterway. The scale of the impact for instream work would be low given the ephemeral nature of the creek. The creek is not mapped as being within the flood planning area, and the proposal is not expected to increase the likelihood of flooding in the area. Following the completion of work in the area, all equipment would be removed from the creek.

The south eastern corner of the proposal is low lying and would require earthworks. This area is not mapped as liable to flooding, though the low-lying topography of the land means it may be subject to waterlogging following rain. Waterlogged soil may change surface water flow and lead to local surface water pooling. This is not expected to have an impact on the road conditions or increase flooding risk to properties in the area.

A PMF event would generally not impact the site based on the available modelling information. Safeguards proposed in Section 6.2.4 would be implemented to minimise risk posed by flooding.

Operation

Operation of the proposal is not likely to result in any significant impacts on water quality. The risk of soil erosion during operation would be minimal, as all areas impacted during construction would be sealed or rehabilitated and landscaped to prevent soil erosion from occurring. The potential for adverse water quality impacts during operation would primarily be because of accident spills and leaks from vehicles using the road, however, the risk of fuel or chemical spill would be no greater than the risks that currently exist. There are no expected impacts on groundwater from operation of the proposal.

The proposal would be built to match the existing levels of road, which is not prone to flooding. The filling of some areas on site would permanently change the topography of the area which may lead to altered surface water runoff regimes. The scale of these impacts is expected to be minor and localised.

6.2.4 Safeguards and management measures

Table 6.6: Hydrology safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|----------------|--|----------------|------------------|--|
| Soil and water | 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. | Contractor | Pre-construction | QA Specification <i>G38 Soil and Water Management</i> |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|------------------|---|----------------|------------------------------------|---|
| Soil and water | <p>Erosion and sediment control measures are to be implemented and maintained to:</p> <ul style="list-style-type: none"> Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets Reduce water velocity and capture sediment on site Minimise the amount of material transported from site to surrounding pavement surfaces Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)). | Contractor | Pre-construction | QA Specification <i>G38 Soil and Water Management</i> |
| Accidental spill | <p>A site specific emergency spill plan will be developed, and include spill management measures in accordance with the Transport Code of Practice for Water Management (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport and EPA officers).</p> | Contractor | Detailed design / Pre-construction | QA Specification <i>G36 Environment Protection</i> |
| Soil and water | <p>Ensure works are carried out in accordance with the following:</p> <ul style="list-style-type: none"> All re-fuelling of vehicles and equipment will be carried out at least 40 m away from drainage lines or watercourses All fuels, chemicals and liquids will be stored in an area surrounded by an impervious bund Excess spoil not required or able to be used for backfilling and proved not to be contaminated will be stockpiled before being reused or removed from the site, and disposed of appropriately. <p>Construction compounds will not be placed within mapped Flood Planning or PMF areas.</p> | Contractor | Construction | QA Specification <i>G36 Environment Protection</i> |

6.3 Soils and geology

6.3.1 Existing environment

Geology

The site is underlain by metamorphic complexes of the Port Macquarie Block. Regional geological units are generally deformed. Geological units have a deeply weathered regolith, and little relationship exists between parent material and soil type. Iron and chromium levels in the geological material have been sufficient to have been mined within the region (eSpade, 2025).

Soils

The highway corridor has been historically disturbed from various earthworks, and more recently, flooding events. The proposal site is located upon the Thrumster soil landscape, which is characterised by the following horizons:

- Dark reddish brown pedal clay loam (topsoil, A1 horizon, generally 0-60 cm below ground level): slightly acidic soils, with high plasticity, high permeability and high available water holding capacity. Soils in this horizon have low wet bearing strength
- Dark reddish brown sub-plastic pedal clay (subsoil, B horizon, generally 20 to 160 cm below ground level): strongly acidic soils with high permeability, low wet bearing strength, low fertility and aluminium toxicity hazards
- Mottled red sub-plastic pedal clay (deep subsoil, C horizon, generally 100 cm below ground level): strongly acidic soils with moderate permeability, low wet bearing strength, low fertility and aluminium toxicity hazard.

Soils in this landscape have a moderate erosion risk and contain moderately reactive sub soils (eSpade, 2025). Local topography is undulating, with the road corridor constructed above the ground level.

Acid Sulphate Soils

A review of the acid sulphate soil (ASS) mapping in the LEP concluded that the proposal site was located outside of mapped ASS areas. A review of the Australian Soil Resource Information System indicates the proposal site is located in an area with low probability of containing ASS (ASRIS, 2014).

Contamination

A search of the EPA Contaminated Land Record on 5 March 2025 did not identify any records of contamination or contamination related notices within the proposal site or within Port Macquarie Hastings LGA.

The list of NSW contaminated sites notified to the EPA was also searched for the suburbs of Thrumster and Sancro, which produced no result. In the wider area, the nearest contaminated site notified to the EPA is 3 Sancro Road Wauchope mapped approximately 2.5 kilometres north of the proposal site.

6.3.2 Potential impacts

Construction

The proposal would result in impacts to soils and landscapes primarily through earthworks during the construction phase. These earthworks would include:

- Removal of vegetated groundcover currently stabilising soils and increasing the risk of erosion and sedimentation through the exposure of soils to weathering processes
- Cut and fill to produce flat surfaces
- Reinstatement of work areas following completion of removal.

The proposal would involve removal of topsoil, earthworks detailed above and stockpiling of spoil for reuse in rehabilitation works. If not adequately managed, earthworks, stockpiling and transportation of materials could potentially have the following impacts:

- Wind erosion of exposed soil and stockpiled materials if not appropriately stabilised with covering or seeding
- An increase in sediment loads entering waterways during rainfall events resulting in stormwater runoff and flooding, including if stockpiles are not located outside of the floodplain and drainage lines.

Construction related erosion and sedimentation impacts would be appropriately managed and are not expected to be significant.

The compaction of soils within the proposal site may also occur as a result of materials and soil stockpiling and parking and machinery movements, potentially impacting soil stability and the regeneration of groundcover.

Stabilisation and rehabilitation would be carried out as soon as practical following disturbance during construction. Topsoil would be reused where possible to encourage natural regeneration and future vegetative growth. A rehabilitation plan would be developed for the proposal to ensure disturbed areas are stabilised and identify further management actions, as necessary. During construction, erosion and sediment controls would be installed in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book) (Landcom, 2004) to minimise erosion from disturbed areas and prevent sediment entering the waterway. In addition, a detailed site-specific SWMP would be prepared for construction of the proposal to manage potential construction-related impacts.

Although there is considered to be minimal potential for widespread contamination to occur in the proposal site, there is the potential to encounter previously unknown contamination during construction.

Soil contamination has the potential to occur as a result of accidental spills or leaks of fuels, oils and other chemicals from equipment and vehicles during construction. To reduce this potential impact, fuels and chemicals would be managed in accordance with the management measures provided in Section 6.3.3.

Fill material imported from off-site would be sourced from certified suppliers to avoid the potential for contaminated fill. Surplus or unsuitable material that cannot be used on-site (for example as part of reinstatement and landscaping) would be classified in accordance with the *Waste Classification Guidelines* (EPA, 2014) and disposed of appropriately.

Operation

Operation of the proposal would have no ongoing impacts to soils and geology following the rehabilitation of the proposal site.

6.3.3 Safeguards and management measures

Table 6.7: Soils safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|--|--|--------------------------|---|--|
| Landform, soil disturbance and erosion | <p>Ensure works are carried out in accordance with relevant specifications including:</p> <ul style="list-style-type: none"> G38 Soil and Water Management (Soil and Water Management Plan) R44 Earthworks (Cut, Fill, Imported Fill and Imported Selected Material). | Transport/ Contractor | Detailed design / pre-construction / construction | <p>QA specification G38 <i>Soil and water management</i></p> <p>QA specification R44 <i>Earthworks</i></p> |
| Rehabilitation | <p>A rehabilitation plan will be prepared covering all areas disturbed as part of the proposal and will include the following:</p> <ul style="list-style-type: none"> Progressive stabilisation and rehabilitation of construction areas back to the original condition or re-vegetated with appropriate native species, as soon as practicable Monitoring to meet clear targets in relation to vegetation establishment and stabilisation of disturbed areas. | Contractor | Detailed design / Pre-construction | QA Specification G36 <i>Environment Protection</i> |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-------------------|---|----------------|------------------------------------|--|
| Contaminated land | If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport Senior Manager Environment and Sustainability and/or EPA. | Contractor | Detailed design / Pre-construction | QA Specification G10 <i>Control of Traffic</i> |

Other safeguards and management measures to address soil impacts are identified in Section 6.3.3

6.4 Traffic and transport

6.4.1 Methodology

In 2018, GHD prepared a Port Macquarie-Hastings Council Local Government Area Traffic Study, Volume 1 – Main Report, Port Macquarie (GHD 2018).

The findings of this report have been updated using 2023 traffic count data supplied by Transport.

6.4.2 Existing environment

Road network

The proposal site is at the intersection of the Oxley Highway and the Pacific Highway. The Oxley Highway is a classified road (Highway 11 (HW11)). The Oxley Highway starts at Nevertire at its junction with the Newell Highway, approximately 90 kilometres north of Dubbo. It runs in a north easterly direction through the towns of Warren, Gilgandra, Coonabarabran and Tamworth. At Bendemeer, the Oxley Highway runs south east through the Walcha and Wauchope before ending in Port Macquarie. The Pacific Highway is one of Australia's busiest roads and connects Sydney to Brisbane.

The Oxley Highway is a busy road corridor heading into Port Macquarie from Wauchope. Eastbound traffic can flow freely until the Pacific Highway – Oxley Highway interchange, where the roundabout breaks traffic flow.

The Pacific Highway is also a busy road corridor and a critical part of the road freight network of Australia's east coast. The Pacific Highway and the Oxley Highway have been identified as critical arterial roads for the Port Macquarie-Hastings LGA.

The proposal site consists of a large roundabout style grade-separated interchange between the Pacific Highway and Oxley Highway. The proposal site also includes the section of the Oxley Highway between the interchange and Billabong Drive. The proposal site is accessed from the east via the roundabout at the Oxley Highway and John Oxley Drive, and from the west along the Oxley Highway.

Traffic volumes

The speed limit of the Oxley Highway varies along its length, from 60 to 110 km/h. The speed limit in the proposal site is 60 km/h to the east of the interchange and 90 km/h to the west towards Billabong Drive. The exit ramps off the Pacific Highway are posted at 60 km/h. Current roundabout configuration prioritises northbound right turn from Pacific Highway over Oxley Highway eastbound through movement, creating delays for the latter.

A previous traffic study undertaken in 2018 found that traffic volumes along the Oxley Highway corridor between Wauchope and Port Macquarie vary considerably along its length. As shown in Figure 6.3 and described above, the traffic count in 2023 was 2,442 vehicles, which demonstrates an increase in traffic volumes along Oxley Highway.

The 2023 traffic count data for the Oxley and Pacific Highway Interchange (Average Daily Traffic ADT) shows that the southbound and northbound combined volume is 20,000 vehicles. Figure 6.2 shows that more vehicles were recorded travelling east of the interchange (to and from Port Macquarie) than west of the interchange (to and from Wauchope). Traffic volumes northbound and southbound are relatively consistent.

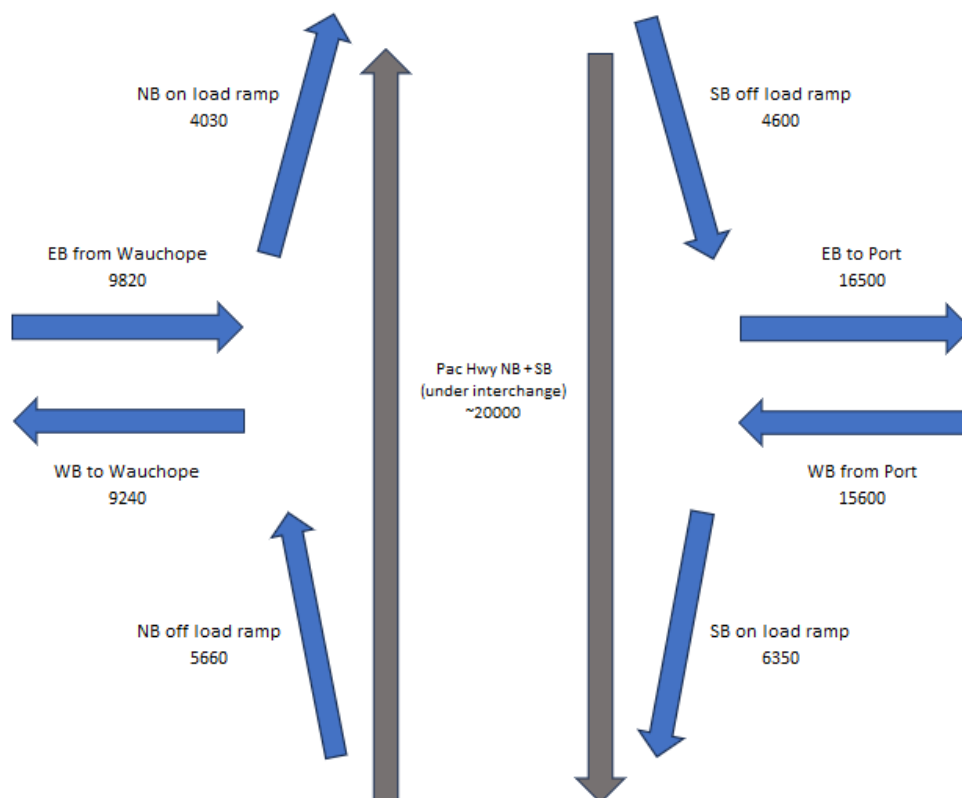


Figure 6.2: Average Daily Traffic

A traffic count on the Oxley Highway between John Oxley Drive and the Pacific Highway – Oxley Highway Interchange was undertaken between 20 and 26 June 2023. Results of the traffic count are presented in Figure 6.3. The traffic count showed that peak usage of the interchange is during daylight hours (6:00 am to 6:00 pm).

The average maximum hourly traffic count was 2,442 vehicles which is inclusive of heavy and light vehicles travelling both east and west. This maximum average was recorded at approximately 3:00 pm. The average maximum hourly traffic count of heavy vehicles was recorded at 3:00 pm and was 327 heavy vehicles. This is inclusive of both east and west-bound heavy vehicles. When daily traffic is highest, at 3:00 pm, the percentage of heavy vehicles is approximately 13 percent.

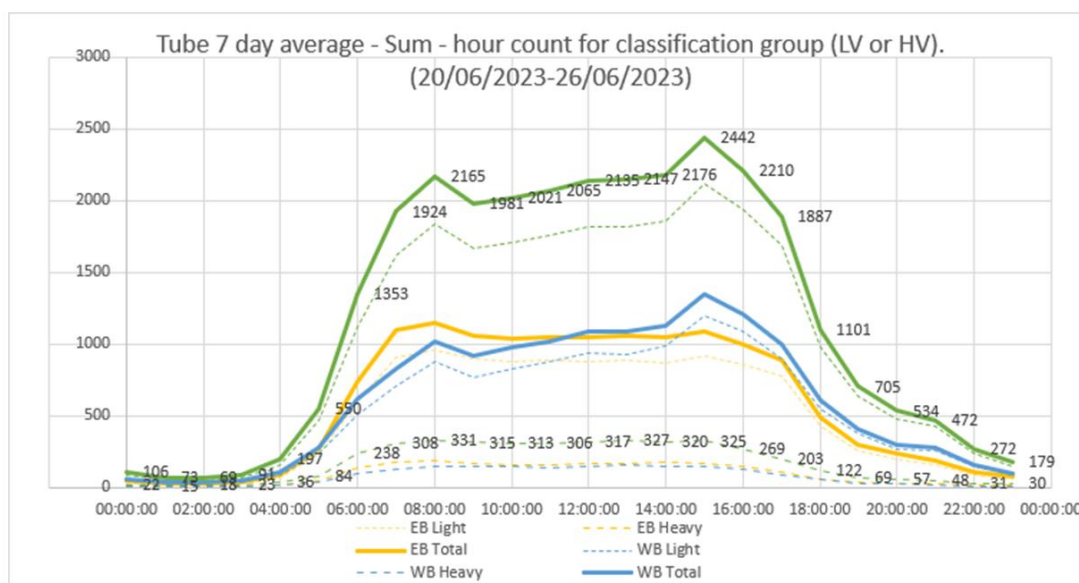


Figure 6.3: Tube 7-day average count

During the morning and afternoon peak traffic periods in both the 2016 and 2023 traffic counts, the Pacific Highway and Oxley Highway interchange becomes busy with traffic due to major business locations and facilities such as the Port Macquarie Base Hospital and University campus serving Port Macquarie. Traffic delays entering the roundabout and extensive queuing, including onto the Pacific Highway, has been observed.

The population of the PMH LGA is expected to grow approximately 16.5 percent from 86,406 in 2021 to 100,686 by 2041 (NSW Planning Portal Projections Explorer, 2023), putting significant strain on the existing road networks. Many of the future growth areas planned for the study area are in the Oxley Highway Corridor, including Thrumster, Innes Peninsula and rural areas around Wauchope. This would result in significant growth in traffic volumes on Oxley Highway, including a 55 percent increase in eastbound traffic during the morning peak period south of Lake Road by 2036, compared to 2016 volumes (GHD, 2018).

Road safety

The highest density of crashes in the PMH LGA is within is in the Port Macquarie CBD. Other significant crash locations are on Hastings River Drive and Lake Road; Wauchope; the intersection of the Pacific Highway with Hastings River Drive; the Pacific Highway and Oxley Highway interchange, and the Oxley Highway/Sancrox Road intersection.

Crash history for the proposal site 2019 to 2023 was sourced from the NSW Centre for Road Safety website. 15 crashes were recorded at the interchange, or on the direct approaches of the interchange, of which two resulted in death (north and southbound on Pacific Highway), four resulted in serious injury, ten resulted in moderate injury and six resulted in minor injury.

Of the 19 recorded fatal crashes between 2019 and 2023 recorded in Port Macquarie-Hastings, only six did not occur on either Oxley Highway or Pacific Highway.

Pedestrians and cyclists

There are no existing provisions for pedestrians and cyclists.

Public transport

There is limited public transport in the area with minimal or no specific public transport features such as bus stops or bus lanes.

6.4.3 Potential impacts

Construction

The traffic generated by construction activities is expected to vary depending upon the stage of construction, however estimated construction traffic volumes for the construction program is as follows:

- Light vehicles – about 40 vehicles/day
- Heavy vehicles – about 10 vehicles/day on average, but with peak of 25/day.

Works for the proposal would generally be carried out (excluding nightworks) during standard working hours of:

- Monday to Friday: 7.00 am to 6.00 pm
- Saturday: 8.00 am to 1.00 pm
- Sundays and public holidays: no work.

As discussed in Section 3.3.3, while construction activities are expected to generally occur during standard construction hours, some out of hours work (nightworks) will be required for specific construction activities next to traffic or works requiring lane reductions.

Construction traffic would likely commence at the start of the working day with workers arriving to site, with the majority of light vehicles arriving within a two hour window. Similarly, light vehicle movements are expected to be higher towards the end of the working day travelling away from the site. Heavy vehicle movements are likely to be spread across the day with around one vehicle on average arriving per hour.

Construction traffic is expected to predominantly come from the north and south via the Pacific Highway. Some construction traffic would also come from the west along the Oxley Highway from Wauchope.

Work compounds and stockpile areas are shown in Figure 3.1. Stockpiles would be regularly accessed by the construction workforce and may generate additional traffic around the intersection of the Oxley Highway and John Oxley Drive. Direct impacts on traffic flow during construction would be generated by works occurring next to or in the existing road corridor. Construction speed limits (typically 40 km/h) would apply to the proposal site, leading to temporary travel delays for motorists. It is worth noting however, that vehicle speeds at peak times at the interchange are generally around this speed, so construction impacts at peak times would be minor. Specific traffic management controls would be required to maintain traffic access and worker safety during these elements of the works. A Traffic Management Plan would be developed for construction of the proposal which would detail traffic management and access safeguard measures for safe passage of motorists during the construction of the proposal and would be tailored to the specific construction methodology that is adopted. It would also detail access routes for construction traffic.

Operation

Operational characteristics

The proposal would involve the treatment of northbound and southbound left hand turns at the interchange. The left turn for vehicles travelling eastbound from the interchange of the Oxley Highway and John Oxley Drive would be treated. In addition, an extra lane would be added to the Oxley Highway between the interchange and Billabong Drive.

Traffic generation, distribution and efficiency

This proposal is not expected to change traffic volumes during operation but instead improve safety and travel efficiency through the provision of left hand turns and an extra lane along the Oxley Highway to Billabong Drive. Traffic efficiency would be significantly improved in the short to medium term. Traffic modelling conducted for the proposal identified that upgrading the interchange would reduce future morning peak delays from 84 seconds to 41 seconds and afternoon peak delays from 104 seconds to 43 seconds (Bitzios Consulting, 2021).

The population of the Port Macquarie- Hastings LGA is expected to increase in the future, which as discussed, would put strain on the existing road network. The increases in efficiency generated by the proposal would support future travel demands associated with population growth and other major developments in the region.

Road safety

Road safety is expected to improve due to greater efficiency of the interchange leading to reduced congestion.

6.4.4 Safeguards and management measures

Table 6.8: Traffic and transport safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-----------------------|---|----------------|----------------------------------|--|
| Traffic and transport | <p>A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Transport Traffic Control at Work Sites Manual (Transport for NSW 2022) and QA Specification G10 Control of Traffic (Transport for NSW, 2008). The TMP will include:</p> <ul style="list-style-type: none"> • confirmation of haulage routes • measures to maintain access to local roads and properties • site-specific traffic control measures (including signage) to manage and regulate traffic movement • measures to maintain pedestrian and cyclist access • requirements and methods to consult and inform the local community of impacts on the local road network • access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. • a response plan for any construction traffic incident • consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • monitoring, review and amendment mechanisms. | Contractor | Pre-construction | QA Specification G10 <i>Control of Traffic</i> |
| Approvals | The construction contractor will obtain and comply with a Road Occupancy License/s (ROL) under Section 138 of the <i>Roads Act</i> prior to construction commencing. | Contractor | Detailed design/Pre-construction | QA Specification G1 <i>Job Specific Requirements</i> |

6.5 Noise and vibration

This section addresses the noise and vibration impacts associated with the proposal and details the management measures proposed to mitigate these impacts. The information presented in this section is drawn from the Oxley Hwy Interchange: Noise and Vibration Impact Assessment (Noise and Vibration Impact Assessment) (GHD 2025) (refer to Appendix F).

6.5.1 Methodology

The methodology for this Noise and Vibration Impact Assessment (NVIA) included:

- Identification of noise sensitive receivers in the study area
- A combination of unattended and operator attended noise monitoring at three locations
- Establishing the noise and vibration assessment criteria

- Predicting the potential construction and operational noise and vibration
- Assessing the potential noise and vibration impacts by comparing the predictions with the criteria
- Providing mitigation measures, where required.

6.5.2 Existing environment

The proposal site is surrounded by a mixture of rural landholdings, commercial properties and residential properties. The main source of noise at the proposal site is from traffic along the Pacific Highway and Oxley Highway.

A combination of unattended and operator attended noise monitoring was carried out at three locations (M1, M2 and M3) considered representative of the most sensitive receivers surrounding the proposal site (refer Figure 6.4). The measured background noise levels at each location are presented in Figure 6.4. The unattended monitoring indicates ambient and background noise levels are typical of a rural area influenced by road traffic noise, while the attended monitoring indicates road traffic noise is the main contributor to the ambient noise environment.

Operator attended noise measurements were conducted during the day on Tuesday 3 September 2024. Each operator attended noise survey was 15 minutes in duration.

Table 6.9: Operator attended noise survey results

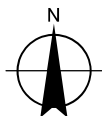
| Location Date/start time Operator SLM Details | Primary noise descriptor (dBA re 20 µPa) | | | | | Description of noise emission and typical maximum levels LAmax (dBA) |
|--|--|-----|------|------|------|---|
| | LAmax | LA1 | LA10 | LA90 | LAeq | |
| M1 03/09/2024 12:15 SVAN 977 SN 97528 | 69 | 64 | 60 | 51 | 57 | Traffic 49 to 65 dBA Plane 50 to 61 dBA Birds 56 to 62 dBA Car on Driveway 53 to 68 dBA |
| M2 03/09/2024 12:55 SVAN 977 SN 97528 | 84 | 74 | 68 | 52 | 64.7 | Traffic 49 to 75 dBA Distant construction 52 to 55 dBA Ambulance siren 53 to 77 dBA Wind in trees 51 to 60 dBA |
| M3 03/09/2024 13:30 SVAN 977 SN 97528 | 67 | 55 | 53 | 50 | 52 | Traffic 52 to 54 dBA Truck Idle 50 to 52 dBA Wind in trees 49 to 56 dBA Lawn mower 51 to 55 dBA |

Results of operator-attended noise surveys indicate that road traffic is the main contributor to the ambient noise environment during the day time period.



Paper Size ISO A4
0 40 80 120 160
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



Disclaimer:
Subject to
detailed design

Transport for NSW
Oxley Highway Interchange
Review of Environmental Factors

Project No. 12624683
Revision No. 0
Date 29 Jul 2025

Noise monitoring locations

FIGURE 6.4

6.5.3 Criteria

Construction noise

Construction noise criteria were developed in accordance with the ICNG (DECC, 2009) for each work area. Construction hours for standard and out of hours work periods are defined in Table 6.10.

Table 6.10: Construction hours

| Period | Monday – Friday | Saturday | Sunday & Public Holidays |
|----------------------------|---------------------|---|--------------------------|
| Standard Hours | 7:00 am to 6:00 pm | 8:00 am to 1:00 pm | No work |
| Out of hours work Period 1 | 6:00 pm to 10:00 pm | 7:00 am to 8:00 am 1:00 pm to 10:00 pm | 8:00 am to 6:00 pm |
| Out of hours work Period 2 | 10:00 pm to 7:00 am | 10:00 pm to 8:00 am | 10:00 pm to 8:00 am |

Proposed construction activities are expected to occur during standard construction hours with out of hours work required for activities adjacent to traffic or reducing the capacity of lanes to meet road occupancy licence requirements.

The ICNG acknowledges that the following activities can be justified to be conducted outside the recommended construction hours:

- The delivery of oversized plant or structure
- Emergency work
- Works for which it can be demonstrated that there is a need to operate outside the recommended standard hours
- Works which maintain noise levels at receivers below the night time noise affected construction noise management levels.

For standard construction hours, the following terms are used in relation to establishment of construction noise criteria:

- The 'noise affected level' represents the point above which there may be some community reaction to noise. For standard construction hours this level is established with reference to the measured rating background level (RBL) plus 10 dB(A). Outside standard construction hours this level is the RBL plus 5 dB(A).
- The 'highly noise affected level' represents the point above-which there may be strong community reaction to noise. This level is set at $LA_{eq}(15min)$ 75 dB(A).

The construction noise management levels (CNMLs) that apply to sensitive receivers near the proposal are presented in Table 6.11.

Table 6.11: ICNG CNMLs at Identified receivers, dB(A)

| Receiver Type | Construction noise management levels, LA_{eq} (15min) | | | | |
|----------------------|---|-----------------------|-------------------------------------|---------|-------|
| | Standard Construction Hours | | Outside standard construction hours | | |
| | Noise affected | Highly Noise affected | Day | Evening | Night |
| Residential | 61 | 75 | 56 | 49 | 41 |
| Commercial | 70 (external) | | | | |
| Industrial | 75 (external) | | | | |
| Educational Facility | 55 (external) ¹ or 45 (internal) | | | | |
| Place of worship | 55 (external) ¹ or 45 (internal) | | | | |

Notes:

1. External noise management level is based on a 10 dB noise reduction through an open window.

Construction traffic noise

The *Road Noise Policy* (DECCW, 2011) (RNP) provides traffic noise target levels for sensitive receivers near existing roads. These levels are applied to construction works (i.e. bridge removal works) to identify potential construction traffic impacts and the subsequent need for reasonable and feasible mitigation measures.

If road traffic noise during proposal construction is within two dB(A) of current levels then the objectives of the RNP are met and no specific mitigation measures are required.

Construction vibration

Currently, there is no Australian Standard that sets the criteria for the assessment of building damage caused by vibration, *Assessing Vibration: A Technical Guideline* (DEC, 2006) provides the relevant criteria, which is based on the British Standard BS 7385.2 – 1993 Evaluation and measurement for vibration in buildings.

For damage to structures due to construction generated vibration, vibration limits are established in accordance with the British Standard BS 7385.2 – 1993 Evaluation and measurement for vibration in buildings and German Standard DIN 4150-3: 1999-02 Structural Vibration – Part 3: Effects of vibration on structures.

Sleep disturbance

In lieu of any specific sleep disturbance criteria in the ICNG, the NPI (EPA, 2017) recommends the following screening criteria when assessed externally at the nearest residential location:

- $LA_{eq}(15min)$ 40 dBA or the prevailing RBL + 5 dBA (whichever is greater); and/or
- LA_{Fmax} 52 dBA or the prevailing RBL + 15 dBA (whichever is greater).

6.5.4 Potential impacts

Construction

Major noise generating plant and their corresponding sound power levels that have been assumed to be used during construction are presented in Table 6.12.

Although it is highly unlikely that all construction equipment would be operating at their maximum sound power levels at any one time, the assessment of the proposed works assumes that all equipment associated to an activity/scenario is operating simultaneously. This approach has been adopted to identify worst case impacts and any associated mitigation measures.

Table 6.12: Construction plant equipment sound power levels

| Scenario ID | Activity | Equipment | Qty | Sound Power Level dB(A) ¹ | Equivalent Sound Power Level dBA |
|-------------|-----------------------------------|-------------------------|-----|--------------------------------------|----------------------------------|
| S1 | Mobilisation & Site Establishment | Truck (medium rigid) | 4 | 103 | 115 |
| | | Road truck | 4 | 108 | |
| | | Scissor Lift | 1 | 98 | |
| | | Franna crane | 1 | 98 | |
| S2 | Compounds | Front end loader | 1 | 91 | 119 |
| | | Excavator (tracked) 35t | 1 | 110 | |
| | | Road truck | 4 | 108 | |
| | | Compressor | 1 | 109 | |
| | | Welding equipment | 1 | 105 | |
| | | Light vehicles | 12 | 103 | |
| | | Power generator | 1 | 103 | |

| Scenario ID | Activity | Equipment | Qty | Sound Power Level dB(A) ¹ | Equivalent Sound Power Level dBA |
|-------------|--------------------------------------|------------------------------|-----|--------------------------------------|----------------------------------|
| S3 | Corridor Clearing | Excavator (tracked) 35t | 1 | 110 | 121 |
| | | Chainsaw 4-5hp | 1 | 114 | |
| | | Tub grinder/ mulcher 40-50hp | 1 | 116 | |
| | | Dump truck | 4 | 110 | |
| S4 | Bulk Earthworks | Scraper 651 | 1 | 110 | 121 |
| | | Excavator (tracked) 35t | 1 | 110 | |
| | | Grader | 1 | 113 | |
| | | Dump truck | 8 | 110 | |
| | | Compactor | 1 | 106 | |
| | | Roller (large pad foot) | 1 | 109 | |
| | | Water cart | 1 | 107 | |
| S5 | Drainage Infrastructure | Backhoe | 1 | 110 | 119 |
| | | Franna crane | 1 | 98 | |
| | | Excavator (tracked) 35t | 1 | 110 | |
| | | Concrete truck | 4 | 109 | |
| | | Truck compressor | 1 | 75 | |
| | | Vibratory Roller | 1 | 109 | |
| | | Road truck | 4 | 108 | |
| S6 | Paving / Asphalting | Pavement laying machine | 1 | 104 | 121 |
| | | Dump truck | 4 | 110 | |
| | | Asphalt truck & sprayer | 1 | 104 | |
| | | Concrete truck | 1 | 109 | |
| | | Smooth drum roller | 1 | 107 | |
| | | Concrete saw | 1 | 118 | |
| S7 | Road Furniture Installation | Road truck | 4 | 108 | 115 |
| | | Scissor Lift | 1 | 98 | |
| | | Franna crane | 1 | 98 | |
| | | Line marking truck | 1 | 108 | |
| S8 | De-mobilisation and site clean up | Truck (medium rigid) | 4 | 103 | 115 |
| | | Road truck | 4 | 108 | |
| | | Scissor Lift | 1 | 89 | |
| | | Franna crane | 1 | 89 | |

Prediction of the construction noise impacts on nearby noise sensitive receptors was performed using the Transport construction and maintenance noise estimator tool (March 2017). Table 6-13 summarises the distance from the construction activity, where sensitive receivers located within that distance are expected to exceed the corresponding management level. The predicted values presented in Table 6.13 are based on the assumptions that:

- There is no line of site between the proposal site and the nearest noise sensitive premises and -5 dB has been applied to calculations
- The construction equipment would be operating continuously at full capacity for the full 15-minute evaluation period which is very unlikely in the actual construction site
- All the construction equipment would be operating simultaneously to estimate the worst-case condition, which is unlikely to occur during actual construction
- The construction equipment would not generate any annoying characteristics (low frequency, tonality, impulsiveness, etc).

Table 6.13: Construction noise impact distances

| ID | Activities | Equivalent SWL | Residential Receivers | | | | | Commercial Receivers (70 dB(A)) | Industrial Receivers (75 dB(A)) |
|----|-----------------------------------|----------------|--|----------------------------------|--|--|--|---------------------------------|---------------------------------|
| | | | Construction Noise Management Level (60 dB(A)) | Highly Affected Level (75 dB(A)) | Outside of standard hours (day) (55 dB(A)) | Outside of standard hours (evening) (47 dB(A)) | Outside of standard hours (night) (37 dB(A)) | | |
| S1 | Mobilisation & Site Establishment | 115 | < 75 m | < 13 m | < 124 m | < 215 m | < 394 m | < 23 m | < 13 m |
| S2 | Compounds | 119 | < 107 m | < 21 m | < 161 m | < 276 m | < 504 m | < 32 m | < 21 m |
| S3 | Corridor Clearing | 121 | < 127 m | < 23 m | < 188 m | < 322 m | < 585 m | < 44 m | < 23 m |
| S4 | Bulk Earthworks | 121 | < 134 m | < 23 m | < 199 m | < 339 m | < 616 m | < 49 m | < 23 m |
| S5 | Drainage Infrastructure | 119 | < 114 m | < 23 m | < 170 m | < 291 m | < 531 m | < 36 m | < 23 m |
| S6 | Paving / Asphaltting | 121 | < 129 m | < 23 m | < 191 m | < 326 m | < 594 m | < 46 m | < 23 m |
| S7 | Road Furniture Installation | 115 | < 72 m | < 13 m | < 121 m | < 210 m | < 385 m | < 23 m | < 13 m |
| S8 | De-mobilisation and site clean up | 115 | < 72 m | < 13 m | < 121 m | < 210 m | < 385 m | < 23 m | < 13 m |

Contours illustrating the construction noise impact zones are presented graphically in Appendix F.

Predicted results indicate that noise associated with the construction of the proposal is expected to impact on nearby sensitive receivers when work is undertaken outside of standard hours.

The predicted noise exceedances are due to the nature of the proposed activities and their proximity of the nearest sensitive receptors. The fact that exceedances have been identified does not indicate that the proposed activities cannot be undertaken, but that care needs to be taken to identify feasible and reasonable mitigation and management measures that can be implemented to minimise the potential impacts. Proposed noise mitigation and management recommendations have been provided in Section 6.5.5.

As per the requirements of the ICNG, predictions are based on a “worst case” assessment and, in most cases, the measured levels during construction of the proposal are likely to be lower than predicted in this assessment. The modelling assumes that all equipment is operating at the same time, which is rarely the case in practice.

Construction traffic noise

A significant increase in traffic volumes would be required to increase road traffic noise by 2 dB(A). The Transport Noise Criteria Guideline applies existing road criteria where the works increase noise levels by more than 2 dB(A) relative to the existing noise levels at the most affected receiver.

Given the low volume of construction traffic associated with the proposed works it is expected that construction road traffic noise levels associated with the works would result in a relative increase in road traffic noise levels of less than 2 dB(A) at the most affected sensitive receivers.

Traffic on local roads would be managed in accordance with a traffic management plan which would be prepared by the contractor and would detail specific routes that construction traffic and local traffic would follow throughout the construction phase.

Construction vibration

The proposed construction activities would contain plant items that are vibration intensive. As a guide, indicative safe working distances for typical items of vibration intensive plant to be used during construction are provided in Table 6.14.

Table 6.14: Safe working distances for vibration intensive plant

| Activity | Approx. size/weight/model | Safe Working Distance | |
|-------------------------|--------------------------------|--|--|
| | | Human comfort (OE&H Vibration Guideline) | Cosmetic damage in Standard dwelling (BS 7385) |
| Vibratory Roller | 1-2 tonne | 15 m to 20 m | 5 m |
| | 2-4 tonne | 20 m | 6 m |
| | 4-6 tonne | 40 m | 12 m |
| | 7-13 tonne | 100 m | 15 m |
| | 13-18 tonne | 100 m | 20 m |
| | > 18 tonne | 100 m | 25 m |
| Small Hydraulic Hammer | 300 kg (5 to 12 t excavator) | 7 m | 2 m |
| Medium Hydraulic Hammer | 900 kg (12 to 18 t excavator) | 23 m | 7 m |
| Large Hydraulic Hammer | 1600 kg (18 to 34 t excavator) | 73 m | 22 m |
| Vibratory Pile Driver | Sheet piles | 20 m | 2 m to 20 m |
| Jackhammer | 1-2 tonne | 15 m to 20 m | 5 m |

The above safe working distances are indicative only and may vary depending on the specific equipment used and the ground conditions.

Aerial imagery shows that portions of the works would be in close proximity to a commercial receiver (approximately 20 metres). Vibration from construction activities may be perceptible at sensitive receiver locations within 50 metres of the works and may cause complaint at sensitive receivers within 10 metres of the works, however these vibration levels can generally be tolerated if prior warning and explanation is provided. Vibration levels are expected to be within guideline values for structural damage at dwellings and buildings of similar design or construction.

Operation noise

The upgraded interchange would improve traffic flow and driver safety. Predicted traffic volumes are predicted to only increase slightly and are presented in Table 6.15.

Table 6.15: Operational traffic volumes

| Scenario | Volume | |
|------------------------|---------|---------|
| | AM Peak | PM Peak |
| Base case | 4035 | 3683 |
| With upgrades | 4431 | 4177 |
| Traffic noise increase | 0.4 | 0.5 |

Traffic volumes were provided to GHD by Transport. The proposal is not expected to generate traffic, however it is expected to improve traffic flow. The relative increase in operational road traffic noise levels associated with the interchange due to the upgrade are predicted to be less than 1 dB which is a negligible increase.

6.5.5 Safeguards and management measures

Table 6.16: Noise and vibration safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---------------------|---|----------------|------------------------------------|--|
| Noise and vibration | <p>A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and identify:</p> <ul style="list-style-type: none"> all potential significant noise and vibration generating activities associated with the activity. feasible and reasonable mitigation measures to be implemented, taking into account Beyond the Pavement: Urban design approach and procedures for road and maritime infrastructure planning, design and construction (Transport for NSW 2023). a monitoring program to assess performance against relevant noise and vibration criteria. | Contractor | Detailed design / Pre-construction | QA Specification G36 <i>Environment Protection</i> |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---|--|----------------|---|--|
| | <ul style="list-style-type: none"> arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures. contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. | | | |
| Noise and vibration | <p>All sensitive receivers (e.g., schools and local residents) likely to be affected will be notified at least 7 days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of:</p> <ul style="list-style-type: none"> the proposal. the construction period and construction hours. contact information for proposal management staff. complaint and incident reporting. how to obtain further information. | Contractor | Detailed design / Pre-construction / Construction | QA Specification G36 <i>Environment Protection</i> |
| Implement community consultation measures | Nearby receptors would be notified of the works prior to commencement. Notification would include expected noise levels, duration of the works and a method of contact. | Contractor | Construction | |
| Site inductions | <p>All employees, contractors and subcontractors would receive an environmental induction. The induction would include:</p> <ul style="list-style-type: none"> All relevant proposal specific and standard noise and vibration mitigation measures. Relevant license and approval conditions. Permissible hours of work. Any limitations on high noise generating activities. Location of nearest sensitive receptors. Employee parking areas. Designated loading/unloading areas and procedures. | Contractor | Pre-construction / Construction | |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|----------------|---------------------------------|-----------|
| | <ul style="list-style-type: none"> Construction works traffic routes. Site opening/closing times (including deliveries). <p>Environmental incident procedures.</p> | | | |
| Behavioural practices | <p>No unnecessary shouting or loud stereos/radios on site.</p> <p>No dropping of materials from height, throwing of metal items and slamming of doors.</p> | Contractor | Construction | |
| Out of hours work (OOHW) | In accordance with Transport's Construction noise and vibration guideline (CVNG). | Contractor | Pre-construction / Construction | |
| Construction hours and scheduling | <p>Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.</p> <p>Standard daytime construction hours:</p> <ul style="list-style-type: none"> Monday to Friday: 7.00 am to 6.00 pm. Saturday: 8.00 am to 1.00 pm. Sundays and public holidays: no work. | Contractor | Pre-construction / Construction | |
| Construction respite period during normal hours (RO) and out-of-hours work (R1) | <p>As a guide high noise and vibration generating activities near receivers should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite should be flexible to accommodate the usage and amenity at nearby receivers.</p> <p>Unless negotiated with the community with consultation documented and approved by Council's proposal manager or permitted under the license there should be no more than:</p> <ul style="list-style-type: none"> Two consecutive evenings or nights per week. Three evenings or nights per week. Six evenings or nights per month. <p>For night work these periods of work should be separated by not less than one week.</p> | Contractor | Pre-construction / Construction | |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|----------------|---|-----------|
| Equipment selection | Use quieter and less noise and vibration emitting removal methods where feasible and reasonable. | Contractor | Pre-construction / Construction | |
| Use and siting of plant | Plant used intermittently would be throttled down or shut down. Noise-emitting plant would be directed away from sensitive receptors. | Contractor | Pre-construction / Construction | |
| Plan worksites and activities to minimise noise and vibration | Traffic flow, parking and loading/ unloading areas would be planned to minimise reversing movements within the site. | Contractor | Detailed design / Pre-construction / Construction | |
| Non-tonal reversing alarms | Where feasible and reasonable, non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all vehicles and mobile plant regularly used on site and for any out of hours work. | Contractor | Construction | |
| Minimise disturbance arising from delivery of goods to construction sites | Loading of materials would occur as far as practical from sensitive receptors. Site access points and roads would be located as far as possible away from sensitive receptors. Dedicated loading/unloading areas would be shielded if close to sensitive receptors. Delivery vehicles would be fitted with straps rather than chains for unloading, wherever possible. | Contractor | Construction | |
| Shield stationary noise sources such as pumps, compressors, generators, fans etc. | Stationary noise sources would be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained. | Contractor | Pre-construction / Construction | |
| Shield sensitive receptors from noisy activities | Structures would be used to shield residential receptors from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where reasonable and feasible). | Contractor | Construction | |

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---------------------------------------|--|----------------|--------------|-----------|
| Communicate with impacted residences. | Noise levels are predicted to exceed OOHW noise limits during construction works at a number of receptors, most notably residences to the east of the proposal. As such, the proponent would communicate with the impacted residents clearly explaining the duration and noise level of the works and inform the residents of any respite periods. | Contractor | Construction | |

6.6 Aboriginal cultural heritage

6.6.1 Methodology

Stage 1 Transport *Procedure for Cultural Heritage Consultation and Investigation* (PACHCI) (27 June 2025) has been prepared for the proposal, see Appendix G.

The assessment was completed in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Due Diligence Code; DECCW 2010) and desktop information review, site inspection and assessment against the requirements of the Due Diligence Code.

The PACHCI Stage 1 Assessment Letter is presented in Appendix G.

6.6.2 Existing environment

The proposal is in Port Macquarie-Hastings LGA, within the Oxley Highway corridor which contains extensive prior ground disturbance.

The assessment is based on the following due diligence considerations:

- The works are proposed within the existing road corridor and areas that have been disturbed
- The proposal is unlikely to harm known Aboriginal objects or places
- The AHIMS search indicated that there are 2 recorded Aboriginal site within the vicinity of the AHIMS search area, however they have been destroyed according to the AHIMS extensive search
- The study area does contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure, however, the cultural heritage potential of the study area appears to be reduced due to the construction of the Oxley Highway, the interchange and the Pacific Highway
- There is an absence of sandstone rock outcrops likely to contain Aboriginal art.

6.6.3 Potential impacts

Construction

Although the proposed works would involve ground surface disturbance, the proposal is considered unlikely to result in an impact to Aboriginal sites or objects due to the existing extensive disturbance on the site.

Potential impacts would be mitigated through the steps outlined in the Transport *Unexpected Heritage Items, Heritage Procedure* 2022.

Operation

The proposal is unlikely to result in any impacts to Aboriginal heritage during operation.

6.6.4 Safeguards and management measures

Table 6.17: Aboriginal heritage safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---------------------|--|----------------|---|---|
| Aboriginal heritage | <p>The <i>Standard Management Procedure - Unexpected Heritage Items</i> (Transport for NSW 2022) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place.</p> <p>Work will only re-commence once the requirements of that Procedure have been satisfied.</p> | Contractor | Detailed design / Pre-construction / Construction | QA Specification G36 <i>Environment Protection</i> |

6.7 Landscape character and visual impacts

6.7.1 Existing environment

Regional landscape

Port Macquarie is known for its scenic location, dominated by coastal and river landscapes. The township is situated on Australia's east coast at the mouth of the Hastings River. The characteristics of the subject sites and their surrounds include suburban residential areas along with other interspersed urban development/land uses, semi-rural land and vegetated forests. Typically, the local area and broader region represent medium to high quality visual amenity. Semi-rural and vegetated forest represent high visual amenity. Urban areas have a lesser visual amenity, however typically these environments are still of a reasonable visual amenity standard given the regional setting and presence of interspersed vegetation. Land uses and properties that have direct outlook to development or infrastructure, compared to natural features, would typically have low to moderate visual amenity.

Site environment

The proposal site is located primarily within the existing road corridor, which is characterised by a sealed road with a single lane in both directions. The road corridor is vegetated both side of the road at the proposal site. The proposal site also includes the Port Macquarie interchange, which is a large roundabout linking the Pacific Highway and Oxley Highway. The interchange is located above the Pacific Highway and is accessed by elevated on and off ramps. The interchange also provides access to the Port Macquarie Service Centre and rest stop, which is frequented by tourists. There are limited residences in the immediate vicinity of the proposal.

6.7.2 Potential impacts

Construction

During construction, positioning of plant, equipment and compounds would be in view of road users and some residences west of the interchange. This would result in minor, temporary visual impacts. Light towers would be required during night works and would generate a minor impact to visual amenity due to light spill.

The proposal would require removal of some vegetation within the boundaries of the proposal site. This would include trimming and/or clearing of remnant native trees and exotic grassland. The removal of this vegetation would have the potential to reduce some screening between sensitive receivers and the road, leading to temporary visual impacts during construction until the disturbed areas are rehabilitated.

Potential visual impacts during construction would be minimised through implementation of the safeguards and management measures outlined in Section 6.7.3.

Operation

Streetlighting upgrades are required at the following design features:

- Interchange roundabout
- Northbound Off Ramp
- Southbound Off Ramp
- Oxley Highway between the interchange and Billabong Drive.

These lighting upgrades would be visible during operation and would result in improved visibility and long-term safety. This would have a positive long-term impact on the community and road users.

The proposal site would be rehabilitated following construction. Minor visual impacts would continue until rehabilitation of the site was completed. The proposal would be clearly visible from the existing service station southeast of the interchange, though impacts at this location is considered negligible due to the existing land use. Clearing along the western side of the proposal may have a minor permanent impact on the view from residences south of the Oxley Highway to the west of the proposal. Visual amenity from the road corridor would be impacted to a minor extent during proposal operation due to the clearing of trees, though as vegetation is established, this impact would reduce over time.

The proposal would be consistent with the existing landscape character of the area.

6.7.3 Safeguards and management measures

Safeguards and management measures that would address landscape character and visual impacts are identified in Sections 6.1.4, 6.2.4, 6.3.3 and 6.10.3

6.8 Property and land use

6.8.1 Existing environment

Land zoning

As outlined in Section 4.1.2, the proposal site is located within the following zones under the LEP (Figure 3.1):

- RU1 Primary Production
- SP2 Classified Road
- R1 General Residential.

The Port Macquarie area supports a variety of land uses, such as residential housing, outdoor recreation, parks and reserves, agriculture and commercial uses. Land use around the proposal site is rural residential housing to the west; road infrastructure and Billabong Zoo to the north; low density housing and the Port Macquarie Service Centre to the east, and vegetated land and road infrastructure to the south.

Public Utilities

The Oxley Highway is a busy transport corridor and major service route into Port Macquarie, supporting substantial urban, special use (Port Macquarie Base Hospital), recreational and industrial usage. As such, a range of utilities and infrastructure occurs. Recent development at Sovereign Hill has resulted in the installation of a range of new utilities and these would expand over time within this and the broader urban development landscape in the Thrumster area.

Street light towers are present within the proposal. A fibre optic telecommunications cable crosses the proposal in the western corner and in the northern part of the proposal site where it crosses beneath the Pacific Highway. An existing water main runs beneath the Oxley Highway between the interchange and Billabong Drive. In addition to the existing water main, there are three proposed water mains next to the existing line, which are anticipated to be constructed progressively between 2021 and 2040. Electricity infrastructure is present underneath the existing interchange and along the Oxley Highway to the east. There is also some below ground and above ground infrastructure in the northern part of the proposal site.

Land acquisition

Partial acquisition is required for Lot 1 DP 1261690 (southwest of the interchange) and Lot 1 DP 1250669 (northeast of the interchange). The land to be acquired is shown in Figure 3.2.

Temporary lease agreements would also be required to enable construction compounds to be established, which is also shown in Figure 1.2.

6.8.2 Potential impacts

Construction

Direct impacts on land use because of the proposal would mainly relate to the temporary presence of construction work within the proposal site. Construction of the proposal would impact traffic flow around the proposal site, however access to the Pacific Highway and Oxley Highway would be maintained throughout the construction program allowing land uses in the area to continue as current. Potential traffic and access impacts are discussed in Section 6.4.3.

The amenity of the road network and surrounding residential properties would be impacted in terms of noise, vibration, air quality and visual amenity. These impacts have been considered, with measures being provided to mitigate impacts, in the following sections:

- Noise and vibration (Section 6.5)
- Visual amenity (Section 6.7)
- Air quality (Section 6.11).

Temporary construction compounds shown in Figure 1.2 would modify land use in those areas during the construction period. These compounds would be placed as close as possible to the existing road corridor and would cover small areas of land, therefore having a negligible to minor impact on land use. Transport would continue to consult with affected landholders before and during construction to minimise the potential for impacts on land use.

Street lighting next to the road may be required to be relocated during construction of the proposal.

Operation

The proposal would require the partial acquisition of 0.543 hectares of private land. This land is comprised of trees and is on the edge of an agricultural lot. Whilst this acquisition would be permanent, the scale of the impact is not considered to be significant.

Following completion of construction, temporary compounds and traffic controls would be removed and land use would return to their preexisting condition.

6.8.3 Safeguards and management measures

Table 6.18: Property and land use safeguards and land use

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|----------------------|--|----------------|------------------------------------|-----------|
| Property acquisition | All property acquisition will be carried out in accordance with <i>the Land Acquisition Information Guide</i> (Transport for NSW 2014) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> . | Transport | Detailed design / Pre-construction | |
| Impacts to services | A Dial Before You Dig search will be undertaken prior to construction starting. Transport will consult with relevant service providers prior to the commencement of construction to develop procedures to be implemented to minimise the potential for service interruptions which have the potential to impact on existing land use. | Transport | Detailed design / Pre-construction | |

6.9 Socio-economic

6.9.1 Methodology

This assessment has been developed in accordance with Transport's Environmental Impact Assessment Practice Note N05 – Socio-economic assessment (Transport for NSW 2020).

The methodology for the socio-economic and land use assessment involved:

- Scoping of the potential socio-economic issues for the proposal and identification of communities likely to be affected by the proposal
- Describing the existing socio-economic environment in the proposal corridor
- Assessing potential impacts of the proposal's construction and operation on the socioeconomic environment of the study area
- Identifying safeguards and management measures to avoid, minimise or mitigate potential socio-economic impacts identified in the assessment.

The description of the existing socio-economic environment of the study area principally draws on information from the Australian Bureau of Statistics (ABS).

The study area for this assessment includes those communities located on, or near to, the Oxley and Pacific Highways. It includes the ABS State Suburbs of:

- Thrumster
- Sancrox.

This assessment also considers at a broader level impacts on regional communities and businesses in the Port Macquarie-Hastings LGA.

6.9.2 Existing environment

Regional and local context

The Port Macquarie-Hastings Council area is located on the Mid North Coast of New South Wales, about 420 kilometres north of Sydney, and 510 kilometres south of Brisbane. The Port Macquarie-Hastings LGA encompasses the major population centres of Port Macquarie, Camden Haven, Wauchope, Lake Cathie and Kendall. The town of Port Macquarie is located on the Hastings River mouth and at the eastern end of the Oxley Highway, which serves transport corridor of the town. Port Macquarie is also located along the Pacific Highway, a key transport link between Sydney and the Queensland border.

The local socio-economic context is dominated by the Sovereign Hills housing development to the east of the proposal site. The majority of this area has been reserved for low density residential housing that is yet to be developed. Businesses in the area are the Port Macquarie Service Centre located at the junction of the Oxley and Pacific Highways; fast food outlets next to the service centre and businesses around the Sovereign Place town centre. Low density rural residential housing is located to the west of the proposal. Billabong Zoo is located long Billabong Road, north of the proposal.

Socio-economic characteristics

Results of the 2021 Census found there were 86,762 people in the Port Macquarie – Hastings LGA of which 5.5 percent identified as Aboriginal and Torres Strait Islander (ABS, 2021).

The Port Macquarie – Hastings LGA has an ageing population, with the average age of residents being 49. Children aged between 0 and 14 made up 15.9 percent of the population and people ages 65 years and over made up 29.1 percent of the population (ABS, 2021). The population of Port Macquarie is expected to grow by 24.37 percent between 2019 and 2036, of which 36 percent is expected to be aged over 60 (Port Macquarie – Hastings Council, 2018).

Other social indicators for the Port- Macquarie Hastings LGA included the following:

- There was a total of 39,952 occupied households within the Port- Macquarie Hastings LGA. Of these households, 68.2 percent were families, 28.8 percent were single person households, and 3.0 percent were group households.
- 8.7 per cent of dwelling were unoccupied.
- The median weekly household income was \$1,829, above the national average of \$1,746.
- The unemployment rate was 4.8 per cent, which was lower than the NSW average of 4.9 per cent.

- Key industries of employment were hospital workers (5.3 percent), social assistance services (3.9 percent) and aged care residential services (3.6 percent).
- Public transport links between Port Macquarie, other towns and localities in the region/ Private vehicles and road transport are the main ways of transit in the LGA, with 70.8 percent of people in the LGA using private vehicles to travel to work.

The proposal would take place in the suburbs of Thrumster (east of the Pacific Highway) and Sancrox (west of the Pacific Highway). In the 2021 Census, 2,380 people lived in Thrumster and 602 people lived in Sancrox. The demographic of Sancrox was generally consistent with the Port-Macquarie LGA, with an average age of 45 years old and a median household income of \$2,050.

The demography of Thrumster was significantly lower than the Port Macquarie – Hastings LGA, with an average age of 32 years. 83.2 percent of the households in Thrumster were family households, of which 61 percent had children (ABS, 2021). Thrumster is a key growth area in the Port-Macquarie LGA, and includes the Sovereign Hills housing development. By 2036, there is expected to be approximately 2635 additional dwellings in Thrumster and adjacent suburbs (Port Macquarie – Hastings Council, 2018).

6.9.3 Potential impacts

Residents, the local community and passing motorists may be subject to some socio-economic impacts related to noise and vibration, air quality, traffic and access, visual amenity, and land use during construction and operation of the proposal.

These potential impacts have been addressed in other sections of this REF, as follows:

- Traffic and access (refer to Section 6.4)
- Noise and vibration (refer to Section 6.5)
- Aboriginal heritage (refer to Section 6.6)
- Landscape character and visual amenity (refer to Section 6.7)
- Land use (refer to Section 6.8)
- Air quality (refer to Section 6.11).

The key socio-economic impacts that may occur during construction and operation of the proposal are described in the following sections.

Construction

Access and transport impacts

The Oxley Highway between the Pacific Highway interchange (Billabong Drive) and Hastings River Drive in Port Macquarie is part of the key aerial road that services Port Macquarie and connects it to the Pacific Highway and townships to the west. Construction of the proposal would require work within the road corridor requiring barricades, temporary speed limit reductions and traffic control. Transport times would be increased around the proposal site which would have a minor impact on motorists, including local residents, transport providers, freight companies and others. Access to properties would be maintained throughout the construction period. No impacts to public transport are expected.

Acquisition and direct property impact

As discussed in Section 6.8, the partial acquisition of part Lot 1 DP1261690 and temporary acquisition of Lot 1 DP1250669 would be required to complete the proposal. Landowners would be consulted prior to the proposal commencing.

Property acquisition would be carried out in accordance with the Land Acquisition Information Guide (Transport for NSW 2014) and the *Land Acquisition (Just Terms Compensation) Act 1991*.

Business, tourism and economy

The Port Macquarie Service Centre and adjacent fast-food outlets are located to the east of the proposal site. Traffic delays associated with the proposal may decrease patronage as travellers on the Pacific Highway choose to stop in different places to avoid delays. Billabong Zoo, located west of the proposal site, is accessed via the Oxley Highway. Billabong Zoo may impact patronage due to people avoiding the area. Direct impacts to these businesses would cease following completion of the proposal.

Construction of the proposal is unlikely to impact tourists visiting Port Macquarie, as it would not restrict access to local attractions or accommodation.

Local amenity

Properties and land use close to the proposal are likely to experience amenity and community values impacts resulting from construction of the proposal, including:

- Temporary increase in traffic and short delays during construction (refer to Section 6.4)
- Temporary increase in noise and vibration from construction activities (refer to Section 6.5)
- Landscape character and visual amenity impacts (refer to Section 6.7)
- Potential temporary impacts on air quality as a result of dust generation during construction (refer to Section 6.11).

Impacts would be temporary and cease following construction completion.

Economy and employment

It is anticipated that a workforce of about 35 full time equivalent construction and site management personnel would be required on site each day during construction, which is anticipated to take place over a 12 to 15 month period. Construction of the proposal has the potential to deliver temporary employment benefits for local labour. The construction workforce has the potential for the following impacts on local businesses:

- Construction works not local to the area may require accommodation during the construction period
- Local and/or regional businesses may experience a small increase in trade through sourcing of construction materials and services, and workforce expenditure in the local area.

These impacts on local businesses are expected to be minor, temporary and positive. Any locally generated employment during construction would also be a positive temporary benefit.

Operation

Port Macquarie, and in particular the suburb of Thrumster is expected to experience significant population growth in the future. The lack of public transport links between Port Macquarie and surrounding areas would see a significant strain put on the existing road network as more private vehicles use it. If the proposal is not constructed, users of the interchange would experience delay, which would generate long term social and economic impacts such as increased travel times, reduced access to businesses and increased potential for accidents. The proposal would accommodate the increased regional traffic and is expected to have medium to long-term benefits for connectivity and access.

No long-term adverse effects are expected.

6.9.4 Safeguards and management measures

Table 6.19: Socio economic safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|----------------|---|----------------|------------------------------------|---|
| Socio-economic | <p>A Communication Plan (CP) will be prepared to help provide timely and accurate information to the community during construction. The CP will include (as a minimum):</p> <ul style="list-style-type: none"> mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions contact name and number for complaints. <p>The CP will be prepared in accordance with the Transport's Stakeholder and community engagement guidelines (2023).</p> | Contractor | Detailed design / Pre-construction | QA Specification G36 <i>Environment Protection</i> |

Other safeguards and management measures to address socio-economic impacts are identified in Section 6.4.4, 6.5.5, 6.8.3 and 6.9.4.

6.10 Resource use and waste management

6.10.1 Policy setting

Legal requirements for the management of resource consumption and waste generation are established under the POEO Act and the *Protection of the Environment Operations (Waste) Regulation 2014* (POEO (Waste) Regulation).

Waste management would be carried out in accordance with the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). Transport is committed to ensuring efficient management of unavoidable waste and to promoting the reuse of such waste through appropriate measures in accordance with the resource hierarchy principles embodied in the WARR Act. The resource management hierarchy principles in order of priority, as outlined in the WARR Act are:

- Avoidance of unnecessary resource consumption
- Resource recovery (including reuse, reprocessing, recycling and energy recovery)
- Disposal.

By adopting the above principles, Transport encourages responsible use of resources and reduces environmental harm in accordance with the principles of ecologically sustainable development and the POEO Act.

6.10.2 Potential impacts

Construction

Inappropriate management of waste and resources can have a range of potential impacts, including:

- Contamination of the site and surrounding environment
- Off-site contamination as a result of inappropriate disposal or handling procedures by unlicensed operators
- Visual amenity impacts as a result of inappropriate storage and disposal of wastes
- Loss of potentially recoverable resources.

Waste generation

Potential waste streams generated during construction works would include:

- Green waste
- Road surface and roadside materials (e.g. gravel, bitumen, fencing, guide posts and rails, etc.)

- Surplus construction materials (e.g. geotextile fabric, excess spoil from earthworks, surplus and redundant erosion and sediment control materials, etc.)
- Concrete washout
- Chemicals and oils
- General waste and packaging from staff
- Wastewater from amenities and office
- Utility adjustments.

The potential to reuse materials would be determined during construction. Unsuitable fill material that cannot be used onsite would be classified in accordance with the Waste Classification Guidelines (EPA, 2014) and disposed of at an approved material recycling or waste disposal facility.

Resource consumption

Construction of the proposal would require the use of a number of resources, including:

- Resources associated with the operation of construction machinery and motor vehicles (e.g. diesel and petrol)
- Material required for road surface construction (road base, asphalt, spray seal, sand, concrete, aggregate)
- Fill required to meet design levels. The initial estimated quantities of these materials that would be required for the proposal are provided in Section 3.3.5
- Materials required for road signage and street lighting
- Construction water dust suppression. 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. It is proposed that water would be obtained from the local water supply network.

The initial estimated quantities of these materials that would be required for the proposal would be confirmed during detailed design. The resources required for construction of the proposal are not currently limited in availability. Materials such as metal and fuel which are non-renewable would be used conservatively. Excess spoil not required or able to be used for backfilling would be stockpiled in a suitable approved location before being disposed of in accordance with the safeguards and management measures detailed in Section 6.10.3.

Resource recovery, reuse and reprocessing

Construction of the proposal would require clearing of native vegetation that may be suitable for recovery and provide opportunities for reuse and reprocessing including:

- Timber resources that may be suitable for reprocessing and reuse as structural timbers for use on existing timber truss bridges owned and operated by Transport
- Hardwood resources to produce wood chip mulch in accordance with Transport QA Specification *R179 (Landscape planting)* from site won hardwood
- Vegetation resources to produce mulch for reuse onsite for erosion and sediment controls or similar bunds in accordance with QA Specification *R179*.

During detailed design, all vegetation proposed for clearing will be assessed in accordance with the above reuse hierarchy to ensure that suitable timber resources are felled and stored for removal offsite for reuse as timber truss bridge items, unsuitable hardwood timber is processed as hardwood wood chip for reuse onsite and other unsuitable vegetation is processed for reuse as organic mulch.

The timber suitability assessment will be undertaken by a nominated Transport Timber inspector with the assessment, felling and storage processes undertaken in accordance with relevant contractual requirements and the relevant Transport best practice procedures and methodologies for timber reuse for timber truss bridges.

Operation

The proposal would not result in a noticeable increase in waste generation during operation.

6.10.3 Safeguards and management measures

Table 6.20: Resource use and waste management safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-------------------|---|----------------|----------------------------------|---|
| Waste management | <p>A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:</p> <ul style="list-style-type: none"> measures to avoid and minimise waste associated with the project classification of wastes and management options (re-use, recycle, stockpile, disposal) statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions procedures for storage, transport and disposal monitoring, record keeping and reporting. <p>The WMP will be prepared taking into account the <i>Environmental Procedure - Management of Wastes on Transport for NSW Land</i> (Transport for NSW, 2014) and relevant Transport Waste Fact Sheets.</p> | Contractor | Detailed design/pre-construction | QA Specification G36 <i>Environment Protection</i> |
| Resource recovery | Ensure that all vegetation proposed for clearing is assessed as required in accordance with the relevant Transport best practice procedures and methodologies for timber reuse for timber truss bridges and reuse hierarchy. | Contractor | Detailed design | |

6.11 Other impacts

6.11.1 Existing environment and potential impacts

Other impacts generated by the proposal are discussed below in Table 6.21.

Table 6.21: Other potential impacts

| Environmental factor | Existing environment | Potential impacts |
|----------------------|---|---|
| Air quality | <p>The proposal site is located in a semi-rural environment. Air quality is primarily influenced by traffic travelling along the Pacific Highway and Oxley Highway and construction of housing southeast of the proposal dependent on wind direction.</p> <p>There are no scheduled industries operating near the proposal site. The nearest scheduled premises is Sancrox Quarry Wauchope, which is located about 2.8 kilometres north of the proposal site. This source primarily produces fine particulate matter.</p> | <p>Construction</p> <p>During the proposed works there would be potential for increased air quality emissions, particularly during dry and windy conditions. Dust emission sources are likely to include:</p> <ul style="list-style-type: none"> Material handling during earthworks Loading, transport and dumping of material Wind erosion of exposed unstable soil surfaces and localised stockpiles. <p>Emissions from plant and construction vehicles are anticipated to have a negligible</p> |

| Environmental factor | Existing environment | Potential impacts |
|-------------------------------------|---|--|
| | There are residential housing developments to the east of the site which may be impacted by air emissions generated from the proposal site. There are scattered rural residential receivers to the west of the proposal site. | <p>impact on air quality given the distance to sensitive receivers (closest being about 200 m).</p> <p>It is considered unlikely that the proposal would cause a significant impact on air quality, as the overall scale of the proposal site is small and work would be relatively short term in duration.</p> |
| Non-Aboriginal Heritage | <p>The Oxley Highway represents a highly disturbed modified road corridor which has been extensively cleared for timber, agriculture and road infrastructure. Heritage potential of the site is low.</p> <p>No items listed on the Australian Heritage Database, NSW State Heritage Inventory or the Port Macquarie-Hastings LEP were identified within the proposal site.</p> <p>The closest listed items were located approximately 5.5 km northwest of the site, being the School Building and Teacher's Dwelling House (Former) (Listing No: I146) and Post Office Building (Former) (Listing No: I051) in Rawdon Island – both are listed under Schedule 5 of Port Macquarie-Hastings LEP.</p> | <p>Construction</p> <p>No impacts to known heritage items would occur during construction of the proposal due to the distance between the site and the nearest item.</p> <p>Given the highly disturbed environment and low heritage potential of the proposal site, is unlikely that unexpected heritage items will be discovered during excavation. Unexpected finds will be managed as per <i>The Standard Management Procedure - Unexpected Heritage Items</i> (Transport for NSW 2022).</p> <p>Operation</p> <p>The proposal is unlikely to result in any impacts to Aboriginal heritage during operation.</p> |
| Hazard and risk | <p>Existing hazards and risks are associated with the operation of the existing road network and the presence of above-ground and underground utilities.</p> <p>The proposal would be undertaken within designated bushfire prone land.</p> <p>No other additional hazards and risks are present within the proposal.</p> | <p>Construction</p> <p>General construction activities involving plant have a low risk of starting a bushfire. Some activities that involve hot work such as welding would have a moderate risk of starting a fire within the proposal. Risk would be managed through the implementation of safe work practices, detailed in statements prepared by the contractor and approved by Transport prior to work commencing. Spills of fuels also pose a heightened bushfire risk. Spill risk will be managed by measures outlined in Section 6.2.4.</p> <p>If a bushfire warning is issued for the area, the site will be evacuated.</p> <p>Operation</p> <p>The proposal would not generate additional bushfire risk during operation.</p> |
| Climate change and greenhouse gases | <p>AdaptNSW Interactive Climate Change Projections map (AdaptNSW, 2024) for the North Coast Region identified that the region is projected to:</p> <ul style="list-style-type: none"> • Increase in temperature by 0.7°C between 2020 and 2039 • Increase in temperature by 1.2°C between 2060 and 2079 • Decrease in annual rainfall of 3.1 percent between 2020 and 2039 | <p>Construction</p> <p>The following construction activities would generate greenhouse gas emissions during construction:</p> <ul style="list-style-type: none"> • Fossil fuel combustion during the use of plant, equipment and vehicles • Electricity use • Embedded emissions from manufacture and delivery of materials. |

| Environmental factor | Existing environment | Potential impacts |
|----------------------|---|--|
| | <ul style="list-style-type: none"> Decrease in annual rainfall of 6.5 percent between 2060 and 2079 Decrease in the number of cold nights (<2°C) by 4.0 nights between 2020 and 2039 Decrease in the number of cold nights (<2°C) by 5.7 nights between 2060 and 2079 No change in the number of severe fire weather days between 2020 and 2039 Increase in the number of severe fire weather days by 0.5 days between 2060 and 2079 Increase in the number of hot days (>35°C) by 3.2 days between 2020 and 2039. <p>Increase in the number of hot days (>35°C) by 6.0 days between 2060 and 2079.</p> | <p>Given the scope and duration of the proposal, the impact of the emissions would be minor in nature.</p> <p>No climate change adaptation requirements have been identified for the construction phase of the proposal.</p> <p>Operation</p> <p>Operation of the proposal is not expected to result in a change to the current climate change and greenhouse gas environment.</p> <p>Electricity would be required for lighting during operation of the proposal.</p> <p>Climate change may result in impacts during operation of the proposal, such as an accelerated rate of pavement deterioration. These impacts are expected to be minor.</p> |

6.11.2 Safeguards and management measures

Safeguards and management measures to address the other impacts generated by the proposal are discussed below in Table 6.22.

Table 6.22: Other impacts Safeguards and management measures

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-------------------------|--|----------------|---|---|
| Air quality | <p>Safeguards will be implemented as part of the CEMP. These will include but not be limited to:</p> <ul style="list-style-type: none"> Potential sources of air pollution Air quality management objectives consistent with any relevant published EPA and/or DCCEEW guidelines Mitigation and suppression measures to be implemented Methods to manage work during strong winds or other adverse weather conditions. | Contractor | Pre-construction | QA Specification G36 <i>Environment Protection</i> |
| Non-Aboriginal Heritage | <p>The <i>Standard Management Procedure - Unexpected Heritage Items</i> (Transport for NSW, 2022) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered.</p> <p>Work will only re-commence once the requirements of that Procedure have been satisfied.</p> | Contractor | Detailed design / Pre-construction / construction | QA Specification G36 <i>Environment Protection</i> |

6.12 Cumulative impacts

6.12.1 Study area

The cumulative impact assessment has considered the proposal site as well as surrounding suburbs.

6.12.2 Broader program of work

The proposal is part of the Oxley Highway Future Growth Program of work. Other projects associated with this program are yet to be funded or approved.

6.12.3 Other projects and developments

A search of the Major Planning Portal was conducted on 4 March 2025. Any projects and/or developments likely to have an impact on the proposal have been listed in Table 6.23.

The Port Macquarie Hastings Council development application tracker was searched on 4 March 2025 and the following projects were identified within 5 km of the proposal site:

- Proposed Sancrox Quarry Expansion Project, located approximately 2.5 kilometres northwest of the proposal site.

There are no other known projects in the vicinity of the proposal.

Table 6.23: Past, present and future projects

| Project | Description | Impacts |
|---|---|--|
| Sancrox Rural Residential Subdivision | <p>State Significant Development</p> <ul style="list-style-type: none">• Approximately 3.9 km northwest of the proposal site• Undergoing modification. | <ul style="list-style-type: none">• Increased traffic on Oxley Highway and Pacific Highway during construction. |
| Cowarra Water Supply Scheme and Thrumster Wastewater Scheme | <p>State Significant Infrastructure</p> <ul style="list-style-type: none">• Approximately 4.8 km northeast of the proposal site (Thrumster) and approximately 7.7 km southwest of the proposal site (Cowarra)• Construction of a wastewater treatment plant and recycled water treatment plant (Thrumster) and new water treatment dam (Cowarra)• Installation of pipelines throughout the suburbs of Thrumster and Port Macquarie• Currently responding to submissions. | <ul style="list-style-type: none">• Increased traffic on Oxley Highway and Pacific Highway during construction• May decrease resource availability in the area during construction. |
| Port Macquarie Health and Education Precinct | <p>State Significant Development</p> <ul style="list-style-type: none">• Demolition of buildings and construction of a mixed-use health and education facility• Approximately 5.8 km northeast of the proposal site• SEARs are currently being prepared for this project. | <ul style="list-style-type: none">• Increased traffic on Oxley Highway and Pacific Highway during construction. |

6.12.4 Potential impacts

Potential cumulative impacts could occur as a result of the proposal occurring simultaneously with other projects in the locality or the accumulation of a number of impacts from one project. This proposal is located in an area where extensive clearing has occurred historically for agricultural and residential purposes but also more recently for the construction (and upgrades) of the Oxley and Pacific Highways. Construction of these highway projects would have impacts on biodiversity in the area.

Construction impacts of the proposal may include temporary traffic congestion and construction noise (refer to Sections 6.4 and 6.5). Operational impacts of the proposal would include removal of native vegetation (refer Section 6.1.) It would also include improved traffic flow and reduced congestion.

6.12.5 Safeguards and management measures

Cumulative impacts for the proposal would be minimized during construction through the application of individual environmental safeguards and management measures included in the preceding sections. Transport would maintain contact with the developer regarding construction timeframes and potential impacts. Any additional mitigation measures from that consultation would be implemented for the proposal.

7. Environmental management

This chapter describes how the proposal will be managed to reduce potential environmental impacts throughout detailed design, construction and operation. A framework for managing the potential impacts is provided. A summary of site-specific environmental safeguards is provided and the licence and/or approval requirements required prior to construction are also listed.

7.1 Environmental management plans (or system)

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

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

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

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures outlined in this REF will 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 will 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

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|------|--|---|--|------------------------------------|-----------|
| GEN1 | General - minimise environmental impacts during construction | <p>A CEMP will be prepared and submitted for review and endorsement of the Transport Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following:</p> <ul style="list-style-type: none"> 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 weed management. <p>The endorsed CEMP will be implemented during the undertaking of the activity.</p> | Contractor / Transport project manager | Detailed design / Pre-construction | |
| GEN2 | General - notification | All businesses, residential properties and other key stakeholders (e.g. schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity. | Contractor / Transport project manager | Pre-construction | |
| GEN3 | General – environmental awareness | All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the proposal. This will include up-front site induction and regular ‘toolbox’ style briefings. | Contractor / Transport project manager | Detailed design / Pre-construction | |

Transport for NSW

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-----|--------------|---|----------------|------------------------------------|--|
| B1 | Biodiversity | <p>A Flora and Fauna Management Plan will be prepared in accordance with Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects (Transport for NSW, 2024) and implemented as part of the CEMP. It will include, but not be limited to:</p> <ul style="list-style-type: none"> plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas requirements set out in the Landscape Design Guideline (Transport for NSW 2023) pre-clearing survey requirements procedures for unexpected threatened species finds and fauna handling procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013) protocols to manage weeds and pathogens. | Contractor | Detailed design / Pre-construction | Transport's <i>Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects</i> (Transport for NSW, 2024) |
| B2 | | <p>If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species and Threatened Ecological Communities Finds Protocol in Guide 9 (Fauna Handling) of the Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects (Transport for NSW, 2024).</p> | Contractor | Construction | <i>Unexpected Threatened Species and Threatened Ecological Communities Finds Protocol in the Guide 9 (Fauna Handling) of the Transport for NSW's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects</i> (Transport for NSW, 2024) |

Transport
for NSW

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-----|-----------------------------------|--|----------------|--------------|---|
| B3 | | Fauna handling must be carried out in accordance with the requirements the Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects (Transport for NSW, 2024) - Guide 9 (Fauna Handling). | Contractor | Construction | Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects (Transport for NSW, 2024) - Guide 9 (Fauna Handling). |
| B4 | Pathogen spread and establishment | All pathogens (e.g., Chytrid, Myrtle Rust and Phytophthora) are to be managed in accordance with the Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects (Transport for NSW, 2024 - Guide 7 (Pathogen Management) and Department of Planning, Industry and Environment (2020) Hygiene guidelines for wildlife: Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants. | Contractor | Construction | Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects (Transport for NSW, 2024 - Guide 7 (Pathogen Management) Department of Planning, Industry and Environment (2020) Hygiene guidelines for wildlife: Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants. |

Transport
for NSW

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-----|---|--|----------------|-----------------------------------|--|
| B5 | Prevention of the spread of noxious weeds | Declared noxious weeds are to be managed according to requirements under the <i>Biosecurity Act, 2015</i> and Guide 6 (Weed Management) of the Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects (Transport for NSW, 2024). | Contractor | Pre-construction and Construction | <i>Guide 6 (Weed Management) of the Transport's Biodiversity Management Guideline: Protecting and Managing Biodiversity on Transport for NSW Projects</i> (Transport for NSW, 2024). |
| SW1 | Soil and water | 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. | Contractor | Pre-construction | QA Specification G38 <i>Soil and Water Management</i> . |
| SW2 | Soil and water | Erosion and sediment control measures are to be implemented and maintained to: <ul style="list-style-type: none"> Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets Reduce water velocity and capture sediment on site Minimise the amount of material transported from site to surrounding pavement surfaces Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)). | Contractor | Pre-construction | QA Specification G38 <i>Soil and Water Management</i> . |
| SW3 | Accidental spill | A site specific emergency spill plan will be developed, and include spill management measures in accordance with the Transport <i>Code of Practice for Water Management</i> (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport and EPA officers). | Contractor | Detailed design/Pre-construction | QA Specification G36 <i>Environment Protection</i> . |
| SW4 | Soil and water | Ensure works are carried out in accordance with the following: <ul style="list-style-type: none"> All re-fuelling of vehicles and equipment will be carried out at least 40 m away from drainage lines or waterways All fuels, chemicals and liquids will be stored in an area surrounded by an impervious bund Excess spoil not required or able to be used for backfilling and proved not to be contaminated will be stockpiled before being reused or removed from the site and disposed of appropriately | Contractor | Construction | QA Specification G36 <i>Environment Protection</i> . |

Transport for NSW

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-----|--|--|------------------------|---|---|
| | | <ul style="list-style-type: none"> Construction compounds will not be placed within the mapped in the Flood Planning or PMF areas. | | | |
| SW5 | Landform, soil disturbance and erosion | <p>Ensure works are carried out in accordance with relevant specifications including:</p> <ul style="list-style-type: none"> G38 Soil and Water Management (Soil and Water Management Plan) R44 Earthworks (Cut, Fill, Imported Fill and Imported Selected Material). | Transport / Contractor | Detailed design / Pre-construction / Construction | QA Specification G38 <i>Soil and water management</i> . QA Specification R44 <i>Earthworks</i> . |
| SW6 | Rehabilitation | <p>A rehabilitation plan will be prepared covering all areas disturbed as part of the proposal and will include the following:</p> <ul style="list-style-type: none"> Progressive stabilisation and rehabilitation of construction areas back to the original condition or re-vegetated with appropriate native species, as soon as practicable Monitoring to meet clear targets in relation to vegetation establishment and stabilisation of disturbed areas. | Contractor | Detailed design / Pre-construction | QA Specification G36 <i>Environment Protection</i> . |
| SW7 | Contaminated land | <p>If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport Environment Manager and/or EPA.</p> | Contractor | Detailed design / Pre-construction | QA Specification G36 <i>Environment Protection</i> . |
| T1 | Traffic and transport | <p>A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Transport Traffic Control at Work Sites Manual (Transport for NSW 2022) and QA Specification G10 Control of Traffic (Transport for NSW, 2008). The TMP will include:</p> <ul style="list-style-type: none"> confirmation of haulage routes measures to maintain access to local roads and properties site-specific traffic control measures (including signage) to manage and regulate traffic movement measures to maintain pedestrian and cyclist access requirements and methods to consult and inform the local community of impacts on the local road network access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads a response plan for any construction traffic incident | Contractor | Pre-construction | QA Specification G10 <i>Control of Traffic</i> . |

Transport for NSW

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-----|---------------------|---|----------------|---|---|
| | | <ul style="list-style-type: none"> consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic monitoring, review and amendment mechanisms. | | | |
| T2 | Approvals | The construction contractor will obtain and comply with a Road Occupancy License/s (ROL) under Section 138 of the <i>Roads Act</i> prior to construction commencing. | Contractor | Detailed design/Pre-construction | QA Specification G1 <i>Job Specific Requirements.</i> |
| NV1 | Noise and vibration | <p>A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and identify:</p> <ul style="list-style-type: none"> all potential significant noise and vibration generating activities associated with the activity feasible and reasonable mitigation measures to be implemented, taking into account Beyond the Pavement: Urban design approach and procedures for road and maritime infrastructure planning, design and construction (Transport for NSW, 2023) a monitoring program to assess performance against relevant noise and vibration criteria arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. | Contractor | Detailed design / pre-construction | QA Specification G36 <i>Environment Protection.</i> |
| NV2 | Noise and vibration | <p>All sensitive receivers (e.g. schools, local residents) likely to be affected will be notified at least 7 days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of:</p> <ul style="list-style-type: none"> the proposal the construction period and construction hours contact information for proposal management staff complaint and incident reporting how to obtain further information. | Contractor | Detailed design / Pre-construction / Construction | QA Specification G36 <i>Environment Protection.</i> |

Transport for NSW

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|-----|----------------------|--|----------------|---|--|
| AH1 | Aboriginal heritage | <i>The Standard Management Procedure - Unexpected Heritage Items</i> (Transport for NSW, 2022) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. Work will only re-commence once the requirements of that Procedure have been satisfied. | Contractor | Detailed design / Pre-construction / Construction | QA Specification G36 <i>Environment Protection</i> . |
| LU1 | Property acquisition | All property acquisition will be carried out in accordance with the Land acquisition information guide (Transport for NSW 2014) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> . | Transport | Detailed design / Pre-construction | |
| LU2 | Impacts to services | A Dial Before You Dig search will be undertaken prior to construction starting. Transport will consult with relevant service providers prior to the commencement of construction to develop procedures to be implemented to minimise the potential for service interruptions which have the potential to impact on existing land use. | Transport | Detailed design / Pre-construction | |
| SE1 | Socio-economic | A Communication Plan (CP) will be prepared to help provide timely and accurate information to the community during construction. The CP will include (as a minimum): <ul style="list-style-type: none"> mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions contact name and number for complaints. The CP will be prepared in accordance with the Transport Stakeholder and community engagement guidelines (2023). | Contractor | Detailed design / Pre-construction | QA Specification G36 <i>Environment Protection</i> . |
| WM1 | Waste management | A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to: <ul style="list-style-type: none"> measures to avoid and minimise waste associated with the project classification of wastes and management options (re-use, recycle, stockpile, disposal) statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions procedures for storage, transport and disposal monitoring, record keeping and reporting. The WMP will be prepared taking into account the <i>Environmental Procedure - Management of Wastes on Transport for NSW Land</i> (Transport for NSW, 2014) and relevant Transport Waste Fact Sheets. | Contractor | Detailed design/pre-construction | QA Specification G36 <i>Environment Protection</i> . |
| WM2 | Resource recovery | Ensure that all vegetation proposed for clearing is assessed as required in accordance with the relevant Transport best practice procedures and methodologies for timber reuse for timber truss bridges and reuse hierarchy. | Contractor | Detailed design | |

Transport for NSW

| No. | Impact | Environmental safeguards | Responsibility | Timing | Reference |
|------|-------------------------|--|----------------|---|--|
| AQ1 | Air quality | <p>Safeguards will be implemented as part of the CEMP. These will include but not be limited to:</p> <ul style="list-style-type: none"> • potential sources of air pollution • air quality management objectives consistent with any relevant published EPA and/or DCCEEW guidelines • mitigation and suppression measures to be implemented • methods to manage work during strong winds or other adverse weather conditions. | Contractor | Pre-construction | QA Specification G36 <i>Environment Protection.</i> |
| NAH1 | Non-Aboriginal heritage | <p><i>The Standard Management Procedure - Unexpected Heritage Items</i> (Transport for NSW, 2022) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered.</p> <p>Work will only re-commence once the requirements of that Procedure have been satisfied.</p> | Contractor | Detailed design / Pre-construction / Construction | QA Specification G36 <i>Environment Protection.</i> |

7.3 Licensing and approvals

Table 7.2: Summary of licensing and approvals required

| Instrument | Requirement | Timing |
|----------------|--|--------------------------------|
| Roads Act 1993 | Road occupancy licence from Road Occupancy Unit at the Transport Management Centre of Transport. | Prior to start of the activity |

8. Conclusion

This chapter provides the justification for the proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Section 193 of the Environmental Planning and Assessment Regulation 2021.

8.1 Justification

The proposal is consistent with a number of national, state and local strategies and plans, including:

- Oxley Highway Draft corridor strategy (Transport for NSW and Roads and Maritime Services 2016)
- NSW Future Transport Strategy 2056 (Transport for NSW 2018)
- Regional NSW Services and Infrastructure Plan (Transport for NSW 2018)
- Road Safety Plan 2026 (Transport for NSW 2023)
- Tourism and Transport Plan (Transport for NSW 2018)
- NSW Freight and Ports Plan 2018-2023 (Transport for NSW 2018)
- North Coast Regional Plan 2041 (Transport for NSW 2022)
- Transport for NSW Reconciliation Action plan 2022-2025 (Transport for NSW 2022).

The proposal is considered justified as it would:

- Reduce travel times and congestion
- Improve road safety on the Oxley Highway and Pacific Highway
- Provide a road transport network with supports future travel demands.

While there would be environmental impacts as a consequence of the proposal, they have been avoided or minimised wherever possible through design and site-specific safeguards, as summarised in Section 7.2. The benefits of the proposal are considered to outweigh the expected impact on the environment.

8.1.1 Social factors

Potential social impacts as a result of the construction of the proposal may include traffic impacts, noise, air quality and amenity impacts. A socioeconomic impact assessment was conducted for the proposal, as discussed in Section 6.9.

Long-term benefits from the proposal include maintaining the Pacific Highway and Oxley Highway as vital freight and commuter routes and improving travel safety and reliability of the connection between Port Macquarie and Wauchope. The proposal would improve the safety of the overpass over the Pacific Highway, reducing vehicle incidents risk and improving road users' travel time. The long-term benefits of the proposal would outweigh any temporary disturbance to the community.

The proposal has been designed to reduce social impacts on the community as far as possible, and the remaining impacts would be managed in accordance with the safeguards in Section 7 of this REF.

8.1.2 Biophysical factors

Potential impacts to a range of biophysical factors have been assessed in Section 6.1, and mitigation measures are proposed to manage identified residual impacts.

The key impact on biodiversity associated with the proposal is the removal of up to 2.73 hectares of native vegetation and associated habitats. The vegetation to be removed could impact the availability and connectivity of habitats.

Subject to vegetation clearing minimisation efforts, preparation of a biodiversity offset strategy would be required in accordance with the Transport *No net loss guidelines* under the Transport *Biodiversity Policy* (Transport for NSW 2022) for potential impacts to the *Biodiversity Conservation Act 2016* and *Environment Protection and Biodiversity Conservation Act 1999* listed threatened ecological community and threatened species habitat. Offsets may be delivered through a range of mechanisms, including securing offset properties under an appropriate legal instrument, purchasing and retiring biodiversity credits, paying into the Biodiversity Conservation Fund or progressing stewardship Site Agreements on suitable properties in accordance with the *No net loss guidelines* (Transport 2024).

The overall impact of vegetation removal is considered to be not significant with the implementation of safeguards recommended in Section 6.1.

8.1.3 Economic factors

The proposal has been designed to be low maintenance and economically viable.

The proposal would result in improved transport connections, travel time between the regions of Port Macquarie and Wauchope, access to and from the Pacific Highway, network reliability, and road user safety. These improvements would enhance the tourism movements around the area and the ability for the community to travel safely between towns.

8.1.4 Public interest

The proposal is in the public interest as it would improve road safety, traffic efficiency and access within the region and between Port Macquarie and Wauchope. Whilst the community would experience some negative impacts during the construction of the proposal, these would be temporary and would be minimised with the implementation of safeguards within Section 7.

The improved road safety on the Oxley Highway and Pacific Highway is anticipated to reduce the risk of vehicular incidents at this intersection and improve traffic flow.

8.2 Objects of the EP&A Act

Table 8.1: Objects of the Environmental Planning and Assessment Act 1979

| Instrument | Requirement |
|---|--|
| 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. | The proposal is needed to improve safety on the Oxley Highway and Pacific Highway. The proposal would result in traffic benefits and encourage growth within the Port Macquarie-Hastings LGA. |
| 1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment. | Ecologically sustainable development is considered in Section 8.2.1. |
| 1.3(c) To promote the orderly and economic use and development of land. | The proposal would assist to reduce travel times and improve transport efficiency. It would provide for future growth and development in the region. |
| 1.3(d) To promote the delivery and maintenance of affordable housing. | Not relevant to the proposal. |
| 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. | Construction of the proposal would require the clearing or permanent modification of existing vegetation, including threatened ecological communities and habitat for protected species. The potential impacts on vegetation, threatened species, populations and ecological communities are addressed in Section 6.1. |
| 1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage). | Heritage is considered in Sections 6.6 and 6.11. |

| Instrument | Requirement |
|--|---|
| 1.3(g) To promote good design and amenity of the built environment. | The proposal has been designed to fit within the existing built environment and road network. |
| 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. | Not relevant to the proposal. |
| 1.3(j) To provide increased opportunity for community participation in environmental planning and assessment. | Community consultation has been addressed in Section 5. |

8.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the proposal.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

The precautionary principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

This principle was considered during route options development (refer to Chapter 2). The precautionary principle has guided the assessment of environmental impacts for this EIS and the development of mitigation measures.

Specialist studies, including biodiversity and noise and vibration assessments were incorporated to gain a detailed understanding of the existing environment.

Intergenerational equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

- Possible compensatory habitat or offsets were identified as outlined in the biodiversity assessment (refer Section 6.1)
- The economic benefits in the form of development potential for surrounding areas for the current and future generation were identified.

Conservation of biological diversity and ecological integrity

- Appropriate scope considered for connectivity and key corridors for species likely to occur in the area as addressed in the Biodiversity assessment (refer Section 6.1)
- Biodiversity offsets are triggered for the impacts on 2.73 hectares of potential Koala habitat.

Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources which may be affected by the carrying out of a project, including air, water, land and living things. The value of the proposal to the community in terms of improved safety was recognised.

8.3 Conclusion

The proposed upgrade the Oxley Highway and Pacific Highway interchange at Port Macquarie, NSW 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 (as 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 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 proposal objectives but would still result in some impacts on biodiversity and noise. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also reduce travel times and improve safety. 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 Government Department of Climate Change, Energy, the Environment and Water 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.



Name: Dharini Collaguazo
Position: Senior Environmental Planner
Company name: GHD Pty Ltd
Date: 31 July 2025

I certify that I have reviewed and endorsed the contents of this REF and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Section 170 of the EP&A Regulation, and the information is neither false nor misleading. I accept it on behalf of Transport.



Name: Alan Dunne
Position: Project/Contract Manager
Transport region/program: Project Services North
Date: 31 July 2025

10. EP&A Regulation publication requirement

Table 10.1: EP&A Regulation publication requirement

| Requirement | Yes/No |
|---|--------|
| Does this REF need to be published under section 171(4) of the EP&A Regulation? | Yes |

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Terms and acronyms used in this REF

Table 11.1: Terms and acronyms used in this REF

| Term / Acronym | Description |
|---|---|
| Alignment | The vertical and horizontal location of the road |
| BC Act | <i>Biodiversity Conservation Act 2016</i> (NSW) |
| Capacity | Maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or a road in one direction during a given time period under prevailing road and traffic conditions |
| CEMP | Construction environmental management plan |
| DCCEEW | Department of Climate Change, Energy, the Environment and Water |
| EIA | Environmental impact assessment |
| EP&A Act | <i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process |
| ESD | 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 |
| FM Act | <i>Fisheries Management Act 1994</i> (NSW) |
| Heritage Act | <i>Heritage Act 1977</i> (NSW) |
| LALC | Local Aboriginal Land Council |
| LEP | Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act |
| LoS | Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers |
| MNES | Matters of national environmental significance under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> |
| NPW Act | <i>National Parks and Wildlife Act 1974</i> (NSW) |
| Roads and Maritime | NSW Roads and Maritime Services, now known as Transport for NSW |
| SEPP | State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act |
| SEPP (Biodiversity and Conservation) | State Environmental Planning Policy (Biodiversity and Conservation) 2021 |
| SEPP (Planning Systems) | State Environmental Planning Policy (Planning Systems) 2021 |
| SEPP (Precincts – Central River City) | State Environmental Planning Policy (Precincts – Central River City) 2021 |
| SEPP (Precincts – Eastern Harbour City) | State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021 |
| SEPP (Precincts – Regional) | State Environmental Planning Policy (Precincts – Regional) 2021 |
| SEPP (Resilience and Hazards) | State Environmental Planning Policy (Resilience and Hazards) 2021 |
| SEPP (Transport and Infrastructure) | State Environmental Planning Policy (Transport and Infrastructure) 2021 |
| QA Specifications | Specifications developed by Transport for use with road work and bridge work contracts let by Transport |
| Transport | Transport for NSW |

Appendix A

Consideration of section 171 factors and matters of national environmental significance and Commonwealth land

Appendix B

Statutory consultation checklists

Appendix C

Concept Design

Appendix D

Consultation responses

Appendix E

Biodiversity Assessment

Appendix F

Noise and Vibration Assessment

Appendix G

PACHCI Stage 1

