# Sutherland to Cronulla Active Transport Link Stage 2

## Submissions Report

Transport for NSW | June 2022

**June** 2022

# Executive summary

## The proposal

The NSW government is proposing to build Stage 2 of the Sutherland to Cronulla Active Transport Link (SCATL).

The proposal involves extending the existing Stage 1 active transport link, which currently terminates just before Kirrawee Station, to Caringbah. While some sections of the proposal are being deferred for further investigation (refer to the changes discussed below), ultimately the proposal would complete an important link in the existing bicycle network and would enable pedestrians and bike riders to connect to key destinations like public transport interchanges, schools, hospitals and residential and retail precincts.

Appropriate road crossing treatments would be provided, including new priority crossings at side streets and improvements to existing signalised crossings (kerb realignment, bicycle lanterns, line marking and lighting).

## Display of the Review of Environmental Factors

Transport for NSW prepared a Review of Environmental Factors (REF) to assess the potential environmental impacts of the proposal. The REF was on display for 33 days between Wednesday 17 November and Sunday 19 December 2021. During this time, Transport for NSW invited the public to provide feedback on the project.

To ensure the health and safety of the community, online community information sessions were held to allow people to meet the project team virtually and ask questions about the proposal. One live session was held on Thursday 9 December from 12pm-12.40pm

A ‘Have your say’ community update was also distributed in the locality inviting comment on the REF and route options and encouraging people to participate in the online community information sessions.

## Summary of issues and responses

A total of 92 submissions were received in response to the display of the REF. This included submissions from Sutherland Shire Council, community organisations (Bicycle NSW, Sutherland Shire Environment Centre, Central and North Miranda Precinct Residents Association) and the community.

The main issues raised in the submissions from the community, organisations and Sutherland Shire Council were:

- Opposition to the route via Oak Road, Flora Street and Clements Parade due to safety concerns, congestion, loss of parking and impacts on adjacent businesses (53 submitters)
- Support for or opposition to the alternative route via President Avenue, Bath Road and Avery Avenue (30 submitters expressed support while seven submitters were opposed)
- Preference for an option which uses the rail corridor (19 submitters)
- Concern that the proposal will only be used by a small number of people with others continuing to drive or opting for more direct routes (15 submitters)
- Concerns, particularly for the elderly and young children, regarding the safety of using shared paths (13 submitters)
- Preference for the route to go all the way to the key destination of Cronulla (eight submitters)

- Opposition to the route along the Kingsway due to the number of road and driveway crossings and the high traffic volumes (eight submitters)[1]
- Concern about loss of trees (five submitters).

## Changes to the proposal

Transport has considered Sutherland Council and community feedback and has decided not to proceed with a route via Oak Road and Flora Street for the western section of SCATL Stage 2 through Kirrawee and Gymea. Transport has developed a route to the south of the railway line for this section and is considering other routes between Sylvania Avenue and Jackson Avenue in Miranda. This section will be subject to further investigation, assessment, and consultation.

Transport has also decided to make changes to the proposal along the Kingsway between Taren Point Road and Banksia Road. The changes involving using the southern side of the Kingsway for SCATL between Taren Point Road and Willarong Road, installing traffic lights at the Kingsway / Willarong Road intersection and closure of the right turning entry into Banksia Road from the Kingsway.

As part of design development since the display of the REF, the need for minor adjustments to the proposal footprint were also identified. These adjustments are needed to provide adequate space for the raised crossings, power pole adjustments and drainage works. The impact associated with these additional work areas have been assessed as minor.

The revised proposal footprint and the area that is subject to further investigation, assessment and consultation are shown in Figure E-1 and Figure E-2.

[1] Several of the submitters who expressed a preference for a route via the rail corridor also referenced the limitations of a route via the Kingsway.

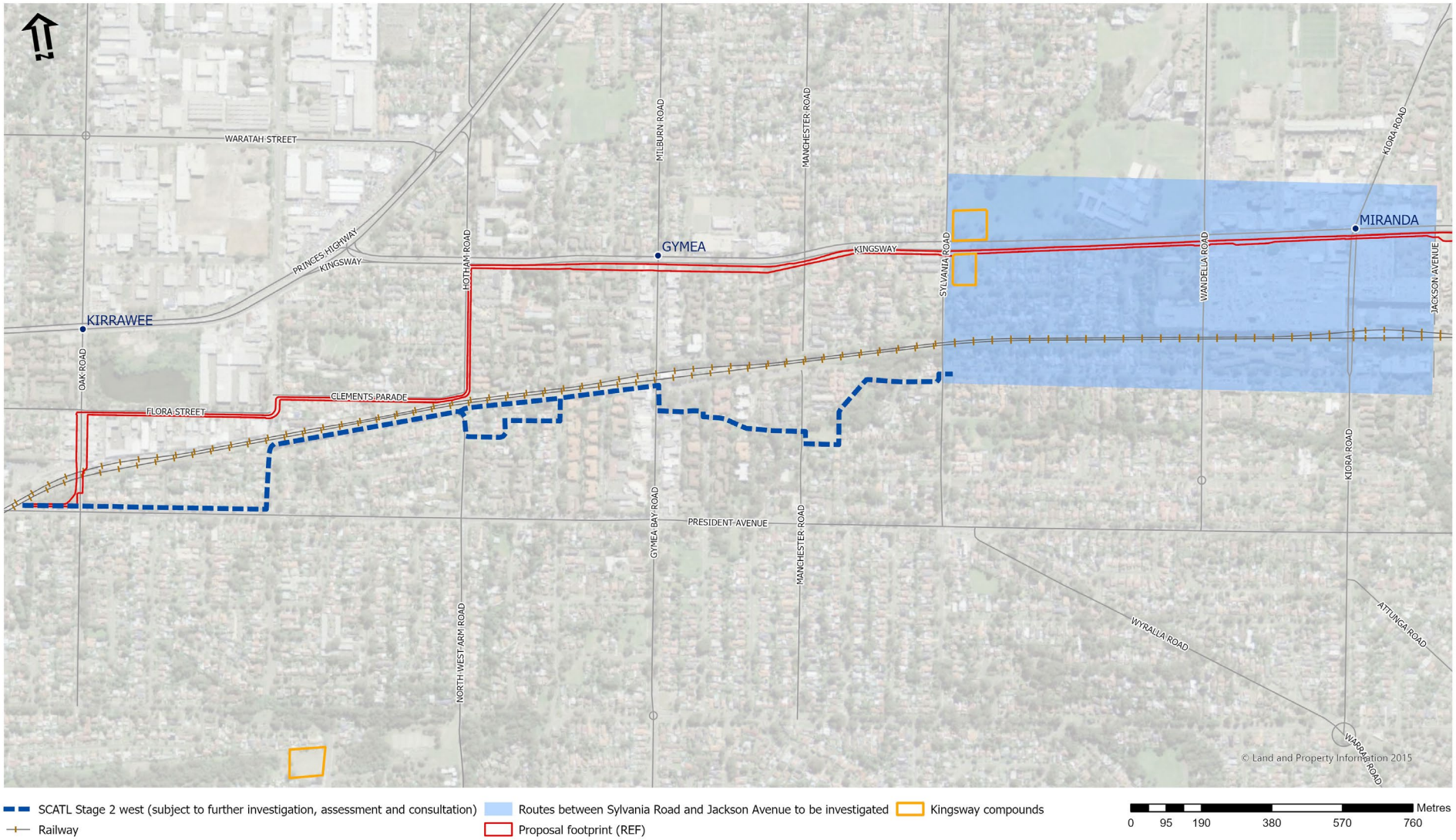


**Figure E-1: Overview of the proposal (west)**

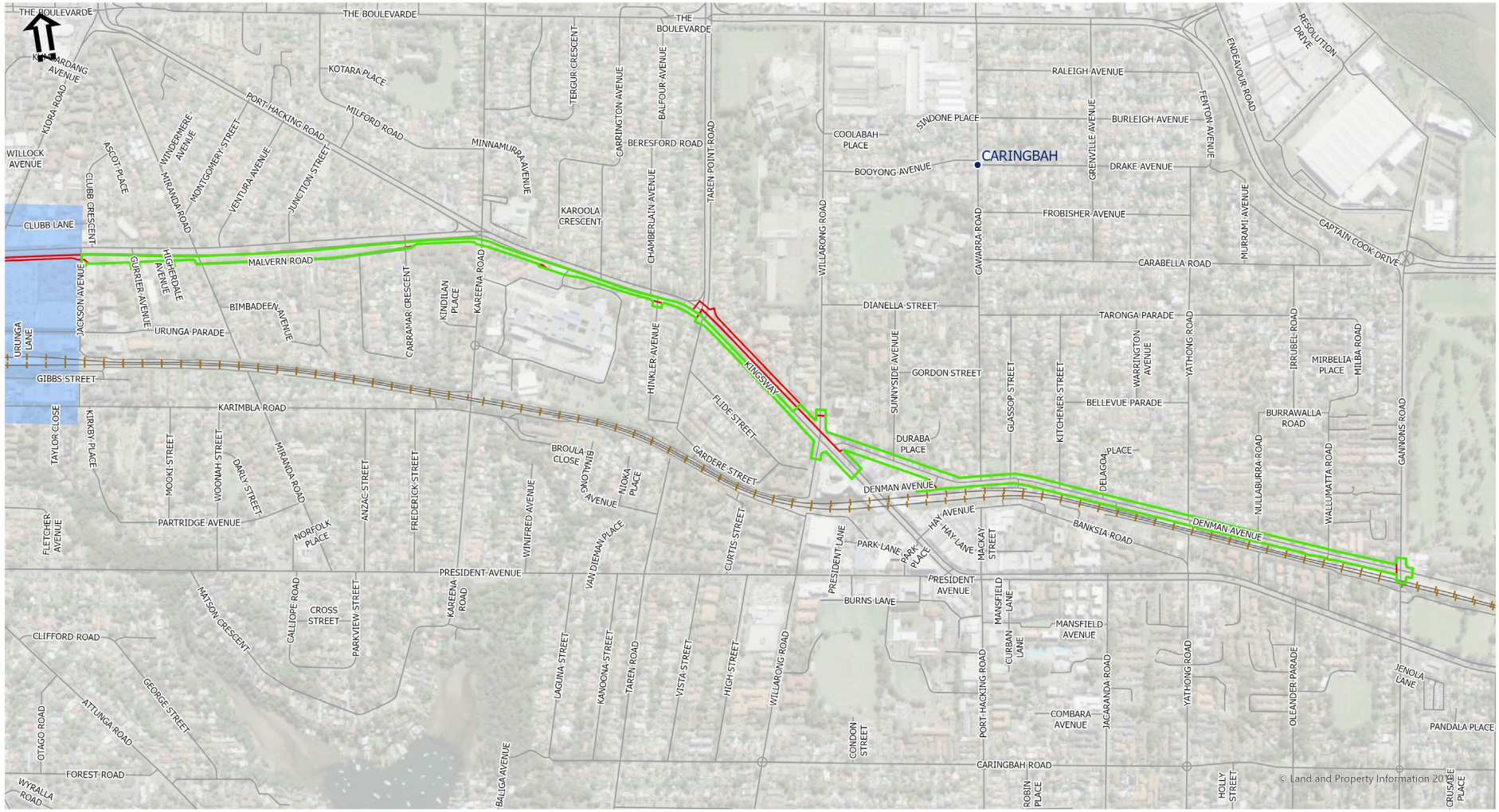


**Figure E-2: Overview of the proposal (east)**

# Environmental assessment of changes

The minor nature of the proposed changes mean that it is unlikely to affect most environmental aspects, however there would be some changes to noise and vibration impacts, landscape and visual impacts and traffic and transport impacts (specifically parking).

**Traffic and transport**

The proposed traffic lights at the Kingsway / Willarong Road intersection would result in some additional stops for traffic on the Kingsway but would allow safe access to and from Willarong Road. The proposed traffic lights would also include signalised pedestrian crossings on all four legs of the intersection which would improve safety and amenity for pedestrians.

The proposed closure of the right turn from the Kingsway (northbound) to Banksia Road would potentially mean some additional travel distance / time for some road users, depending on their destination. The alternative route would be a right turn a the new Willarong Road traffic lights, then via Willarong Road, Dianella Street and Sunnyside Avenue. The additional travel distance could be up to about 900 metres, which equates to additional travel time of about one minute at the posted speed limit of 50 kilometres per hour.

Additional parking impacts associated with the proposal (inclusive of the changes) are:

- Higherdale Avenue – Installation of raised crossing reduces five metres of parking space (about one parking space) on the eastern kerb
- Banksia Road – Due to the ramp for the on-road cycle path, the parking zone on the southern side of Banksia Road is reduced by 20 metres (about three parking spaces)
- Denman Avenue (western end) – Net loss of three 1P angled parking spaces along the southern side of Denman Avenue. Provision of seven new fully indented motorcycle parking spaces.

While on-street parking demand is high at these locations, the loss of a small number of additional spaces in the context of available parking on the wider local road network is considered minor. The net loss of three time-limited car spaces on Denman Road is not expected to have a substantial impact on convenient access to nearby businesses.

**Noise and vibration**

A revised noise and vibration assessment has been prepared for the proposal and considers the minor proposal footprint changes (excluding the section between Taren Point Road and Banksia Road which has been assessed separately in Chapter 4). The proposed changes to the proposal footprint are small and only result in minor changes to noise predictions.

The proposed changes between Taren Point Road and Banksia Road (including the proposed traffic lights at Willarong Road) are expected to result in exceedance of noise management levels in the surrounding locality, including exceedance of highly noise affected levels for the nearest receivers. This is consistent with the REF and mitigation measures have been proposed to address these impacts.

There would be some noise from the audible locating and crossing signals associated with the proposed new traffic lights. These signals would be adjusted to ensure they meet maximum noise level goals established in accordance with the *Management framework on audio tactile push buttons* (Roads and Traffic Authority, 2005). This would minimise potential sleep disturbance impacts.

**Landscape character and visual amenity**

The proposed extensions, to the proposal footprint, are minor and would not result in any additional tree removal compared to the footprint assessed in the REF. The presence of traffic lights at the Kingsway / Willarong Road intersection would be a noticeable visual change but would be consistent with the character of the arterial road environment.

The proposed changes would therefore not alter the impact ratings provided in the REF for landscape character zones and viewpoints.

## Additional studies

A revised noise and vibration assessment has been prepared for the proposal and is included in Appendix A. The revised assessment identified noise management levels based on background noise monitoring, which was not collected originally due to changes to the noise environment associated with COVID-19 restrictions. The revised assessment also considers the amended proposal footprint (excluding the section between Taren Point Road and Banksia Road which has been assessed separately in Chapter 4).

## Next steps

Transport for NSW as the determining authority 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

## 1.1 The proposal

The NSW government is proposing to build Stage 2 of the Sutherland to Cronulla Active Transport Link (SCATL), a walking and cycling path to help make walking and bike riding a more convenient, safer and enjoyable transport option (the proposal).

Stage 1 of SCATL opened in April 2020, delivering a 1.3 kilometre active transport link between Sutherland and Kirrawee. A potential future stage (Stage 3) between Caringbah and Cronulla is subject to further planning and investigation, and would be the subject of a separate assessment and planning approval process.

A more detailed description of the proposal can be found in the Sutherland to Cronulla Active Transport Link Stage 2 – Review of Environmental Factors (the REF) prepared by Transport for NSW in November 2021. Changes to the proposal as presented in the REF have been made in response to community and stakeholder feedback and these are described in Chapter 3 (Changes to the proposal).

## 1.2 REF display

Transport for NSW prepared the REF to assess the potential environmental impacts of the proposal. The REF was on display for 33 days between Wednesday 17 November and Sunday 19 December 2021. The REF was available on the project webpage to view or download.

To ensure the health and safety of the community and the staff, online community, information sessions were held virtually to allow people to meet the project team and ask questions about the proposal. One live session was held on Thursday 9 December from 12pm-12.40pm and made available on the website for future viewing.

The REF was also published on the Transport for NSW project website *www.transport.nsw.gov.au/projects/current-projects/sutherland-to-cronulla-active-transport-link* and was made available for download. The REF public display and website link was advertised in the Sutherland Shire Leader on 24 November 2021.

A ‘Have your say’ community update was also distributed in the locality, inviting comment on the REF and route options and encouraging people to participate in the online community information sessions. Households and businesses across six suburbs received this update including: Sutherland, Kirrawee, Gymea, Miranda, Caringbah and Woolooware.

## 1.3 Updated statutory context

The Environmental Planning and Assessment Regulation 2021 came into force on 1 March 2022. This regulation requires the following criteria to be assessed in Reviews of Environmental Factors:

- Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the *Environmental Planning and Assessment Act, 1979*
- Other relevant environmental factors

The statutory planning framework of the proposal including relevant regional strategic plans and district strategic plans was considered in Section 2.1 of the REF. In addition to that discussion, it is noted that Planning Priority 5 from the Sutherland

Shire Local Strategic Planning Statement (Sutherland Shire Council, 2020) relates directly to the provision of SCATL and active transport infrastructure in the Sutherland Shire.

It is considered that all relevant environmental factors have been considered. As a result, no further assessment is required in relation to the Environmental Planning and Assessment Regulation 2021.

## 1.4 Purpose of the report

This submissions report relates to the Sutherland to Cronulla Active Transport Link Stage 2 REF and should be read in conjunction with that document.

The REF was placed on public display and 92 submissions were received by Transport for NSW. This submissions report summarises the issues raised and provides responses to each issue (Chapter 2). It details changes to the proposal since finalisation of the REF (Chapter 3), environmental assessment of proposed changes (Chapter 4), additional studies (Chapter 5) and identifies new or revised environmental management measures (Chapter 6).

# 2 Response to issues

Transport for NSW received 92 submissions. Submissions were accepted up until Sunday 19 December 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 3 of this report.

**Table 2-1: Respondents**

| Ref | Respondent | Submission No. | Section where issues are addressed |
|---|---|---|---|
| 1 | Individual | 1711-1 | 2.3.1, 2.3.5, 2.3.6, 2.3.8, 2.3.9, 2.3.10, 2.4.1, 2.5.3 |
| 2 | Individual | 1711-3 | 2.3.5 |
| 3 | Individual | 1811-1 | 2.3.6, 2.4.1 |
| 4 | Individual | 1811-3 | 2.5.2, 2.6 |
| 5 | Individual | 1811-4 | 2.3.5 |
| 6 | Individual | 1811-5 | 2.3.6 |
| 7 | Individual | 1911-1 | 2.3.5 |
| 8 | Individual | 1911-2 | 2.3.1, 2.3.7, 2.5.4 |
| 9 | Individual | 2011-1 | 2.3.1 |
| 10 | Individual | 2111-1 | 2.3.1, 2.4.5 |
| 11 | Individual | 2111-2 | 2.4.3 |
| 12 | Individual | 2111-3 | 2.4.2, 2.4.3, |
| 13 | Individual | 2211-1 | 2.4.2, 2.4.3, 2.5.4 |
| 14 | Individual | 2211-2 | 2.3.6, 2.3.7 |
| 15 | Individual | 2211-3 | 2.3.7 |
| 16 | Individual | 2211-4 | 2.3.10, 2.6, 2.10.2 |
| 17 | Individual | 2211-5 | 2.3.6, 2.3.7, 2.10.2 |
| 18 | Individual | 2311-1 | 2.3.6, 2.5.1, 2.5.2 |
| 19 | Individual | 2311-2 | 2.3.6, 2.3.7 |
| 20 | Individual | 2311-3 | 2.3.7 |
| 21 | Individual | 2311-4 | 2.3.6 |
| 22 | Individual | 2411-1 | 2.5.1 |
| 23 | Individual | 2511-1 | 2.4.2 |
| 24 | Individual | 2511-2 | 2.3.6 |
| 25 | Individual | 2511-3 | 2.3.6, 2.3.7, 2.4.4 |
| 26 | Individual | 2511-4 | 2.3.6, 2.3.7 |
| 27 | Individual | 2511-5 | 2.4.3 |
| 28 | Individual | 2511-6 | 2.3.6, 2.3.10 |
| 29 | Individual | 2511-7 | 2.3.6, 2.4.2 |
| 30 | Individual | 2511-8 | 2.3.7 |

| Ref | Respondent | Submission No. | Section where issues are addressed |
|---|---|---|---|
| 31 | Individual | 2611-1 | 2.3.5, 2.4.1, 2.4.2, 2.6 |
| 32 | Individual | 2611-2 | 2.3.6, 2.3.7 |
| 33 | Individual | 2611-3 | 2.3.6, 2.3.7 |
| 34 | Individual | 2611-4 | 2.3.6 |
| 35 | Individual | 2611-5 | 2.3.7, 2.3.10, 2.4.1 |
| 36 | Individual | 2711-1 | 2.3.6, 2.3.7 |
| 37 | Individual | 2811-1 | 2.3.6, 2.3.7 |
| 38 | Individual | 2811-2 | 2.4.3 |
| 39 | Individual | 2911-1 | 2.4.3 |
| 40 | Individual | 2911-2 | 2.3.7 |
| 41 | Individual | 2911-3 | 2.3.1, 2.3.6 |
| 42 | Individual | 2911-4 | 2.3.5, 2.3.6 |
| 43 | Individual | 2911-5 | 2.3.6, 2.3.10 |
| 44 | Individual | 3011-1 | 2.3.6, 2.3.7, 2.3.10 |
| 45 | Individual | 3011-2 | 2.3.6, 2.3.7, |
| 46 | Individual | 3011-3 | 2.3.5, 2.3.6, 2.3.7 |
| 47 | Individual | 0112-1 | 2.3.6, 2.3.7 |
| 48 | Individual | 0112-2 | 2.3.7 |
| 49 | Individual | 0112-3 | 2.3.5, 2.3.8 |
| 50 | Individual | 0212-1 | 2.3.1, 2.3.6, 2.4.3 |
| 51 | Individual | 0212-2 | 2.3.6, 2.3.6, 2.3.7 |
| 52 | Individual | 0312-1 | 2.3.1, 2.4.1, 2.5.2, 2.5.3 |
| 53 | Individual | 0312-2 | 2.3.6 |
| 54 | Individual | 0412-1 | 2.3.6 |
| 55 | Individual | 0512-1 | 2.3.6 |
| 56 | Individual | 0512-2 | 2.3.6, 2.3.7 |
| 57 | Individual | 0512-3 | 2.3.6, 2.3.7 |
| 58 | Individual | 0612-1 | 2.3.10 |
| 59 | Individual | 0612-2 | 2.10.2 |
| 60 | Individual | 0712-1 | 2.3.6, 2.3.7, 2.4.3 |
| 61 | Individual | 0812-1 | 2.3.1, 2.5.2 |
| 62 | Individual | 0812-2 | 2.3.6 |
| 63 | Individual | 0912-1 | 2.4.3, 2.10.1 |
| 64 | Individual | 0912-2 | 2.3.1, 2.3.6, 2.3.10 |
| 65 | Individual | 0912-3 | 2.3.1, 2.3.6, 2.3.7, 2.4.1, 2.4.2, 2.10.1, 2.10.2 |
| 66 | Individual | 1012-1 | 2.3.6, 2.4.3 |
| 67 | Individual | 1112-1 | 2.3.1, 2.3.6, 2.4.2 |

| Ref | Respondent | Submission No. | Section where issues are addressed |
|---|---|---|---|
| 68 | Individual | 1112-2 | 2.3.6 |
| 69 | Individual | 1312-1 | 2.3.1, 2.3.6, 2.3.7 |
| 70 | Individual | 1312-2 | 2.3.5, 2.3.6, 2.4.1, 2.4.2 |
| 71 | Bicycle NSW | 1312-3 | 2.3.5, 2.3.8, 2.3.9, 2.4.3, 2.5.3, 2.9 |
| 72 | Individual | 1312-4 | 2.4.3, 2.10.1 |
| 73 | Individual | 1412-1 | 2.3.6 |
| 74 | Individual | 1412-2 | 2.3.5 |
| 75 | Individual | 1512-1 | 2.3.5, 2.3.7, 2.3.9, 2.4.1, 2.5.3, 2.10.2 |
| 76 | Individual | 1512-2 | 2.3.7 |
| 77 | Individual | 1512-3 | 2.3.6, 2.3.7 |
| 78 | Individual | 1712-1 | 2.3.6, 2.3.7 |
| 79 | Individual | 1712-2 | 2.3.10, 2.4.1 |
| 80 | Individual | 1712-3 | 2.3.6, 2.3.7 |
| 81 | Individual | 1712-4 | 2.3.6, 2.3.7 |
| 82 | Individual | 1912-1 | 2.3.6, |
| 83 | Individual | 1912-2 | 2.3.6, 2.3.7 |
| 84 | Individual | 1912-3 | 2.3.5, 2.5.4 |
| 85 | Individual | 1912-4 | 2.3.5, 2.3.8, 2.3.9 |
| 86 | Sutherland Shire Environment Centre | 1912-5 | 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.3.6, 2.3.7, 2.3.8, 2.3.9 |
| 87 | Central and North Miranda Precinct Residents Association | 1912-6 | 2.3.1, 2.3.3, 2.3.5, 2.3.6, 2.3.7, 2.3.8, 2.3.9, 2.4.1, 2.4.3, 2.6 |
| 88 | Individual | 1912-7 | 2.3.6 |
| 89 | Individual | 1912-8 | 2.3.5, 2.3.9 |
| 90 | Individual | 1912-9 | 2.3.7 |
| 91 | Individual | 1912-10 | 2.3.10, 2.4.1 |
| 92 | Sutherland Shire Council | 2312-1 | 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.3.6, 2.3.7, 2.3.8, 2.3.9, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.3, 2.6, 2.7, 2.8 |

## 2.1 Overview of issues raised

A total of 92 submissions were received in response to the display of the REF. This included submissions from Sutherland Shire Council, community organisations and individuals.

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 Transport for NSW response to these issues forms the basis of this chapter.

The main issues raised in the submissions from the community, organisations and Sutherland Shire Council were:

- Opposition to the route via Oak Road, Flora Street and Clements Parade due to safety concerns, congestion, loss of parking and impacts on adjacent businesses (53 submitters)
- Support for or opposition to the alternative route via President Avenue, Bath Road and Avery Avenue (30 submitters expressed support while seven submitters were opposed)
- Preference for an option which uses the rail corridor (19 submitters)
- Concern that the proposal will only be used by a small number of people with others continuing to drive or opting for more direct routes (15 submitters)
- Concerns, particularly for the elderly and young children, regarding the safety of using shared paths (13 submitters)
- Preference for the route to go all the way to the key destination of Cronulla (eight submitters)
- Opposition to the route along the Kingsway due to the number of road and driveway crossings and the high traffic volumes (eight submitters)[2]
- Concern about loss of trees (five submitters).

## 2.2 Consultation

### Submission numbers

1711-3, 2111-3, 0812-1, 0912-3, 1912-5, 1912-6, 2312-1

### Issue description

- The consultation process should be restarted given the change in the route
- Concern that community feedback will not influence the outcome
- Concern about the reasons for adopting the current proposal instead of the rail corridor route
- Query regarding whether there has been a letter box drop for residents most affected by the new route
- An ongoing community forum should be used to validate assumptions about community use of the proposed route
- Suggestion that a community ride event could be held to promote the cycleway

### Response

Transport has used a range of engagement tools to consult with the community and identified stakeholders, and the REF has been displayed to encourage community input. A ‘Have your say’ community update was also distributed in the locality inviting comment on the REF and route options and encouraging people to participate in online community information sessions.

[2] Several of the submitters who expressed a preference for a route via the rail corridor also referenced the limitations of a route via the Kingsway.

The community and stakeholder feedback received has been considered in detail and has resulted in changes to the proposal, which are described in Chapter 3 (Changes to the proposal). Transport will provide further opportunity for community and stakeholder input into the proposed changes.

A community forum for SCATL is not currently proposed. A response regarding the forecast use of the SCATL is provided in Section 2.3.1.

The suggestion of a community ride to promote SCATL will be considered further should the proposal be approved and proceed to construction.

## 2.3 Need and options considered

### 2.3.1 Proposal need

#### Submission numbers

1711-1, 1911-2, 2011-1, 2111-1, 2911-3, 0212-1, 0312-1, 0812-1, 0912-2, 0912-3, 1112-1, 1312-1, 1912-5, 1912-6, 2312-1

#### Issue description

- The proposed shared path will only be used by a small number of people with others continuing to drive, opting for more direct routes (such as via President Avenue and Karimbla Road) or avoiding the path due to safety concerns
- Query about the projected 2,500 daily bicycle movements and observation that only a limited number of people are using Stage 1 of SCATL between Sutherland and Kirrawee
- Query about the budget for the proposal and comment that money should be spent on other community needs
- Benefits associated with suggested links to the Esplanade along the Cronulla beach front and the Kamay Botany Bay National Park are problematic. The shared path along the Bate Bay frontage is incomplete with no immediate plans to complete and is congested in peak periods. There is no complete on-road or off-road active transport connection to Kamay Bay National Park.

#### Response

The proposal would provide a dedicated active transport link which separates pedestrians and cyclists from other road users. This is expected to attract substantial usage by increasing safety for users and promoting active transport to novice and less confident riders. Provision of a complete network of safe and comfortable bicycle routes is also known to generate a ‘network effect’ due to greater connectivity and legibility, resulting in greater cycling patronage.

Experience has shown that following the opening of other cycleways in Sydney there is a substantial increase in rider volumes in the first few months, with further substantial increases over the first two to three years. There is expected to be additional active transport use due to a mode shift from private vehicles.

The proposal would represent value for money with quantified economic benefits (health benefits, reduced congestion, reduced vehicle operating costs, reduced accident costs etc.) substantially exceeding estimated proposal costs.

Comments regarding the status of active transport along the Esplanade and connections to Kamay Botany Bay National Park are acknowledged. Transport sees value in the connection to the existing active transport network at Gannons Road and the broader regional travel opportunities it provides.

### 2.3.2 Proposal objectives

#### Submission numbers

1912-5, 2312-1

#### Issue description

- Concerns that the preferred route does not adequately address the Urban Design Principles set out in (Section 2.3.3) of the REF. Timeliness has been compromised by the introduction of inclines, travel through highly congested areas and waiting for signals and traffic at intersections and driveways.
- Query about the 40 per cent increase in safety (second proposal objective) noting that if the improvement is based on cyclists currently using the traffic lanes on the Kingsway, then the comparison is flawed as the intended users of SCATL, such as families, would not be using the Kingsway due to safety risks.

#### Response

Transport considers that the proposal adequately responds to the urban design principles in Section 2.3.3. of the REF. While an alternative option that uses the rail corridor may perform better regarding timeliness for some trips, the rail corridor option is not being pursued for the reasons stated in Section 2.4.4 of the REF, which are expanded on in Section 2.3.5 of this submissions report.

The 40 per cent increase in safety is based on cyclists moving from the road onto the new path. This is considered appropriate because SCATL is expected to provide an attractive option for many riders who currently use the road.

### 2.3.3 Alignment with strategic plans

#### Submission numbers

1912-5, 1912-6, 2312-1

#### Issue description

- Concerns that the proposal does not adequately address Objective 3 from the South District Plan (Greater Sydney Commssion, 2018) which is to plan infrastructure that will adapt to future needs. Further concerns that the proposal does not take into account the high likelihood of user conflict and injury when heavier and faster forms of transport (e-bikes and scooters) are routed through congested areas such as South Village and Miranda. As population grows, these centres will become even more crowded and will make the path unsafe and unable to accommodate the projected number of users.
- Concerns that the proposal departs from the Principles in the NSW Government Cycleway Design Toolbox (Transport for NSW, 2020):
- Safe – changing the route to involve more major roads and intersections will make the link less safe
- Connected – route does not continue to Cronulla, being a popular residential area as well as a destination for exercise, eating, entertainment, shopping and work
- Direct – provides a less direct route and fails to link Cronulla, being a key destination. A detour via Captain Cook Drive adversely affects the usability of the link as it makes it an unviable alternative for short trips.  It will be a disincentive for short trips

- Attractive – to achieve this outcome, major roads and intersections should be avoided
- Comfortable –the original route is flatter which would appeal to a broader range of the community. It makes the transport link more accessible and comfortable, and avoids poor air quality near major roads
- Adaptable –the quality of active transport links along roads and footpaths will deteriorate with time.
- The REF indicates it is aligned to six outcomes of the Future Transport Strategy 2056, including customer focus, and safety and performance. For the proposal to be a success it must align with the expectations of the uses of the completed link. Based on available community feedback seen so far, the current route risks alienating the community members. Parts of the current route do not satisfy the strategy objective of safety and performance.
- Alignment with the key objectives of the 2020/21 Walking and Cycling Program is queried given that the proposal would not be eligible for funding under the program.

### Response

The proposal is considered consistent with Objective 3 from the South District Plan (Greater Sydney Commssion, 2018) because it responds to a growing interest in active transport and allows mobility in the area to adapt to emerging technologies such as e-bikes. It also supports the growing use of on demand services (such as food delivery) and parcel delivery services which would benefit from the improved accessibility provided by the new infrastructure.

Currently e-bikes can be used on shared paths provided they are designed to be propelled primarily by the rider (with assistance provided by the electric motor for uphill sections or when riding into a headwind). In this context e-bikes would not be expected to be travelling at substantially higher speeds than traditional bicycles. E-scooters would not be permitted as they can be solely propelled by the electric motor. Concerns about user conflict and safety are addressed in Section 2.5.3.

Transport considers that the proposal would be safe, attractive, comfortable and sufficiently adaptable with ongoing maintenance to a suitable standard. While not as direct from start of start to finish as a rail corridor option, the proposal would better provide for short local trips and a more direct connection to key destinations such as, schools, higher education facilities, health, town centres, hospitals, employment centres, commercial and retail precincts, and parks and recreational facilities. Links from Gannons Road to Cronulla are currently being investigated for a future stage of SCATL.

Transport considers the proposal to be aligned with Future Transport Strategy 2056 (Transport for NSW, 2018) for the reasons stated in Section 2.1 of the REF. Transport has considered feedback and is proposing changes to improve the proposal and address concerns – refer to Chapter 3 (Changes to the proposal). Safety is addressed in Section 2.5.3 while the performance of SCATL is addressed in several sections including Section 2.3.1.

While the proposal is not being funded under the Transport for NSW Walking and Cycling Program, the objectives of the program are considered useful reference points for successful active transport projects.

### 2.3.4 Options evaluation process

#### Submission numbers

1912-5, 2312-1

#### Issue description

- The methodology used to rank route options is flawed. In Table 2-4 of the REF the assignment of '2' for Customer Experience and Place (criteria 2) for route 2a appears to be inaccurate when the serious flaws of the route are so obvious that the community has said they will not use it. If a '3' or '4' were assigned for Customer Experience and Place instead of a '2', route 1a would outrank route 2a.
- It is imperative the guidance on route provided by the community feedback be given a high weighting.

#### Response

The methodology for the selection of the preferred option is described in Section 2.4.1 of the REF and is considered appropriate. The rankings provided in Table 2-4 were determined by workshop participants with varied areas of experience and expertise. It is noted that option 1a (in corridor option between Kirrawee and Cronulla) ranked higher than the preferred option against the Customer Experience and Place criterion.

Consideration of issues raised by the community and stakeholders is a key input to decision making about the proposal. As part of the option selection process the ability of each option to respond to community expectations and minimise community impacts was considered (criterion 5). The community and stakeholder feedback received during the public display period has been considered in detail and has resulted in changes to the proposal, which are described in Chapter 3 (Changes to the proposal). Transport will provide further opportunity for community and stakeholder input into the proposed changes.

### 2.3.5 Options – Rail corridor

#### Submission numbers

1711-1, 1711-3, 1811-4, 1911-1, 2611-1, 2911-4, 3011-3, 0112-3, 0312-1, 1312-2, 1312-3, 1412-2, 1512-1, 1912-3, 1912-4, 1912-5, 1912-6, 1912-8, 2312-1

#### Issue description

- General support for an option which uses the rail corridor, noting that it would avoid local road and driveway crossings and provide a direct, safe, enjoyable, family friendly route away from traffic. Fewer conflict points are essential to user satisfaction and safety.
- The specific issues preventing the use of the rail corridor should be provided
- SCATL should provide the east-west spine for off-road active transport network to improve regional function and connectivity. Cost should not be given the highest priority as this is an essential major infrastructure.
- Shared paths operate successfully in rail corridors in other parts of Sydney
- Parts of the rail corridor would be suitable for SCATL, with some sections already used by pedestrians and cyclists under long standing arrangements with Council
- The rail corridor option would be better for longer journeys but can still provide local connections to key destinations via footpaths and Sutherland Shire Council's existing and proposed cycling network

- The rail corridor option offers a more ‘future-proof’ treatment considering planned population increases in the area
- The rail corridor option would be better at facilitating a combined use of train and active transport
- The proposal includes elements, such as raised boardwalks, which may have been avoided or minimised if at least partially in the rail corridor
- The rail corridor option would minimise impacts on trees and provides an opportunity to remove invasive weed species and provide new native tree plantings
- The rail corridor option would minimise noise and vibration impacts, and disruption to commercial premises during construction
- The rail corridor would attract sufficient users to provide the passive surveillance required to make people feel safe. Paths with limited passive surveillance work well including at Woolooware Bay, Como to Oatley, M7 Motorway and Woronora River Bridge.
- The rail corridor between Kirrawee and Gymea seems to have been dismissed as an option despite indications that it would be quite straightforward, requiring fencing to be moved by half a metre
- Rail corridor and Council owned land should be used east from Kareena Road and exit routes can be negotiated with developers
- Specific preference for the rail corridor instead of Denman Avenue
- Comment that the original option which used the rail corridor has strong community support and provides an opportunity for an active transport spine from which local connections can be further developed by Council
- Query as to whether the abutments for the railway bridge over Gannons Road were designed to accommodate a second bridge for pedestrians and cyclists
- There should be transparency around the costs of the rail corridor option. Costs should be made public to allow solution to be found or a clear rationale for not proceeding the rail corridor option.

### Response

Transport acknowledges that the change of the preferred route from within the rail corridor to outside the rail corridor was unexpected for some community members and stakeholders and acknowledges that there is still a strong desire from the community to construct the active transport link within the rail corridor.

While the rail corridor provides a direct link between Sutherland and Cronulla, the inclusion of active transport infrastructure within this corridor turned out to not be a feasible option. It provided a much poorer user experience and was significantly more complex and costly and was inferior in meeting some key project objectives.

Section 2.4 of the REF provided an overview of the key reasons the proposal was preferred to a route using the rail corridor. These included:

- Provision of a route outside the rail corridor with a superior user experience which utilises shady suburban streets with good amenity
- Provision of more direct local connections to key destinations such as, schools, higher education facilities, health, town centres, hospitals, employment centres, commercial and retail precincts, and parks and recreational facilities

- Easy access with customers able to join and leave the active transport link as they like, making it a more attractive option for short local trips compared to the rail corridor
- Better security as customers would be more visible to passers-by, other users and the wider community
- Less complicated construction that is not dependent on track possession
- Minimal utilities impact compared to rail corridor options, which minimises the delivery timeframe.

Preliminary design work on a rail corridor option has confirmed the complexity of construction required and identified that some of the necessary structures and features would lead to a poor user experience, urban design outcomes and associated visual impacts. Some of the key additional issues for construction of a rail corridor option included:

- SCATL would generally be an “infrastructure-heavy” design of predominantly concrete and steel which would be confined between the property boundary and security fences
- The route would be generally unshaded with very little available space for new tree planting
- The need for security lighting and CCTV surveillance
- Requirement for multiple structures such as long retaining walls, overpass bridges at Sylvania Road, Kiora Road and Gannons Road, and underpasses at Gymea Bay Road and Wandella Road
- Several long access ramps to provide access to the rail corridor at suitable grades
- Utility relocations including a section near Miranda Road where signalling infrastructure would need to be relocated
- A lengthy construction period given that much of the construction work would need to occur during rail possession periods.

It was also identified that for some sections of the rail corridor (such as near Avery Avenue), a path would inhibit access and manoeuvring by longer Sydney Trains maintenance vehicles.

Other examples of active transport within or immediately adjacent to rail corridors in Sydney (such as at Chatswood, Rhodes to Meadowbank, and Oatley to Como) are typically shorter, require fewer new structures or rely on existing structures, and were able to be delivered with minimal impact on rail operations.

A rail corridor option would not avoid tree removal, with likely impacts on a number of trees, including along the southern side of Denman Avenue. Construction noise would also be an issue with impacts on residents along the rail corridor expected over an extended period due to the longer duration of construction.

### 2.3.6 Options – Oak Road / Flora Street / Clements Parade route

#### Submission numbers

1711-1, 1811-1, 1811-5, 2211-2, 2211-5, 2311-1, 2311-2, 2311-4, 2511-2, 2511-3, 2511-4, 2511-6, 2511-7, 2611-2, 2611-3, 2611-4, 2711-1, 2811-1, 2911-3, 2911-4, 2911-5, 3011-1, 3011-2, 3011-3, 0112-1, 0112-2, 0212-1, 0212-2, 0312-2, 0412-1, 0512-1, 0512-2, 0512-3, 0712-1, 0812-2, 0912-2, 0912-3, 1012-1, 1112-1, 1112-2,

1312-1, 1312-2, 1412-1, 1512-3, 1712-1, 1712-3, 1712-4, 1912-1, 1912-2, 1912-5, 1912-6, 1912-7, 2312-1

#### Issue description

- Opposition to the route via Oak Road due to safety concerns, congestion, loss of parking and impacts on adjacent businesses
- Concern about safety of the crossing at the busy railway car park entry / exit
- Concern about the high numbers of pedestrians, including elderly, that would be mixed with cyclists on Oak Road
- If Oak Road must be used, the footpath should be narrowed to the original width to accommodate the cycleway
- Concern about busy driveway crossings on Flora Street including potential accidents due to poor visibility when exiting the Oak Road lane to access Flora Street (due to a fence)
- Concerns about safety along Clements Parade, particularly outside Kirrawee Public School and comment that there is insufficient space on Clements Parade to accommodate the path
- Concern about loss of parking on Clements Parade.

#### Response

Transport has considered Council and community feedback and has decided not to proceed with a route via Oak Road, Flora Street and Clements Parade for the western section of SCATL Stage 2 through Kirrawee and Gymea.

Transport is investigating an alternative route for this section of SCATL and will carry out consultation with residents and businesses before proceeding. Further details are provided in Chapter 3 (Changes to the proposal).

### 2.3.7 Options – President Avenue / Bath Road / Avery Avenue route

#### Submission numbers

1911-2, 2211-2, 2211-3, 2211-5, 2311-2, 2311-3, 2511-3, 2511-4, 2511-8, 2611-2, 2611-3, 2611-5, 2711-1, 2811-1, 2911-2, 3011-1, 3011-2, 3011-3, 0112-1, 0112-2, 0212-2, 0512-2, 0512-3, 0712-1, 0912-3, 1312-1, 1512-1, 1512-2, 1512-3, 1712-1, 1712-3, 1712-4, 1912-2, 1912-5, 1912-6, 1912-9, 2312-1

#### Issue description

- Support for the alternative route via President Avenue, Bath Road and Avery Avenue
- Concerns about safety, noise, property access, loss of parking and impacts on trees
- Comment that the bridge over the railway is too narrow, has poor visibility and would require path users to cross traffic on the northern side of the bridge
- Need for a suitable two-way crossing of the railway between Avery Avenue and Clements Parade. A dedicated bridge across the railway, perhaps from Avery Avenue directly to Bath Road, would be a good solution.
- Concerns about a route using President Avenue due to difficulties accessing driveways and associated delays to traffic and buses on President Avenue and the potential for rear end crashes

- The route along Bath Road and Avery Avenue introduces an incline
- Alternative route between Kirrawee and Gymea (via Bath Road and Avery Avenue local parks and the M6 corridor to Sylvania Road) could be constructed as a discrete stage, more quickly and less expensively than the equivalent route via the Kingsway.

#### Response

Transport has considered Council and community feedback and has decided not to proceed with a route via Oak Road, Flora Street and Clements Parade for the western section of SCATL Stage 2 through Kirrawee and Gymea.

Transport is investigating an alternative route for this section of SCATL and will carry out consultation with residents and businesses before proceeding. Further details are provided in Chapter 3 (Changes to the proposal).

### 2.3.8 Options – Kingsway

#### Submission numbers

1711-1, 0112-3, 1312-2, 1312-3, 1912-4, 1912-5, 1912-6, 2312-1

#### Issue description

- Opposition to the route along the Kingsway due to the number of driveways and the high traffic volumes, the related safety risks and poor amenity
- The proposed route requires users to negotiate driveways where it is hard to see the exiting or entering vehicles (especially if riding at some speed)
- Between Hotham Road and Jackson Ave, the route is problematic, crossing driveways for high density housing blocks between Sylvania and Wandella Roads and requiring users to navigate the hazards of frequently used driveways, large numbers of pedestrians and shopping trolleys in front of the heavily used shopping centre
- Concern about 'dogleg' through Miranda, which includes hilly terrain, number of traffic signals and busy roads
- Crossings like Kareena Road and Taren Point Road are undesirable for cyclists as it requires them to dismount and wait for signals
- Original studies for SCATL in 2008 did not favour a route via the Kingsway due to increased density and road congestion and intersections. This route has become significantly worse since 2008 and will only become less suitable and more unsustainable and adaptable with every year.
- Consider an alternative route via Taren Point Road and Flide Street, with a new signalised crossing at Willarong Road
- The strategic goal of mode shift of private car use to active transport will not be achieved if heavy reliance on Kingsway is maintained.
- All options east of Sylvania Road have difficulties noting that the Kingsway is not acceptable from a safety and user experience perspective while there are resident concerns about a route using Karimbla Road.

#### Response

The option selection process and outcomes are discussed in Chapter 2 (Need and options considered) of the REF. After considering Council and community feedback Transport has decided not to proceed with a route via Oak Road, Flora Street and

Clements Parade, and this will also remove the section of SCATL along the Kingsway between Hotham Road and Sylvania Road.

Most of the link would be fully separated from the road and located within the verge. The path will be set back from the kerb to leave an area for existing established trees, power poles and signage.

Paths that cross driveways are commonplace in NSW and motorists are currently required to check and give way to path users including children on bikes. Measures to treat the busiest driveways (i.e. at shopping centres etc. will be investigated during detailed design). Several side street crossing treatments will be used along SCATL including raised crossings or threshold treatments that clearly highlights the path.

While signalised crossings may result in some delays, they are a safe way for users for path users to negotiate major roads.

While a less direct alternative route via Taren Point Road and Flide Street is not proposed, Transport is now proposing traffic lights at the Willarong / Kingsway intersection (refer to 3.3).

Alternative routes to the Kingsway through Miranda were considered and found to not be feasible, including:

- President Avenue – grades too long and steep in some sections
- Karimbla Avenue – not supported by the local community
- Rail corridor – Section 2.4 of the REF provided an overview of the key reasons the proposal was preferred to a route using the rail corridor. Further discussion is provided above in Section 2.3.5.

### 2.3.9 Options – Extension to Cronulla

#### Submission numbers

1711-1, 1312-3, 1512-1, 1912-4, 1912-5, 1912-6, 1912-8, 2312-1.

#### Issue description

- The proposal does not go all the way to the key destination of Cronulla, something the community have identified as an issue
- The route along Gannon's Road to Captain Cook Drive and Elouera Road is inconvenient, poorly connected, unsafe and unpleasant. This route was built by Council to link areas around Woolooware Bay with the central active transport link as proposed in original design where SCATL runs along the rail corridor as much as possible.
- Council also welcomes the opportunity to progress stage 3 of SCATL between Gannons Road and Cronulla Rail Station and sees the rail corridor playing an important role in delivering a superior outcome.

#### Response

Transport will investigate active transport connections to Cronulla as part of a future stage of SCATL. A future route to Cronulla would be subject to environmental assessment and community consultation.

### 2.3.10 Options – Other

#### Submission numbers

1711-1, 2211-4, 2511-6, 2611-5, 2911-5, 3011-1, 0612-1, 0912-2, 1712-2, 1912-10

### Issue description

- The time it would take to traverse the route is unacceptable and that a trial run along the route should be conducted
- The preferred route is really a series of local routes and would not work as an efficient commuter link
- Suggested route option via President Avenue and Sylvania Road to the Kingsway
- Consider using the eastern side of Acacia Road going north from President Avenue, meeting the wide path running down Princes Highway and then along the Kingsway
- Suggested alternative route via Acacia Road and Flora Street, noting that Flora Street is quiet and needs a new path
- Query as to how the proposed east-west link will connect to the existing cycle route from Kurnell to Taren Point bridge and beyond
- Link should continue along President Ave and cross back north towards the Kingsway in between Kirrawee shops and Gymea Bay Road
- Suggested alternative route via The Boulevarde and Captain Cook Drive
- To avoid the Banksia Road crossing, consider using the existing cyclist path along Gannons road, then Captain Cook Drive, onto the Boulevard, then left up Kareena Road and right onto the Kingsway.

### Response

The option selection process and outcomes are discussed in Chapter 2 (Need and options considered) of the REF. Transport considers that the proposal would be safe, attractive and comfortable, and while not as direct from start of start to finish as a rail corridor option, the proposal would provide better local connections to key destinations.

Several of the comments related to alternative routes for the western section of SCATL Stage 2 through Kirrawee and Gymea. After considering Council and community feedback Transport has decided not to proceed with a route via Oak Road, Flora Street and Clements Parade. A route to the south of the rail line is favoured and would be subject to further investigation, assessment and community consultation. Further detail is provided in Chapter 3 (Changes to the proposal).

A route via Gannons road, then Captain Cook Drive, onto the Boulevard, then left up Kareena Road and right onto the Kingsway would be less direct and would not include to key destinations in Miranda. With proposed changes to the proposal (refer to Chapter 3), including a closure of the right turn to Banksia Road, the safety of the Banksia Road pedestrian crossing would be improved.

Connection to the existing cycle route from Kurnell to Taren Point bridge and beyond would be via several north-south roads, including the existing shared path on the eastern side of Gannons Road.

## 2.4 Proposal description

### 2.4.1 Design - alignment and crossings

### Submission numbers

1711-1, 1811-1, 2611-1, 2611-5, 0312-1, 0912-3, 1312-2, 1512-1, 1712-2, 1912-6, 1912-10, 2312-1

### Issue description

- The proposed link is too narrow, has tight bends and has too many road crossings
- The Kingsway between Kiora Road and Sutherland hospital has steep grades which makes it suitable for only fitter, younger cyclists. It would not cater for cyclists of all ages and abilities, which a cycleway is supposed to do.
- Query as to whether there is sufficient space on Kingsway between Wandella Road and Jackson Avenue, noting the high levels of pedestrian activity in this area
- Query about the location of the path and road crossings on the Kingsway near Sutherland Hospital
- Suggestion that the path should cross to the northern side of Kingsway to the west of Taren Point Road to avoid the high levels of foot traffic near Sutherland Hospital
- Query about whether there is sufficient space for a shared path on Kingsway between Taren Point Road and Willarong Road
- The intersection of Banksia Road and Kingsway should be upgraded to traffic lights and comment that the pedestrian crossing is dangerously positioned and services large numbers of school children
- Consider a “switch back” away from throat of the Kingsway / Denman Road intersection to allow vehicles from Kingsway to turn into Denman and then stop at a relocated crossing
- Comment that there are too many changes of types of pathways and that this is confusing
- The northern footpath along Banksia Road and Denman Ave could be widened to avoid loss of parking on the southern side
- Query as to whether pedestrians will be able to continue to use the southern side of Denman Road, to avoid crossing Cawarra Road, Glassop Street and Kitchener Street
- The use of Banksia Road and Denman Avenue would be enhanced with minor rail corridor fencing changes and potentially reduce the need for expensive infrastructure.

### Response

The design criteria for the proposal are included in Section 3.2.1 of the REF. A 2.5 metre path width for shared paths and a 2.4 metre width for cycle paths (along with additional buffers) is considered adequate and considers existing constraints with a focus on minimising loss of trees and the need to relocate power poles.

The steepness of the path is mainly determined by the steepness of the existing streets the link follows, however a maximum vertical grade of five per cent has been targeted where possible. The route via the Kingsway keeps long grades at or below five percent, while alternatives such as President Avenue have long grades of around 10 percent. It is noted that Karimbla Road achieves similar grades to the Kingsway, however this route does not have community support.

Several side street crossing treatments will be used along SCATL including raised crossings or threshold treatments that clearly highlight the path. While signalised crossings may result in some delays, they are a safe way for users for path users to negotiate major roads.

There is sufficient width in the existing footpath area on the southern side of the Kingsway between Wandella Road and Jackson Avenue to accommodate a 2.5 metre wide shared path. As pedestrians will be able to use the shared path, there would be no reduction in in space for this group.

Near Sutherland Hospital, a 2.5 metre wide shared path can be adequately accommodated on the southern side of the Kingsway.

After considering Council and community feedback, Transport has decided to make changes to the proposal along the Kingsway between Taren Point Road and Banksia Road. This includes shifting the path to the southern side of the Kingsway between Taren Point Road and Willarong Road, installing traffic lights at the Kingsway / Willarong Road intersection and closing the right turn from the Kingsway to Banksia Road. The closure of the right turn to Banksia Road would improve safety for users of the crossing as there would be fewer turning movements negotiating the intersection. See Section 3.3 for further information.

Changes to pathway types have been minimised, with most of SCATL Stage 2 comprising shared path. Where there is a variation to pathway types (such as on Banksia Road and Denman Avenue) signage and pathway markings would ensure this section of SCATL can be easily negotiated by users.

The alignment along the southern side of Denman Avenue provides an opportunity to provide an uninterrupted section of dedicated cycleway, with pedestrians continuing to use the existing footpath on the northern side of Denman Avenue. Accommodating both pedestrians and cyclists on the northern side of Denman Avenue would not provide this benefit. It is also expected that the existing footpath would need to be removed and replaced, as widening is not usually practical.

Transport has designed the SCATL route along Denman Avenue to be fully contained within the road reserve which means there is no need to relocate the railway corridor fence.

### 2.4.2 Design – design features and standards

#### Submission numbers

2111-3, 2211-1, 2511-1, 2511-7, 2611-1, 0912-3, 1112-1, 1312-2, 2312-1

#### Issue description

- The route should be well signposted and include maps, drinking water fountains, servicing areas and bike racks near public transport
- Transitions from roadway to footpath should not have a bump and should be smooth and a gradual incline
- Suggestion that buttons for light operations be positioned further back from the kerb
- The route seems to reuse existing footpaths, which can be dangerous if they are not wide enough and suitably marked
- Query as to whether it is necessary to have both footpaths and shared paths, when the footpaths could just be made wider
- Separation between the path and adjacent traffic is needed
- The safety fence separating the path from traffic on Denman Road should be continued to Gannons Road
- Query about exit points from the path along Denman Avenue as the fence could limit access to side streets

- Query about the clearance envelope for the link
- Comment that landscaping should not impede pedestrian and bicycle traffic
- Query as to whether different surfaces have been considered to reduce impacts on trees
- Query whether fence will be moved or trees removed to make room for the path outside Sutherland Hospital
- Non-compliance with the Transport for NSW Cycleway Design Toolbox for a Principal Network route including:
- Oak Road – Absolute minimum offset for bi-directional pathway from parked cars and directly passes entry/exit to centre car park
- Flora Street – Shared pathway on commercial and industrial street on priority route (squeeze points down to 1.7 metres)
- Bath Road, Clements Parade and Hotham Road – Shared pathways proposed
- Kingsway – Large sections are designated as shared pathways.

### Response

The location of features including signage, outdoor seating, bike racks, bollards and drinking fountains, and the design of road to path transitions, would be confirmed as part of the detailed design for SCATL Stage 2.

The location of buttons at signalised pedestrian crossings is determined by the position of the signal pole and would comply with relevant standards. No changes to the position of existing signal poles are proposed.

Where SCATL Stage 2 follows the alignment of an existing footpath, the existing path would be replaced with a new shared path or cycle way as specified in the design. Widening of existing footpaths is usually not practical from a construction perspective.

Most of the link would be fully separated from the road and located within the verge. The path will be set back from the kerb to leave an area for existing established trees, power poles and signage. Small sections of the link on local roads will need to be ‘on-road’ where there is not enough room in the footpath. In these cases, separation from traffic would be achieved with a raised kerb buffer, and in most cases a parking lane as well.

Fencing alongside the path would be placed to protect users from hazards such as steep grades or drop-offs. Fencing would only be used in areas where there are hazards and users would have the opportunity to enter/exit the path wherever there is no fence. If close to a side street, Transport will investigate methods to provide a safe access gap in the fencing.

The adopted buffer distances are detailed in Section 3.2 of the REF and are reproduced below:

- 1.0 metre buffer to vehicle parking lane (nearside same direction)
- 0.4 metre buffer to vehicle parking lane (nearside opposite direction)
- 1.0 metre buffer to traffic travel lane (nearside opposite direction)
- 0.4 metre buffer to traffic travel lane (nearside same direction)
- 0.2 metre clearance to obstacles

As part of the detailed design / construction process, strategies and treatments have been adopted with a focus on those trees assessed as having a high retention value.

This has included consideration of alternative path types to minimise impacts on tree roots. Further details are provided in Section 2.6 of the REF.

While Transport acknowledges the guidance detailed in the Cycleway Design Toolbox, there is often insufficient available space in urban areas to provide separate pedestrian and cycle paths. Wherever possible, separate paths have been included in the SCATL design. It should also be noted that there would be very little opportunity to provide separate paths in a rail corridor route.

### 2.4.3 Design – shared paths and shared zones

#### Submission numbers

2111-2, 2211-1, 2511-5, 2811-2, 2911-1, 0212-1, 0712-1, 0912-1, 1012-1, 1312-3, 1312-4,1912-6, 2312-1

#### Issue description

- Separate paths for pedestrians and cyclists should be provided for safety reasons
- Shared paths are too dangerous, particularly for the elderly and young children
- Shared paths have inadequate space given cyclist speeds and riding behaviour
- Shared cyclist / vehicle zones are not supported.

#### Response

Shared paths can operate safely, with research showing that shared paths represent a relatively low safety risk and that the marking of a centreline is effective in increasing left-hand travel and lowering cyclist speeds (Transport for NSW, 2015). On a shared path, bicycle riders must keep to the left (unless it is not practical) and give way to pedestrians. This means slowing down and even coming to a stop if necessary.

The proposal as presented in the REF included a small section of shared zone adjacent to the Kingsway, to the east of Premier Street. Transport has decided not to proceed with the portion of the SCATL route that traverses Premier Street, including the small section of shared zone (refer to Section 3.1 of this Submissions Report).

### 2.4.4 Maintenance

#### Submission numbers

2511-3, 2312-1

#### Issue description

- Query about maintenance responsibilities for the active transport link and suggestion that this could be a burden on ratepayers
- Council input into component selection is needed to ensure a reasonable balance is achieved between cost and asset life. In addition, an inventory of potential assets should be made available at 65 per cent detailed design stage, so that a fair assessment of implications for Council's long-term financial plan can be made.

#### Response

On completion, and subject to agreement, the ownership, operation and maintenance responsibility of the SCATL (excluding lighting and traffic lights) would be transferred

from Transport for NSW to Sutherland Shire Council. Council will continue to be consulted during the preparation of the detailed design.

### 2.4.5 Proposal timing

#### Submission numbers

2211-1

#### Issue description

- Comment that the proposal should be delivered more quickly.

#### Response

Subject to approval, construction of the Jackson Avenue to Gannons Road section is anticipated to commence in early 3early 2023 and take twelve to eighteen months to complete, weather permitting. Some parts of the proposal have been deferred for further investigation, assessment and consultation as discussed in Chapter 3 (Changes to the proposal).

## 2.5 Traffic and transport

### 2.5.1 Traffic impacts

#### Submission numbers

2311-1, 2411-1

#### Issue description

- Concern about impeding of traffic on President Avenue
- Concern about traffic generated by new apartments on Pinnacle Street and comment converting the road to be shared with cyclists will add to congestion and affect traffic flow and safety

#### Response

Transport is investigating an alternative route for the western section of SCATL Stage 2 through Kirrawee and Gymea and will carry out further assessment and consultation with residents and businesses before proceeding. This will include consideration of any potential impacts to traffic on President Avenue. Further details are provided in Chapter 3 (Changes to the proposal).

The proposal does not take existing road space along the Kingsway and does not require sharing of road space near Premier Street.

### 2.5.2 Parking

#### Submission numbers

1811-3, 2311-1, 0312-1, 0812-1,

#### Issue description

- Concern about loss of parking in the context of parking demand created by new unit developments and query about new spaces to offset the loss
- There is no provision for alternative parking near Gannons Road for people attending activities at Jenola Park

- Concern that the proposal will increase parking demand in the area
- Parking impacts are concentrated at crossings of side streets and along Denman Avenue and community feedback is needed to better understand these impacts, especially where parking occupancy is high.

#### Response

The proposal would result in the permanent loss of up to 12 on-street car parking spaces. Loss of parking is primarily at local street intersections with Kingsway and estimates of parking loss take into account the existing requirement not to park within 20 metres of a signalised intersection and within 10 metres of an unsignalised intersection. The removal of the nominated parking spaces is necessary to maintain adequate sight lines and maintain safety for path users.

By helping to reduce car dependency, the proposal would also help moderate parking demand at key centres along the route.

Given the limited impacts on parking across the length of the proposal, parking offsets are generally not proposed.

### 2.5.3 Safety

Note that safety issues relating to design aspects such as shared paths, shared zones and crossings are considered in Section 2.4.1 to 2.4.3.

#### Submission numbers

1711-1, 0312-1, 1312-3, 1512-1, 2312-1

#### Issue description

- Concern about pedestrian and cyclist safety, noting the large number of driveways along the route, particularly along the Kingsway outside Westfield
- Concerns about safety are reflected in community feedback and assurances about safety do not account for vehicles entering and leaving the Kingsway at speed
- The proposed section of on road cycleway on Banksia Road / Denman Avenue between Kingsway and Cawarra Road is not safe
- Concern that loss of parking on Denman Avenue will cause people to park outside residences and create safety issues by further narrowing the road and affecting sight distances for people leaving their residences
- It is highly likely that owners of driveways will strongly object to being made to give way to bike riders, and that drivers will be reluctant to give way at side streets, especially once traffic banks up and driver frustration levels rise
- An independent safety evaluation of the in and out of rail corridor options should be completed and made publicly available
- A road safety audit should be carried out and made publicly available.

#### Response

Paths that cross driveways are commonplace in NSW and motorists are currently required to check and give way to path users including children on bikes. Measures to treat the busiest driveways (i.e. at shopping centres etc. will be investigated during detailed design). Several side street crossing treatments will be used along SCATL including raised crossings or threshold treatments that clearly highlight the path.

The proposed section of on-road cycleway on Banksia Road / Denman Avenue between Kingsway and Cawarra Road is needed as there is not enough room in the existing footpath area. Separation from traffic would be achieved with a raised kerb buffer and a parking lane.

The loss of informal parking along the southern verge on Denman Avenue may cause some increase in parking along the northern side of Denman Avenue, a practice which is currently permitted and already occurs. NSW parking rules state that vehicles must not park on or across a driveway unless dropping off, or picking up, passengers.

A road safety audit of the proposal has been carried out as part of the detailed design process. Issues raised by the audit are being addressed as the design progresses.

### 2.5.4 Permitted path users

#### Submission numbers

1911-2, 2211-1, 0912-3

#### Issue description

- Query whether electric scooters will be permitted on the pathway
- Comment that more consideration needs to be given to people to use mobility scooters
- Concern about parking on the nature strip and footpaths
- Query as to whether high speed riders will be allowed to use the route.

#### Response

Mobility scooters are used by less mobile people to help them get to everyday places, such as the local shops. They are subject to the same rules that apply to pedestrians and users are encouraged to ride on the footpath, preferably at walking speed, which is 2-3 kilometres per hour.

Currently, e-bikes can be used on shared paths provided they are designed to be propelled primarily by the rider (with assistance provided by the electric motor for uphill sections or when riding into a headwind). E-scooters which can be solely propelled by the electric motor are currently not permitted for use in NSW outside private properties.

On a shared path bicycle riders must keep to the left (unless it is not practical) and give way to pedestrians. This means slowing down and even coming to a stop if necessary.

## 2.6 Landscape character and visual amenity

#### Submission numbers

1811-3, 2211-4, 2611-1, 1912-6, 2312-1

#### Issue description

- Concern about loss of trees and request for specific information about the loss of trees along Denman Avenue noting that they provide a visual barrier and mitigate noise from the rail line
- Preserve as many of the mature trees as possible with and carry out replanting
- Support for 4:1 replanting ratio

- Leaving tree assessment process to the construction phase risks high tree loss and limits opportunities to reduce impacts through design.

### Response

As part of the design / construction process, strategies and treatments have been adopted with a focus on those trees assessed as having a high retention value. This has included consideration of alternative path types to minimise impacts on tree roots. Further details are provided in Section 2.6 of the REF.

Impacts on street trees are discussed in Section 6.2.3 of the REF. That section notes that while the use of alternative path / pavement types as has allowed the retention of a large number of trees, the concept design identifies 127 trees within the construction footprint of the proposal which may require removal. Of these trees:

- 5 are of high retention value.
- 34 are of medium retention value.
- 88 are of low retention value.

The number of affected trees is likely to change noting the proposed changes to the proposal detailed in Chapter 3 (Changes to the proposal) and that opportunities to retain trees will continue to be considered during detailed design.

## 2.7 Noise and vibration

### Submission numbers

2312-1

### Issue description

- The noise assessment did not include chain saws or wood chipping machines which would create an additional noise source to that of concrete saws, trucks and excavators and could expose residents to high levels of noise for longer periods. The noise mitigation and management plan should consider these activities.
- The noise assessment did not consider the impact on residents adjacent to compounds from the loading and unloading of materials / stockpiles and heavy vehicle movements when operational. The study appears to only have addressed the setup of the work compounds - this may generate more noise but is in comparison to the operational length of the project and compounds of a much shorter duration.
- Out of hours operations will potentially affect receivers around the work compounds more often than along specific sections of the SCATL route. Compound operation should be covered in the noise mitigation and management plan and out of hours works should be strongly justified.
- Sensitive commercial premises (such as cafés at Miranda and Kirrawee) are particularly vulnerable to noise. The noise mitigation and management plan should address mitigating noise impacts within the town centres.
- The noise assessment identifies that schools, places of worship, Sutherland Hospital and the Hazelhurst Art gallery would be adversely affected by construction noise. The noise mitigation and management plan to be developed specifically address mitigating noise impacts to these land use activities (such as avoiding noise near schools during exam periods).

- Use of larger plant and machinery near receivers should be avoided where possible to minimise vibration. Where works occur near receivers, dilapidation reports should be offered.

### Response

An updated noise and vibration assessment has been carried out and summarised in Chapter 4 (Additional studies) and included in Appendix A.

The noise and vibration assessment provides a broad representation of the likely worst-case impacts from each component of the construction works. A 4-5hp chainsaw has a typical sound power level of 114 LAeq SWL while a 40-50hp mulcher has a sound power level of 116 LAeq SWL. As a concrete saw has a typical sound power level of 118 LAeq SWL, it is considered that worst-case impacts have been assessed. It is noted that chainsaws / mulchers would not likely operate simultaneously with concrete saws.

Compound establishment was adopted for a worst-case assessment for the compound as it typically generates higher noise levels. It is acknowledged, that there would be some noise associated with compounds for the duration of the proposal construction. The Noise and Vibration Management Plan (refer to mitigation measure NV1 in the REF) would include measures to minimise noise impacts from compound operation, including the loading and unloading of materials and heavy vehicle movements.

To minimise disruption to traffic, some work may need to be carried out outside standard construction hours. For work required outside standard hours, feasible and reasonable work practices to minimise noise nuisance (nominally set at 5 dB(A) above background noise levels) would be planned and implemented through the Noise and Vibration Management Plan. This would include notifying potentially affected residents and businesses.

The Noise and Vibration Management Plan would consider potential impacts on and appropriate mitigation in relation to more sensitive commercial premises as well as schools, places of worship, Sutherland Hospital and the Hazelhurst Art gallery.

Where vibration intensive plant are used, vibration would be managed to minimise disturbance to building occupants and to avoid damage to buildings and other structures. If recommended minimum working distances cannot be met by selecting smaller plant, vibration monitoring would occur to quantify and help manage vibration. Refer to mitigation measure NV2 in Chapter 5 (Environmental management).

## 2.8 Biodiversity

### Submission numbers

2312-1

### Issue description

- The cumulative impacts of the proposal and intersection works at President Avenue / Bath Road makes Sydney Turpentine-Ironbark Forest threatened ecological community significant
- Measures requested to reduced impacts on Pollard Park:
- Shared path along President Ave and Oak Rd adjacent to Pollard Park to be “Type 3 boardwalk” to minimise impact to tree roots

- Verges either side of the shared path, adjacent to Pollard Park, to be native grasses and /or shrubs indicative of the Sydney Turpentine-Ironbark Forest community
- New “cycle safety fence” to be installed between the shared path and Pollard Park to prevent cyclists cutting the corner or taking a short cut through the park
- Bush regeneration be undertaken in Pollard Park to close tracks, regenerate bare areas, and remove weeds
- Mural to be painted on the railway overpass wall on Oak Road to create community awareness about the importance of Sydney Turpentine Ironbark Forest.
- Corner of Sylvania Road and The Kingsway contain significant Ironbark trees that are also remnants of the Sydney Turpentine-Ironbark Forest community. These locations are not recommended for use as compounds without exclusion from the tree protection zone.

### Response

Transport is investigating an alternative route for the western section of SCATL Stage 2 through Kirrawee and Gymea and will carry out further assessment and community consultation. Council comments regarding potential impacts on Sydney Turpentine-Ironbark Forest threatened ecological community at Pollard Park will be considered during detailed design and construction planning.

The proposed compound on the corner of Sylvania Road and The Kingsway will be configured to avoid impacts on the tree protection zones of significant Ironbark trees at that location.

## 2.9 Socio-economic

### Submission numbers

1312-3, 2312-1

### Issue description

- Concerns about business impacts due to loss of parking and driveway crossings, and consequential proposal delays
- Concern about business impacts due to noise, dust and poor amenity and following pressures of COVID-19 business impacts.

### Response

Business impacts within Kirrawee have been avoided by the changes to the proposal outlined in Chapter 3 (Changes to the proposal). At other locations, businesses are not expected to be substantially affected by the proposal once operational and may benefit from an increase in passing trade.

Amenity for businesses during construction will be a key consideration and measures would be implemented to address noise, vibration and air quality impacts. Businesses would be kept informed via the Community and Stakeholder Engagement Plan.

## 2.10 Other issues

### 2.10.1 Regulatory issues

#### Submission numbers

0912-1, 0912-3, 1312-4

#### Issue description

- Query regarding rules and offences for shared path use
- Query about financial contribution from cyclists and fines for not complying with rules
- Comment that bikes should be registered and have number plates.

#### Response

A shared path is an area open to the public that is designated for the use of both bicycle riders and pedestrians. On a shared path bicycle riders must keep to the left (unless it is not practical) and give way to pedestrians, and this means slowing down and even coming to a stop if necessary. Research indicates there is not a strong basis for introducing further regulation of cyclist and pedestrian behaviour on shared path usage.

Bicycle riders are subject to the relevant road rules and enforcement by authorised officers. Registration of bicycles is not currently required in NSW.

### 2.10.2 Beyond the scope of the proposal

#### Submission numbers

2211-4, 2211-5, 0612-2, 0912-3, 1512-1

#### Issue description

- A safe cycling route through Cronulla should be provided as there is currently no safe legal way of getting from North to South Cronulla
- An off road link from Cronulla to Kurnell over the sand dunes, linking the new playing fields to both suburbs, should be a priority
- Comment that there have been few upgrades to Oak Road to cater for the increase in traffic
- Query about whether the crossing of Gannons Road near Captain Cook Drive (near the baseball fields) will be improved with the provision of a marked crossing or footbridge
- Comment about the narrow concrete path and uneven ground adjacent to the existing path on along Kingsway outside Port Hacking High School
- The on road section on Elouera Road is unsafe, particularly for children and novice cyclists.

#### Response

Comment regarding other cycleway routes and improvements are noted but are beyond the scope of SCATL Stage 2. Improvements to local roads and paths (except for Transport for NSW active transport initiatives) are the responsibility of Sutherland Shire Council.

# 3 Changes to the proposal

## 3.1 Western section through Kirrawee and Gymea – President Avenue to Sylvania Road

Transport has considered Council and community feedback and has decided not to proceed with a route via Oak Road and Flora Street for the western section of SCATL Stage 2 through Kirrawee and Gymea. Transport has developed an alternate route to the south of the railway line for this section (see Figure 3-1 and Figure 3-2) which would address community feedback and improved amenity for users.

The alternate route for the western section is being investigated to include provision of a shared path along the following route:

- Northern side of President Avenue between Oak Road and Bath Road
- Western side of Bath Road, northern side of Avery Avenue
- Badto Avenue and existing pathway connection between Badto Avenue and Talara Road, or a direct link between Avery Avenue and Talara Road
- Existing shared path link to Koorabel Avenue, Turners Lane and Gymea Bay Road
- Crossing of Gymea Bay Road, South Street and then via the existing pathway route between South Street, Chapman Street, Premier Street and Manchester Road
- M6 corridor (SP2 Infrastructure zoned land) to Thacker Street and Sylvania Road
- North on Sylvania Road to the Kingsway (connecting with the route shown in the REF).

This alternate route is currently preliminary and subject to change. Transport will carry out consultation with residents and businesses along the alternate route for the western section of SCATL Stage 2, further develop the design and carry out environmental assessment for the proposed change. An addendum to the REF (to be publicly displayed for community and stakeholder comment) will be prepared before proceeding with the western section of SCATL Stage 2 through Kirrawee and Gymea.


**Figure 3-1: Potential route for western section of SCATL Stage 2 through Kirrawee and Gymea – map 1**


**Figure 3-2: Potential route for western section of SCATL Stage 2 through Kirrawee and Gymea – map 2**

## 3.2 Sylvania Road to Jackson Avenue

Transport has considered community feedback and has decided to further investigate route options between Sylvania Road and Jackson Avenue.

Transport will develop route options for this section and carry out consultation with Council, residents and businesses. An addendum to the REF (to be publicly displayed for community and stakeholder comment) will be prepared before proceeding with a new route through this part of Miranda.

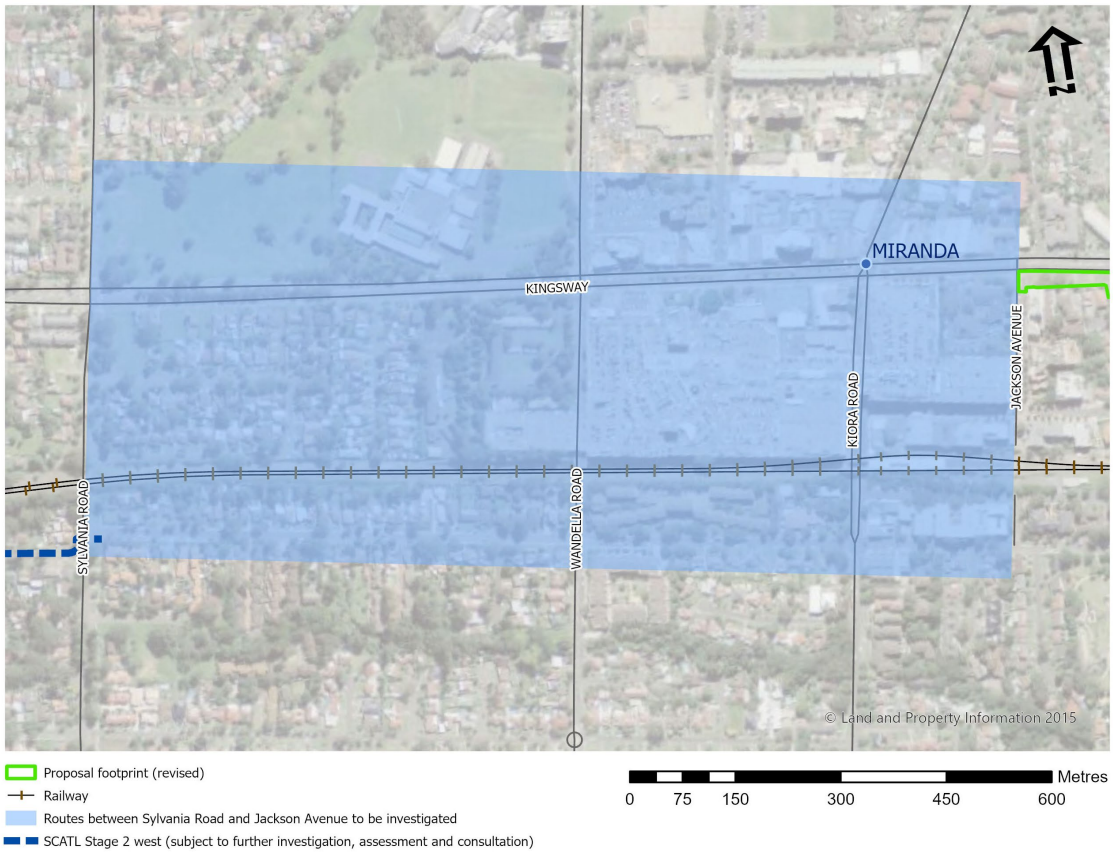


**Figure 3-3: Section for further investigation in Miranda**

## 3.3 Taren Point Road to Banksia Road

Transport has considered Council and community feedback and has decided to make changes to the proposal along the Kingsway between Taren Point Road and Banksia Road and at the Willarong Road intersection (see Figure 3-4).). The proposed changes would help ensure a safer, more efficient flow of local traffic, pedestrians and active transport users.

The proposed changes include the following:

- Revised SCATL route between Taren Point Road and Banksia Road.
- Upgrading the intersection of Willarong Road and the Kingsway with traffic lights
- New pedestrian / bicycle crossings on all legs of the intersection
- closure of the right turning entry into Banksia Road from the Kingsway
- Changed parking conditions on Willarong Road.

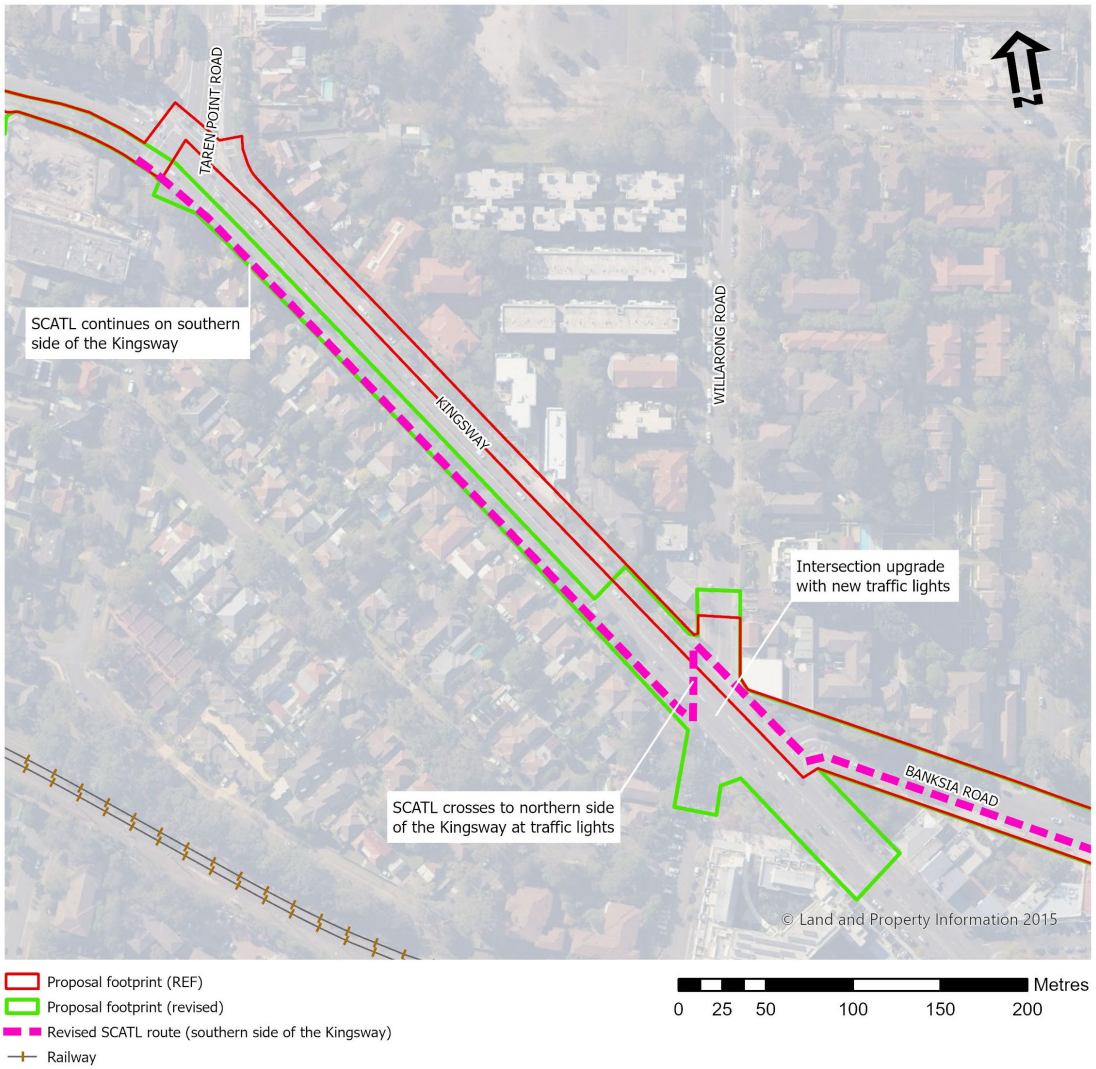


**Figure 3-4: Proposed changes to SCATL route along southern side of the Kingsway**

Transport will consult residents and businesses near the proposed change and consider any feedback before finalising the design

## 3.4 Proposal footprint refinements

As part of design development since the display of the REF, the need for minor adjustments to the proposal footprint were identified. The following adjustments are proposed:

- Jackson Avenue – boundary extended further to the south to accommodate drainage works (refer to Figure 3-5)
- Gurrier Avenue – boundary extended further to the south to accommodate pavement restoration of the existing raised threshold crossing (refer to Figure 3-5)
- Higherdale Avenue – boundary extended further to the south to accommodate pavement works associated with new raised threshold crossing (refer to Figure 3-5)
- Miranda Road – minor adjustment to allow kerb ramp construction (refer to Figure 3-5)

- Carramar Crescent – minor adjustment to adequately accommodate crossing (refer to Figure 3-6)
- Kingsway (on Sutherland Hospital boundary) – Area of proposed construction lease (to facilitate access) (refer to Figure 3-7)
- Hinkler Avenue – boundary extended further to the south to accommodate power pole / streetlight adjustments (refer to Figure 3-7)
- Denman Avenue / Banksia Road intersection – boundary extended further to the west along Denman Avenue to accommodate the proposed new raised threshold crossing and parking adjustments (refer to Figure 3-8)
- Denman Avenue – minor adjustments to accommodate refinement of the path alignment
- Denman Avenue / Gannons Road intersection – boundary extended further to the east to accommodate adjustments to pedestrian crossings (refer to Figure 3-9).


**Figure 3-5: Proposal footprint adjustments – Jackson Avenue, Gurrier Avenue, Higherdale Avenue and Miranda Road**


**Figure 3-6: Proposal footprint adjustment – Carramar Crescent**

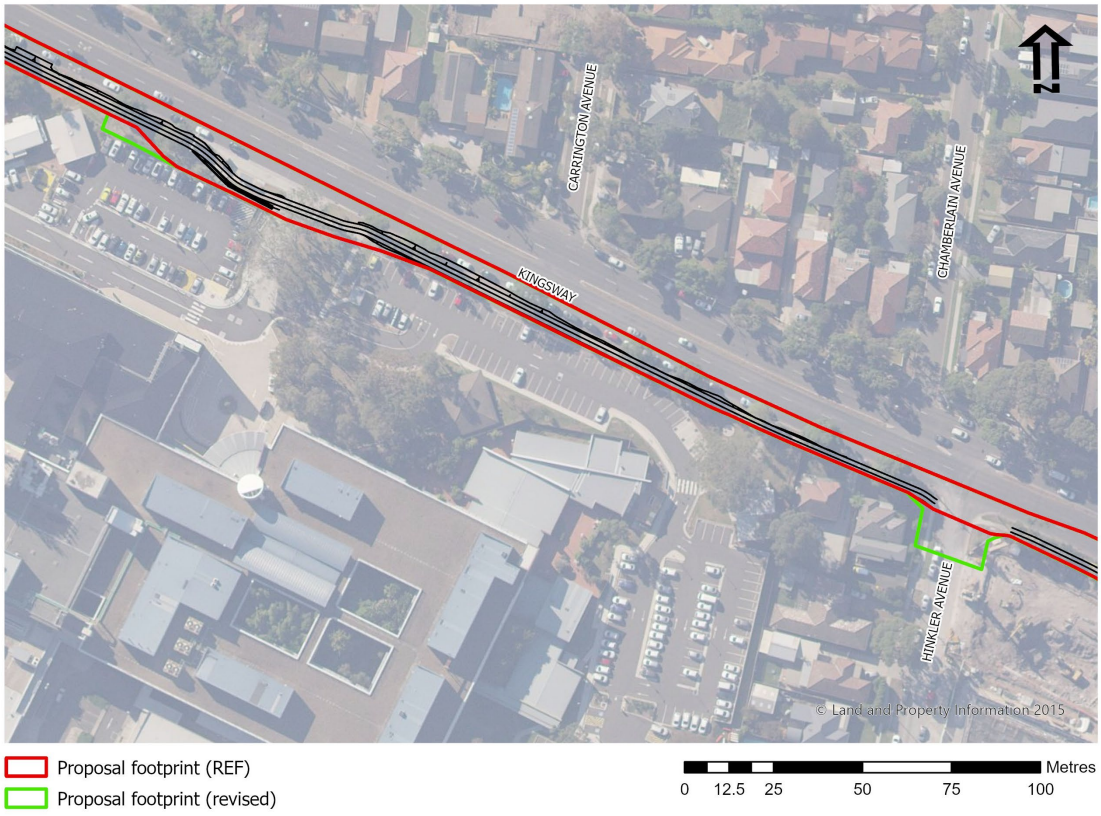


**Figure 3-7: Proposal footprint adjustment – Sutherland Hospital and Hinker Avenue**

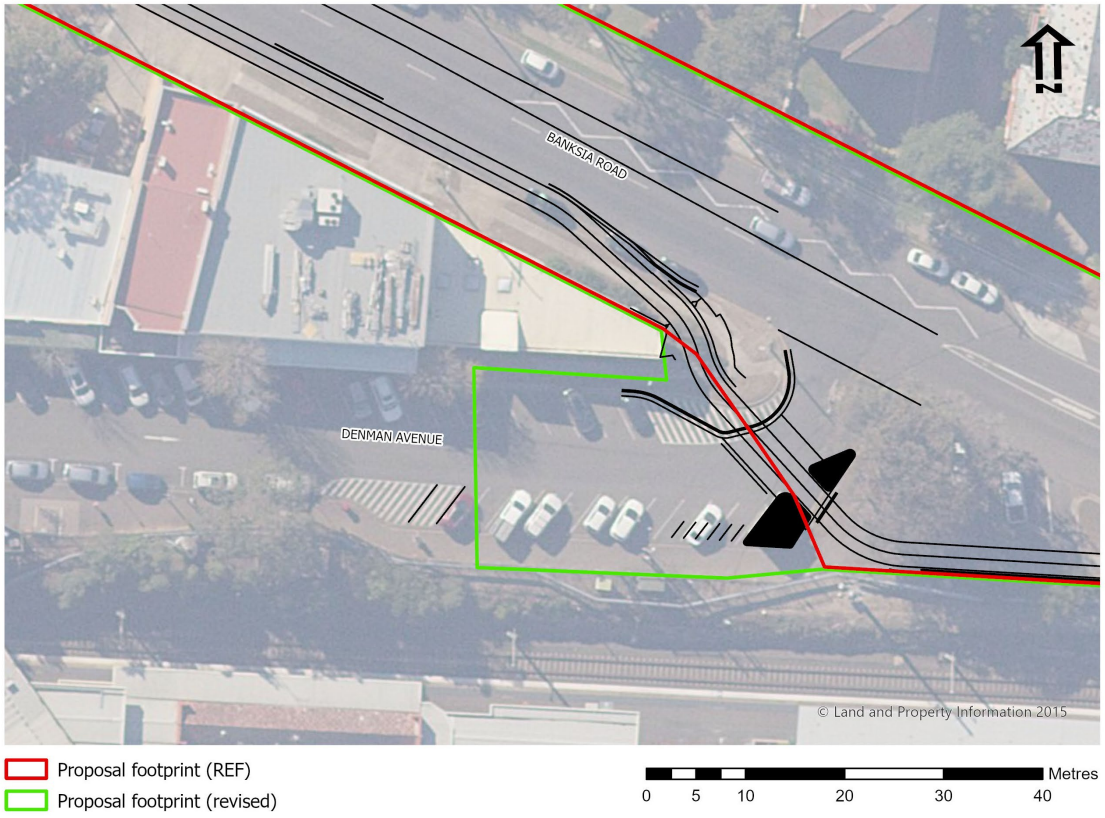


**Figure 3-8: Proposal footprint adjustment – Denman Avenue / Banksia Road**

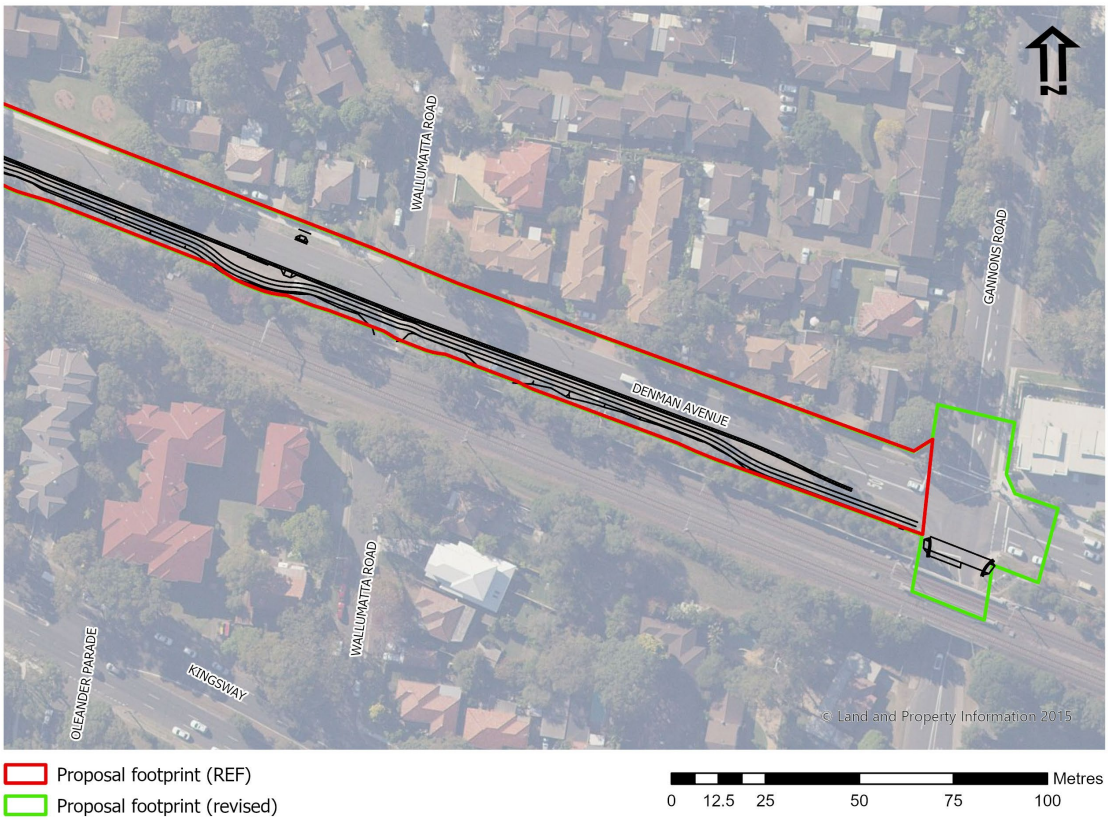


**Figure 3-9: Proposal footprint adjustment – Denman Avenue**

# 4 Environmental assessment

The changes to the western section of the proposal (though Kirrawee, Gymea and Miranda) Banksia will be subject to community consultation, further design development and environmental assessment. An addendum to the REF (to be publicly displayed for community and stakeholder comment) will be prepared before proceeding with this change and is not considered further in this Submissions Report.

The changes between Taren Point Road and Banksia Road is described in Section 3.3, along with the environmental assessment.

The only other change to the proposal is the various adjustments to the proposal footprint described in Section 3.4. The minor nature of the proposed changes mean that it is unlikely to affect most environmental aspects, however there would be some changes to noise and vibration impacts, landscape and visual impacts and traffic and transport impacts (specifically parking).

## 4.1 Traffic and transport

### 4.1.1 Methodology

The traffic and transport assessment methodology is presented in Section 6.1.1 of the REF. This has been applied to the proposed change.

### 4.1.2 Existing environment

The existing environment relevant to traffic and transport is described in Section 6.1.2 of the REF. Additionally, it is noted that at the eastern end of Denman Avenue there is time-limited 60 degree angle rear to kerb parking (1 hour, 8:30am - 6pm Monday to Friday, 8:30am -12:30pm Saturday). A total of 40 angle parking spaces and a further six parallel spaces are provided in this area.

### 4.1.3 Potential impacts

Most aspects of the proposed change would not alter impacts on general traffic, emergency vehicles, pedestrians, or cyclists.

The proposed traffic lights at the Kingsway / Willarong Road intersection would result in some additional stops for traffic on the Kingsway but would allow safe access to and from Willarong Road. The new traffic lights would be monitored and managed by the Sydney Coordinated Adaptive Traffic System (SCATS), which improves traffic flow and ensures minimum overall stops and delays for road users.

The proposed traffic lights would also include signalised pedestrian crossings on all four legs of the intersection which would improve safety and amenity for pedestrians.

The proposed closure of the right turns between the Kingsway and Banksia Road would improve pedestrian and cyclist safety in this area, however it would also potentially mean some additional travel distance / time for some road users, depending on their destination. The alternative route would be a right turn at the new Willarong Road traffic lights, then via Willarong Road, Dianella Street and Sunnyside Avenue. The additional travel distance could be up to about 900 metres, which equates to additional travel time of about one minute at the posted speed limit of 50 kilometres per hour.

The proposed closure of the right turns between the Kingsway and Banksia Road would also affect some bus routes. Transport is working with bus operators to identify suitable changes to bus routes that will minimise any impacts on customers.

Some changes to parking impacts have been identified and are detailed in Table 4-1.

**Table 4-1: Loss of on street parking – changes**

| Location | REF assessment | Updated assessment | Comment |
|---|---|---|---|
| Higherdale Avenue | No loss of parking | Installation of raised crossing reduces five metres of parking space (about one parking space) on the eastern kerb. | While on-street parking demand is high at this location, the loss of one space in the context of available parking on the wider local road network is considered minor. |
| Banksia Road | No loss of parking | Due to the ramp for the on-road cycle path, the parking zone on the southern side of Banksia Road is reduced by 20 metres (about three parking spaces). | While on-street parking demand is high at this location, the loss of one space in the context of available parking on the wider local road network is considered minor. |
| Denman Avenue | No loss of marked car parking spaces | Net loss of three 1P angled parking spaces along the southern side of Denman Avenue. Provision of seven new fully indented motorcycle parking spaces. | The time-limited nature of these spaces suggest they are more likely to be used by customers of nearby shops rather than commuters. The net loss of three time-limited car spaces is not expected to have a substantial impact on convenient access to nearby businesses.<br>The new motorcycle parking uses space not suitable for access by larger vehicles. |

### 4.1.4 Revised safeguards and mitigation measures

The safeguards presented in Section 6.1.4 of the REF are considered adequate to address the traffic and transport impacts associated with the proposed changes. An additional measure has been proposed which requires further consultation with bus operators.

**Table 4-2: Additional traffic and transport environmental management measures**

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|
| Public transport network changes during construction | Consultation with bus operators will continue with relation to routes affected by the proposal between Taren Point and Banksia Road | Transport for NSW | Detailed design | Additional measure |

## 4.2 Noise and vibration

### 4.2.1 Methodology

A revised noise and vibration assessment has been prepared for the proposal and considers the amended proposal footprint (excluding the section between Taren Point Road and Banksia Road) (refer to Appendix A). The revised assessment identified noise management levels based on background noise monitoring, which was not collected originally due to changes to the noise environment associated with COVID-19 restrictions.

For the section of SCATL between Taren Point Road and Banksia Road, the distances, where noise management levels are likely to be exceeded during construction, were taken from the revised noise and vibration assessment and applied to the amended construction footprint. This was done for the 'pavement formation works' scenario described in Section 4.4 of the noise and vibration assessment, as it is expected to have the highest noise levels.

For the proposed traffic lights at Willarong Road, construction noise impacts have been considered in accordance with the *Construction Noise and Vibration Guideline* (Roads and Maritime Services, 2016) and associated noise estimator tool. The 'estimator scenario' worksheet was used with the 'road furniture installation' scenario selected as representative of the noisiest day works and the 'profiling' scenario as scenario selected as representative of the noisiest evening / night works. A shielding correction of -5 dBA was included to recognise the screening to the broader area provided by the by the first row of buildings along the Kingsway frontage. The adjustment was not applied to the calculation of highly noise affected distances or affected distances for non-residential receiver types.

A qualitative assessment of potential operational noise was also carried out and primarily focused on noise from the audible locating and crossing signals associated with the proposed new traffic lights at Kingsway / Willarong Road.

### 4.2.2 Existing environment

The proposed changes between Taren Point Road and Banksia Road occur within an area that mainly comprises residential receivers who are located within a noise environment dominated by traffic on the Kingsway and Taren Point Road, as well as local construction sites and domestic noise. There is some commercial development clustered around the Kingsway / Willarong Road intersection. Figure 4-1 shows the non-residential receivers in the vicinity of the intersection.


**Figure 4-1: Non-residential receivers between Taren Point Road and Banksia Road**

### 4.2.3 Criteria

Noise Catchment Area 4 (NCA 4), as identified in Section 2.4 of the revised noise and vibration assessment, best represents the areas likely to be affected by the changes between Taren Point Road and Banksia Road, including the proposed traffic lights. The background noise levels and Noise Management Levels (NML) for NCA 4 are provided in Table 4-3.

**Table 4-3: Noise management levels for NCA4**

| Period | RBL (dBA) | NML dB LAeq(15min) |
|---|---|---|
| Day | 43 | 53 |
| Evening | 38 | 43 |
| Night | 30 | 35 |

### 4.2.4 Potential impacts

#### Proposal footprint refinements

The proposed changes to the footprint are small and only result in minor changes to noise predictions.

#### Revised path alignment between Taren Point Road and Banksia Road

The changes to the path alignment between Taren Point Road and Banksia Road would result in minor changes to the extent of noise impacts when compared with the REF. The affected distances (the distance within which NMLs are likely to be

exceeded) for different assessment periods are provided in Table 4-4 and are shown on Figure 4-2.

**Table 4-4: Affected distances – Pavement formation works**

| Receiver type | Period | Affected distance | Affected receivers |
|---|---|---|---|
| Residential | Standard hours | ~185m | Yes |
| | Evening | ~525m | Yes |
| | Night | ~1000m | Yes |
| | Highly noise affected | ~5m | Yes |
| Education | When in use | ~23m | No |
| Hospital | When in use | ~23m | No |
| Places of worship | When in use | ~23m | No |
| Passive recreation | When in use | ~90m | No |
| Active recreation | When in use | ~35m | No |
| Commercial | When in use | ~23m | Yes |

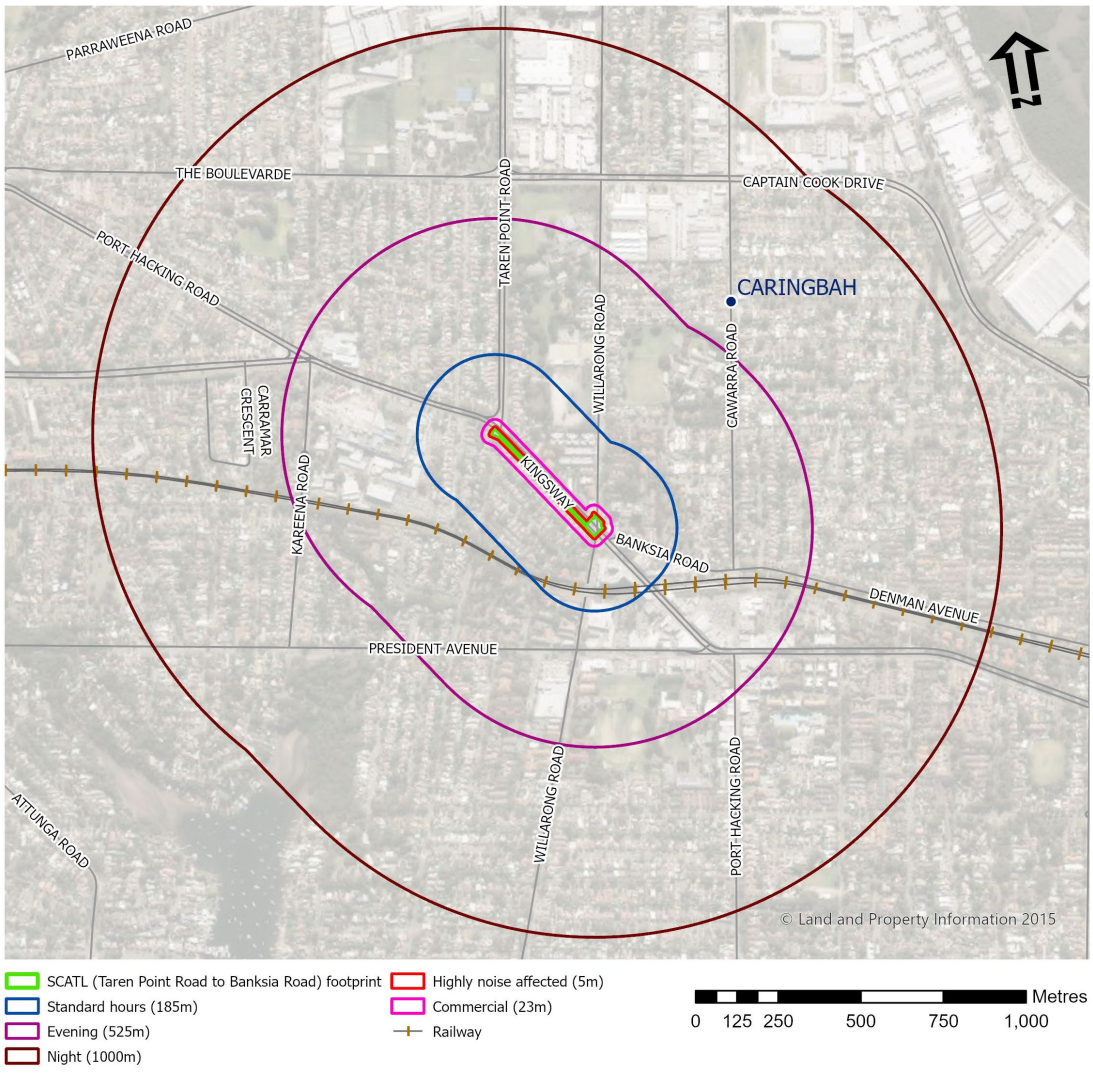


**Figure 4-2: Affected distances – Pavement formation works**

Table 4-4 shows LAeq(15min) noise emissions are predicted to be above the standard hours NMLs for nearby residential receivers up to 185 metres from the proposal site, as well as commercial receivers immediately adjacent to the proposal site. Noise emissions are anticipated to exceed the highly noise affected NML of 75dB LAeq(15min) for receivers up to approximately five metres from the proposal site (mainly the front yards of receivers on the southern side of Kingsway).

### Kingsway / Willarong Road intersection works

*Construction*

The affected distances (the distance within which NMLs could be exceeded) for the noisiest works associated with the proposed intersection works are provided in Table 4-5 and Table 4-6. Figure 4-3 shows the affected distances for residential receivers.

**Table 4-5: Affected distances – intersection works (road furniture) - day**

| Receiver type | Period | Affected distance | Affected receivers |
|---|---|---|---|
| Residential | Standard hours | ~103m | Yes |
| | Evening | ~163m | Yes |
| | Night | ~495m | Yes |
| | Highly noise affected | ~13m | Yes |
| Education | When in use | ~136m | No |
| Hospital | When in use | ~44m | No |
| Places of worship | When in use | ~136m | No |
| Passive recreation | When in use | ~82m | No |
| Active recreation | When in use | ~42m | No |
| Commercial | When in use | ~23m | Yes |

**Table 4-6: Affected distances – intersection works (profiling) - night**

| Receiver type | Period | Affected distance | Affected receivers |
|---|---|---|---|
| Residential | Standard hours | ~195m | Yes |
| | Evening | ~460m | Yes |
| | Night | ~870m | Yes |
| | Highly noise affected | ~27m | Yes |
| Education | When in use | ~253m | No |
| Hospital | When in use | ~103m | No |
| Places of worship | When in use | ~253m | No |
| Passive recreation | When in use | ~165m | No |
| Active recreation | When in use | ~103m | No |
| Commercial | When in use | ~56m | Yes |

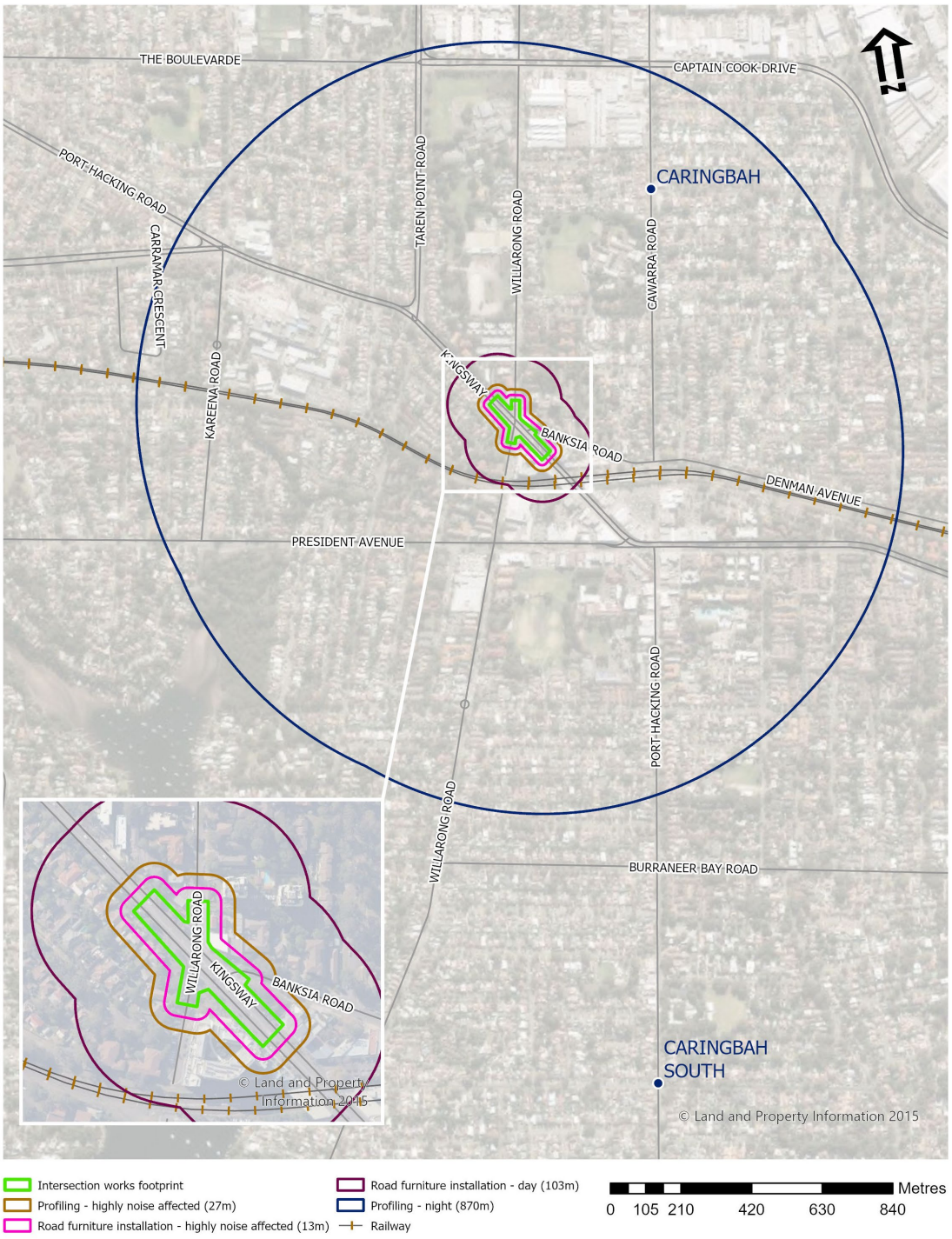


**Figure 4-3: Affected distances – residential**

Table 4-5 and Table 4-6 shows LAeq(15min) noise emissions are predicted to be above the standard hours NMLs for nearby residential receivers for up to 103 metres for road furniture installation during standard hours and for up to 870 metres for profiling at night. Exceedances at commercial receivers immediately adjacent to the proposal site are also expected. Noise emissions are anticipated to exceed the highly noise affected NML of 75dB LAeq(15min) for receivers up to approximately 13 metres for road furniture installation and 27 metres for profiling.

*Operation*

The proposed changes would not result in a change to the number of heavy vehicles using the section of the Kingsway between Taren Point Road and Willarong Road and are not expected to result in a major change to maximum noise level events. Noise from breaking and accelerating to and from the new traffic light controlled intersection could result some additional maximum noise level events.

The provision of traffic lights with pedestrian crossings at the Kingsway / Willarong Road intersection would involve the installation of audible locating and crossing signals to assist vision impaired users.

The locating signal is characterised by a short duration tonal pulse approximately every three seconds. The crossing signal is a rapid tonal pulse.

The loudest producible noise level during the walk phase is 85dBA at a distance of one metre from the push button device (which corresponds to a sound power level of 93dBA). To account for the tonal component at the start of the walk phase, a 5dBA correction is applied to the noise source level in accordance with the *Noise Policy for Industry* (Environment Protection Authority, 2017). Hence, the maximum sound power level for the walk phase signal is 98dBA.

To achieve a balance between ensuring the safety needs of vision impaired persons and the amenity needs of nearby noise sensitive receivers, the audio-tactile pedestrian push button devices are designed to produce an audio signal with a built-in volume control that is automatically adjusted relative to the ambient noise level. Additionally, the devices are fitted with a three-setting volume switch that can allow a volume adjustment potential of 6dBA, where required. Following installation, the audible locating and crossing signals would be adjusted to ensure they meet LAmax noise goals established in accordance with the *Management framework on audio tactile push buttons* (Roads and Traffic Authority, 2005). This would minimise potential sleep disturbance impacts.

### 4.2.5 Revised safeguards and mitigation measures

The safeguards presented in Section 6.3.5 of the REF are considered adequate to address the construction noise impacts associated with the proposed changes. An additional measure has been proposed to address potential noise impacts associated with the proposed new traffic lights.

**Table 4-7: Additional noise and vibration environmental management measures**

| Impact | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|
| Noise from audible locating and crossing signals | The audible locating and crossing signals at the Kingsway / Willarong Road intersection will be adjusted to ensure they meet LAmax noise goals established in accordance with the Management framework on audio tactile push buttons (Roads and Traffic Authority, 2005). | Transport for NSW | Operation | Additional measure |

## 4.3 Landscape character and visual amenity

### 4.3.1 Methodology

The landscape character and visual amenity assessment methodology is presented in Section 6.2.1 of the REF. This has been applied to the proposed change.

### 4.3.2 Existing environment

The existing environment relevant to landscape character and visual amenity is described in Section 6.2.2 of the REF.

The following landscape character zones identified in the REF are relevant to the proposed change:

- LCZ4 Kingsway Residential – The sensitivity of this area is considered moderate. The Kingsway is a major east-west traffic route that has a pleasant 'parkway' character, with the majority of land uses along the road being residential.
- LCZ6 Caringbah Residential – The sensitivity of this area is considered moderate. The Caringbah residential zone is a generally cohesive established residential area with a mix of building types and an extensive coverage of street trees.

The following viewpoints identified in the REF are relevant to the proposed change:

- Viewpoint 9 – Banksia Road, at the corner of the Kingsway, looking south-east
- Viewpoint 10 – Denman Avenue, Caringbah, about 20 metres east of Nullaburra Road, looking east.

Similar to the northern side of the Kingsway between Taren Point Road and Willarong Road, the southern side of the Kingsway has a number of mature Brush Box (*Lophostemon confertus*) positioned between the kerb and the existing footpath.

Photographs showing the existing environment near the Kingsway / Willarong Road intersection are provided in Figure 4-4 and Figure 4-5.

**Figure 4-4: View west to the Kingsway / Willarong Road intersection**

**Figure 4-5: View east to the Kingsway / Banksia Road intersection**

### 4.3.3 Potential impacts

The proposed extensions to the proposed footprint are minor and would not result in any additional tree removal compared to the footprint assessed in the REF. Impacts on street trees are being minimised through design of the horizontal path alignment and through alternative path types which minimise impacts on tree roots. Measures to protect trees during construction are also proposed (refer to Section 6.2.5 of the REF).

The presence of traffic lights at the Kingsway / Willarong Road intersection would be a noticeable visual change but would be consistent with the character of the arterial road environment. The proposed change would therefore not alter the impact ratings provided in the REF for LCZ4 (moderate-low) and LCZ6 (moderate-low).

For viewers from viewpoints 9 and 10, a slight larger construction area could be perceived however this would not the impact ratings provided in the REF (moderate-low for both viewpoints).

### 4.3.4 Revised safeguards and mitigation measures

No changes to the safeguards and management measures presented in Section 6.2.5 of the REF are proposed as a result of the proposed changes. Minor refinements to safeguards LCV7, LCV8 and LCV9 are included in Section 6.2.

# 5 Additional studies

## 5.1 Updated noise and vibration assessment

A revised noise and vibration assessment has been prepared for the proposal. The revised assessment includes noise catchment areas and noise management levels based on background noise monitoring, which was not collected originally due to changes to the noise environment associated with COVID-19 restrictions. The revised assessment excludes the proposed changes between Taren Point Road and Banksia Road (which have been considered above in Section 4.2 of this Submissions Report).

A summary of the revised assessment is provided below while the full report is included in Appendix A.

### 5.1.1 Methodology

The methodology for the revised noise and vibration assessment was substantially the same as that described in Section 6.3.1 of the REF. However, instead of using 'representative noise environment' background noise levels from the Transport for NSW Maintenance and Construction Noise Estimator, measured noise levels have been used to set noise management levels. The availability of noise monitoring data has also allowed the refinement of noise catchment areas (NCAs).

### 5.1.2 Existing environment

Five NCAs were identified for the revised noise and vibration assessment:

- NCA 1 – Area surrounding the Kirrawee compound site. Residential neighbourhood with the noise environment dominated by traffic noise from the local road network and distant traffic from Kingsway and Princes Highway, general urban hum and environmental noise.
- NCA 2 – Area surrounding the previously proposed alignment along Kingsway from Sylvania Road to Wandella Road. This NCA has been retained as it includes proposed site compounds. Dominated by traffic from the Kingsway, as well as noise from nearby construction sites.
- NCA 3 – Area surrounding the previously proposed alignment along Kingsway from Wandella Road to Jackson, and the western extent of the currently proposed alignment. Dominated by traffic from the Kingsway, as well as noise from nearby construction sites.
- NCA 4 – Area surrounding the proposal alignment from Jackson Avenue to Taren Point Road. This area primarily comprises residential receivers with the noise environment dominated by traffic on the Kingsway and Taren Point Road as well as local construction sites and domestic noise.
- NCA 5 – Area surrounding the alignment from Banksia Road to Gannons Road. This area is representative of the suburban areas near the alignment and is dominated by suburban sources such as local traffic, lawn mowers in dwelling gardens and the continuous hum of distant traffic.

The location of the NCAs and unattended noise monitoring locations are shown in Figure 5-1 while Table 5-1 provides a summary of background noise monitoring results.

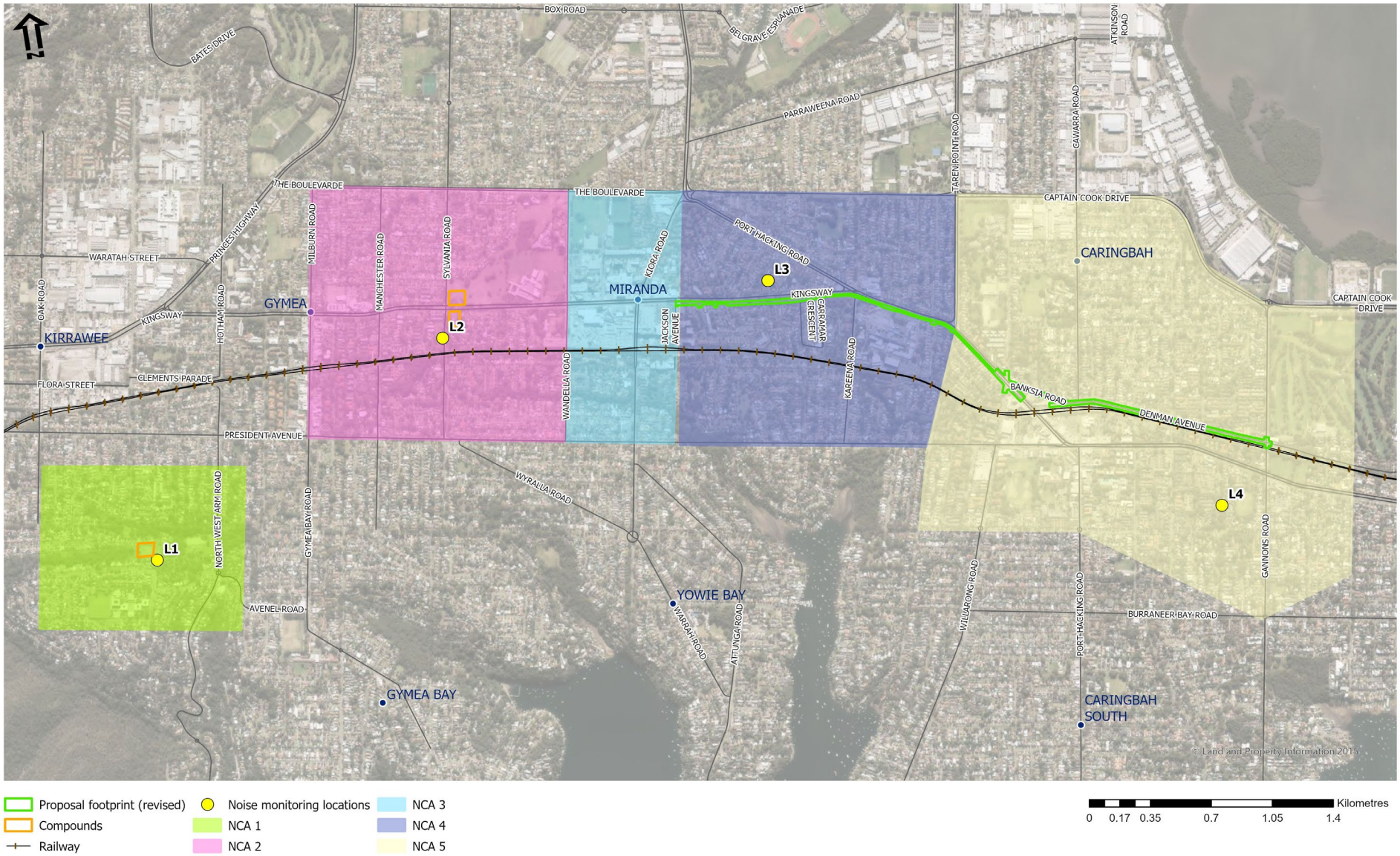


**Figure 5-1: Noise catchment areas and noise monitoring locations**

**Table 5-1: Background noise monitoring summary (RBL, dBA)**

| Location | Day 7am – 6pm | Evening 6pm – 10pm | Night 10pm – 7am# |
|---|---|---|---|
| L1/NCA1 | 39 | 34 | 30 (29) |
| L2/NCA2 | 48 | 41 | 30 (28) |
| NCA3 | 48 | 41 | 30 (28) |
| 3L3L3/NCA4 | 43 | 38 | 30 (29) |
| 4L4L4/NCA5 | 41 | 37 | 30 (27) |

Note: The minimum RBL for the night period is 30dBA. Bracketed value is the measured value.

### 5.1.3 Criteria

The noise and vibration assessment criteria for residential receivers have been updated using the results of noise monitoring and are provided in Table 5-2. Other criteria remain as presented in Section 6.3.3 of the REF.

**Table 5-2: Construction noise management levels – residential receivers**

| Receiver | Assessment period | RBL (db $LA_{90}$) | NML (db $LA_{eq}$) |
|---|---|---|---|
| NCA 1 | Standard hours | 39 | 49 |
| | Out-of-hours Period 1[1] | 34 | 39 |
| | Out-of-hours Period 2[2] | 30 | 35 |
| NCA 2 | Standard hours | 48 | 58 |
| | Out-of-hours Period 1[1] | 41 | 46 |
| | Out-of-hours Period 2[2] | 30 | 35 |
| NCA 3 | Standard hours | 48 | 58 |
| | Out-of-hours Period 1[1] | 41 | 46 |
| | Out-of-hours Period 2[2] | 30 | 35 |
| NCA 4 | Standard hours | 43 | 53 |
| | Out-of-hours Period 1[1] | 38 | 43 |
| | Out-of-hours Period 2[2] | 30 | 35 |
| NCA 5 | Standard hours | 41 | 51 |
| | Out-of-hours Period 1[1] | 37 | 42 |
| | Out-of-hours Period 2[2] | 30 | 35 |

1 Out-of-hours Period 1: Monday to Friday 6pm-10pm, Saturday 7am-8am and 1pm-10pm, Sunday / Public Holiday 8am-6pm

2 Out-of-hours period 2: Monday to Friday 10pm-7am, Saturday 10pm-8am, Sunday / Public Holiday 6pm-7pm

### 5.1.4 Potential impacts

The construction scenarios included in this assessment are described in Section 6.3.4 of the REF. The specific locations and types of equipment used for construction are not known at this stage. It is also unlikely that all plant and equipment would operate simultaneously but may be used sequentially across each part of the construction area. On that basis, the assessment provides a broad representation of the likely worst-case impacts from each component of the construction work.

Individual receivers would be affected for relatively short periods as construction moves along the alignment. While evening and night works would only be required in limited circumstances where necessary to ensure safety or avoid delays to traffic (along the Kingsway), predictions have been provided for these periods.

While the predictive modelling considered topography and the influence of buildings, other features that affect the propagation of noise, including solid boundary fences and sheds were not accounted for. Therefore, the results of the predictive modelling are highly conservative and representative of the highest potential noise emissions from the proposed construction activities.

### Construction noise – compound establishment

Table 5-3 shows $L_{Aeq(15min)}$ noise emissions are predicted to be above the NMLs for nearby residential receivers and active recreation areas during establishment of the compound sites.

**Table 5-3: Affected distances – Compound establishment**

| Receiver type | Period | NML (dB $LA_{eq}$) | Affected distance[1] |
|---|---|---|---|
| Residential NCA 1 | Day | 49 | Approx. 270 metres |
| | Evening | 39 | Approx. 650 metres |
| | Night | 35 | Approx. 845 metres |
| | Highly affected | 75 | Approx. 25 metres |
| Residential NCA 2 | Day | 58 | Approx. 215 metres |
| | Evening | 46 | Approx. 505 metres |
| | Night | 35 | Approx. 680 metres |
| | Highly affected | 75 | Approx. 8 metres |
| Active recreation | When in use | 65 | Approx. 20 metres |

Note 1: Distance up to which the NML would be exceeded.

### Construction noise – earthworks and alignment formation

Table 5-4 shows $L_{Aeq(15min)}$ noise emissions for earthworks and alignment formation are predicted to be above the standard hours NMLs for nearby residential receivers to approximately 185 metres from the proposal site, as well as places of worship, active recreation areas and commercial receivers immediately adjacent to the proposal site. Given the proximity of adjacent buildings to the proposal site, noise emissions are anticipated to exceed the highly noise affected NML of 75dB $LA_{eq(15min)}$ for receivers up to 25 metres from the proposal site.

**Table 5-4: Affected distances – earthworks and alignment formation**

| Receiver type | Period | NML (dB $LA_{eq}$) | Affected distance[1] |
|---|---|---|---|
| Residential NCA 4 | Day | 53 | Approx. 120 metres |
| | Evening | 43 | Approx. 400 metres |
| | Night | 35 | Approx. 830 metres |
| | Highly affected | 75 | Approx. 10 metres |

| Receiver type | Period | NML (dB $LA_{eq}$) | Affected distance[1] |
|---|---|---|---|
| Residential NCA 5 | Day | 51 | Approx. 185 metres |
| | Evening | 42 | Approx. 405 metres |
| | Night | 35 | Approx. 800 metres |
| | Highly affected | 75 | Approx. 25 metres |
| Places of worship | When in use | 45 (internal)<br>70 (external) | Approx. 20 metres |
| Passive recreation | When in use | 60 | Approx. 65 metres |
| Active recreation | When in use | 65 | Approx. 45 metres |
| Commercial | When in use | 70 | Approx. 20 metres |

Note 1: Distance up to which the NML would be exceeded.

### Construction noise – pavement formation works

Table 5-5 shows $L_{Aeq(15min)}$ noise emissions are predicted to be above the standard hours NMLs for nearby residential receivers up to 240 metres from the proposal site, as well as The Sutherland Hospital, places of worship, active recreation areas and commercial receivers immediately adjacent to the proposal site. Given the proximity of adjacent buildings to the proposal site, noise emissions are anticipated to exceed the highly noise affected NML of 75dB $L_{Aeq(15min)}$ for receivers up to approximately 30 metres from the proposal site.

**Table 5-5: Affected distances – pavement formation works**

| Receiver type | Period | NML (dB $LA_{eq}$) | Affected distance[1] |
|---|---|---|---|
| Residential NCA 4 | Day | 53 | Approx. 185 metres |
| | Evening | 43 | Approx. 525 metres |
| | Night | 35 | Approx. 1000 metres |
| | Highly affected | 75 | Approx. 5 metres |
| Residential NCA 5 | Day | 51 | Approx. 240 metres |
| | Evening | 42 | Approx. 530 metres |
| | Night | 35 | Approx. 835 metres |
| | Highly affected | 75 | Approx. 30 metres |
| Hospital wards | When in use | 45 (internal)<br>70 (external) | Approx. 23 metres |
| Places of worship | When in use | 45 (internal)<br>70 (external) | Approx. 23 metres |
| Passive recreation | When in use | 60 | Approx. 90 metres |
| Active recreation | When in use | 65 | Approx. 35 metres |
| Commercial | When in use | 70 | Approx. 23 metres |

### Construction noise – kerb realignment including concrete sawing

Table 5-6 shows $L_{Aeq(15min)}$ noise emissions would potentially be above the relevant NMLs for all receiver types. The predictive modelling indicates that during the night period, residential receivers to a distance exceeding one kilometre from the proposal site may experience noise levels above the NMLs. Additionally, receivers within approximately 45 metres would potentially be exposed to noise levels above the highly noise affected NML of 75dB $L_{Aeq(15min)}$. The identified affected distances are highly conservative and assumes that noise readily spreads along paths of little resistance such as roadways. In most circumstances, the affected distances would be lower due to barrier effects from buildings and other structures.

**Table 5-6: Affected distances – kerb realignment**

| Receiver type | Period | NML (dB $LA_{eq}$) | Affected distance[1] |
|---|---|---|---|
| Residential NCA 4 | Day | 53 | Approx. 430 metres |
| | Evening | 43 | Approx. 990 metres |
| | Night | 35 | Approx. 1000 metres |
| | Highly affected | 75 | Approx. 30 metres |
| Residential NCA 5 | Day | 51 | Approx. 465 metres |
| | Evening | 42 | Approx. 820 metres |
| | Night | 35 | Approx. 1000 metres |
| | Highly affected | 75 | Approx. 45 metres |
| Hospital wards | When in use | 45 (internal)<br>70 (external) | Approx. 70 metres |
| Places of worship | When in use | 45 (internal)<br>70 (external) | Approx. 70 metres |
| Passive recreation | When in use | 60 | Approx. 200 metres |
| Active recreation | When in use | 65 | Approx. 135 metres |
| Commercial | When in use | 70 | Approx. 70 metres |

### Construction noise – line marking and road furniture installation

Table 5-7 shows $L_{Aeq(15min)}$ noise emissions are predicted to be above the standard hours NMLs for nearby residential receivers up to 90 metres from the proposal site. Additionally, places of worship, active recreation areas, and commercial receivers immediately adjacent to the proposal site may also experience noise levels above the relevant NMLs. Given the proximity of adjacent buildings to the proposal site, noise is anticipated to exceed the highly noise affected NML of 75dB LAeq(15min) for receivers within approximately 15 metres of the proposal site.

**Table 5-7: Affected distances – line marking and road furniture**

| Receiver type | Period | NML (dB $LA_{eq}$) | Affected distance[1] |
|---|---|---|---|
| Residential NCA 4 | Day | 53 | Approx. 70 metres |
| | Evening | 43 | Approx. 285 metres |

| Receiver type | Period | NML (dB $LA_{eq}$) | Affected distance[1] |
|---|---|---|---|
| | Night | 35 | Approx. 625 metres |
| | Highly affected | 75 | Approx. 5 metres |
| Residential NCA 5 | Day | 51 | Approx. 90 metres |
| | Evening | 42 | Approx. 295 metres |
| | Night | 35 | Approx. 520 metres |
| | Highly affected | 75 | Approx. 15 metres |
| Places of worship | When in use | 45 (internal)<br>70 (external) | Approx. 20 metres |
| Passive recreation | When in use | 60 | Approx. 50 metres |
| Active recreation | When in use | 65 | Approx. 40 metres |
| Commercial | When in use | 70 | Approx. 20 metres |

### Construction noise levels – sleep disturbance

Out of hours construction activities occurring during the night-time have the potential to generate noise emissions that may cause sleep disturbance at receivers near the proposal footprint. Modelling identified that noise emissions have the potential to be above the maximum noise trigger level at residential receivers located within about 70 metres of the proposal footprint.

### Construction traffic noise

The proposal would generate up to five heavy and ten light construction vehicle movements per day at the peak of construction activity. These volumes are small in the context of daily traffic, particularly on the Kingsway, and are not expected to result in perceptible increase in road traffic noise levels over the construction period.

### Construction vibration

The main potential source of construction vibration would be vibratory rollers and hydraulic hammers. The use of hydraulic hammers would potentially occur during demolition of the existing pavement, while rolling may take place along the alignment prior to any road resurfacing. Peak levels of vibration from rolling typically occurs as the roller stops to change direction and a resonance is created as the roller (and vibrator) is stationary.

Construction plant would be selected to ensure minimum safe working distances set by the Construction Noise and Vibration Guideline (Roads and Maritime Services, 2016) are complied with where possible, for cosmetic damage and human response to vibration. If safe working distances cannot be complied with, additional measures including vibration monitoring would be implemented.

### Operation

Operational noise from the proposal would typically be associated with pedestrians using the active transport link. Raised voices or loud conversations may occur, however, these noise events would be sporadic and would likely have a negligible effect on the $LA_{eq(15min)}$ noise levels at receiver locations adjacent to the link.

The proposal alignment generally runs immediately adjacent to the Kingsway, with the noise environment dominated by road traffic noise. It is expected that operational

noise from the proposal would be significantly masked by existing road traffic noise. For quieter sections of the alignment, the Maximum Noise Level Assessment criterion of 65dB $LA_{max}$ could be exceeded at receivers with about eight metres should users be shouting.

### 5.1.5 Safeguards and management measures

The safeguards and mitigation measures identified in Section 6.5 of the REF are adequate considering the results of the revised noise and vibration assessment. No additional or modified measures are proposed.

# 6 Environmental management

The REF for the project identifies the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (section 7.2 of the review of environmental factors).

After consideration of the issues raised in the public submissions no changes to proposed safeguards and management measures were considered necessary.

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

## 6.1 Environmental management plans

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

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

The CEMP and EWMS will be prepared prior to construction of the project and must be reviewed and endorsed by the Transport for NSW Environment Officer, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with specifications including QA Specification G36 – Environmental Protection (Management System) and QA Specification G10 – Traffic Management.

## 6.2 Summary of safeguards and management measures

The REF for the project identifies 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 project (refer to Chapter 7 of the REF) have been revised. The environmental management measures in Table 3-1 will guide the subsequent phases of the project. Additional and/or modified environmental safeguards and management measures to those presented in the REF have been made **bold**, while deleted measures, or parts of measures, have been ~~struck out~~.

**Table 6-1: Summary of safeguards and management measures**

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| GEN1 | General – minimise environmental impacts during construction | A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following:<br>• Any requirements associated with statutory approvals<br>• Details of how the project will implement the identified safeguards outlined in the REF<br>• Issue-specific environmental management plans<br>• Roles and responsibilities<br>• Communication requirements<br>• Induction and training requirements<br>• Procedures for monitoring and evaluating environmental performance, and for corrective action<br>• Reporting requirements and record-keeping<br>• Procedures for emergency and incident management<br>• Procedures for audit and review.<br>The endorsed CEMP will be implemented during the undertaking of the activity. | Contractor Transport for NSW project manager | Pre-construction Detailed design | |
| GEN2 | General – notification | All businesses, residential properties and other key stakeholders (e.g. schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity. | Contractor Transport for NSW project manager | Pre-construction | |
| GEN3 | General – environmental awareness | All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular 'toolbox' style briefings.<br>Site-specific training will be provided to personnel engaged in activities or areas of higher risk. | Contractor Transport for NSW project manager | Pre-construction | |
| **GEN4** | **General** | **Further investigations and stakeholder engagement is to be undertaken prior to finalising the preferred routes for the section of SCATL west of Jackson Ave.** | **Transport for NSW** | **Pre-construction** | **Additional Safeguard** |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | **The potential impacts associated with this section is to be the subject of an Addendum REF/s that must be determined prior to construction commencing this section.** | | | |
| **GEN5** | **General** | **Consultation will be undertaken with residents and businesses near the proposed change between Taren Point Road and Banksia Road. Any feedback received will be considered prior to finalising the design, and be subject to further environmental assessment, if required.** | **Transport for NSW** | **Pre-construction** | **Additional Safeguard** |
| TT1 | Traffic and transport | A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Traffic Control at Work Sites Manual (Roads and Maritime, 2018) and QA Specification G10 Control of Traffic (Roads and Maritime, 2008). The TMP will include:<br>• Confirmation of haulage routes<br>• Measures to maintain access to local roads and properties<br>• Site-specific traffic control measures (including signage) to manage and regulate traffic movement<br>• Measures to maintain pedestrian and cyclist access<br>• Requirements and methods to consult and inform the local community of impacts on the local road network<br>• Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads<br>• A response plan for any construction traffic incident<br>• Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic monitoring, review and amendment mechanisms. | Contractor | Pre-construction | Section 4.8 of QA G36 Environment Protection |
| TT2 | Local community notification | Undertake consultation with potentially affected residences prior to the commencement of and during works in accordance with the Transport for NSW's Community Involvement and Communications Resource Manual. | Transport for NSW | Pre-construction / construction | Additional measure Section 2.2 of QA G10 Traffic Management |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | Consultation should include but not be limited to door knocks, newsletters or letter box drops providing information on the proposal, working hours and a contact name and number for more information or to register complaints. | | | |
| TT3 | Community information | Provide road users and local communities with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities. | Contractor | Construction | Additional measure |
| TT4 | Access | Maintain access to properties during construction. Where that is not possible or necessary, provide temporary alternative access arrangements in consultation with affected landowners and the relevant local road authority. | Contractor | Pre-construction / construction | Additional measure |
| TT5 | Impacts to pedestrians and cyclists | Maintain pedestrian and cyclist access throughout construction. Where that is not possible or necessary, provide temporary alternative access arrangements in consultation with affected landowners and the local road authority. | Contractor | Construction | Additional measure |
| TT6 | Emergency services vehicles | Traffic management measures will be implemented to ensure emergency services vehicles can negotiate the intersection during construction. | Contractor | Construction | Additional measure |
| TT7 | Public transport network changes during construction | Maintain access for public transport services. Consult with bus operators, Transport for NSW, the Sutherland Shire Council (as relevant), and inform the community of any temporary changes to bus stop operation. | Contractor | Construction | Additional measure |
| TT8 | Operational traffic and safety | Treatments to enhance safety at major driveway crossings will be investigated during detailed design. | Transport for NSW | Detailed design | Additional measure |
| **TT9** | **Public transport network changes during construction** | **Consultation with bus operators will continue with relation to routes affected by the proposal between Taren Point and Banksia Road** | **Transport for NSW** | **Detailed design** | **Additional measure** |
| LCV1 | Landscape character and visual impact | An Urban Design Plan (including detailed urban design drawings and landscape plans) will be prepared to support the final detailed project design.<br>The Urban Design Plan will present an integrated urban design for the project, providing further practical detail on the | Transport for NSW | Detailed design | Standard measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | application of design principles and objectives identified in this REF. The Plan will confirm design treatments for:<br>• Location and identification of existing vegetation and proposed landscaped areas, including species to be used<br>• Details of the staging of landscape works taking account of related environmental controls such as erosion and sedimentation controls and drainage<br>• Details of replacement tree planting (at a ratio of four trees to one tree removed – along the route or at other locations nominated by Council) using species selected in consultation with Sutherland Shire Council<br>• Procedures for monitoring and maintaining landscaped or rehabilitated areas.<br>The Urban Design Plan will be prepared in accordance with relevant guidelines, including:<br>• Beyond the Pavement: Urban design approach and procedures for road and infrastructure planning, design and construction (Roads and Maritime, 2020)<br>• Landscape Guideline (Roads and Maritime Services, 2019). | | | |
| LCV2 | Visual impacts | Where reasonable and feasible trees will be retained in design. | Transport for NSW | Detailed design | Additional measure |
| LCV3 | Visual impacts | Following the completion of construction works, plant/equipment will be removed, and disturbed areas will be revegetated, turfed, or otherwise restored as appropriate. | Contractor | Construction | Additional measure |
| LCV4 | Visual impacts | Construction facilities will be contained within the construction works zone boundary and occupy the minimum area practicable for their intended use. | Contractor | Construction | Additional measure |
| LCV5 | Visual impacts | Provide suitable barriers to screen views from adjacent areas during construction. | Contractor | Construction | Additional measure |
| LCV6 | Visual and landscape impacts | Opportunities to support the Five Million Trees for Greater Sydney initiative and the greening our city Premier's priority will be explored during detailed design and as part of the | Transport for NSW | Detailed design | Additional measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | development of the landscape design for the proposal. This would occur in consultation with the Sutherland Shire. | | | |
| LCV7 | Impacts on street trees | Tree protection zones would be implemented to minimise the impact to street trees where possible.<br>Any pruning of trees (or tree roots) is to occur ~~under the supervision of~~ **in consultation with** an AQF5 qualified arborist and in accordance with a pre-agreed methodology.<br>Vehicles, plant or equipment would not be parked or stored within the tree protection zone, if parking or storage is required additional mitigation measures would be implemented to minimise the impact to the vegetation. | Contractor | Construction | Additional measure |
| LCV8 | Impacts on street trees | All proposed works within the tree protection zone must be carried out ~~under the supervision of~~ **in consultation with** the project arborist | Contractor | Construction | Additional measure |
| LCV9 | Impacts on street trees | **Tree sensitive methods will be considered for** any underground services proposed within the tree protection zone ~~will be installed using tree sensitive methods~~ such as horizontal directional drilling boring, non-destructive excavation. ~~and carried out under the supervision of~~ The project arborist **will be consulted when required**. | Contractor | Construction | Additional measure |
| LCV9 | Impact from lighting | Temporary site lighting will be installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting, and an approved Traffic Management Plan. | Contractor | Construction | Additional measure |
| LCV10 | Impacts from lighting | The design of new street lighting will consider potential light spill impacts on adjacent properties. | Transport for NSW | Detailed design | Additional measure |
| NV1 | Construction noise and vibration | A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP.<br>The NVMP will generally follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and the Construction Noise and Vibration Guideline (Roads and Maritime Services, 2016) and identify:<br>• Key potential noise and vibration generating activities associated with the activity | Contractor | Pre-construction | Section 4.6 of QA G36 Environment Protection |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | • Feasible and reasonable mitigation measures to be implemented<br>• A monitoring program to assess performance against relevant noise and vibration criteria<br>• A review process scheduling and assessing out-of-hours activities including consideration of alternatives to out-of-hours work, plant selection, work locations and screening to minimise impacts<br>• A working schedule which records respite periods for extended out-of-hours works<br>• Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures<br>• Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. | | | |
| NV2 | Construction vibration | Where vibration intensive plant such as vibratory rollers are used, vibration must be managed to minimise disturbance to building occupants and to avoid damage to buildings and other structures (including heritage fabric). This includes adhering to the recommended minimum working distances for vibration intensive plant identified in Section 7.1 of the Construction Noise and Vibration Guideline (Roads and Maritime Services, 2016).<br>If recommended minimum working distances cannot be met by selecting smaller plant, vibration monitoring will occur to quantify and help manage vibration. If necessary, trial vibration measurements will be conducted to further assess any possible impacts and buffer distances that may be required. | Contractor | Construction | Additional measure |
| NV3 | Construction 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 activity that may have an adverse noise or vibration impact. The notification will provide details of:<br>• The proposal<br>• The construction period and construction hours | Contractor | Pre-construction | Standard measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | • Contact information for project management staff<br>• Complaint and incident reporting<br>• How to obtain further information. | | | |
| NV4 | Construction hours and scheduling | Where feasible and reasonable, construction will be carried out during the standard daytime working hours and work generating high noise levels will be scheduled during less sensitive time periods. | Contractor | Construction | Additional measure |
| NV5 | Construction respite period during normal hours and out of hours | The duration and respite of high noise generating activities will be carried out in accordance with the Construction Noise and Vibration Guideline, and in consultation with the community. As a guide, high noise generating activities near receivers will be carried out in blocks that do not exceed three hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite will be flexible to accommodate the usage and amenity at nearby receivers. | Contractor | Detailed design / pre-construction / construction | Additional measure |
| NV6 | Plant noise levels | The noise levels of plant and equipment will have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix F of the Construction Noise and Vibration Guideline.<br>A noise monitoring audit program will be implemented to ensure equipment remains within the more stringent of the manufacturer's specifications or Appendix F of the Construction Noise and Vibration Guideline.<br>Only the necessary size and power of equipment will be used. | Contractor | Detailed design / pre-construction / construction | Additional measure |
| NV7 | Equipment selection | Use quieter and less noise emitting construction methods where feasible and reasonable. | Contractor | Detailed design / pre-construction / construction | Additional measure |
| NV8 | Use and siting of plant | The offset distance between noisy plant and adjacent sensitive receivers will be maximised.<br>Plant used intermittently will be throttled down or shut down.<br>Noise-emitting plant will be directed away from sensitive receivers. Only have necessary equipment on site. | Contractor | Detailed design / pre-construction / construction | Additional measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| NV9 | Plan work sites and activities to minimise noise | Locate compounds away from sensitive receivers and discourage access from local roads where possible.<br>Parking and loading/unloading areas will be planned to minimise reversing movements within the site.<br>Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible.<br>Very noisy activities will be scheduled for normal working hours.<br>If the work cannot be undertaken during the day, it should be completed before 11:00pm where possible. | Contractor | Detailed design / pre-construction / construction | Additional measure |
| NV10 | Non-tonal and ambient sensitive reversing alarms | Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site and for out of hours work.<br>The use of ambient sensitive alarms that adjust output relative to the ambient noise level will be considered. | Contractor | Detailed design / pre-construction / construction | Additional measure |
| **NV11** | **Noise from audible locating and crossing signals** | **The audible locating and crossing signals at the Kingsway / Willarong Road intersection will be adjusted to ensure they meet LAmax noise goals established in accordance with the Management framework on audio tactile push buttons (Roads and Traffic Authority, 2005).** | **Transport for NSW** | **Operation** | **Additional measure** |
| FF1 | Biodiversity impacts | Biodiversity Management Plan is to be prepared and included with in the CEMP.<br>The plan would include:<br>• A site walk over with an ecologist as part of the pre-clearing surveys<br>• A map showing vegetation clearing boundaries and sensitive area/no go area or trees to be protected<br>• Incorporation of management measures identified as a result of pre-clearing survey reports, completed by an ecologist<br>• A detailed cleaning process in accordance with Biodiversity Guidelines (2011) | Contractor | Pre-construction | Additional measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | • Identify controls/mitigation measures to prevent impacts on sensitive location or no go zones or tree protection zones<br>• A stop work procedure in the event of identification of unidentified species, habitat or populations. | | | |
| FF2 | Biodiversity impacts | Pre-clearing survey will be conducted in accordance with Biodiversity Guidelines, Guide 1 (Roads and Maritime, 2016) and will:<br>• Confirm (with the assistance of a surveyor) clearing boundaries, exclusion zones, protected habitat features and revegetation areas prior to starting work<br>• Identify, in toolbox talks, where biodiversity controls are located on the site. | Contractor | Pre-construction | Additional measure |
| FF3 | Injury to fauna | A suitably qualified ecologist or experienced wildlife handler would be engaged to survey and handle any fauna. | Contractor | Pre-construction Construction | Additional measure |
| FF4 | Spread of weeds | Weed management will occur in accordance with Biodiversity Guidelines, Guide 6 (Roads and Maritime, 2016) and include:<br>• The Identification of weeds on site (confirmed during pre-clearing survey)<br>• Weed management priorities and objectives Exclusion zones, protected habitat features and revegetation areas prior to starting work within or directly next to the site<br>• The location of weed infested areas<br>• Weed control methods<br>• Measures to prevent the spread of weeds, including machinery hygiene procedures and disposal requirements<br>• A monitoring program to measure the success of weed management<br>• Communication with local Council noxious weed representative. | Contractor | Pre-construction | Additional measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| FF5 | Spread of weeds | Reuse of topsoil free from weeds or pathogens would be used as part of habitation/landscaping works, where reasonable and feasible. | Contractor | Construction | Additional measure |
| FF6 | Spread of diseases affecting plants | Management measures will be implemented to control and/or prevent the introduction and/or spread of disease-causing agents such as bacteria and fungi in accordance with the Biodiversity Guidelines, Guide 7 (Roads and Maritime, 2016). | Contractor | Construction | Additional measure |
| FF7 | Unexpected threatened species finds | If unexpected flora or fauna are discovered on site stop work immediately and implement the Roads and Maritime Unexpected Threatened Species Find Procedure in the Biodiversity Guidelines, Guide 1 (Roads and Maritime, 2016). | Contractor | Construction | Additional measure |
| FF8 | Loss of trees | The loss of trees due to the proposal will be offset consistent with the Vegetation Offset Guide (Transport for NSW, 2020). | Transport for NSW | Construction | Additional measure |
| FF9 | Protect native flora and fauna, minimise edge effects and avoid inadvertent impacts | Site-specific training will be given to personnel when working in the vicinity of areas of identified biodiversity value that are to be protected. | Contractor | Construction | Additional measure |
| FF10 | Minimise risks to native flora and fauna during construction | Consult with an arborist to confirm the depth and extent of existing tree root systems in the vicinity of the works and to advise if the proposed works would cause any harm to the tree roots. | Contractor | Detailed design / pre-construction | Additional measure |
| NAH1 | Non-Aboriginal heritage | The Standard Management Procedure – Unexpected Heritage Items (Roads and Maritime Services, 2015) will be followed in the event any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered.<br>Work will only re-commence once the requirements of that Procedure have been satisfied. | Contactor | Construction | Section 4.10 of QA G36 Environment Protection |
| NAH2 | Non-Aboriginal heritage | Prepare and implement a Non-Aboriginal Heritage Management Plan (NAHMP) as part of the CEMP. It will provide specific guidance on measures and controls to be | Contractor | Detailed design / pre-construction | Additional safeguard |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | implemented to avoid and mitigate impacts to non-Aboriginal heritage. | | | |
| NAH3 | Site induction | Train all personnel working on site to ensure they are aware of the requirements of the NAHMP and relevant statutory responsibilities. Provide site-specific training to personnel when working in the vicinity of identified non-Aboriginal heritage items. | Contractor | Pre-construction | Additional safeguard |
| SE1 | Community engagement | A Community and Stakeholder Engagement Plan (CSEP) will be prepared and will include:<br>• Procedures and mechanisms that would be implemented in response to the key social impacts identified for the proposal<br>• Procedures and mechanisms that would be used to engage with affected landowners, business owners, and the wider community to identify potential access, parking, business visibility, and other impacts and develop appropriate management measures<br>• Procedures to keep the community informed about construction and any associated changes to conditions (e.g. detours or lane closures) such as through advertisements in local media and advisory notices or variable message signs<br>• Procedure for the management of complaints and enquiries, including a contact name and number for complaints. | Transport for NSW | Pre-construction | Standard measure |
| SE2 | Community engagement | Notify local residents and potentially affected businesses before the work starts regarding the timing, duration and likely impact of construction activities., including interruptions to utility services. | Contractor | Construction | Additional measure |
| SE3 | Safety and security | The safety of people using the path would be further considered in detailed design in accordance with crime prevention through environmental design principles. | Transport for NSW | Detailed design | Additional measure |
| SE4 | Access | Access to businesses will be maintained during construction. Where temporary changes to access arrangement are necessary, the contractor will advise owners and tenants and | Contractor | Pre-construction / construction | Additional measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | consult with them in advance with regards to alternative access arrangements. | | | |
| SE5 | Access | Access to bus stops will be maintained during construction. Where changes to access arrangement are necessary, the contractor will advise those impacted. | Contractor | Pre-construction / construction | Additional measure |
| SW1 | Soil and water | A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction.<br>The SWMP would include:<br>• Stockpile management plan<br>• Dewatering plan which includes process for monitoring flocculants and dewatering water from site<br>• A process to routinely monitor the Bureau of Meteorology weather forecast<br>• Preparation of a wet weather (rain event) plan which includes a process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather<br>• Inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sediment controls.<br>The SWMP will address:<br>• Transport for NSW Code of Practice for Water Management<br>• The Blue Book- Managing Urban Stormwater: Soils and Construction, Volume 1 and 2<br>• Transport for NSW Technical Guideline – Temporary Stormwater Drainage for Road Construction. | Contractor | Detailed design Pre-construction | Section 2.1 of QA G38 Soil and Water Management |
| SW2 | Soil and water | A site specific Erosion and Sediment Control Plan/s will be prepared and implemented in accordance with the Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 | Contractor | Detailed design Pre-construction | Section 2.1 of QA G38 Soil and Water Management |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | (Landcom, 2004) as part of the Soil and Water Management Plan. | | | |
| SW3 | Soil and water | All stockpiles would be designed, established, operated and decommissioned in accordance with the Transport for NSW Stockpile Management Procedures. | Contractor | Construction | Additional measure |
| SW4 | Soil and water | Controls would be implemented at construction zones exit points to minimise the tracking of material onto the road. | Contractor | Construction | Additional measure |
| SW5 | Contamination | A Detailed Site Investigation ("DSI") will be undertaken prior to construction works, targeting the AECs where exposure pathways are potentially complete. The DSI should include, but not be limited to:<br>• Sampling of soil and along the road verges adjacent to the BP service station on the corner of Kingsway and Gymea Bay Road, and the 7-Eleven service station on the corner of Kingsway and Willarong Road<br>• Sampling of shallow soils (to approximately 0.5m depth) along the public road verges adjacent to the automotive repair workshops on Flora Street and Kingsway<br>• Observation of open service utility pits for presence of hazardous materials including asbestos in pit linings<br>• Field screening at open utility pits for presence of volatile organic compounds at pits in close proximity to service stations and mechanical workshops. | Transport for NSW | Detailed design | Additional measure |
| SW6 | Contamination | If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport for NSW Environment Manager and/or EPA. | Contactor | Detailed design Pre-construction | Section 4.2 of QA G36 Environment Protection |
| SW7 | Accidental spills | A site-specific emergency spill plan will be developed, and include spill management measures in accordance with the | Contactor | Detailed design | Section 4.3 of QA G36 |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | Transport for NSW Code of Practice for Water Management (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport for NSW and EPA officers). | | Pre-construction | Environment Protection |
| SW8 | Removal of excavated material | Classify all waste material excavated and removed from the proposal area in accordance with the NSW Waste Classification Guidelines (EPA, 2004). | Contactor | Pre-construction | Additional measure |
| SW9 | Existing condition of ancillary sites | Undertake a pre-construction land assessment prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) to identify the presence of any pre-existing wastes or stored materials.<br>The assessment should be prepared in accordance with the Transport for NSW Management of road construction and maintenance wastes (Roads and Maritime Services, 2016). | Contactor | Pre-construction | Additional measure |
| AH1 | Aboriginal heritage | The Standard Management Procedure – Unexpected Heritage Items (Roads and Maritime Services, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport 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. Work will only re-commence once the requirements of that Procedure have been satisfied. | Contractor | Construction | Section 4.9 of QA G36 Environment Protection |
| AQ1 | Air quality | An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the CEMP. The AQMP will include, but not be limited to:<br>• Potential sources of air pollution (including site compound operation)<br>• Air quality management objectives consistent with any relevant published EPA guidelines<br>• Mitigation and suppression measures to be implemented | Contactor | Construction | Section 4.4 of QA G36 Environment Protection |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | • Methods to manage work during strong winds or other adverse weather conditions.<br>The AQMP will include the following requirements:<br>• Plant and equipment will be maintained in good condition and in accordance with manufactures specifications<br>• Plant and machinery will be turned off when not in use<br>• Work activities will be reprogrammed if the management measures are not adequately restricting dust generation<br>• Disturbed areas will be minimised in extent and rehabilitated progressively<br>• Dust will be suppressed on stockpiles and unsealed or exposed area using methods such as water trucks/hoses, temporary stabilisation methods, soil binders or other appropriate practices<br>• No burning of material on site will be undertaken<br>• Visual monitoring of air quality will be undertaken to verify the effectiveness of controls and enable early intervention<br>• Vehicles transporting materials and equipment will have their loads covered. | | | |
| CC1 | Climate change risk | Climate change adaptation strategies identified in the Climate Change Risk Register will be considered during detailed design. | Contractor | Detailed design | Additional measure |
| WM1 | Waste | A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:<br>• Measures to avoid and minimise waste associated with the project<br>• Classification of wastes and management options (re-use, recycle, stockpile, disposal)<br>• Statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions | Contactor | Detailed design / pre-construction | Section 4.2 of QA G36 Environment Protection |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | • Procedures for storage, transport and disposal<br>• Monitoring, record keeping and reporting. | | | |
| WM2 | Waste | The following resource management hierarchy principles will be followed:<br>• Avoid unnecessary resource consumption as a priority<br>• Avoidance will be followed by resource recovery (including reuse of materials reprocessing and recycling and energy recovery<br>Disposal will be undertaken as a last resort (in accordance with the Waste Avoidance and Resource Recovery Act 2001. | Contractor | Detailed design<br>Construction | Additional measure |
| WM3 | Waste | Prepare and implement a design resource plan. As a minimum, the plan is to include the following information:<br>• Quantities and type of materials that will be produced by the project<br>• Steps taken during detailed design to minimise the generation of material (such as excavated material)<br>• How the design maximises the on-site reuse of any excavated materials<br>• How detailed design maximises the opportunities for the use of recycled materials (ensuring that the material are fit for purpose and meet engineering performance standards)<br>• Details of the quantities and type materials that cannot be reused onsite. | Contractor | Detailed design | Additional measure |
| WM4 | Waste | Housekeeping at construction sites will be addressed regularly. This will include collection and sorting of recycling, general waste and green waste.<br>Waste will be disposed regularly at a licensed waste facility or recycling facility where available. | Contractor | Construction | Additional measure |
| HR1 | Hazards and risks | A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to:<br>• Details of hazards and risks associated with the activity | Contractor | Construction | Additional measure |

| No. | Impacts | Environmental safeguards | Responsibility | Timing | Reference |
|---|---|---|---|---|---|
| | | • Measures to be implemented during construction to minimise these risks<br>• 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<br>• A monitoring program to assess performance in managing the identified risks<br>• Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations.<br>The HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice and EPA publications. | | | |
| S1 | Sustainability | The design and delivery of the proposal will address the requirements of the Transport for NSW Sustainable Design Guidelines – Version 4.0 (Transport for NSW, 2017). The proposal will target a Silver rating. | Transport for NSW | Detailed design Construction | Additional measure |
| CU1 | Cumulative impacts | Public domain treatments proposed as part of adjacent development projects will be considered during detailed design. | Design contractor | Detailed design | Additional measure |
| CU2 | Cumulative impacts | Current and upcoming projects with the potential to interact with the proposal will be monitored. Where potential cumulative impacts are identified, the scheduling of works will be coordinated with interacting projects to minimise potential impacts. This will include:<br>• Scheduling works to allow suitable respite periods for construction noise<br>• Scheduling of works to minimise consecutive construction noise impacts, where feasible.<br>• Coordinating lane closures and pedestrian/cyclist diversions to minimise the overall number of occasions where disruption occurs. | Transport for NSW Project Manager | Construction | Additional measure |

## 6.3 Licencing and approvals

Table 6-2 provides a summary of the licensing and approval requirements relevant to the project.

**Table 6-2: Summary of licensing and approvals required**

| Instrument | Requirement | Timing |
|---|---|---|
| *Roads Act 1993* (section 138) | Road occupancy licence | Prior to start of activity |

# References


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