



# Central Coast Highway and Tumby Road Intersection Upgrade

Submissions report

Transport for NSW | June 2022

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Prepared by AECOM Australia Pty Ltd and Transport for NSW

TfNSW 22.107

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# Executive summary

## The proposal

Transport for NSW (TfNSW) propose to design and construct the Central Coast Highway and Tumbi Road intersection upgrade project. This would involve replacing the existing roundabout with traffic lights, as well as road widening throughout the intersection (the Proposal). The Proposal would also include utility relocations and drainage, lighting and bus stop upgrades, new and upgraded paths and crossings for pedestrians and cyclists.

Other key features of the Proposal include:

- Providing two right turn lanes out of Tumbi Road onto the highway southbound
- Widening the Central Coast Highway north of the intersection to two lanes in each direction
- Relocating two existing bus stops to a common location northbound on the Central Coast Highway just north of the intersection
- Upgrading the existing large culvert under the Central Coast Highway north of the Tumbi Road intersection including a new pipe crossing, to improve stormwater drainage
- Providing a U-turn bay in front of Pacific Garden Hotel for southbound traffic
- Providing a new parking and loading facility to the Wamberal Grocer and Fruit Market (subject to landowner agreement)
- Retaining walls and landscaped batter slopes to prevent impacts on Wamberal Lagoon Nature Reserve
- Relocation and adjustment of existing utilities including water, sewerage, electricity, gas and telecommunications.

The Proposal is the first stage the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project, which aims to improve travel on the Central Coast Highway between Tumbi Road, Wamberal and Bateau Bay Road, Bateau Bay. The objectives for the broader upgrade of the Central Coast Highway between Wamberal and Bateau Bay Road include:

- Objective 1: Traffic flow improvement, including better peak period travel times and reliability, by reducing peak period delays in the vicinity of the intersection
- Objective 2: Improved road safety for all road users
- Objective 3: Enhance existing road based public transport at the intersection, by providing safe crossing between opposing bus stops and bus facility improvements
- Objective 4: Improve local walking and cycling connections between places along and across the intersection, and provide for future links for pedestrian and cycling infrastructure that supports local and State Government initiatives for active transport.

## Display of the Review of Environmental Factors

TfNSW prepared a review of environmental factors (REF) to assess the potential environmental impacts of the proposed works. The REF was publicly displayed for 33 days between Wednesday 6 October 2021 and Monday 8 November 2021. The REF was available for viewing on the TfNSW project website ([nswroads.work/tumbi](https://nswroads.work/tumbi)).

A virtual information session was held during the display period to give the community an opportunity to ask questions and learn more about the REF and Proposal. TfNSW also spoke individually with businesses and residents who would be directly affected by the Proposal.

The REF and information sessions were promoted on Facebook and community updates were delivered via email and post to over 5,000 stakeholders, community members and residents in the area surrounding the Proposal.

## Summary of issues and responses

Public display of the REF and the supporting consultation resulted in a total of 35 submissions, of which 30 were from the general community, two were from businesses and three were from community groups.

Of these submissions, 9 per cent were in support of the Proposal, 20 per cent objected to the Proposal. The remaining 71 per cent of submissions offered no position but suggested some form of change to one or more elements of the Proposal.

The main issues raised and responses to those issues are summarised below.

### *Project design – Road design*

A number of design suggestions were raised regarding the proposed intersection upgrade, including:

- **Connecting the Old Tumbi road cul-de-sac to the Central Coast Highway.** This suggestion is not considered feasible, as the steep grades on the Old Tumbi Road approach would require extensive earthworks, require the removal of additional vegetation and present a safety risk. It could also encourage traffic to short cut through residential areas to avoid the intersection.
- **Alternative bus and road lanes through the intersection.** A dedicated southbound lane that is not subject to stopping at the lights is not feasible, as it would have environmental impacts including encroachment into Wamberal Lagoon Nature Reserve. It would also introduce safety issues for the proposed pedestrian crossings and for buses requiring access to the southbound bus stop situated near Wamberal Cemetery.

The preferred design option presented in the REF was chosen as it best meets the Proposal objectives for the 'Central Coast Highway upgrade - Wamberal to Bateau Bay' upgrade and the strategic need to improve traffic congestion and road safety along the Central Coast Highway at its intersection with Tumbi Road.

### *Project design – Shared paths, footpaths and cycle lanes*

A number of design suggestions were raised regarding proposed shared paths and footpaths, including:

- **Shared paths on both sides of the Central Coast Highway.** The Proposal includes the construction of improved or new footpath and shared path connections on both sides of the Central Coast Highway and Tumbi Road. This includes a new three metre off-road shared path adjacent to the southbound lanes of the Central Coast Highway, a new 1.5 metre footpath near the northbound lanes, and a new 1.5 metre footpath along the northern side of Tumbi Road as it approaches the intersection. The new three metre shared path stops at the northern end of the Proposal where pedestrians and cyclist would have to return to using the existing verge and shoulders of the highway as they currently do.
- **Changing Tumbi Road footpaths to shared paths, with road crossings to include bicycle suitable ramps.** The concept design presented in the REF proposes footpaths on both sides of Tumbi Road near the intersection. Suggestions to install a shared path on Tumbi Road near the intersection are noted. A new REF safeguard for detailed design has been added in Section 4.0 to further investigate a new shared path connection on Tumbi Road between Dalpura Road and the Central Coast Highway (within the current Proposal boundary).

The Proposal would also provide dedicated, signal-controlled pedestrian crossings with bicycle suitable ramps at all arms of the intersection. These new and upgraded facilities would improve safety and accessibility for pedestrians and cyclists travelling through the Proposal area.

## **Traffic and transport – Road access**

Concerns were raised regarding the removal of U-turn capabilities for traffic travelling on the Central Coast Highway. Once the Proposal is complete, the following U-turn options would be available for vehicles wishing to change direction on the Central Coast Highway and when turning out of Tumbi Road:

- For motorists travelling northbound on the Central Coast Highway, U-turn access at the Crystal Street roundabout would be available.
- For motorists travelling southbound on the Highway, a new U-turn facility would be provided in front of the Pacific Garden Hotel.
- South of the intersection, motorists travelling south may also use the Ocean View Drive roundabout to turn. Alternatively, the roundabout at the intersection of Pitt Road and Tall Timbers Road would also be available.
- For motorists approaching the intersection from Tumbi Road wishing to return back up Tumbi Road, U-turn access at the Crystal Street roundabout or the local roads in Wamberal would be available. For motorists travelling to Tumbi Umbi or further they can detour via Bellevue Road.

The Crystal Street roundabout is proposed to be replaced with traffic lights in the future, as part of a separate scope of works for the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project. Further U-turn opportunities to the north of the Proposal area are currently being investigated as part of future planning for the Central Coast Highway corridor.

## **Changes to the Proposal**

During the public display of the REF, minor modifications to the concept design of the Proposal have occurred. These are:

- A small section at the front of the car park of the Forresters Garden Resort would be retained during the construction period. It was previously proposed to be removed and rebuilt nearby.
- A small pull over bay on the Central Coast Highway southbound, near the maintenance vehicle access ramp, has been removed and the shoulder narrowed to be made consistent with the rest of the upgraded Central Coast Highway
- The section of footpath located near the proposed car park for the Wamberal Grocer and Fruit Market would be shifted slightly to maintain a consistent offset from the kerb. No changes were made to the proposed car park or driveway for the Wamberal Grocer and Fruit Market.

These modifications are minor and do not change the extent of the Proposal area as assessed in the REF, nor do they introduce new elements. The environmental assessment presented in the REF remains valid and no additional assessment is considered necessary. Following approval of the REF, elements of the Proposal would continue to be further refined during the detailed design phase.

## **Next steps**

As the determining authority, Transport for NSW will consider the information in the REF and this submissions report and make a decision whether or not to proceed with the Proposal.

Transport for NSW will inform the community and stakeholders of this decision and where a decision is made to proceed, will continue to consult with the community and stakeholders prior to and during the construction phase.

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# 1. Introduction and background

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## 1.1 The proposal

Transport for NSW (TfNSW) propose to design and construct the Central Coast Highway and Tumbi Road intersection upgrade project. This would involve replacing the existing roundabout with traffic lights, as well as road widening throughout the intersection (the Proposal). The Proposal would also include utility relocations and drainage, lighting and bus stop upgrades, new and upgraded paths and crossings for pedestrians and cyclists.

Other key features of the Proposal include:

- Providing two right turn lanes out of Tumbi Road onto the highway southbound
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- Retaining walls and landscaped batter slopes to prevent impacts on Wamberal Lagoon Nature Reserve
- Relocation and adjustment of existing utilities including water, sewerage, electricity, gas and telecommunications.

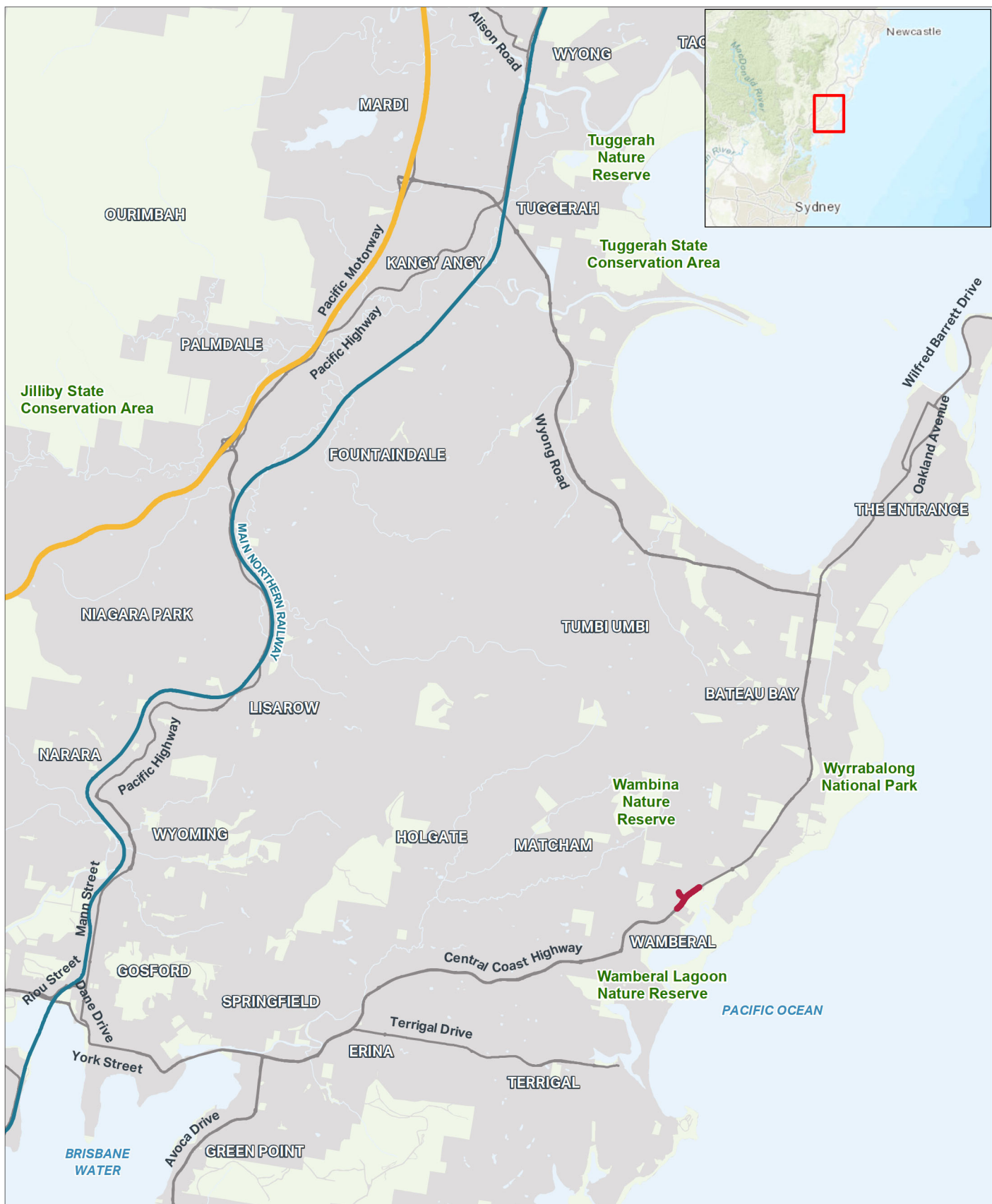
A more detailed description of the Proposal is available in the Central Coast Highway and Tumbi Road Intersection Upgrade Review of Environmental Factors (REF), prepared by Transport in October 2021.

The Proposal is the first stage the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project, which aims to improve travel on the Central Coast Highway between Tumbi Road, Wamberal and Bateau Bay Road, Bateau Bay. The objectives for the broader upgrade of the Central Coast Highway between Wamberal and Bateau Bay Road include:

- Objective 1: Traffic flow improvement, including better peak period travel times and reliability, by reducing peak period delays in the vicinity of the intersection
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- Objective 4: Improve local walking and cycling connections between places along and across the intersection, and provide for future links for pedestrian and cycling infrastructure that supports local and State Government initiatives for active transport.

The location of the Proposal is shown in **Figure 1-1**, an overview of the Proposal is shown in **Figure 1-2**, **Figure 1-3** and **Figure 1-4** and the property acquisition boundaries are in shown **Figure 1-5**.





**FIGURE 1-1:** Location of the Proposal

**Legend**

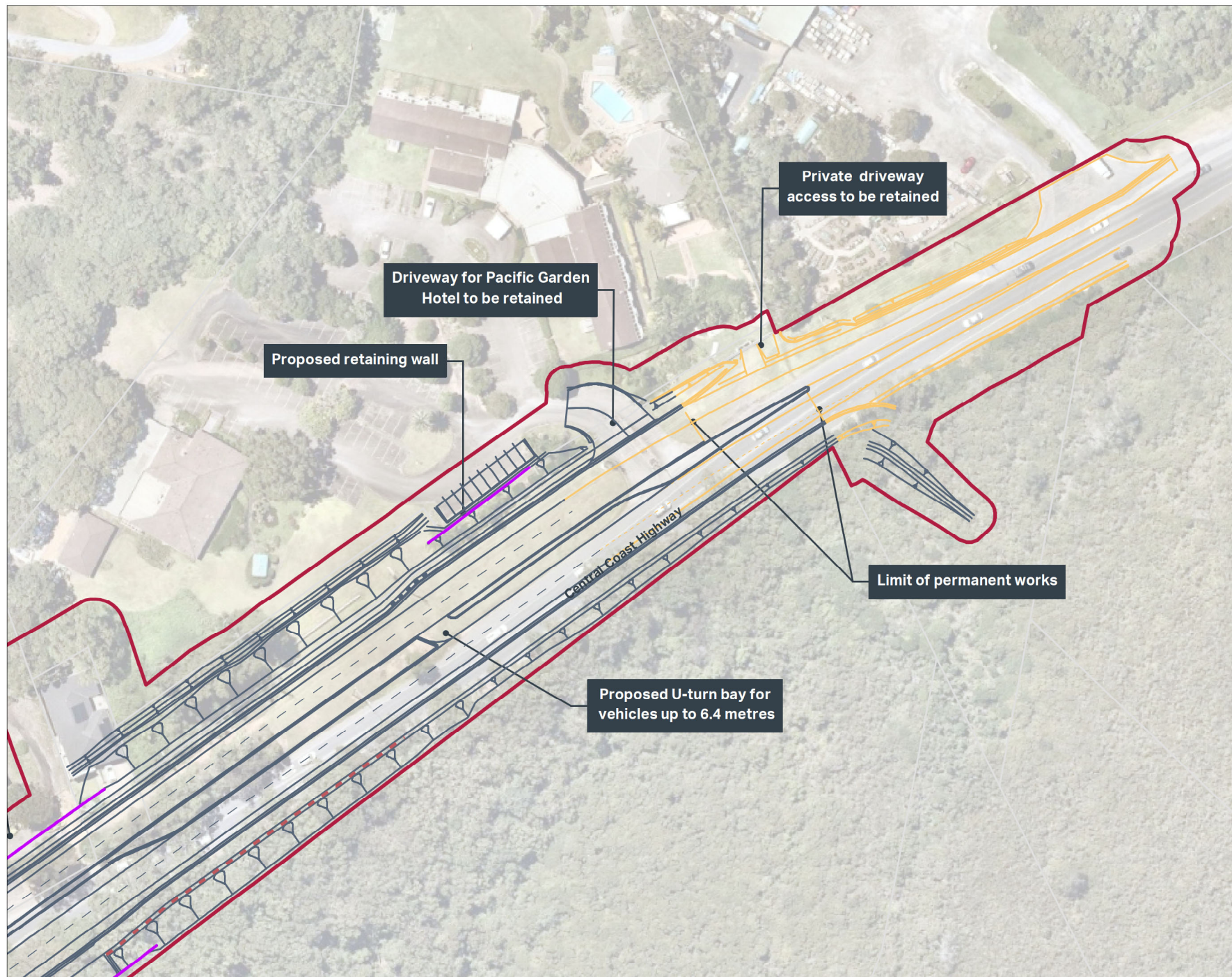
- Proposal area
- Motorway
- Primary road
- Railway





0 10 20 m

**Figure 1-2:**  
PROJECT KEY FEATURES



## Legend

- Proposal area
- Temporary works
- Proposed car park
- Shared Path
- Permanent works
- Proposed retaining wall

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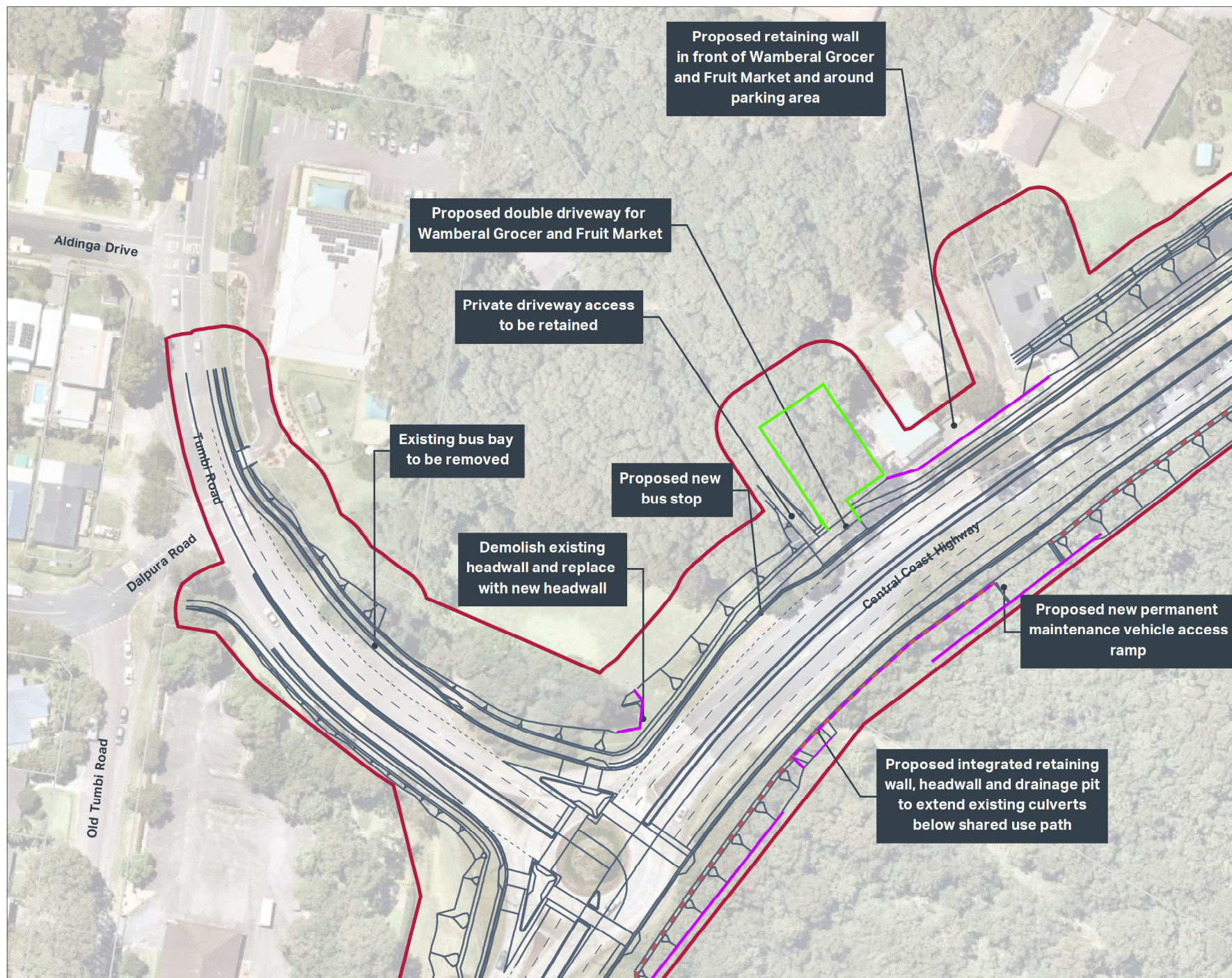
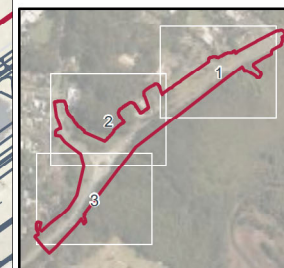
Source: Imagery @ Nearmap, 2020.





0 10 20 m

**Figure 1-3:**  
PROJECT KEY FEATURES



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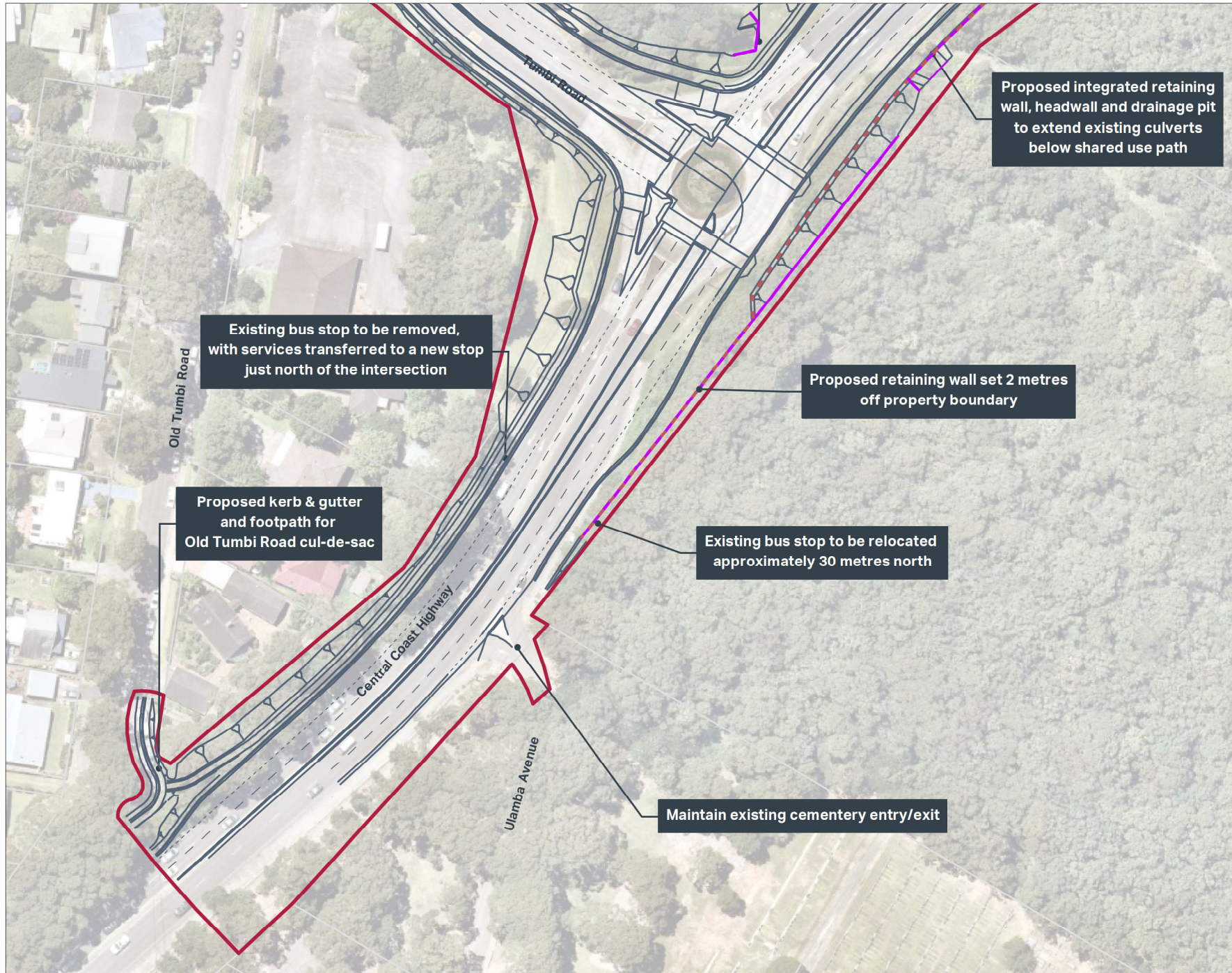
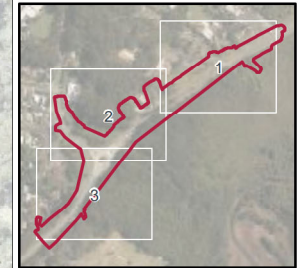
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**Figure 1-4:**  
PROJECT KEY FEATURES



## Legend

- Proposal area
- Temporary works
- Proposed car park
- Shared Path
- Permanent works
- Proposed retaining wall

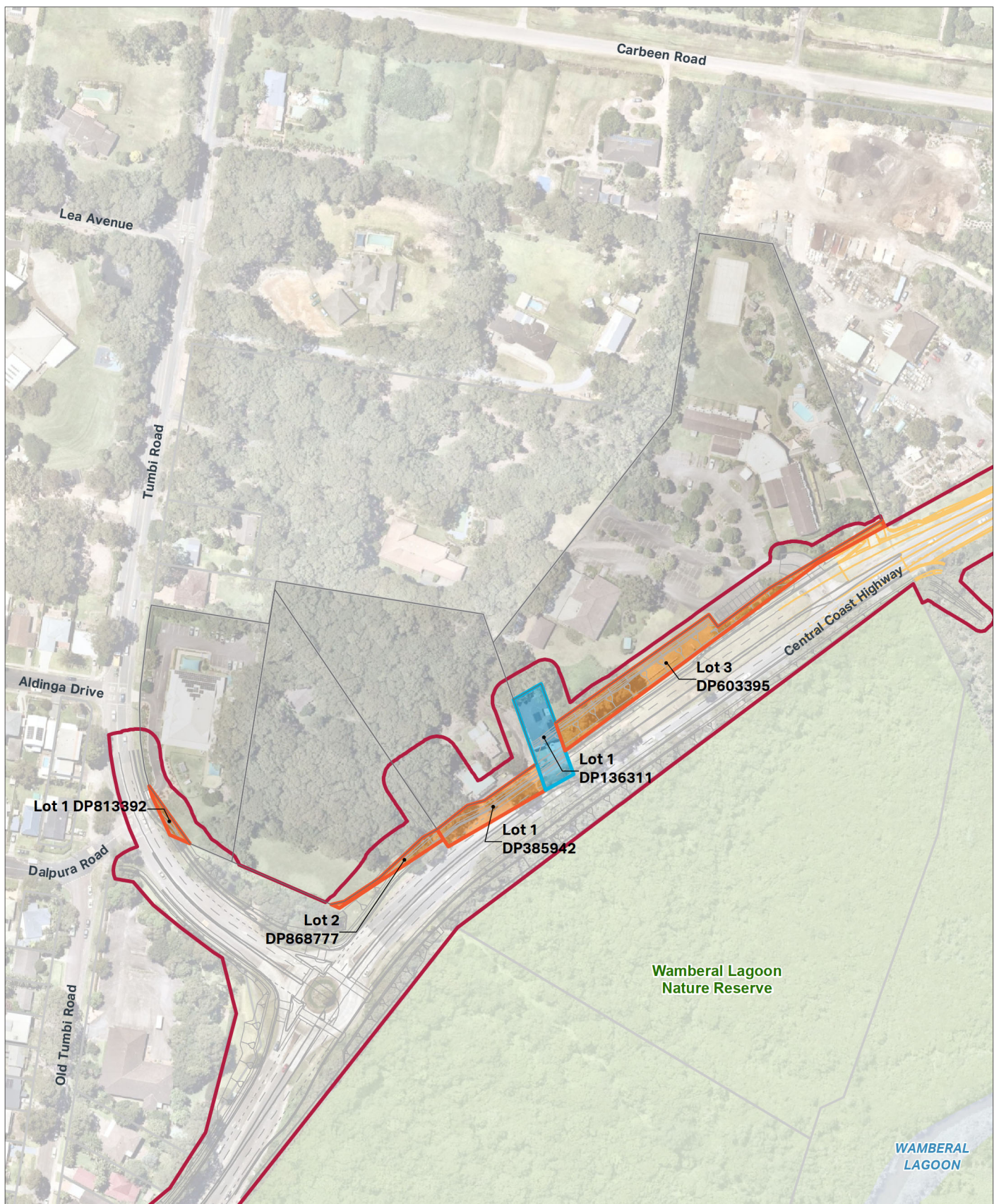
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**FIGURE 1-5: PROPERTY ACQUISITION**



**Legend**

<span style="border: 2px solid red; padding: 2px;"> </span> Proposal area	<span style="background-color: #00a0e3; border: 1px solid black; padding: 2px;"> </span> Acquisition	<span style="border-bottom: 2px solid black; width: 20px; display: inline-block;"></span> Permanent works
<span style="background-color: #90ee90; border: 1px solid black; padding: 2px;"> </span> Nature reserve	<span style="background-color: #00a0e3; border: 1px solid black; padding: 2px;"> </span> Full Acquisition	<span style="border-bottom: 2px solid orange; width: 20px; display: inline-block;"></span> Temporary works
<span style="background-color: #add8e6; border: 1px solid black; padding: 2px;"> </span> Waterbody	<span style="background-color: #ffa500; border: 1px solid black; padding: 2px;"> </span> Partial Acquisition	

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## 1.2 REF display

Transport for NSW prepared a review of environmental factors (REF) to assess the potential environmental impacts of the proposed works. The REF was publicly displayed for 33 days between Wednesday 6 October 2021 and Monday 8 November 2021.

The REF was available for viewing at [nswroads.work/tumbi](https://nswroads.work/tumbi).

A virtual information session was held on Wednesday 20 October to give the community an opportunity to ask questions and learn more about the REF and Proposal. TfNSW also spoke directly with businesses and residents who would be directly affected by the Proposal.

The REF and information session were also advertised on Facebook and community updates were emailed to community and key stakeholders, as well as posted to properties in Wamberal including those around the Proposal, and the greater area.

## 1.3 Purpose of the report

This submissions report relates to the REF prepared for the Central Coast Highway and Tumbi Road Intersection Upgrade, and should be read in conjunction with that document.

The REF was placed on public display and submissions relating to the Proposal and the REF were received by TfNSW. This submissions report summarises the issues raised and provides responses to each issue (Chapter 2). It details changes made to the concept design during the submissions period, and assesses the environmental impact of changes to the Proposal (Chapter 3). It also identifies new or revised environmental management measures (Chapter 4).

No changes to the Proposal are proposed that would require the preparation of a preferred infrastructure report.



## 2. Response to issues

TfNSW received 35 submissions, which were accepted until Monday 8 November 2021. **Table 2-1** lists the respondents and each respondent's allocated submission number. The table also indicates where the issues from each submission have been addressed in Chapter 2 of this report.

Table 2-1 Respondent submission numbers

Respondent	Submission No.	Section number where issues are addressed
Wamberal Public School P&C	1	Section 2.12.1, 2.12.2.
Individual	2	Section 2.2.6.
Individual	3	Section 2.12.1.
Individual	4	Section 2.12.3.
Individual	5	Section 2.12.3.
Individual	6	Section 2.2.4.
Individual	7	Section 2.2.4.
Individual	8	Section 2.4.1, 2.4.2, 2.4.3, 2.6.1, 2.6.2, 2.8.1, 2.9.1, 2.10.1.
Individual	9	Section 2.7.3, 2.10.1.
Business	10	Section 2.2.2, 2.2.3, 2.2.4, 2.7.3, 2.7.5, 2.9.1, 2.10.1, 2.12.1, 2.12.3.
Individual	11	Section 2.7.3, 2.7.6.
Individual	12	Section 2.12.1.
Central Coast Cemeteries	13	Section 2.7.2, 2.7.7.
Individual	14	Section 2.2.1.
Individual	15	Section 2.3.1, 2.12.1, 2.12.2.
Individual	16	Section 2.2.4, 2.7.2, 2.7.5.
Individual	17	Section 2.2.4.
Individual	18	Section 2.7.2.
Individual	19	Section 2.2.3, 2.2.4, 2.12.1, 2.12.3.
Individual	20	Section 2.12.3.
Individual	21	Section 2.3.1.
Individual	22	Section 2.2.4, 2.7.4, 2.7.9, 2.8.2, 2.9.2, 2.12.1.
Individual	23	Section 2.2.4.
Individual	24	Section 2.5.1, 2.6.2.

Respondent	Submission No.	Section number where issues are addressed
Individual	25	Section 2.2.6, 2.2.7, 2.7.1, 2.7.7, 2.7.8, 2.8.2, 2.11.1.
Individual	26	Section 2.2.3, 2.2.4, 2.7.1, 2.7.5, 2.12.1, 2.12.3.
Individual	27	Section 2.2.5.
Individual	28	Section 2.2.5, 2.7.1.
Individual	29	Section 2.2.4, 2.7.2, 2.7.5, 2.12.1.
NSW Central Coast Bicycle Users Group	30	Section 2.2.3.
Individual	31	Section 2.2.3, 2.12.3.
Individual	32	Section 2.2.3.
Individual	33	Section 2.2.3, 2.12.1.
Individual	34	Section 2.7.5, 2.7.6.
Business	35	Section 2.7.3, 2.7.5, 2.10.1, 2.12.1.

## 2.1 Overview of issues raised

A total of 35 submissions were received in response to the display of the review of environmental factors. Out of these 35 submissions, 30 were from the general community, two were from businesses and three were from community groups.

Of these submissions, 9 per cent were in support of the Proposal, 20 per cent objected to the Proposal. The remaining 71 per cent of submissions offered no position, but suggested some form of change to one or more elements of the Proposal.

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

The main issues raised by the community were:

- The project design – submissions provided suggestions for improving the road network, pedestrian and cyclists pathways
- Traffic and access impacts during the operation of the intersection, specifically the lack of U-turn opportunities and reduced access to Wamberal Cemetery
- Impacts to Wamberal Lagoon Nature Reserve
- Business impacts to Wamberal Grocer and Fruit Market.

All 35 submissions were identified as unique submissions. All submissions have been assigned a submission number (refer to **Table 2-1**).



## 2.2 Project Design

### 2.2.1 General

#### *Submission number(s)*

14.

#### *Issue description*

- Queries if the proposal includes signalised crossings.

#### *Response*

The Proposal includes improved bus stop facilities, paths on all approaches, and signal controlled crossings, including crossings of the left turning lanes in and out of Tumbi Road, allowing safer pedestrian movement between opposing bus stops, across the highway and Tumbi Road. A full description of the Proposal is provided in Section 3 of the REF.

### 2.2.2 Wamberal Grocer and Fruit Market car park

#### *Submission number(s)*

10.

#### *Issue description*

- Suggestions to change the proposed car park at the Wamberal Grocer and Fruit Market by extending the proposed bus bay to include a turning bay into the driveway of the business.

#### *Response*

During the concept design phase of the Proposal, a similar feature to this suggestion was considered. It was not adopted due to the challenge of fitting utilities between this taper and the shop building, particularly overhead power to Ausgrid's requirements, without adversely affecting the business. The requested facility could only be provided as an extension of the proposed bus bay further south due to their close proximity.

TfNSW investigations identified road safety conflicts between exiting buses and vehicles using the bay to turn left into the carpark. The design included as part of the Proposal is considered to be a balanced solution in this regard.

The design would however continue to be refined during the detailed design phase in accordance with relevant standards and in consultation with the property owners.

### 2.2.3 Shared paths, footpaths and cycle lanes

#### *Submission number(s)*

10, 19, 26, 30, 31, 32, 33.

## Issue description

- Suggestions for the detailed design of on-road marked cycle lanes
- Suggestions for the detailed design of off-road cycle-lanes and off-road shared paths while ensuring compliance with the relevant standards
- Suggestions for the shared path to be constructed on both sides of the Central Coast Highway. Suggests these shared paths are better off being a cycle lane
- Suggestions for various design changes with the view to enhancing safety or accessibility for pedestrians and cyclists including:
  - Installing a shared path on Tumbi Road
  - Changing the shared path to be a cycle lane only
  - Installing shared paths on both sides Tumbi Road and Central Coast Highway
  - Installing a continuous northbound channel for cyclists on the right of the left turning lane into Tumbi Road.
- Queries the reasoning of shared paths, noting they have no obvious destination and suggestion that it could instead provide room for an additional lane which could improve accessibility.

## Response

- **On-road marked cycle lanes** - TfNSW policy and design requirements, as well as current best practices along high speed and high traffic volume roads such as the Central Coast Highway, require newly constructed shared paths and cycle lanes to be separate to traffic lanes.

Constructing new on-road cycle lanes on the Central Coast Highway and Tumbi Road is not feasible for this Proposal as the increase in road corridor width would mean the Proposal encroached into the adjacent Wamberal Lagoon Nature Reserve.

- **Detailed design of off-road shared paths/cycle lanes** – The proposed shared path on the eastern side of the Central Coast Highway would be three metres wide and would be constructed as per the current TfNSW and Austroads design standards.

During construction of the shared path, to avoid encroachment into the adjacent Wamberal Lagoon Nature Reserve, new street signs and bus shelters may be installed within sections of the shared path.

Refinements to the design of shared paths would be further investigated during the detailed design phase especially in areas near bus stops.

- **Request for shared path or on-road cycle lane on both sides of the Central Coast Highway** - The Proposal includes the construction of improved or new footpath and shared path connections on both sides of the Central Coast Highway and Tumbi Road. This includes a new three metre off-road shared path adjacent to the southbound lanes of the Central Coast Highway, a new 1.5 metre footpath adjacent to the northbound lanes, and a new 1.5 metre footpath along the northern side of Tumbi Road as it approaches the intersection.

Constructing a separate on-road cycle lane and a separate footpath at both sides of the Central Coast Highway is not feasible as Transport's active transport provisions require cycle lanes in high-speed environments, such as highways, to be physically separated from traffic for safety purposes.

Furthermore, the widening of the highway would result in environmental impacts, including the possible need to encroach into the adjacent Wamberal Lagoon Nature Reserve. It would also increase the impact to adjacent properties, some of which are already affected by the proposal.

- **Design changes with the view to enhancing safety or accessibility for pedestrians and cyclists** - The concept design in the REF proposes footpaths on both sides of Tumbi Road near the intersection. Suggestions to install a shared path on Tumbi Road near the intersection are noted and would be investigated during the detailed design phase. A new management measure to investigate a shared

path connection on Tumbi Road between Dalpura Road and the Central Coast Highway (within the Proposal boundary) has been added to Section 4.

The Proposal would provide dedicated, signal-controlled pedestrian crossings with bicycle suitable ramps at all arms of the intersection, with signalised crossings of the turning lanes into and out of Tumbi Road. These new and upgraded facilities would improve the safety and accessibility for pedestrians and cyclists travelling through the Proposal area.

- **Shared path has no obvious destination** - The new three metre wide shared path adjacent to the southbound side of the Central Coast Highway stops at the northern extent of the Proposal, where pedestrians and cyclist would need to use the existing verge and shoulders of the highway to continue to travel north. The termination of the shared path at this point is intended to allow for a future extension of the shared path north to Crystal Street, and eventually Bateau Bay as part of the fourth proposal objective outlined in Section 1.1.

Further extensions and links north are planned to occur progressively as part of future stages of the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project, which is subject to separate environmental assessment.

## 2.2.4 Road design

### *Submission number(s)*

6, 7, 10, 16, 17,19, 22, 23, 26, 29.

### *Issue description*

- Suggestions for a road connection from the Central Coast Highway to Old Tumbi Road to improve access to nearby local roads while providing a new U-turn access way to the Tumbi Road intersection
- Suggestions for alternative vehicle U-turn access points and routes within the Proposal area
- Suggestions for the design of the Tumbi Road configuration at the intersection including:
  - Changing the left turn only lane from Tumbi Road onto the Central Coast Highway into a left or right turn lane
  - Providing two left-turn lanes into Tumbi Road from the Central Coast Highway
  - Modification of the Dalpura Road from Tumbi Road intersection.
- Suggestions for constructing alternative northbound bus lanes on the Central Coast Highway, including the installation of a bus B-light.
- Suggestions for constructing alternative road lanes on the southbound side which are not subject to stopping at the lights
- Suggestions for installing turning breaks in the proposed median strip to improve access
- Suggestions for upgrading the entrance at the Forresters Beach Garden Centre to make it safe for on-road cyclists and to remove the risk of potholes caused by heavy vehicles accessing the site.

### *Response*

- **Old Tumbi Road connection** - A road connection from the Central Coast Highway to Old Tumbi Road was considered not feasible for a number of reasons:
  - The steep grades on the Old Tumbi Road approach would require extensive earthworks to achieve the relevant levels for an appropriate connection between the two roads
  - A turn lane may also be required for decelerating vehicles
  - There would be environmental impacts through the removal of additional vegetation

- It would extend the limit of work southwards towards Wamberal Cemetery, resulting in a potential safety risk given the proximity to the proposed upgraded intersection and the potential for conflicts between vehicles leaving the local road and those on the highway.
- **Alternative vehicle U-turn access points and routes** – Traffic lights were determined the most appropriate treatment to provide satisfactory traffic performance at this location for at least 20 years. In NSW, U-turns at signalised intersections are not permitted for road safety reasons. For motorists approaching the intersection from Tumbi Road wishing to return back up Tumbi Road, the local roads in Wamberal would be available, or they may make a turn left onto the Central Coast Highway and either:
  - U-turn at the Crystal St roundabout, or
  - Proceed to Bellevue Road (suitable if travelling to Tumbi Umbi or further).

For motorists travelling northbound on the Central Coast Highway, U-turn access at the Crystal Street roundabout or the local roads in Wamberal would be available.

For motorists travelling southbound on the Highway, a new U-turn facility would be provided in front of the Pacific Garden Hotel. South of the intersection, vehicles travelling south may also use the Ocean View Drive roundabout to turn. Alternatively, the roundabout at the intersection of Pitt Road and Tall Timbers Road would also be available.

The Crystal Street roundabout is proposed to be replaced with traffic lights as part of a separate scope of works for the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project. New facilities, including new U-turn opportunities to the north of the Proposal Area, are currently being investigated as part of future planning for the Central Coast Highway corridor. It should be noted that the broader upgrade is subject to environmental assessment and would be displayed to the community in the near future.

Emergency vehicles (ambulance, police, State Emergency Services and fire brigade) have the authority to make U-turns at traffic light intersections and may also cross the central median.

- **Design of Tumbi Road** - Approaching the new intersection on Tumbi Road, the road would be widened on the north-eastern side to accommodate one left turn lane onto the highway north and two right turn lanes onto the highway south. On the Central Coast Highway, the existing northbound left turn lane would be extended to allow additional traffic to turn into Tumbi Road.

Providing two left turn lanes into Tumbi Road is not considered feasible as this would impact the edges of properties situated on Old Tumbi Road. It would also require additional work in Tumbi Road for traffic to merge into the single lanes in either direction. Traffic modelling presented in Appendix H of the REF concluded that the extended single left turn lane into Tumbi Road would meet the desired vehicle capacity during peak times and accommodate any additional queuing of vehicles waiting to give way or at the pedestrian lights.

No formal works at the Dalpura Road and Tumbi Road intersection are proposed, as works on Tumbi Road are only extending to the intersection of this road with the Central Coast Highway. A roundabout at this location was investigated during early concept design, but found not to be feasible due to increased impacts on adjacent properties including Juniors at Wamberal, key utilities including high voltage power and a sewer pump station. It would also have significant impacts on the drain running beside Tumbi Road.

The suggested addition of a right turn lane on Tumbi Road to Dalpura Road would require the widening of the road and affect the adjacent Juniors at Wamberal preschool property. The addition of a right turn lane in this area would also cause waiting vehicles to obstruct the approach lanes to the intersection and reduce the capacity of the intersection and potentially create safety issues.

The existing 'Keep Clear' road marking on the gap at this intersection would remain. Vehicles are currently required to wait at the roundabout until a break in traffic occurs on the Central Coast Highway to ensure they can safely enter the highway. Additional capacity created by the new approach lanes to

the intersection would reduce queue lengths through this intersection. The traffic lights and signalised crossings would also provide for more gaps in traffic during peak times.

- **Alternative bus lanes** - The construction of a separate bus lane or bay on the Tumbi Road approach is not considered feasible and may result in additional business, property and environmental impacts.

It would also affect the design of the drainage channel currently situated north of the intersection and the existing and proposed location of underground utilities. One of the objectives of the Proposal, as stated in Section 2.3.1 of the REF, is to enhance existing road-based public transport at the intersection. The road design has provided for upgraded bus stop facilities along with safer connections including crossings, to access those stops.

The road design has also allowed for indented bus bays in both directions on the Central Coast Highway close to the intersection. These bus bays have been designed in accordance with relevant standards (Guide to Road Design – Austroads) and have sufficient space for buses to safely decelerate, pull over and merge back onto the highway. They have been located on the departure side of the new intersection to avoid buses needing to merge into queued or weaving traffic on the approaches.

- **Alternative road lanes** - Constructing a dedicated southbound lane that is not subject to stopping at the lights is not feasible for this Proposal. The intersection design requires two right turn lanes out of Tumbi Road, so a third separated southbound slip lane on the highway would further increase the width of the highway upgrade through the intersection and on the approaches. This would have environmental impacts including encroachment into the adjacent Wamberal Lagoon Nature Reserve.

It would also introduce safety issues with potential conflict between through traffic moving at speed and the proposed pedestrian crossings and for buses requiring access to the southbound bus stop situated near the Wamberal Cemetery.

- **Proposed median strip** - The concrete median barrier is provided as part of the design for safety reasons, principally to remove the risk of collisions. Breaks in the median for property access could encourage turning movements across multiple lanes in a high risk environment. Also, if they are alongside a right turn bay they can create rear-end collision collisions as there are multiple places to stop for a turn in front of unsuspecting trailing vehicles.
- **Forresters Beach Garden Centre entrance** - The location of the entrance to the Forresters Beach Garden Centre is part of the temporary transition works connecting the Proposal to the existing road network to the north. As part of these works, the driveway to the garden centre would be sealed. The road shoulder in the vicinity of the Forresters Beach Garden Centre driveway is not currently a formal cycleway.

## 2.2.5 Bus stops

### *Submission number(s)*

27, 28.

### *Issue description*

- Concerned about the removal of the bus stop on Tumbi Road and suggests moving it closer to Juniors at Wamberal.
- Suggestions for moving the proposed consolidated bus stop to Tumbi Road, between the intersections at Dalpura Road and Aldinga Drive, opposite Juniors at Wamberal.

## **Response**

The design of bus stop locations considers customer catchments and has been carried out in consultation with the local bus operator, Red Bus. Wherever feasible, the facilities requested by Red Bus have been provided. Transport would continue to consult with Red Bus during the detailed design phase and would specifically discuss the community feedback in relation bus stop locations.

The relocated Tumbi Road bus stop would be placed a short distance around the corner on the Central Coast Highway (see Figure 1-3).

A new footpath would be constructed between the original location and the new location, including new pedestrian lights across Tumbi Road at the intersection for safer crossing to the residential area to the south.

The new location would also have improved facilities including a bus bay separated from active traffic, and would improve the ability to access and transfer to other services running north and south along the Central Coast Highway, which would also use this stop. More information on the new permanent bus stop is detailed in Section 3 and 6.11 of the REF.

There is already a bus stop situated between Dalpura Road and Aldinga Drive. This bus stop would not be affected by the Proposal. Re-building the bus stop on the opposite side of Tumbi Road approaching the highway is also not feasible for the following reasons:

- The main Central Coast bus routes do not travel along Tumbi Road and would have to turn around to access and return to the highway. Only one route; No. 48 currently stops at this location and could access the proposed new location. Other chartered school buses that transport students directly to Wamberal Public School do not use the bus stop on Tumbi Road approaching the Central Coast Highway.
- Widening Tumbi Road would not allow for safely rebuilding a bus stop in Tumbi Road (with a bay) without substantial disturbance to the nearby watercourse. There is also the potential that buses may encounter difficulties in re-joining the traffic queues approaching the intersection during red light phases.

### **2.2.6 Speed limits**

#### **Submission number(s)**

2, 25.

#### **Issue description**

- Queries if the speed limits at the intersection would be changed, or if they would be changed in the future.
- Concerns as to why the speed limit at the intersection would not change and argues that revenue raising from speeding fines is more important than road safety.

## **Response**

The proposed design allows for the existing posted speed zones to be retained. The enforcement of road speed limits are beyond the scope of the Proposal. Once the Proposal is complete, Transport for NSW would continue to review speed limits on a routine basis along with the remainder of the Central Coast Highway.

## **2.2.7 Signage and enforcement**

### ***Submission number(s)***

25.

### ***Issue description***

Queries what signage, driver engagement mechanisms and enforcement would be used to slow drivers prior to and through this intersection.

### ***Response***

New and adjusted signage and line marking would be installed as part of the Proposal. Signage would be designed in accordance with relevant guidelines and standards for safety. This may include, though would not be limited to, speed limit signage and line marking, traffic light warning signs, bus zone signs, 'no stopping' signs and pedestrian crossing warning signs.

## **2.3 Justification**

### **2.3.1 Alternative design options**

### ***Submission number(s)***

15, 21.

### ***Issue description***

- Suggestions for a signalised roundabout.

### ***Response***

As detailed in Section 2.4 of the REF, TfNSW undertook investigations during early planning phases of the proposal for potential alternative intersection upgrades for the Tumby Road and Central Coast Highway intersection. During this process, upgrading the intersection with a signalised roundabout was one option investigated. The investigation determined that this option would not provide sufficient traffic capacity for the current peak period congestion and any future growth on the highway, and would not address existing and future safety issues or connectivity for all road users.

The alternative designs would not improve safety or local connections for pedestrians or cyclists throughout the road corridor and across the intersection.

## **2.4 Construction**

### **2.4.1 Disturbance area**

### ***Submission number(s)***

8.

### ***Issue description***

- Queries how wide the construction footprint is from Forresters Beach Road to Tumbi Road.

### ***Response***

The limits of the Tumbi Road intersection upgrade Proposal are shown on **Figure 1-2, Figure 1-3, Figure 1-4** and end on the Central Coast Highway approximately 400 metres north of the existing Tumbi Road intersection along the Central Coast Highway.

Further works north of this location to Crystal Street and Forresters Beach Road are part of the greater Central Coast Highway upgrade from Wamberal to Bateau Bay, for which concept design is underway including further development of a construction footprint. That project would be the subject of a separate Review of Environmental Factors, with a public display in the future.

## **2.4.2 Construction duration**

### ***Submission number(s)***

8.

### ***Issue description***

- Queries how long construction would take to complete.

### ***Response***

Construction of the Tumbi Road intersection Proposal is expected to commence in 2023 and is likely to take up to two years to complete. This is however subject to construction funding release and granting of project planning approvals.

## **2.4.3 Ancillary facilities**

### ***Submission number(s)***

8.

### ***Issue description***

- Queries where ancillary facilities would be located.

### ***Response***

As detailed in Section 3.4 of the REF, at least one temporary ancillary facility for a site office and temporary storage would be required to support construction of the Proposal.

Three locations for potential ancillary facilities have been nominated as potentially suitable for the Proposal. Use of any of these locations are still subject to further negotiations with landholders closer to construction, including for availability, access and leases.

The potential sites are:

- **Ancillary facility 1** – commercial nursery north of the construction boundary at part Lot 4 in DP603395 – 893 The Entrance Road, Wamberal



- **Ancillary facility 2** –Lot 51 DP 1028301, The Entrance Road, Foresters Beach
- **Ancillary facility 3** – property at 35 Bellevue Road at part Lot 197 in DP755234.

Any ancillary facilities selected for use during construction would include, at a minimum, site water run-off controls and management of dust and noise to reduce impacts to adjacent properties.

## 2.5 Consultation

### 2.5.1 Consultation during REF preparation

#### *Submission number(s)*

24.

#### *Issue description*

- Notes a response to an issue raised by the NSW National Parks and Wildlife Service is missing in Table 5-3 of the REF.

#### *Response*

This table formatting issue within the REF is noted. The issue raised by NSW National Parks and Wildlife Service was addressed on the previous page (page 88).

## 2.6 Biodiversity

### 2.6.1 Wamberal Lagoon Nature Reserve

#### *Submission number(s)*

8.

#### *Issue description*

- Concerned about works encroaching on Wamberal Lagoon Nature Reserve
- Concerned about the adjacent Nature Reserve and asks if NPWS would be compensated for future monitoring and repair works (weed control, supplementary planting etc), once the Proposal has been constructed and its associated rehabilitation works have been completed
- Concerned about potential off-site impacts affecting the Wamberal Lagoon Nature Reserve, such as sedimentation and litter, during construction and operation.

#### *Response*

As detailed in Section 1.1 of the REF, no permanent acquisition or temporary use of any part of the Wamberal Lagoon Nature Reserve is proposed. Vegetation trimming for the Proposal, including overhead vegetation, would be limited to vegetation growing outside the boundary of the Wamberal Lagoon Nature Reserve. The boundary of the Wamberal Lagoon Nature Reserve would be marked and established as an exclusion area for any activities other than approved low impact ground survey and environmental controls.

Furthermore, as detailed in Section 6.3.4 of the REF, a Soil and Water Management Plan (SWMP) would be prepared and implemented as part of the CEMP. The Plan would provide detailed and specific erosion, sediment and pollution controls for the large drainage channel flowing beside Tumby Road to the Wamberal Lagoon Nature Reserve and for the edge of the works along the Wamberal Lagoon Nature Reserve boundary.

As detailed in Section 6.1.4 of the REF, a revegetation and regeneration plan would be prepared which would aim to manage weeds and encourage native vegetation regrowth along the eastern extent of the Proposal where it fronts the Wamberal Lagoon Nature Reserve. The plan is only intended for the edge of the nature reserve adjacent to the project and only for a limited period to manage construction impacts. This plan would be further developed in detailed design and require engagement with and endorsement from National Parks and Wildlife Service. In line with plans on other Transport proposals, any works undertaken under the plan would include a monitoring program and maintenance period for up to three years after construction, separate from road landscaping.

As detailed in Table 5-3 of the REF, a number of potential surface water quality treatment options were explored during the development of the concept design, including gross pollutant traps (GPT). Despite concerted design effort it was not feasible to accommodate any of these devices within the Proposal area, without needing to encroach upon land within the boundary of the Wamberal Lagoon Nature Reserve or without compromising the worker safety and maintainability of the design. However, as detailed in Section 6.3.3 of the REF, some water quality treatment can still be achieved where runoff is directed to informal landscaped or vegetated swales. Vegetated swales would still assist in pollutant load reduction but not necessarily to the level of pollutant removal normally achieved by the larger measures.. Therefore, in detailed design, TfNSW would further investigate locations and where feasible incorporate drainage infrastructure such as smaller vegetated swales and shallow informal filter beds.

Waste management associated with the Proposal has been discussed in Section 6.13.3 of the REF. Waste management measures and procedures would be prepared for the CEMP which follows the *Roads and Maritime Technical Guide: Management of road construction and maintenance waste*. All wastes would be managed in accordance with the *Protection of the Environment Operations Act 1997*. Works sites would be maintained, kept free of rubbish and cleaned up at the end of each working day and waste material, would not be left on site once the works have been completed.

## **2.6.2 Wildlife corridors**

### ***Submission number(s)***

8, 24.

### ***Issue description***

- Queries if any wildlife migration studies were undertaken
- Queries if the Proposal would cater for a wildlife corridor for native fauna, or if wildlife fencing would be installed along the Nature reserve boundary near Crystal Street
- Suggests that a wildlife crossing should be installed as part of the Proposal in the form of:
  - A tunnel, which can be installed next to the existing culvert located under the road on the northern side of the roundabout and
  - An overhead walkway over the highway at the same location or further along past the fruit shop.

## **Response**

A full biodiversity impact assessment has been prepared for the Proposal (Appendix C of the REF). The assessment also considered impacts to wildlife movement across the road corridor. The assessment determined that impacts to the movement of wildlife would be minor given the nature of the habitat on each side of the Central Coast Highway and the expected low desire for wildlife to cross at this location.

As detailed in Section 6.1.4 of the REF, landscaping species selection in areas more likely to support existing or future connectivity, such as adjacent to the Wamberal Grocer and Fruit Market, would be investigated during the detailed design process, with regard to their overall structure and refuge value. This includes the investigation of planting of taller canopy species next to the road to facilitate for future glider movement across the roadway.

The project team is also undertaking further investigation of potential aerial fauna crossings as part of detailed design north of the new intersection. These may not be feasible however due to lack of tall vegetation near the road and the width of the road corridor including paths and overhead lighting and utilities. This is also addressed by a safeguard in the REF.

Wildlife crossing just north of the Proposal towards Crystal Street is currently being investigated as part of the concept design of the remaining upgrade of the Central Coast Highway from Wamberal to Bateau Bay. This is subject to a separate REF which is currently in preparation. Further information on wildlife fencing and structures, if feasible, would be detailed and displayed with this REF in the near future.

## **2.7 Traffic and transport**

### **2.7.1 Pedestrians**

#### **Submission number(s)**

25, 26, 28.

#### **Issue description**

- Queries what pedestrian safety mechanisms would be used in the project to facilitate pedestrian movements, including students, in the area
- Concerns about the consolidation of the bus stops at Tumbi Road and asks if additional crossings for students to access the bus stop outside the cemetery to get to school would be provided
- Concerns that moving the bus stop to be near the Wamberal Grocer and Fruit would mean that students would have to walk back over the busy Tumbi intersection to reach their houses.

## **Response**

As detailed in Section 3.0 and Section 6.6 of the REF, the Proposal would provide upgrades and extensions of the existing pedestrian network including:

- Footpaths along the full western extent of the upgraded section of Central Coast Highway and along the northern and southern sides of Tumbi Road within the Proposal area
- A new footpath connection to the existing footpath along the eastern side of Old Tumbi Road, connecting to the footpath along the western side of the Central Coast Highway.

Pedestrians (including students) wanting to cross either Tumbi Road or the Central Coast Highway would be able to do so safely with the provision of the dedicated, signal-controlled pedestrian crossings of all arms of the proposed intersection.

## **2.7.2 Access to the Wamberal Cemetery**

### ***Submission number(s)***

13, 16, 18, 29.

### ***Issue description***

- Concerns that the removal of the roundabout removes U-turn access, making it difficult for traffic to access the Wamberal Cemetery.

### ***Response***

This was addressed in in Section 6.6 (Traffic and Transport) and Appendix L (Socio-economic impact Assessment) of the REF. The REF noted that the Crystal Street roundabout to the north of the Proposal would provide for an alternative U-turn opportunity for this traffic.

The Crystal Street roundabout is proposed to be replaced with traffic lights as part of a separate scope of works for the of the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project . New facilities, including new U-turn access opportunities to the north of the Proposal are currently being investigated as part of future planning for the Central Coast Highway corridor. It should be noted that the broader upgrade is still subject to separate environmental assessment which is currently being prepared and would be displayed to the community in the near future.

## **2.7.3 Access to the Wamberal Grocer and Fruit Market**

### ***Submission number(s)***

9, 10, 11, 35.

### ***Issue description***

- Concerns that the removal of the roundabout removes U-turn access and would make it difficult for southbound traffic to access the Wamberal Grocer and Fruit Market.

### ***Response***

Both the traffic and transport and socio-economic assessments presented in the REF considered change to the Wamberal Grocer and Fruit Market access. These noted that under the Proposal, vehicles travelling southbound would not be able to turn right into the premises and would need to access the business via the northbound lanes of the Central Coast Highway. During and following construction of the Proposal, vehicles travelling south wishing to enter the Wamberal Grocer and Fruit Market may use the Ocean View Drive roundabout to turn. Alternatively, the roundabout at the intersection of Pitt Road and Tall Timbers Road would also be available.

The introduction of a median strip at this location is provided as part of the design for safety reasons. The median strip improves road safety by reducing the risk of collision due to vehicles stopping to turn right across the northbound lanes of the Central Coast Highway when entering the Wamberal Grocer and Fruit Market. Breaks in the median for property access have the potential to encourage unsafe movements across multiple lanes of traffic in a high risk environment.

## 2.7.4 Property access

### *Submission number(s)*

22.

### *Issue description*

- Concerns that access to the laneway situated on Old Tumbi Road would be affected by the Proposal and queries if it would be improved by the Proposal.

### *Response*

The Proposal would not permanently alter access to the existing laneway on Old Tumbi Road. The Proposal does not include for any upgrade works to this laneway.

As detailed in Section 3.1 of the REF, works on Old Tumbi Road would include new kerb and gutter and a pedestrian footpath connection from the Central Coast Highway to the Old Tumbi Road cul-de-sac. This would connect to the existing footpath on the eastern side of Old Tumbi Road.

As detailed in Section 6.6.3 of the REF, some existing accesses to properties on Old Tumbi Road may be temporarily affected during construction. Most of these impacts would be limited to short term closures and alternative access arrangements would be made wherever feasible. Should the access laneway situated on the western side of Old Tumbi Road be temporarily affected during construction, TfNSW would consult with property owners prior to any changes.

Once operational, all properties affected by changed access arrangements as a result of the Proposal would be provided with restored or new permanent access arrangements during operation.

## 2.7.5 Road access - operation

### *Submission number(s)*

10, 16, 26, 29, 34, 35.

### *Issue description*

- Concerns that the removal of the roundabout removes U-turn capabilities for traffic travelling on the Central Coast Highway and no alternative access routes are in place
- Concerns about the ability of traffic to enter the Central Coast Highway from intersecting streets, including for emergency services
- Concerns that vehicles would struggle to turn right onto Tumbi Road from Aldinga Drive.

### *Response*

For motorists approaching the intersection from Tumbi Road wishing to return back up Tumbi Road, the local roads in Wamberal would be available. They may also make a turn left onto the Central Coast Highway and either:

- U-turn at the Crystal St roundabout, or
- Proceed to Bellevue Road (suitable if travelling to Tumbi Umbi or further).

For motorists travelling northbound on the Central Coast Highway, U-turn access at the Crystal Street roundabout or the local roads in Wamberal would be available. For motorists travelling southbound on the

Highway, a new U-turn facility would be provided in front of the Pacific Garden Hotel. South of the intersection, vehicles travelling south may also use the Ocean View Drive roundabout to turn. Alternatively, the roundabout at the intersection of Pitt Road and Tall Timbers Road would also be available.

The Crystal Street roundabout is proposed to be replaced with traffic lights as part of a separate scope of works for the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project. New facilities, including new U-turn opportunities to the north of the Proposal area, are currently being investigated as part of future planning for the Central Coast Highway corridor. It should be noted that the broader upgrade is still subject to environmental assessment which is currently underway and would be displayed to the community in the near future.

Emergency vehicles (ambulance, police, State Emergency Services and fire brigade) have the authority to make U-turns at traffic light intersections and may also cross the central median.

For vehicles wishing to turn right from Aldinga Drive to Tumby Road, the new intersection would reduce delay times as queues are expected to be shorter on the approach to the intersection. The new road lanes at Tumby Road approaching the new traffic lights would allow split queues and would more cars to access the Central Coast Highway at one time during signal changes.

Currently at the intersection, vehicles are required to wait at the roundabout until a break in the traffic on the Central Coast Highway occurs to ensure vehicles can safely enter the highway. The existing 'Keep Clear' road marking at the Aldinga Drive and Tumby Road intersection would also remain.

## **2.7.6 Increased traffic and congestion - operation**

### ***Submission number(s)***

11, 34.

### ***Issue description***

- Concerns that the removal of the roundabout would cause additional congestion, on and around Tumby Road where vehicles are trying to re-access the Central Coast Highway.

### ***Response***

Traffic modelling, as presented in Section 6.6 of the REF and Appendix H of the REF, showed the intersection requires traffic signals to improve traffic flow during peak periods, cater for existing traffic demand, and reduce local congestion. The signalised intersection modelling by Transport demonstrated substantial relief in terms of traffic reduction, while improving journey times for Central Coast Highway traffic. This change to the intersection would also complement the objectives for improved traffic efficiency and safety along the broader Central Coast Highway corridor towards Bateau Bay and Forresters Beach.

The upgraded intersection would allow increased traffic volumes to turn from Tumby Road onto the Central Coast Highway, substantially reducing delays and traffic queues. Traffic intersection modelling (Appendix H of the REF) indicates that after the upgrade the intersection will perform satisfactorily in the afternoon peak across all three future year scenarios (2025, 2035 and 2045). The modelling predicts that the average delay and queue length for the upgraded intersection in the afternoon peak will be 38 seconds and 440 metres in 2045. This is in contrast with the 'do nothing' scenario, where the modelling identified that the average delay and queue length in the afternoon peak would be greater than 1,000 seconds and 2,070 metres.

The improvement in future intersection performance in the morning peak is also substantial but not as pronounced as during the afternoon peak.

It is anticipated that there would be a small increase in the number of vehicles entering nearby local roads, including Braemar Drive and Dalpura Road, to access the traffic lights at the Tumbi Road intersection. This small increase is unlikely to significantly affect the surrounding local road networks.

### **2.7.7 Road safety**

#### ***Submission number(s)***

13, 25.

#### ***Issue description***

- Concerns that the Proposal would make it unsafe and inconvenient to visit the cemetery when travelling from the south
- Queries if there would be a perceived drop in accidents at the intersection once the traffic lights are operational.

#### ***Response***

The Proposal is expected to improve traffic flow on the Central Coast Highway by widening the highway to two lanes in each direction, therefore reducing congestion and improving safety. The Wamberal Cemetery is currently only accessible via the southbound lanes of the Central Coast Highway. The proposed signalised intersection is expected to improve road safety at the cemetery exit as the traffic signals would provide gaps, thereby allowing vehicles to safely join the Central Coast Highway.

The Proposal would improve safety and traffic efficiency whilst catering for the high existing traffic demands at the intersection. Dedicated pedestrian crossings, traffic signals and refuge islands would be provided across all arms of the upgraded intersection, substantially improving the accessibility (including to bus stops) and safety of the intersection.

The traffic lights would improve road user safety by regulating vehicle movement at the intersection to ensure right of way for each direction, in contrast to the present roundabout where gaps in traffic are required to ensure vehicles can safely turn into the roundabout.

### **2.7.8 Traffic modelling**

#### ***Submission number(s)***

25.

#### ***Issue description***

- Queries how long the queues in both time and length are expected to be on all entries to the new intersection at peak traffic times.

#### ***Response***

The outcomes of the traffic modelling for the Proposal are summarised in Section 6.6.3 (Traffic and transport) and Appendix H of the REF. Relevant information regarding queues at peak times are detailed in Section 4.2.1, Table 2, Table 3, Attachment A and Attachment B of Appendix H of the REF.

The upgraded intersection would allow increased traffic volumes to turn from Tumbi Road onto the Central Coast Highway, substantially reducing delays and traffic queues. Traffic intersection modelling indicates



that after the upgrade the intersection will perform satisfactorily in the afternoon peak across all three future year scenarios (2025, 2035 and 2045). The modelling predicts that the average delay and queue length for the upgraded intersection in the afternoon peak will be 38 seconds and 440 metres in 2045. This is in contrast with the 'do nothing' scenario, where the modelling identified that the average delay and queue length in the afternoon peak would be greater than 1,000 seconds and 2,070 metres.

The improvement in future intersection performance in the morning peak is also substantial but not as pronounced as during the afternoon peak.

Overall, it was considered that the signalised intersection provides significant congestion relief and would improve journey times for traffic on Central Coast Highway and Tumbi Road. Modelling also indicated that queue lengths within the proposed turning bays are not expected to exceed their capacity. As such, obstruction of through traffic by turning traffic is not likely to occur.

### **2.7.9 Parking**

#### ***Submission number(s)***

22.

#### ***Issue description***

- Concerns that the Proposal would reduce off street parking outside their property on Old Tumbi Road, as they currently rely on the existing laneway's off-street parking.

#### ***Response***

The traffic and transport assessment presented in Section 6.6 of the REF included an assessment of the potential car parking impacts associated with construction and operation of the Proposal. The laneway used to access residential properties on Old Tumbi Road would not be affected by the Proposal.

A Construction Traffic Management Plan (CTMP) would be developed that includes temporary measures to manage short term parking and access impacts during construction including engagement with residents and temporary arrangements.

## **2.8 Noise and Vibration**

### **2.8.1 Night time construction noise**

#### ***Submission number(s)***

8.

#### ***Issue description***

- Concerns regarding night time construction noise, particularly from reverse beacons.

#### ***Response***

The noise and vibration assessment presented in Section 6.7 (Noise and vibration) and Appendix I (Noise and Vibration technical report) of the REF included an assessment of the potential noise and vibration



impacts associated with construction of the Proposal. Construction works would be a mixture of day and night works. Day works would be carried out as follows:

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

The REF also states in section 6.7 and 3.4, that due to high traffic volumes along the highway during weekdays and a need for extended traffic lane closures, a substantial amount of construction would have to be undertaken outside of standard working hours to minimise disruptions to traffic flow, extensive delays on the larger transport network and to protect the safety of workers and the travelling public.

Mitigation measures to manage construction noise impacts are provided in Section 6.6.5 of the REF including the preparation of a Construction Noise and Vibration Management Plan (CNVMP).

Under REF safeguard NV5, The CNVMP would also contain a comprehensive night works approval procedure, including:

- Maintain a rolling schedule of upcoming night work periods
- Inclusion of scheduled respite for the community for extended periods of night work
- Methods for expanded community engagement, notification and agreements.

Non-tonal reversing beepers (or an equivalent mechanism) would also be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work where feasible and safe.

## **2.8.2 Noise (operation)**

### ***Submission number(s)***

22, 25.

### ***Issue description***

- Concerns about the increased road noise the additional lanes on the Central Coast Highway would create and asks if any compensation measures would be implemented
- Queries what noise abatement mechanisms would be used or offered to decrease transmission and or absorption into properties.

### ***Response***

The noise and vibration assessment presented in Section 6.7 (Noise and vibration) and Appendix I (Noise and Vibration technical report) of the REF included an assessment of the potential noise and vibration impacts associated with operation of the Proposal. Predicted noise levels are based on a worst-case scenario and consider unfavourable weather conditions including temperature inversions.

Based on operational noise modelling, noise levels are not predicted to increase by more than 2 dB at any receiver as a result of the Proposal, but some receivers are predicted to exceed the cumulative limit once the Proposal is built. That is, the affected properties are already subject to substantial noise from the existing road, with the Proposal only contributing a marginal increase.

The noise and vibration technical report found 11 sensitive receivers eligible for the consideration of feasible and reasonable noise mitigation. Noise mitigation options in the form of low noise pavements, noise barriers, and architectural (at-receiver) treatments would be considered further in detailed design.

## 2.9 Property and land use

### 2.9.1 Wamberal Grocer and Fruit Market

#### *Submission number(s)*

8, 10.

#### *Issue description*

- Concerns about the two scenarios regarding the acquisition of the Wamberal Fruit Market.

#### *Response*

As noted in the Section 6.11.3 of the REF, the Wamberal Grocer and Fruit Market is located on a land parcel identified for partial acquisition. Should the Wamberal Grocer and Fruit Market continue to operate on the property, it would be necessary for the Proposal to occupy part of the property currently used for car parking at the front of the shop. In this case, as part of ongoing consultation with the Wamberal Grocer and Fruit Market, TfNSW is investigating a new car park within the property to the south of the existing premises, allowing for customers to access the business safely. The acquisition of land at the front of the property would not otherwise alter the operation of the business, as it would retain its high degree of visibility to passing traffic and ability to receive deliveries via its existing side access.

### 2.9.2 Property prices

#### *Submission number(s)*

22.

#### *Issue description*

- Concerned that the Proposal would impact their property price.

#### *Response*

Many aspects influence property values such as location and use. TfNSW acknowledges that the Proposal affects land owners directly affected through acquisition and may indirectly impact neighbouring or nearby properties. TfNSW would continue to consult with neighbouring landholders and the broader community throughout the detailed design and construction phases in order to manage potential indirect impacts.

TfNSW would contact landowners directly affected by the Proposal to discuss their circumstances and property impacts, including the process of acquisition. Appropriate compensation would be negotiated in line with the Land Acquisition Information Guide (Roads and Maritime, 2014) and the *Land Acquisition (Just Terms Compensation) Act 1991*.

## 2.10 Socio-economic

### 2.10.1 Business impacts

#### *Submission number(s)*

8, 9, 10, 35.

#### *Issue description*

- Concerns that access impacts to the Wamberal Grocer and Fruit Market would affect its business
- General concern regarding access impacts to businesses caused by the proposed intersection.

#### *Response*

As detailed in Section 6.11.3 of the REF, access and travel time to the Wamberal Grocer and Fruit Market would depend on the outcome of ongoing discussions with the landowner. Should the business be able to continue to operate, the existing combined access and car park area would be removed to facilitate the widened road. In this case a new car park would be provided to the south of the existing building, with a safer, formalised access being provided for motorists entering and exiting the premises.

The REF acknowledges that access to the Wamberal Grocer and Fruit Market would be affected by the raised median, making it more difficult for some southbound traffic to access the premises. However, a break in the median for property access could encourage movements across multiple lanes of traffic in a high risk environment. For other businesses, the U-turn opposite the Pacific Garden Hotel would limit impacts to their operations.

## 2.11 Air quality

### 2.11.1 Increased emissions (operation)

#### *Submission number(s)*

25.

#### *Issue description*

- Queries if there would be an increase in vehicle emissions during the peak times at the intersection.

#### *Response*

As detailed in Section 6.12.2 of the REF, given the Proposal has not been designed to, and is not expected to, induce new traffic to the area, it is expected that the overall operational emissions would not increase substantially compared to the existing scenario.

Air quality impacts associated with idling traffic at the proposed traffic lights may lead to localised increases in exhaust emissions. This is expected to be offset over time however by the reduction in queues at peak periods. It is also expected that in the coming years improvements in automotive technology would reduce overall vehicle emissions through increases in efficiency of engines, greater prevalence of idle-stop technology and the expected trend to an all-electric fleet.

## 2.12 Out of Scope

### 2.12.1 Project design

#### *Submission number(s)*

1, 3, 10, 12, 15, 19, 22, 26, 29, 33, 35.

#### *Issue description*

- Suggestions for a road connection between Carbeen Road and the Central Coast Highway
- Suggestions to reduce congestion and safety risks on Tumbi Road and surrounding local roads near the Wamberal Public School
- Concerns that one lane on Tumbi Road past the Wamberal Public School is not enough, with suggestions for widening and extending Tumbi Road (both ways) from the Central Coast Highway towards the Wamberal Public School
- Queries if Braemar Drive would have traffic lights installed at some stage
- Suggestions for installing 'give way' signs on Tumbi Road at its intersection with Aldinga Drive
- Queries if a guard rail or retaining wall would be installed near the access laneway that is accessed via Old Tumbi Road
- Suggests that the provision of a cycling verge/lane needs to be installed from the Ocean View Drive roundabout to the lights at Pitt Road and southbound from the roundabout at Tumbi Road to the Ocean View Drive roundabout
- Suggests the proposed shared/cycle paths at the intersection link to the future bike routes between Wamberal and Tumbi Umbi as proposed in the Central Coast Council's Central Coast Bike Plan 2019-2029.

#### *Response*

Matters raised in these submissions are beyond the scope of the Proposal. The Proposal is for the Central Coast Highway and Tumbi Road Intersection Upgrade Project. The Proposal is part of a broader commitment to improve travel on the Central Coast Highway between Tumbi Road, Wamberal and Bateau Bay Road, Bateau Bay, which would see the highway widened to two lanes in both directions for 3.8 kilometres. The objectives for the broader 'Central Coast Highway upgrade - Wamberal to Bateau Bay' project are detailed in Section 1.1. While out of scope for this Proposal, items raised during the submission period may be addressed in the broader Proposal to widen the Central Coast Highway up to Bateau Bay. The next stage is currently in concept design and a separate REF would be prepared for future public display.

The Tumbi Road intersection Proposal area is smaller and shown in **Figure 1-2**, **Figure 1-3** and **Figure 1-4** and detailed in Section 3.1 of the REF. The upgraded (widened) section of the Central Coast Highway would tie back into the existing single lane configuration near the southern and northern limit of the Proposal area.

The design for the Central Coast Highway and Tumbi Road intersection has maintained the existing arrangement for Carbeen Road, not connecting it to the Central Coast Highway. This location is low lying and flood prone which constrains the option to provide the connection. Given that satisfactory traffic performance on the network would be achieved through the upgrade of the Tumbi Road intersection, TfNSW are not currently proposing to connect Carbeen Road to Central Coast Highway.

Extending the upgrade of Tumbi Road towards the Wamberal Public School and upgrades to connecting streets including Lea Avenue, Carbeen Road and Dashwood Close fall within Central Coast Council's jurisdiction. The Proposal only focuses on Tumbi Road at its intersection with the Central Coast Highway. Extending the current Proposal further along Tumbi Road to cover this area is currently not being considered by Transport.

The design for the Central Coast Highway and Tumbi Road intersection has maintained the existing arrangement for Aldinga Drive. Installing 'give way' signs on Tumbi Road at the Aldinga Drive intersection is not considered to be feasible.

Tumbi Road has a higher traffic volume and speed when compared to Aldinga Drive and adding signs would potentially create congestion on Tumbi Road. This would likely affect the operation of the new intersection and has the potential to create additional safety issues. It would also contradict the Proposal's objectives to improve traffic flow and reliability by reducing peak period delays in the vicinity of the intersection.

As detailed in Section 3.1 of the REF, works on Old Tumbi Road include new kerb and gutter and a pedestrian footpath connection between the Old Tumbi Road cul-de-sac and the Central Coast Highway. This would connect to the existing footpath that resides on the eastern side of Old Tumbi Road. No guard rails or retaining walls are proposed to be installed on Old Tumbi Road as there is a low risk to safety for pedestrians and drivers.

Installing a cycling lane from the Ocean View Drive roundabout to the traffic lights at Pitt Road or a southbound cycling lane southbound from the roundabout at Tumbi Road to the Ocean View Drive roundabout is outside the scope of the Proposal. Cycle paths towards Tumbi Road are also out of scope and fall within Central Coast Council's jurisdiction. The Proposal would however upgrade existing cyclist facilities at the intersection including the provision of a new three metre wide shared path along the eastern side of the Central Coast Highway to the north and south of the Tumbi Road intersection.

TfNSW is now considering the opportunity in detailed design to modify some of the footpath to shared path along Tumbi Road within the limits of the Proposal. This would be designed to connect into any future shared path facilities that may be constructed further along Tumbi Road as a part of the Central Coast Cycle Plan. This would depend on space available and feasibility, given the drainage and utilities present along the road verge. An REF safeguard has been added in Section 4.0 to undertake an investigation in detailed design to include a shared path on Tumbi Road within the Proposal limits, where feasible.

## **2.12.2 Congestion and pedestrian safety near Wamberal Public School**

### ***Submission number(s)***

1, 15.

### ***Issue description***

- Concerns that the current congestion issue that occurs on the Tumbi Road and Central Coast Highway connection during the Wamberal Public School hours would not be solved. This congestion is based on the cars entering and exiting Lea Ave to drop off/pick up students
- Concerns that the current configuration at Lea Avenue is a safety risk and causes congestion during school hours
- Concerns about pedestrian/cyclist safety due to lack of footpaths around the Wamberal Public School and near Lea Ave
- Concerns that school bus drop offs and pickups on Aldinga Drive causes congestion and stops should be moved to Tumbi Road, near the Wamberal Public School

- Concerns that the current bus stop at Aldinga Drive and the constant pickups and drop offs at this location near the school are a safety risk.

### **Response**

The concerns raised regarding the congestion issues and pedestrian safety at Wamberal Public School and the Lea Avenue intersection are noted. Upgrades to these parts of the local road network are beyond the scope of the Proposal and would fall under the remit of Central Coast Council. These items would be passed on to Central Coast Council for their consideration.

The current Proposal includes sections of footpaths and shared path within the Proposal limits as well as well as crossings at all arms of the new traffic lights.

Moving the bus stop currently located on Aldinga Drive is outside the scope of the Proposal. A new permanent bus stop would however be constructed approximately 30 metres north of the Tumbi Road intersection. This stop would consolidate the following bus stops located within the Proposal area, which would be closed and relocated to the new location:

- Bus stop 2260174 - Central Coast Highway opposite Ulamba Avenue. This stop would be moved from the northbound carriageway of the highway and serves bus routes, 17, 18, 19, 21, 22, 23 and 28
- Bus stop 2260187 - Tumbi Road at Central Coast Highway. This stop would be moved from the southbound carriageway of Tumbi Road, just prior to the intersection with the Central Coast Highway. This bus stop only serves bus route 48.

Access to this bus stop would be improved through the provision of new footpaths along both sides of Tumbi Road and the Central Coast Highway, as well as dedicated signalised pedestrian crossings across all approaches to the upgraded intersection. This improves on the current access which requires the use of a small unprotected median refuge on Tumbi Road. Furthermore, the new footpath connection from the southern end of Old Tumbi Road to the western side of the Central Coast Highway would provide a more direct path for residents on Barooga Road, Inala Place and Old Tumbi Road, removing the need to walk via Dalpura Road.

### **2.12.3 Other proposed Central Coast Highway projects**

#### **Submission number(s)**

4, 5, 10, 19, 20, 26, 31.

#### **Issue description**

- Concerns the Central Coast Highway upgrade would affect their property by making it front the Central Coast Highway where it is currently separated by a service lane between Bakali Road and Maas Parade
- Suggests that the proposed future Central Coast Highway upgrade projects at the Bellevue Road and Passage Road intersections need to be carefully planned out to ensure safe access and reduced congestion is maintained at both areas
- Queries if a U-turn facility on Crystal Street could be considered once the Crystal Street roundabout is replaced by the greater Wamberal to Bateau Bay upgrade with traffic lights
- Concerns about future works at Crystal Street and Forresters Beach Road - that there won't be a U-turn bay to accommodate for the residents/houses between these roads. Suggestions for a U-turn bay at Bakali Road to mitigate this
- Suggests that a shared path be constructed from Crystal Street to Lea Avenue

- Suggests cycle lanes be installed on both sides of the highway between Tumbi Road and the Junction roundabout up to the first roundabout in Bateau Bay
- Suggests for provisions be made for cyclists from the Wamberal lights (Pitt Road) prior to the Tumbi Road intersection through to the projects proposed for future Central Coast Highway upgrades between Wamberal and Bateau Bay.

### **Response**

The concern from the community regarding these issues are noted. The Proposal is for the Tumbi Road Intersection component of the larger Wamberal to Bateau Bay project of the Central Coast Highway upgrade. Design components and construction works on these roads are outside of the Tumbi Road intersection upgrade Proposal area and are therefore out of scope.

New facilities, including new U-turn opportunities and future shared path connections are under investigation as part of the next stage of the Central Coast Wamberal to Bateau Bay upgrade. It should be noted that the broader project of the Central Coast Highway upgrade is subject to additional environmental assessment and concerns would be forwarded to the relevant design team to consider. The current Strategic Design for the greater Central Coast Highway upgrade can viewed on the TfNSW project website.

One of the objectives of the Proposal, as stated in Section 2.3.1 of the REF, is to improve local walking and cycling connections between places along and across the intersection, and provide for future links for pedestrian and cycling infrastructure that supports local and State Government initiatives for active transport. The proposed shared path contributes to the overall aim of connecting an active transport route along the Central Coast Highway. There is already an existing shared path between Pitt Road and the southern limit of the Proposal area, which would be extended a further 600m as part of this Proposal. The broader project of the Central Coast Highway upgrade would continue to investigate additional shared path connections northwards along the highway.



## 3. Changes to the Proposal

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### 3.1.1 Concept design changes

During the public display of the REF, minor modifications to the concept design of the Proposal have occurred. These include:

- The small section at the front of the Forresters Garden Resort car park, would be retained during the construction period. It was previously proposed to be removed and replaced
- The pull over bay on the Central Coast Highway southbound, near the maintenance vehicle access ramp, has been removed and the shoulder narrowed to be made consistent with the rest of the upgraded Central Coast Highway
- The section of footpath located near the proposed car park for the Wamberal Grocer and Fruit Market would be shifted to maintain a consistent offset from the kerb. No changes were made to the proposed car park or driveway for the Wamberal Grocer and Fruit Market.

These modifications are minor and do not change the extent of the Proposal area as assessed in the REF, nor do they introduce new elements. The environmental assessment presented in the REF remains valid and no additional assessment is considered necessary. Following approval of the REF, elements of the Proposal would continue to be further refined during the detailed design phase.

### 3.1.2 Statutory changes

In accordance with Section 5.5 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal. Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act would have significant impact on the environment.

The factors specified in clause 228(2) of the *Environmental Planning and Assessment Regulation 2000* have been separately considered in Appendix A of the REF. The *Environmental Planning and Assessment Regulation 2021* (The Regulation) comes into force from 1 March 2022. The new Regulation has renumbered sections and provisions, including Clause 228, which listed the factors which Division 5.1 assessments were required to consider. This clause is now renumbered to Section 171.

The Regulation introduces two additional factors in Section 171 (previously the clause 228 factors) for which all Division 5.1 assessments would be required to consider in determining whether the activity will have a significant impact. The two new factors are:

- *(q): Any strategic plans made under Part 3 of the Act, including local strategic planning statements, regional and district plans*
- *(r): Any environmental factors that may be relevant to the likely impact of an activity on the environment and not just those factors listed in Section 171.*

An amended Section 171 checklist (previously the 228 factors) has been presented in Table 3-1 below and the changes have been underlined.



Table 3-1 Section 171 checklist

Factor	Impact
a) Any environmental impact on a community?	
The Proposal would require total and partial acquisition of land within the Proposal area. Property acquisition would be carried out in accordance with the Land Acquisition Information guide (Roads and maritime, 2013) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	Short term negative
Construction of the Proposal would result in environmental impacts, including altered visual amenity, traffic, and access for some residents, noise and air quality impacts. These impacts would be temporary and managed with the mitigation measures outlined in the REF.	Short term negative
The Proposal would result in a loss of around 0.89 ha of native vegetation and 1.28 hectares of non-native/miscellaneous ecosystems. The ancillary sites would lead to the potential loss of 3.24 hectares non-native/miscellaneous ecosystems including landscape plantings, highly disturbed areas with limited or no native vegetation and maintained mixed native exotic ground cover.  There is sufficient presence of intact native vegetation nearby the Proposal including Wamberal Lagoon Nature Reserve.	Short term negative
The intersection upgrade from a two-lane roundabout at the Tumbi Road junction to a signalised intersection, and upgraded lane configurations including the provision of adequate turning bays would provide improved travel efficiency and safety to the intersection. The Proposal would improve the performance of the intersection at Tumbi Road and the Central Coast Highway. Similarly, the Proposal would improve journey reliability and improve driver safety by through the provision of dedicated turning lanes, improved drainage and street lighting.  Improved shared path connections would be installed as part of the Proposal, including the re-establishment of footpaths to facilitate the new intersection and road widening.	Long-term positive
b) Any transformation of a locality?	
During the construction of the Proposal there would be amenity impacts including traffic, noise and air quality impacts which would temporarily transform the locality. Management measures contained in the CEMP would be implemented to minimise these effects.	Short-term negative
The Proposal would result in a permanent change in land use from the existing land uses to a road corridor. This would remove the ability of the land to be developed for residential or agricultural purposes in the future. The Proposal would also result in minimal visual impacts for nearby residents due to the widened road. Landscaping and urban design elements have been incorporated into the design to minimise these impacts.	Long-term negative

Factor	Impact
c) Any environmental impact on the ecosystems of the locality?	
<p>Most of the Proposal is located in a modified landscape, subject to previous land disturbance. However, the Proposal would result in 0.89 ha of native vegetation clearance consisting of PCT 1564, PCT 1589, PCT 1625 and PCT 1716. Native vegetation to be removed within the Proposal area east of the Central Coast Highway and north of Tumbi Road is adjacent to large areas of intact native vegetation.</p> <p>Fauna would likely utilise these areas of native vegetation, including Wamberal Lagoon Nature Reserve. There is also potential to impact species that traverse the roadway however the Proposal would only contribute a marginal increase to the distance biota would need to traverse to connect between vegetation patches.</p> <p>Vegetation to be removed for establishment of the ancillary facilities consist of disturbed native and exotic ground cover devoid of mid-storey and canopy and planted / maintained mixed vegetation patches which do not form a coherent native plant community.</p> <p>A Flora and Fauna Management Plan would be prepared as part of the CEMP. According to Tests of Significance, the Proposal would not have a significant impact on these species or ecological communities as the Proposal is unlikely to place a local occurrence of any of these species or ecological communities at risk of extinction.</p>	Short-term negative
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	
There are no anticipated reductions in aesthetic, recreational, scientific or other environmental quality or value of a locality.	Long-term neutral
e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?	
The Wamberal Lagoon Nature Reserve is located east of the Central Coast Highway and is protected as a place of high environmental quality under the <i>National Parks and Wildlife Service Act 1974</i> . No access, work or storage would take place on any land within the boundaries of this Nature Reserve, with appropriate safeguards in place to minimise any potential off-site impacts to this land (see Section 7 of the REF). Furthermore, the inclusion of fencing/handrails in front of this boundary may discourage unwanted entry into Wamberal Lagoon Nature Reserve.	Nil
f) Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i> )?	
Fourteen threatened species were determined to have potential habitat present within the Proposal area and would be directly affected as part of the Proposal. Tests of Significance concluded the Proposal would not have a significant impact on these species or ecological communities as the Proposal is unlikely to place a local occurrence of any of these species or ecological communities at risk of extinction.	Nil

Factor	Impact
<p>There is the potential that the Proposal may further impact the ability of certain species to traverse the roadway and further isolate these populations. Species most affected by this would include arboreal mammals, frogs and reptiles. However, the Proposal would only contribute a marginal increase to the distance biota would need to traverse to connect between vegetation patches.</p> <p>The removal of vegetation adjacent to the Wamberal Lagoon Nature Reserve would affect the vegetation within the reserve due to edge effects. Edge effects in this case would include the potential for localised alterations to species assemblages, including through weed invasion. It is difficult to determine the extent to which these effects would intrude into the reserve, though it is noted that the edge effect observed within the existing vegetation was highly localised, being approximately 2-3 m on average. The impact of edge effects would be managed as part of the construction of the Proposal through the application of a planting regime of native vegetation reflective of the affected PCT and a weed control and bush regeneration program for disturbed roadside areas adjacent to the Wamberal Lagoon Nature Reserve.</p> <p>This impact has been assessed as being of low magnitude and additional mitigation measures deemed unnecessary.</p>	Long-term negative
g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	
It is not anticipated that the Proposal would endanger any species of animal, plant or other form of life.	Long-term neutral
h) Any long-term effects on the environment?	
Operation of the Proposal would improve traffic flow, travel efficiency and safety through Wamberal by reduced congestion at the intersection of the Central Coast Highway and Tumbi Road and improve the movement for motorists, freight vehicles, as well as pedestrians and cyclists using the shared path.	Long-term positive
The Proposal would result in 0.89 ha of native vegetation clearance. Specific mitigation measures including tree planting/landscaping efforts to address these impacts.	Long-term negative
i) Any degradation of the quality of the environment?	
The Proposal would have some temporary impacts during construction associated with visual amenity, traffic, dust and noise and vibration. These impacts would be short term and minimised through the implementation of the safeguards provided in the REF.	Short-term negative
j) Any risk to the safety of the environment?	
<p>During construction, an increase in heavy vehicle movements associated with the transportation of equipment and materials may decrease road safety. The increased transportation of dangerous goods and hazardous materials may also impact safety risk. This is considered minor given the current levels of heavy vehicles using the Central Coast Highway. Nevertheless, traffic management safeguards are provided in the REF to reduce traffic impacts.</p> <p>Potential impacts could occur where some working area occur within areas subject to inundation during a flood event, leading to changes in flood patterns or redistributing flows. However, flood behaviour within and surrounding the</p>	Short-term negative

Factor	Impact
Proposal area is well understood, with adequate advance flood warning available to evacuate equipment and protect the work prior to inundation.	
<p>Operation of the Proposal would improve safety for road users, especially through Wamberal by providing dedicated turning lanes and providing an extra traffic lane for through traffic. This would improve traffic flow and travel times. The Proposal would also see an increase in safety for pedestrians and cyclists.</p> <p>Raising the road levels increases the height at which floodwaters need to reach before overtopping the road. This, in combination with the increased hydraulic capacity of the upgraded culvert crossings, provides a greater level of flood immunity to the road.</p>	Long-term positive
k) Any reduction in the range of beneficial uses of the environment?	
The Proposal would result in the acquisition and a permanent change in land use from the existing land uses to a road corridor. This would remove the ability of the land to be developed for residential or agricultural purposes in the future.	Long-term negative
l) Any pollution of the environment?	
The Proposal would have some temporary impacts during construction associated with visual amenity, increased traffic, dust and noise and vibration. The Proposal could also result in minor impacts to water quality from erosion and sedimentation impacts and from potential oil or fuel spills from construction machinery. These impacts would be short-term and minimised through the implementation of the safeguards provided in the REF.	Short-term negative
Operational pollution is likely to be consistent with the existing Central Coast Highway	Long-term neutral
m) Any environmental problems associated with the disposal of waste?	
Construction of the Proposal would result in a number of waste streams to be generated, including the potential for asbestos and other hazardous waste. Mitigation measures for the disposal of waste streams likely to be produced during construction are detailed in the REF. Waste streams would be managed in accordance with <i>Management of Wastes on Roads and Maritime Services Land</i> procedure.	Short-term negative
Waste generation during operation of the Proposal is likely to be minor consistent with the operation of the existing Central Coast Highway.	Long-term neutral
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	
The Proposal is unlikely to affect any resources that are or are likely to become in short supply.	Nil
o) Any cumulative environmental effect with other existing or likely future activities?	
There is potential for cumulative impacts to occur as a result of the construction of the Proposal occurring simultaneously with other projects, including traffic, noise, air quality and visual impacts. The impacts would be temporary during the construction period and would be minimised with the mitigation measures provided in the REF.	Short-term negative

Factor	Impact
The operation of the Proposal would have a positive cumulative impact on travel times, road safety and efficiency. The Proposal would result in improved safety for Wamberal by reducing congestion and enhancing efficiency throughout the area. As part of the broader program of works (Central Coast Highway upgrade - Wamberal to Bateau Bay) this positive cumulative impact will be even more effective.	Long-term positive
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	
The Proposal is located about one kilometre from the coast. The Proposal is unlikely to impact coastal processes or hazards including those predicted under climate change conditions.	Nil
q) Any strategic plans made under Part 3 of the Act, including local strategic planning statements, regional and district plans	
<p><u>The Proposal is consistent with the following key infrastructure strategies:</u></p> <ul style="list-style-type: none"> <li>• <u>Future Transport Strategy 2056 (NSW Government 2018) - Upgrading the Central Coast Highway to two lanes between Tumbi Road, Wamberal and Bateau Bay Road, Bateau Bay and the installation of traffic lights at the Tumbi Road intersection would improve reliability within this key road corridor. This would directly deliver outcomes sought in the Future Transport Strategy 2056, including the provision of better and safer journeys for all transport customers and the enhancement of movement corridors</u></li> <li>• <u>State Infrastructure Strategy 2018-2038 (Infrastructure NSW 2018) - Part 9 of the 2018 State Infrastructure Strategy 2018-2036 details the strategies for transport in NSW. Six key strategic directions are listed, along with key recommendations. This Proposal is aligned with two of those responses: infrastructure planning, prioritisation and delivery and integrating land use and infrastructure planning.</u></li> <li>• <u>National Road Safety Strategy 2021-30 – Consultation Draft (Infrastructure and Transport Ministers, 2021) – aims to reduce the rates of death and serious injury from road crashes over the next ten years. The Proposal is consistent with these goals as it seeks to improve the safety of the road corridor for all road users including pedestrians and cyclists, whilst also managing the risk posed by roadside hazards and other infrastructure</u></li> <li>• <u>Central Coast Regional Transport Plan (Transport for NSW, 2013) – This plan addresses transport needs and priorities that are specific to the Central Coast Region. The Central Coast Highway is identified as a key focus for future investment. The Proposal is consistent with the broad direction of this plan</u></li> <li>• <u>Central Coast Regional Plan 2036 (NSW Department of Planning and Environment, 2016) - The plan's vision is to create a healthy natural environment, a flourishing economy and well-connected communities. The plan proposes delivery of the vision through four key goals. Under these goals, the plan develops 23 directions and associated actions. Those most relevant to the Proposal are:</u> <ul style="list-style-type: none"> <li>– <u>Goal 1, Direction 4 – Strengthen inter-regional and intra-regional connections for business</u></li> </ul> </li> </ul>	<u>Long-term positive</u>

Factor	Impact
<ul style="list-style-type: none"> <li>- <u>Goal 3, Direction 17 – Align land use and infrastructure planning. This direction emphasises the delivery of new infrastructure to meet the needs of a growing population.</u></li> <li>• <u>NSW 2021: A Plan to Make NSW Number One (NSW Government 2011) - The plan identifies several goals to improve the transport network, such as reducing travel times and improving road safety. The road and shared path upgrades included in the Proposal directly address these priority action areas</u></li> <li>• <u>Road Safety Plan 2021 – The plan sets out priority areas to address recent increases in the road toll and to achieve the NSW Government’s State Priority Target to reduce fatalities by 30 per cent by 2021. The Proposal is consistent with the intent and priorities of this Plan as it addresses the priority action areas of improving road safety</u></li> <li>• <u>Central Coast Council Community Strategic Plan 2018-2028 - Of the five primary themes identified in the Community Strategic Plan, Theme 2 – Smart: “A growing and competitive region” and Theme 4 – Responsible: “Delivering essential infrastructure”, align with the objectives of the Proposal. The Proposal would involve investment in infrastructure including active transport and improved pedestrian access to service the growing population of the region, and is therefore consistent with the aims of the CSP.</u></li> </ul> <p><u>These strategies are discussed in further detail in Chapter 2 of the REF.</u></p>	
(r) <u>Any environmental factors that may be relevant</u>	
<p><u>All relevant environmental factors associated with the Proposal have been considered as shown in Chapter 6 of the REF.</u></p>	Nil

## 4. Environmental management

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The REF for the Proposal identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Chapter 7 of the REF). Should the Proposal proceed, environmental management would be guided by the framework and measures outlined below.

### 4.1 Environmental management plans (or system)

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

A CEMP would be prepared to describe safeguards and management measures identified. The CEMP would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The CEMP would be prepared prior to construction of the Proposal and must be reviewed and certified by environment staff, Transport Northern region, prior to the commencement of any on-site works. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with relevant specifications.

### 4.2 Summary of safeguards and management measures

The REF for the Proposal identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

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



Table 4-1 Summary of environmental safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
GEN1	General - minimise environmental impacts during construction	<p>A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity.</p> <p>As a minimum, the CEMP will address the following:</p> <ul style="list-style-type: none"> <li>Any requirements associated with statutory approvals</li> <li>Details of how the project will implement the identified safeguards outlined in the REF</li> <li>Issue-specific environmental management plans</li> <li>Roles and responsibilities</li> <li>Communication requirements</li> <li>Induction and training requirements</li> <li>Procedures for monitoring and evaluating environmental performance, and for corrective action</li> <li>Reporting requirements and record-keeping</li> <li>Procedures for emergency and incident management</li> <li>Procedures for audit and review.</li> </ul> <p>The endorsed CEMP will be implemented during the undertaking of the activity.</p>	Contractor / TfNSW Project Manager	Pre-construction / Construction	QA G36 Environment Protection
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 / TfNSW project manager	Detailed Design/ Pre-construction	QA G36 Environment Protection



No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
GEN3	General – environmental awareness	<p>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.</p> <p>Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include (the following are examples only):</p> <ul style="list-style-type: none"> <li>• Areas of Aboriginal heritage sensitivity</li> <li>• Threatened species habitat</li> <li>• Adjoining residential areas requiring particular noise management measures</li> </ul>	Contractor / TfNSW project manager	Pre-construction/ Construction	QA G36 Environment Protection
GEN4		<p>The permanent footprint of the Proposal, and all major construction activities, will be undertaken outside of the boundary of the Wamberal Lagoon Nature Reserve. Minor foot access may be required to the peripheral areas of the nature reserve for the purposes of investigations such as topographical or environmental surveys. Such works will be permissible as exempt development, though agreement of NPWS will be sought prior to any such access taking place.</p>	Contractor / TfNSW project manager	Detailed Design /Construction	<p>QA G36 Environment Protection</p> <p>Road Design Drawings</p> <p>PS311 Specification Environmental Design and Compliance</p>
<b>Biodiversity</b>					
B1	Biodiversity	<p>A Flora and Fauna Management Plan will be prepared in accordance with Transport for NSW's <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on Projects</i> (RMS,</p>	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>2011) and implemented as part of the CEMP. It will include, but not be limited to:</p> <ul style="list-style-type: none"> <li>Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas</li> <li>Requirements set out in the Landscape Guideline (RMS, 2008)</li> <li>Pre-clearing survey requirements</li> <li>Procedures for unexpected threatened species finds and fauna handling</li> <li>Procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013)</li> <li>Protocols to manage weeds and pathogens.</li> </ul>			<p>QA Specification G40 Clearing and Grubbing</p> <p>Biodiversity Guidelines: (RTA 2011).</p>
B2	Biodiversity	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Contractor/TfNSW Project Manager	Detailed design/pre-Construction	<p>QA Specification G36 Environment Protection</p> <p>Road Design Drawings</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B3	Aquatic impacts	Aquatic habitat, specifically the unnamed watercourse within the proposal area and additional drainage line to the north east of the proposal, will be protected in accordance with Guide 10: Aquatic habitats and riparian zones in the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Contractor	Construction	Biodiversity Guidelines: (RTA 2011).
B4	Vegetation removal	Pre-clearing surveys will be undertaken in accordance with Guide 1: Pre-clearing process of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Contractor	Construction	QA Specification G40 Clearing and Grubbing  Biodiversity Guidelines: (RTA 2011).

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B5	Vegetation removal	Vegetation and habitat removal will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Contractor	Construction	QA Specification G40 – Clearing and Grubbing  Biodiversity Guidelines: (RTA 2011).
B6	Vegetation removal	Native vegetation will be re-established in accordance with Guide 3: Re-establishment of native vegetation of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Contractor	Detailed Design/ Construction	Biodiversity Guidelines: (RTA 2011).  PS311 Specification Environmental Design and Compliance
B7	Vegetation removal	The unexpected species find procedure is to be applied according to <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) if threatened ecological communities, not addressed in the biodiversity assessment, are identified in the Proposal area.	Contractor	Construction	Biodiversity Guidelines: (RTA 2011).  QA Specification G36 Environment Protection
B8	Vegetation removal	A revegetation and regeneration plan will be compiled which will aim to rehabilitate and manage native vegetation along the eastern extent of the Proposal fronting the Wamberal Lagoon Nature Reserve.	Contractor/TfNSW Project Manager	Detailed Design/ Construction	PS311 Specification Environmental Design and Compliance

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		This will include planting of vegetation consistent with the identified PCT in that area. Rehabilitation of disturbed vegetation, specifically through weed control, will be undertaken to aid in the recovery of native vegetation and reduce colonisation by weeds and exotic species.			Road Design Drawings
B9	Wildlife Connectivity	<p>Landscaping species selection in areas more likely to support existing or future connectivity, such as adjacent to the fruit shop, should be investigated in design with regard to their overall structure and refuge value.</p> <p>This includes planting of taller canopy species next to the road to facilitate for future glider movement across the roadway.</p>	Contractor	Detailed Design/Pre-construction	<p>Wildlife Connectivity Guidelines for Road Projects (RTA 2011).</p> <p>Road Design Drawings</p>
B10	Fragmentation of identified habitat corridors	<p>Connectivity measures will be implemented in accordance with the Wildlife Connectivity Guidelines for Road Projects (RTA 2011).</p> <p>The viability and benefit of an aerial fauna crossing structure <u>will</u> be considered in the detailed design phase with respect to connectivity across the Central Coast Highway between the Wamberal Lagoon Nature Reserve and vegetation on the western side of the road.</p>	Contractor/TfNSW Project Manager	Detailed Design	<p>Wildlife Connectivity Guidelines for Road Projects (RTA 2011).</p> <p>PS311 Specification Environmental Design and Compliance</p> <p>Road Design Drawings</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B11	Edge effects on adjacent native vegetation and habitat	<p>Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011).</p> <p>In particular temporary exclusion fencing will be provided along the Nature Reserve boundary and a strict no entry procedure for vehicles, plant and equipment implemented during construction.</p>	Contractor	Construction	<p>QA Specification G40 – Clearing and Grubbing</p> <p>Biodiversity Guidelines: (RTA 2011).</p>
B12	Injury and mortality of fauna	Fauna will be managed in accordance with Guide 9: Fauna handling of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Contractor	Construction	<p>Biodiversity Guidelines: (RTA 2011).</p> <p>QA Specification G36 Environment Protection</p>
B13	Invasion and spread of weeds	Weed species will be managed in accordance with Guide 6: Weed management of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).			<p>Biodiversity Guidelines: (RTA 2011).</p> <p>QA Specification G36 Environment Protection</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B14	Invasion and spread of weeds	<p>To minimise spread of weeds and disease;</p> <ul style="list-style-type: none"> <li>All vehicles will be inspected for soil and plant materials before their first entry to the Proposal area and non-complying plant and equipment will be refused entry until cleaned.</li> </ul> <p>All materials imported to the site for landscaping and environmental controls such as mulch, topsoil and plat materials will be certified as weed free and inspected before entry to the site.</p>	Contractor	Construction	QA Specification G36 Environment Protection
B15	Invasion and spread of pests	The contractor will undertake a pre-construction weed survey and undertake preliminary removal or control of weed species within the construction zone and clearing limits.	Contractor	Construction	QA Specification G40 – Clearing and Grubbing
B16	Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with Guide 2: Exclusion zones of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).	Contractor	Construction	<p>Biodiversity Guidelines: (RTA 2011).</p> <p>QA Specification G36 Environment Protection</p>
B17	Noise, light and vibration	Permanent and temporary lighting will be directed away from natural areas particularly adjacent to the Wamberal Lagoon Nature Reserve, as far as practicable and in accordance with Australian Standards for road lighting and worker safety. Vegetation selected for planting adjacent to the nature reserve should consider growth habit and its	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		ability to reduce light entering the nature reserve.			
<b>Landscape character and visual</b>					
LV1	Landscape character and visual impact	<p>An Urban Design and Landscape Plan will be prepared as part of the design stage of the Proposal. The Plan will include:</p> <ul style="list-style-type: none"> <li>• Location and identification of vegetation in the Proposal area to be retained and proposed landscaped areas</li> <li>• Details of the staging of built elements including barriers/retaining walls</li> <li>• Details of the staging of landscape works</li> <li>• Details of visual treatments on retaining structures, shelters and shared path barriers/fences to fit with the local landscape</li> <li>• Maintenance measures for landscaped or rehabilitated areas, including timing of maintenance works</li> <li>• A landscape monitoring program including an inspection program and frequency of inspection.</li> </ul>	Contractor	Detailed design	<p>PS381 Specification Urban Design</p> <p>Road Design Drawings</p> <p>TfNSW Beyond the Pavement, Urban design principles and procedures (2020)</p>



No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
LV2	Landscape character and visual impact	<p>A revegetation plan will be prepared by a specialist bush regeneration specialist and included in the design for planting of batters and proposal edges along the Wamberal Nature Reserve. This will include:</p> <ul style="list-style-type: none"> <li>• Weed control,</li> <li>• Local sourced and endemic species, encouraging natural regeneration.</li> <li>• Possible local seed collection for plantings where practical and legal.</li> </ul> <p>For planting adjacent to the Wamberal Lagoon Nature Reserve, all plant material will be locally sourced (seed collection preferred), with any seed collection to commence within three months of construction contract award, where possible.</p>	Contractor	Detailed design	PS311 Specification Environmental Design and Compliance
LV3	Landscape and visual	Retain and protect existing trees wherever practical to minimise impacts upon views and the landscape character. Include tree protection measures in the CEMP for trees to be retained within or on the edge of works.	Contractor	Detailed Design/ Construction	<p>PS311 Specification Environmental Design and Compliance</p> <p>QA Specification G40 – Clearing and Grubbing</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
LV4	Landscape and visual	Provide cut-off or directed lighting within and outside of the construction site and ancillary facilities, with lighting location and direction considered to ensure glare and light spill is minimised.	Contractor	Construction	QA Specification G36 Environment Protection
<b>Surface water and flooding</b>					
W1	General	<p>A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The Plan will at a minimum:</p> <ul style="list-style-type: none"> <li>• Develop detailed designs for the major erosion and sedimentation control measures.</li> <li>• Assess erosion and sedimentation risks and impacts.</li> <li>• Develop erosion and sedimentation avoidance, mitigation and management measures for the Proposal and any ancillary facilities.</li> <li>• Provide advice and deliverables in accordance with RMS procedure PN 143 Erosion and Sedimentation Management Procedure (RTA, 2008).</li> <li>• Inspection, monitoring and review of the effectiveness of all controls during construction and following significant wet weather events or onsite incidents.</li> <li>• Provide detailed and specific erosion, sediment and pollution controls for the large drainage channel flowing beside Tumbi Road to the Wamberal Lagoon</li> </ul>	Contractor	Detailed Design/ Construction	<p>QA Specification G38 Soil and Water</p> <p>PN 143 Erosion and Sedimentation Management Procedure (RTA, 2008)</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Nature Reserve and for the edge of the works along the Wamberal Lagoon Nature Reserve boundary.			
W2	Erosion and sediment control mitigation	<p>A site-specific Erosion and Sediment Control Plan(s) will be prepared and implemented and included in the Soil and Water Management Plan. This plan should be progressive and revised and re-submitted with each stage of construction.</p> <p>The Plan(s) will identify detailed measures and controls to be applied to minimise erosion and sediment control risks for the Proposal and any ancillary facilities.</p> <p>Constraints on access for regular maintenance and final removal after stabilisation of the works must also be considered in the selection of controls for these locations.</p> <p>The Plan will also include arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms, severe weather warnings) and specific controls and follow-up measures to be applied in the event of wet weather.</p>	Contractor	Construction	<p>QA Specification G38 Soil and Water</p> <p>PN 143 Erosion and Sedimentation Management Procedure (RTA, 2008) Managing Urban Stormwater: Soils and Construction series (2004)</p>
W3	Erosion and sediment control mitigation	Any areas established within the Proposal boundary or at ancillary facility sites for stockpiling will be planned, operated and decommissioned in accordance with the RMS Technical Guideline EMS-TG-010: Stockpile Site Management and RMS Stockpile Site Management Guideline 2015	Contractor	Construction	<p>QA Specification G38 Soil and Water</p> <p>RMS EMS-TG-010: Stockpile Site</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>In particular this will include obtaining appropriate planning approvals/permissions where relevant, control of stockpile heights, appropriate separation of stored materials and other controls such as:</p> <ul style="list-style-type: none"> <li>• Site controls for dust, noise, run-off,</li> <li>• Cover before significant weather events</li> <li>• Bunds</li> <li>• Diversion of offsite flows away from storage</li> <li>• Stabilised laydowns</li> <li>• Storage clear of frequently flooded low-lying areas and located 20m from nearby waterways and drains unless otherwise isolated or managed for run-off.</li> </ul>			Management and Stockpile Site Management Guideline 2015
W4	Erosion and sediment control mitigation	<p>Batters will be designed and constructed to minimise risk of exposure, instability and erosion, and to support long-term, on-going best practice management, in accordance with Roads and Maritime 'Guideline for Batter Surface Stabilisation using vegetation' (2015).</p> <p>The temporary stabilisation or final landscaping of disturbed areas will be undertaken progressively as construction stages are completed. Temporary or permanent stabilisation or final landscaping will be included as an item in the construction program for each stage.</p>	Contractor	Detailed Design/ Construction	<p>Managing Urban Stormwater: Soils and Construction series (2004)</p> <p>RMS Guideline for Batter Stabilisation using Vegetation (2015).</p>
W5	Erosion and sediment control mitigation	Consistent with any specific requirements of the approved Soil and Water Management Plan, control measures will be implemented to minimise risks associated with erosion and sedimentation and entry of materials to	Construction Contractor	Construction	QA Specification G38 Soil and Water

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>drainage lines and waterways. Controls that may be considered, include:</p> <ul style="list-style-type: none"> <li>• Identification of upslope run-on waters from undisturbed areas of catchment and diversion of these around un-stabilised areas of the Proposal.</li> <li>• Sediment management devices, such as but not limited to fencing, hay bales or sandbags, coir logs and graded or lined earth or sandbag diversion bunds and banks.</li> <li>• Measures to divert or capture and filter water prior to discharge, such as drainage diversion channels to flush and sediment sumps or traps</li> <li>• Scour protection and energy dissipaters at locations of high erosion risk</li> <li>• Controls at exit points of ancillary facilities and the proposal site from working areas to minimise the tracking of soil and particulates onto pavement surfaces. Any soil material transported onto pavement surfaces will be swept and removed at the end of each working day.</li> <li>• Location and storage of construction materials, fuels and chemicals, including controls where possible will be managed in accordance with <i>Managing urban stormwater: soils and construction</i> (the Blue Book).</li> </ul>			Managing Urban Stormwater: Soils and Construction series (2004)

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> <li>Stabilisation of the surface of batters and drains, including temporary works and diversions.</li> </ul>			
W6	Erosion and sediment control mitigation	Temporary surface stabilisation and batter drainage controls will be included in the Soil and water management Plan and ESCP for the construction of permanent or temporary batters/banks near the boundary of the Wamberal Lagoon Nature Reserve or the large drainage line beside Tumby Road, before permanent stabilisation or landscaping.	Contractor	Detailed design/ Construction	QA Specification G38 Soil and Water
W7	Water Quality and Surface water mitigation	A background water quality assessment should be conducted for the drainage lines into the nature reserve and Wamberal Lagoon. This assessment will inform the water quality objectives for the construction water quality program. The parameters measured, and the timing and frequency of water quality monitoring to be agreed between TfNSW and the Contractor prior to construction commencing.	Contractor	Detailed Design	PS311 Specification Environmental Management and Compliance
W8	Water Quality and Surface water mitigation	<p>A water quality monitoring program for construction will be developed and implemented as part of the Soil and Water Management Plan in accordance with Roads and Maritime Guideline for Construction Water Quality Monitoring (Roads and Maritime, 2003).</p> <p>The monitoring program is to include:</p> <ul style="list-style-type: none"> <li>Visual monitoring of the quality of site runoff, and of downstream water quality</li> </ul>	Contractor	Construction	<p>QA Specification G36 Environment Protection</p> <p>QA Specification G38 Soil and Water</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>should be conducted daily, including a simple site record</p> <ul style="list-style-type: none"> <li>Weekly downstream water quality monitoring for the duration of work on drainage lines discharging to the Wamberal Nature Reserve.</li> <li>At a minimum, this would include monitoring within or immediately downstream of the large drainage line adjacent to Tumbi Road, and at an upstream location that is beyond the direct influence of the works.</li> <li>Emergency management, including notification of unusual results, response and clean-up procedures</li> </ul>			
W9	Surface water quality mitigation	<p>A Spill Management Procedure will be prepared and implemented as part of the CEMP to minimise the risk of pollution arising from spillage or contamination on the site and adjoining areas. The Spill Management Plan will address, but not necessarily be limited to:</p> <ul style="list-style-type: none"> <li>Management of chemicals and potentially polluting materials</li> <li>Any specialised containment, security and bunding requirements</li> <li>Maintenance of plant and equipment</li> <li>Emergency management, including notification, response and clean-up procedures.</li> </ul>	Contractor	Pre-construction / Construction	<p>QA Specification G38 Soil and Water</p> <p>QA Specification G36 Environment Protection</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
W10	Surface water contamination	<p>There is to be no release of dirty water into drainage lines and/or waterways.</p> <p>Surface water will be managed in accordance with <i>Managing urban stormwater: soils and construction</i> (the Blue Book)</p>	Contractor	Construction	QA Specification G38 Soil and Water
W11	Surface water contamination	Water quality control measures are to be used to prevent any contamination of surface waters from construction materials (e.g. Litter or waste, concrete, grout, etc) entering drain inlets or waterways. This is to be addressed in the CEMP.	Contractor	Construction	QA Specification G38 Soil and Water
W12	Water – Flood Management and Evacuation Procedure	<p>A Flood Management and Evacuation Procedure will be prepared as part of the CEMP to manage a potential flood event during construction and will outline evacuation procedures and measures to reduce risk, including removal of all plant/equipment, stabilising exposed areas and removing or securing any potential storage area to prevent pollution from chemicals and waste materials. The plan will include:</p> <ul style="list-style-type: none"> <li>Processes for monitoring and mitigation of flood risk for the Proposal site and any ancillary facilities</li> <li>Evaluation of what rainfall and storm events will trigger the plan, based on the local rainfall patterns and flood modelling.</li> <li>Evacuation procedures along with a map indicating the potential locations where to evacuate.</li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection



No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> <li>Process to evaluate conditions post-event for re-opening of the site and ancillary facilities including but not limited to plant access, clean up and de-watering.</li> <li>Immediate post-event inspection and review of plans and processes for future events</li> <li>Links to incident reporting processes for managing any breaches or failures or site controls.</li> </ul>			
W13	Flood Mitigation	Weather and rainfall conditions will be regularly monitored in advance to identify potential flood conditions and manage potential flooding impacts in accordance with the CEMP, including stop work periods.	Contractor	Construction	QA Specification G38 Soil and Water
W14	Flood Mitigation	If existing drainage lines are to be impacted during construction, then a construction methodology is to be developed in advance of drainage works commencing which aims to maintain existing flows and consider the provision of temporary alternate flow paths or diversions, and temporary stabilisation of disturbed outlets and banks of drainage lines.	Contractor	Construction	QA Specification G36 Environment Protection  QA Specification G
<b>Groundwater</b>					
GW1	Groundwater quality	Risks to groundwater posed by construction activities will be managed as part of the Soil and Water Management Plan (SWMP) in the CEMP.	Contractor	Construction	QA Specification G38 Soil and Water

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		The SWMP should consider measures to prevent impacts to shallow groundwater from construction activities including but not limited to management of deep excavations including a dewatering management procedure, general site chemical and water storage, handling and management practices and control of minor spills from construction near excavations.			RMS Groundwater Impact Assessment Practice Note (August 2019)
GW2	Groundwater drawdown	<p>If high seepage rates are encountered during excavations into natural ground surface, a detailed procedure for groundwater management will be developed for the SWMP.</p> <p>The procedure will consider measures including, but not limited to containment of run-off of groundwater from excavations, minimising the duration of excavations to limit volumes of seepage, collection of groundwater from dewatering of earthworks and testing of water quality prior to discharge, testing and reuse of water on-site.</p>	Contractor	Construction	QA Specification G38 Soil and Water
GW3	Contamination	<p>Should groundwater be encountered during excavation works, groundwater will be managed in accordance with the requirements of the Waste Classification Guidelines (EPA, 2014) and Roads and Maritime Technical Guideline: Environmental Management of Construction Site Dewatering (RTA 2011) and the Preliminary Groundwater Impact Assessment.</p> <p>A low concentration of PFOS was identified in one of the design sampling wells</p>	Contractor	Construction	<p>QA Specification G38 Soil and Water</p> <p>RMS Technical Guideline: Environmental Management of Construction Site</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>(geotechnical investigation borehole BH2004) and therefore further sampling of groundwater is recommended for any areas where dewatering and disposal of groundwater is required. This requirement will be included in any dewatering management plan prior to construction.</p> <p>If identified during further sampling, controls to mitigate exposure to low levels of PFOS in groundwater for human health and/or ecological receptors during construction phase, must also be documented in the CEMP.</p>			Dewatering (RTA 2011)
GW4	Groundwater quality	<p>Ongoing groundwater impacts during operation may be mitigated through consideration of the following in detailed design and handover of the completed proposal:</p> <ul style="list-style-type: none"> <li>• Provision for stormwater drainage collection systems that are isolated from natural groundwater.</li> <li>• Accident and spill clean-up response measures that minimise, to the extent practicable, releases to the environment and groundwater.</li> </ul>	Contractor	Detailed Design/ Operation	Handover Drawings/ Report

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
<b>Soils and contamination</b>					
E1	Contamination	The CEMP will identify the areas of known or potential contamination which may be impacted during construction and includes the controls and monitoring required to mitigate the risks of exposure to the identified human health and/or ecological receptors.	Contractor	Detailed Design/ Construction	QA Specification G36 Environment Protection
E2	Contamination	<p>The CEMP will include an unexpected finds procedure for any soil and water contamination that is identified and not anticipated based on the findings of the PSI and the REF.</p> <p>If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. This may include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Diversion of surface runoff around stockpiles and excavations</li> <li>• Capture of any contaminated runoff from stockpiles or disturbed areas</li> <li>• Temporary cover on excavations and stockpiles.</li> </ul> <p>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 (for the Proposal area) or further actions are identified in consultation with the TfNSW Environment Manager and/or the appropriate regulatory agency (EPA).</p>	Contractor	Construction	<p>Specification G36 Environment Protection</p> <p>RMS Guideline for the Management of Contamination (2017)</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
E3	Contamination	<p>An Asbestos Management Plan will be developed and implemented to manage asbestos and asbestos containing material if encountered at the ancillary facilities during the construction. The plan will include:</p> <ul style="list-style-type: none"> <li>• Identification of potential asbestos on site</li> <li>• Procedures to manage and handle any asbestos</li> <li>• Mitigation measures if asbestos is encountered during construction</li> <li>• Procedures for disposal of asbestos in accordance with the NSW EPA guidelines, Australian Standards and relevant industry codes of practice.</li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection
E4	Contamination	<p>A SAQP should be prepared for detailed design or construction which includes targeted sampling of shallow soils in vicinity of BH2001 to delineate chromium impacts and characterise the soils to allow for excavation and off-site disposal during the construction phase.</p> <p>The SAQP should also consider at a minimum:</p> <ul style="list-style-type: none"> <li>• Soil testing to delineate the extent of acid sulphate soils where deep excavation works are required.</li> <li>• In-situ waste classification for proposed areas of excavation and disposal of soil.</li> </ul>	Contractor	Detailed design	PS311 Environmental Management and Compliance  PS331
E5	Contamination	<p>An ASSMP will be prepared as part of the CEMP for earthworks, utility and drainage works of the Proposal if greater than 1,000 tonnes of potential ASS are to be disturbed</p>	Contractor	Construction	QA Specification G36

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>during construction. The ASSMP will detail the management requirements for ASS within the disturbed areas of the Proposal in accordance with Roads and Maritime Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze (RTA, 2005) and ASSMAC (1998).</p> <p>The plan will consider testing requirements and handling procedures, where materials are identified in-situ, offsite treatment options, containment of any stockpiles of suspected ASS/PASS materials and locations for treatment.</p> <p>All natural soils below ground level should be assumed to be PASS, unless high density assessment indicates specific horizons are not PASS. Controls to mitigate exposure to acid sulfate soils by ecological receptors during construction phase, will also be documented in the CEMP.</p>			<p>Environment Protection</p> <p>RMS Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock &amp; Monosulfidic Black Ooze (RTA, 2005)</p>
<b>Traffic and transport</b>					
T1	Traffic and Transport	<p>A TMP will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Transport for NSW Traffic Control at Work Sites Manual Version 6 (Transport for NSW, 2020) and QA Specification G10 Control of Traffic (Transport for NSW, 2010). The TMP will include:</p> <ul style="list-style-type: none"> <li>Confirmation of haulage routes</li> </ul>	Contractor	Construction	<p>QA Specification G10 Traffic Management.</p> <p><i>Traffic Control at Work Sites Manual Version 6</i></p>



No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> <li>Measures to maintain access to local roads and properties</li> <li>Site specific traffic control measures (including signage) to manage and regulate traffic movement</li> <li>Measures to maintain pedestrian and cyclist access</li> <li>Requirements and methods to consult and inform the local community of impacts on the local road network</li> <li>Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads.</li> <li>A response plan for any construction traffic incident</li> <li>Consideration of other developments that may be under construction to minimise cumulative impacts.</li> </ul>			(Transport for NSW, 2020)
T2	Access to properties	Access to properties will be maintained during construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the relevant local road authority.	Contractor and TfNSW Project Manager	Construction	QA Specification G10 Traffic Management.

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
T3	Access to properties	Disruptions to property access and traffic will be notified to landowners at least five days prior in accordance with the relevant community consultation processes outlined in the Traffic Management Plan (TMP)	Contractor and TfNSW Project Manager	Construction	QA Specification G10 Traffic Management.
T4	Local road condition	Pre-construction and post construction road condition reports for local roads likely to be used during construction will be prepared. Any damage resulting from construction (not normal wear and tear) will be repaired unless alternative arrangements are made with the relevant road authority. Copies of road condition reports will be provided to the local roads authority	Contractor	Pre and post construction	QA Specification G10 Traffic Management.
T5	Pedestrian and cyclist access	Safe pedestrian and cyclist access will be maintained throughout construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners, the community and the local road authority (Central Coast Council) in advance.	Contractor	Construction	QA Specification G10 Traffic Management.
T6	Bus stops	During construction access to existing bus services within the Proposal will be maintained and following consultation with bus service providers, temporary stops and access provided where relocation is necessary for construction activities	Contractor/TfNSW Project Manager	Construction	QA Specification G10 Traffic Management.
T7	Shared path	An audit will be undertaken into the deferral of the section of the shared path north from the intersection along the Central Coast Highway adjacent to the Wamberal Lagoon Nature	Contractor/TfNSW Project Manager	Detailed Design	Road Design Drawings

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>Reserve, to investigate safety issues where users are required to merge back onto the existing highway shoulders and verges to the north.</p> <p>Should a decision be made to defer the construction of the path north of the intersection, the design will ensure that adequate provisions including utility locations, landscaping, earthworks and drainage are included to enable separate construction of the path in the near future for the full length of the highway to connect to other shared footpaths at Crystal Street.</p>			Detailed Design Report
<u>T8</u>	<u>Project Design</u>	<p><u>Based on suggestions raised during the community submissions stage of the REF, TfNSW will investigate changes to the proposed footpath to shared path along Tumbi Road within the limits of the Proposal. This will include investigation of the feasibility of a shared path, which will provide the benefit of potential future connection into any future shared path facilities that may be constructed further along Tumbi Road as a part of the Central Coast Cycle Plan. The ability to accommodate this upgrade will depend on the ability for drainage and utilities to be appropriately managed within the available space.</u></p>	<u>Contractor/TfNSW Project Manager</u>	<u>Detailed Design</u>	<p><u>Road Design Drawings</u></p> <p><u>Detailed Design Report</u></p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
<b>Noise and vibration</b>					
NV1	Operational Noise	Noise mitigation options in the form of low noise pavements, noise barriers, and architectural (at-receiver) treatments will be investigated and developed further in detailed design based on the properties identified in the REF for consideration of noise treatment	Contractor	Detailed Design	RMS Noise Mitigation Guideline (2015)
NV2	Operational Noise	The final design of the proposal will include full design and specification of all the noise attenuation measures required for the proposal (such as: noise walls, noise mounds, architectural treatments, pavement treatments) for all properties identified as being impacted by operational traffic noise.	Contractor	Detailed Design	PS311 Environmental Management & Compliance  RMS Noise Mitigation Guideline (2015)
NV3	Operational Noise	Where properties have been identified for at-receiver treatment options and these properties could also be substantially impacted by noise from construction works, TfNSW will investigate and engage with those property owners on the early installation of treatments to provide noise mitigation during the construction of the proposal, and implement where feasible.	TfNSW Project Manager	Detailed Design	
NV4	Construction Noise and vibration	A Construction Noise and Vibration Management Plan will be prepared as part of	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<p>the Construction Environmental Management Plan. The CNVMP will identify:</p> <ul style="list-style-type: none"> <li>• All potential significant noise and vibration Generating activities associated with the activity</li> <li>• Noise and vibration sensitive receivers</li> <li>• Measures to be implemented during construction to minimise noise and vibration impacts.</li> <li>• Feasible and reasonable mitigation measures to be implemented, taking into account the RMS Construction Noise and Vibration Guideline process and principles.</li> <li>• A monitoring program to assess performance against relevant noise and vibration criteria</li> <li>• Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures.</li> </ul>			RMS Construction Noise and Vibration Guideline (2016)

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV5	Noise and vibration	<p>The CNVMP will also contain a comprehensive night works approval procedure, including</p> <ul style="list-style-type: none"> <li>• Maintain a rolling schedule of upcoming night work periods,</li> <li>• Inclusion of scheduled respite for the community for extended periods of night work</li> <li>• Methods for assessment and review of impacts,</li> <li>• Methods for expanded community engagement, notification and agreements</li> <li>• Records of community engagement, and proposed mitigation measures.</li> </ul>	Contractor	Construction	<p>QA Specification G36 Environment Protection</p> <p>Staging Plans</p>
NV6	Noise and vibration	All sensitive receivers likely to be affected will be notified at least five working days prior to commencement of any works associated with the scenario that may have an adverse noise or vibration impact. The notification will include details of:	Contractor/TfNSW Project Manager	Construction	QA Specification G36 Environment Protection



No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> <li>The construction activities likely to have noise or vibration impact</li> <li>Construction period and construction hours</li> <li>Any proposed mitigation measures for noise and vibration</li> <li>Contact information for the proposal, including out of hours contact project</li> <li>Complaint and incident reporting and how to obtain further information.</li> </ul>			
NV7	Noise and vibration	<p>All employees, contractors and subcontractors are to receive awareness training in control of noise and vibration as part of their regular site induction and updated prior to any significant period of nightwork:</p> <ul style="list-style-type: none"> <li>All relevant Proposal specific and standard noise and vibration mitigation measures</li> <li>Relevant licence and approval conditions</li> <li>Permissible hours of work</li> <li>Any limitations on high noise generating activities</li> <li>Location of nearest sensitive receivers</li> <li>Construction employee parking areas</li> <li>Designated loading/unloading areas and procedures</li> <li>Site opening/closing times (including deliveries)</li> <li>Environmental incident procedures.</li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV8	Noise and vibration	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Works generating high noise and/or vibration levels should be scheduled during less sensitive time periods. Where it is unavoidable to conduct works in standard hours for safety of workers and the public, for the safe and efficient operation of the road network or to maintain critical access to local services, then an assessment and approval process will be undertaken as per the CNVMP and RMS Construction Noise and Vibration Guidelines.	Contractor	Construction	QA Specification G36 Environment Protection  RMS Construction Noise and Vibration Guideline (2016)
NV9	Noise and vibration	Where feasible and reasonable, high noise generating work (75 dB(A) $L_{Aeq}$ at receiver) should be carried out during standard construction hours and in continuous blocks of no more than three hours with at least one hour respite between each block of work generating high noise impact, where the location of the work is likely to impact the same receiver.	Contractor	Construction	QA Specification G36 Environment Protection  RMS Construction Noise and Vibration Guideline (2016)
NV10	Noise	Where high noise generating activities (75 dB(A) $L_{Aeq}$ at receiver) are required out of hours the following will be implemented: <ul style="list-style-type: none"> <li>The equipment will be used prior to 10pm where feasible and reasonable</li> <li>Where the above cannot be achieved, the equipment can be used where feasible and reasonable controls are implemented</li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection  RMS Construction Noise and

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		and there is engagement with any highly noise affected community receivers.			Vibration Guideline (2016)
NV11	Noise	<p>The following will be implemented for deliveries to and from the Proposal:</p> <ul style="list-style-type: none"> <li>• Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers or</li> <li>• loading/unloading areas are to be shielded or screened if close to sensitive receivers</li> <li>• Delivery vehicles are to be fitted with straps rather than chains for unloading, wherever possible</li> <li>• When establishing work areas, site compounds and laydowns consideration will be given to arranging the site to limit the need for reversing associated with regular/repeatable movements, where safe and space permits.</li> </ul>	Contractor	Construction	QA Specification G10 Traffic Management.
NV12	Noise	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work.	Contractor	Construction	QA Specification G36 Environment Protection
NV13	Noise and vibration	Consideration will be given to the layout of the ancillary facilities in order to maximise distance and shielding to nearby receivers (e.g. positioning of site sheds, earth bunds and hoarding to maximise shielding to residential receivers).	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Longer term screening and shielding of the boundaries of the site and will also be included in the CEMP, following a quantitative assessment of the risk of noise impact in pre-construction and proximity to sensitive receivers.			
NV14	Noise	<p>Where safe and practicable, long periods of noisy work and night work that is 5dB(A) above the noise management levels in the REF, should be scheduled to avoid major student examination periods such as before or during Higher School Certificate.</p> <p>Where this is unavoidable, assessment of noise and vibration impacts and engagement with the local community and Wamberal School should occur 3 weeks in advance of works.</p>	Contractor	Construction	<p>QA Specification G36 Environment Protection</p> <p>RMS Construction Noise and Vibration Guideline (2016)</p>
NV15	Vibration	Vibration intensive equipment size will be selected to avoid working within the structural damage minimum working distances. The use of less vibration intensive methods of construction or equipment will be considered where feasible and reasonable.	Contractor	Construction	RMS Construction Noise and Vibration Guideline (2016)
NV16	Vibration	Where the use of vibration intensive equipment within the relevant minimum working distances cannot be avoided, a detailed inspection will be carried out and a written and photographic report prepared to document the condition of buildings and structures within the minimum working distances. This will be conducted during the development of the CEMP and reviewed prior	Contractor	Construction	<p>QA Specification G36 Environment Protection</p> <p>RMS Construction Noise and</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		to the commencement of vibration intensive work. A copy of the report will be provided to the relevant landowner or land manager			Vibration Guideline (2016)
NV17	Noise and vibration	<p>Vibration generating activities will be managed to minimise the potential for impacts on structures and sensitive receiver(s), including maximising minimum safe working distances where practicable, or use of alternate methods to minimise vibration where minimum safe working distances cannot be achieved.</p> <p>Where alternatives cannot be implemented, vibration monitoring is to be undertaken and receivers notified at least 5 days in advance of works.</p>	Contractor	Construction	<p>QA Specification G36 Environment Protection</p> <p>RMS Construction Noise and Vibration Guideline (2016)</p>
<b>Aboriginal heritage</b>					
AH1	Aboriginal heritage	<p><i>The Unexpected Heritage Finds Guideline Standard Management Procedure - Unexpected Heritage</i> Items (Transport for NSW, 2015) will be included in the CEMP and followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction including at ancillary facilities. This applies where Transport for NSW 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>	Contactor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
AH2	Aboriginal heritage	The contractor will arrange for an induction will be held by the Darkinjung Local Aboriginal Land Council (LALC) on local heritage values and objects to assist in identifying any unexpected items that may be uncovered during works.	Contactor/TfNSW Project Manager	Construction	QA Specification G36 Environment Protection
AH3	Aboriginal heritage	An updated heritage risk assessment will be prepared to assess the ancillary facility locations prior to signing any leases or agreements to use the area.	Contactor/TfNSW Project Manager	Detailed Design/Construction	
<b>Non-Aboriginal Heritage</b>					
NA1	Non-Aboriginal heritage	<i>The Unexpected Heritage Finds Guideline</i> (Transport for NSW, 2015d) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contactor	Construction	QA Specification G36 Environment Protection
<b>Property and land use</b>					
P1	Property acquisition	All property acquisition will be carried out in accordance with the <i>Land Acquisition Information Guide</i> (Transport for NSW, 2012) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	TfNSW	Detailed Design	Land Acquisition Information Guide (Transport for NSW, 2012)
P2	Property acquisition	The Proposal will include design of and implementation of property adjustments including fencing, driveways/access and other property infrastructure impacted by the	Contractor/TfNSW Project Manager	Detailed Design/Construction	Road Design Drawings



No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Proposal in consultation with affected property owners.			
P3	Land use	Further investigation into the feasibility of signage along the boundary with the nature reserve to notify people of penalties for unauthorised access of the Wamberal Lagoon Nature Reserve.	Contractor in consultation with NPWS	Detailed Design	PS311 Environmental Management & Compliance
<b>Socio-economic</b>					
SE1	Community cohesion	<p>A Community Liaison Plan (CP) will be prepared and implemented as part of the CEMP to ensure provision of timely and accurate information to the community during construction. The CP will include (as a minimum):</p> <ul style="list-style-type: none"> <li>Processes to actively identify the affected local community and obtain contact details, including routine review.</li> <li>Consultation activities to provide advance notification of details and timing of proposed activities to affected residents, including for notifying traffic changes and access changes, major project milestones and managing night and weekend work processes.</li> <li>Project hotline or contact number for complaints</li> <li>How the Proposal webpage will be maintained for the duration of the Proposal.</li> <li>A complaints handling procedure.</li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
SE2	Public transport	Further consultation with bus companies will be undertaken to confirm and refine bus stop changes and design. This should also include an audit of the layout of the bus stops and how that may impact on shared path users and pedestrian routes.	Contractor	Detailed Design	
SE3	Access impacts	Advance notice (at least 3 weeks) of changes to bus stops, pedestrian paths and cycle arrangements will be made to surrounding communities. This will also note the temporary impacts to the Juniors at Wamberal childcare centre access and impacts to the Kingdom Hall of Jehovah's Witnesses access and parking.	Contractor	Construction	QA Specification G36 Environment Protection
SE5	Business impacts	The Proposal will regularly engage with directly affected businesses regarding the progress of the Proposal to allow businesses time to prepare for changed local conditions through the area.	TfNSW Project Manager	Detailed Design/Construction	QA Specification G36 Environment Protection
SE6	Business impacts	Temporary 'open for business' signage options will be investigated and installed at businesses located within the Proposal if construction staging is likely to impact access or visibility.	Contractor	Construction	QA Specification G36 Environment Protection
SE7	Further stakeholder engagement	Ongoing consultation will occur with directly affected residents and businesses throughout the development of the detailed design and during construction. This will include information on relevant impacts during	TfNSW Project Manager	Detailed Design/Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		construction including changes to property, access and adjustments to accommodate the Proposal.			
<b>Air Quality</b>					
AQ1	Air Quality	<p>Air quality management measures for the proposal area and any ancillary facilities will be implemented as part of the CEMP. The CEMP will identify:</p> <ul style="list-style-type: none"> <li>• Potential sources of air pollution (such as dust, vehicles transporting waste, plant and equipment) during construction</li> <li>• Air quality management objectives consistent with relevant published EPA and/or DPIE guidelines.</li> <li>• Mitigation and suppression measures to be implemented.</li> <li>• Methods to manage works during strong winds or other adverse weather conditions</li> <li>• A progressive rehabilitation strategy for exposed surfaces</li> <li>• Community notification and complaint handling procedures.</li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection
AQ2	Air Quality	<ul style="list-style-type: none"> <li>• To minimise the generation of dust from construction activities, the following measures will be implemented both for the Proposal site and any ancillary facilities/compounds: <ul style="list-style-type: none"> <li>- Apply water (or alternate surface stabilisation measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)</li> </ul> </li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> <li>- Install screening, buffers and sealed hardstands and access tracks for ancillary facilities.</li> <li>- Cover stockpiles when not in use and locate away from areas next to residences</li> <li>- Appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading</li> <li>- Prevent mud and dirt being tracked onto sealed road surfaces.</li> <li>- Progressively apply final stabilisation or landscaping to disturbed surfaces as completed</li> </ul> <p>Methods for management of dust and site vehicle emissions will be incorporated into project inductions, training and pre-start/toolbox talks.</p>			
AQ3	Air Quality	Vehicle and machinery movements during construction will be restricted to designated areas and sealed/compacted surfaces where practicable. Access tracks and gate access will be regularly swept and watered down at gate access and on site access tracks.	Contractor	Construction	QA Specification G10 Traffic Management.

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
AQ4	Air Quality	Plant and machinery will be regularly checked and maintained in a proper and efficient condition. Plant and machinery will be switched off when not in use and not left idling.	Contractor	Construction	QA Specification G36 Environment Protection
<b>Waste and resource use</b>					
M1	Waste and resource use	<p>Waste management measures and procedures shall be prepared for the CEMP which follows the <i>Roads and Maritime Technical Guide: Management of road construction and maintenance waste</i>.</p> <p>All wastes will be managed in accordance with the <i>Protection of the Environment Operations Act 1997</i>.</p> <p>The measures will include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Measures to avoid and minimise waste associated with the project</li> <li>• Consideration of resource management hierarchy principles</li> <li>• Procedures to ensure the legal classification of wastes and management options (re-use, recycle, stockpile, disposal)</li> <li>• Procedures for storage, transport and disposal including the identification of suitable temporary storage areas for material awaiting classification</li> </ul>	Contractor	Construction	<p>QA Specification G36 Environment Protection</p> <p>RMS Technical Guide: Management of road construction and maintenance waste.</p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		<ul style="list-style-type: none"> <li>Measures for collecting and removing waste from site progressively and completely by proposal completion</li> <li>The preparation and maintenance of a Waste Management Register</li> <li>Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions</li> <li>Monitoring, record keeping and reporting</li> </ul>			
M2	Waste and resource use /Contamination	The CEMP for the Proposal will include procedures for waste disposal and tracking including disposal of fill, soil and bedrock in accordance with the NSW EPA (2014) Waste Classification Guidelines and applicable provisions under the PoEO Act. Work, health and safety controls to prevent exposure of construction workers to contamination will be implemented in accordance with the requirements of the <i>Work Health and Safety Act 2011</i> and the <i>Work Health and Safety Regulation 2017</i> .	Contractor	Construction	QA Specification G36 Environment Protection  NSW EPA (2014) Waste Classification Guidelines
M3	Waste and resource use	If vegetation is to be mulched and transported off-site for beneficial re-use, it is to be assessed for the presence of weeds, pests, and other diseases and a Mulch Management Plan prepared in accordance with the <i>Roads and Maritime Technical Procedure: Mulch Management</i> .	Contractor	Construction	QA Specification G36 Environment Protection  RMS Technical



No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		The use and storage of mulch onsite from any source will be in accordance with Roads and Maritime's environmental Direction 25: <i>Management of Tannins from Vegetation Mulch</i> .			Procedure: Mulch Management.
M4	Waste and resource use	<p>An Asbestos Management Plan (AMP) shall be prepared for the ancillary facilities where ACM may be located. The AMP will set out how asbestos or ACM will be managed and disposed of during construction if encountered.</p> <p>The AMP shall be prepared in accordance with SafeWork NSW's <i>Code of Practice – How to Manage and Control Asbestos in the Workplace</i> (SafeWork NSW, 2016) and <i>Working with Asbestos: Guide 2008</i> (WorkCover NSW, 2008).</p>	Contractor	Construction	<p>Working with Asbestos: Guide 2008 (WorkCover NSW, 2008).</p> <p>SafeWork NSW's Code of Practice – How to Manage and Control Asbestos in the Workplace</p>
M5	Waste and resource use	<p>A dedicated concrete washout facility will be provided during construction so that runoff from the washing of concrete machinery, equipment and concrete trucks can be collected and disposed of at an appropriate waste facility.</p> <p>This facility will not be located near drainage points or disturbed areas which discharge to nearby coastal wetlands or the boundary of the Wamberal Lagoon Nature Reserve.</p>	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
M6	Waste and resource use	Waste material, is not to be left on site once the works have been completed.	Contractor	Construction	QA Specification G36 Environment Protection
M7	Waste and resource use	Waste is not to be burnt on site.	Contractor	Construction	QA Specification G36 Environment Protection
M8	Waste and resource use	Asbestos removal must be undertaken in accordance with <i>Working with Asbestos Guide 2008</i> published by WorkCover Australia. This includes low risk items such as ACM pipes and unexpected finds containing ACM.	Contractor	Construction	QA Specification G36 Environment Protection  Working with Asbestos: Guide 2008 (WorkCover NSW, 2008).
M9	Waste and resource use	A completed and signed notice under section 143(3A) of the Protection of the Environment Operations Act 1997 (NSW) ("POEO Act") ("s.143 Notice") will be received by either TfNSW or its contractors prior to transporting project waste generated by or for TfNSW to a place that is not owned by TfNSW and is not a licensed landfill or resource recovery facility. TfNSW and its contractors will ensure that such waste is appropriately classified and correctly described on the s.143 Notice and	Contractor	Construction	RMS Technical Guide: Management of road construction and maintenance waste.

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		the receiving site has the appropriate approvals for the waste.			
M10	Waste and resource use	Works sites will be maintained, kept free of rubbish and cleaned up at the end of each working day.	Contractor	Construction	QA Specification G36 Environment Protection
M11	Waste and resource use	Waste bins will be provided for workers for general waste collection.	Contractor	Construction	QA Specification G36 Environment Protection
M12	Waste and resource use	Excess spoil not required or able to be used for backfilling will be stockpiled in a suitable location within before being reused or removed from the site, and disposed of appropriately in accordance with the NSW EPA Waste Classification Guidelines (2014). Stockpiles will be managed in accordance TfNSW Technical Guideline EMS-TG-010: Stockpile Site Management.	Contractor	Construction	RMS Technical Guide: Management of road construction and maintenance waste.
M13	Waste classification	A materials re-use and waste management plan should be prepared prior to construction. The plan will include further assessment and testing to further characterise and target materials to be excavated to meet the requirements for on-site reuse and waste classification for off-site disposal.	Contractor	Detailed Design	PS311 Specification Environmental Management and Compliance

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
<b>Hazards and risks</b>					
HR1	Hazard and risk	<p>Hazard and risk management measures will be prepared and implemented as part of the CEMP. The Plan will identify:</p> <ul style="list-style-type: none"> <li>• Details of hazards and risks associated with the activity and measures to be implemented during construction to minimise these risks</li> <li>• Record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials</li> <li>• A monitoring program to assess performance in managing the identified risks, including "equipment checking and maintenance requirements</li> <li>• Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations.</li> <li>• Details of emergency response contacts, including hospitals and medical centres, and reporting notification requirements to surrounding communities.</li> </ul>	Construction contractor	Construction	QA Specification G36 Environment Protection
HR2	Hazard and risk	Emergency response plans will be incorporated into the construction environmental management plan.	Contractor	Construction	QA Specification G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
HR3	Bushfires	<p>Measures to address bush fire response and management will be prepared and included as part of the CEMP. The Plan will identify The Plan will identify:</p> <ul style="list-style-type: none"> <li>• Protection zone locations and management details</li> <li>• Landscaping requirements including indicative design layout and vegetation density thresholds</li> <li>• Access provisions such as evacuation locations, and alternate emergency access</li> <li>• Water supplies and bush fire suppression systems</li> <li>• Details regarding any other essential bush fire safety requirements.</li> </ul>	Contractor	Construction	QA Specification G36 Environment Protection
HR4	Bushfires	<p>Construction activities involving flammable materials and ignition sources (for example, welding) will be proactively managed to ensure that the potential for fire is effectively minimised. High risk construction activities, such as welding and metal work, will be subject to a risk assessment on total fire ban days and restricted or ceased as appropriate.</p>	Contractor	Construction	QA Specification G36 Environment Protection

### 4.3 Licensing and approvals

Table 4-2 Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Roads Act 1993</i>	Road Occupancy Licence	Prior to start of the activity



## 5. References

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Austroads (2019). *Guide to Road Design*.

Transport for NSW, 2021. *Central Coast Highway and Tumbi Road Intersection Upgrade – Review of Environmental Factors*. October 2021.

Transport for NSW, 2021. *Central Coast Highway and Tumbi Road Intersection*. Available at:  
<https://roads-waterways.transport.nsw.gov.au/projects/central-coast-highway-upgrade-tumbi-road-intersection/index.html>

