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Coffs Harbour Bypass

Submissions Report
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Chapter 4

Response to community submissions

4. Response to community submissions

This chapter addresses submissions received from the community. As discussed in **Chapter 2, Submissions received**, each submission was examined individually to identify and understand issues raised and to allow for detailed categorisation according to the key issue categories and sub-issues.

The distribution breakdown of issue categories raised by the community is shown in **Figure 4-1**.

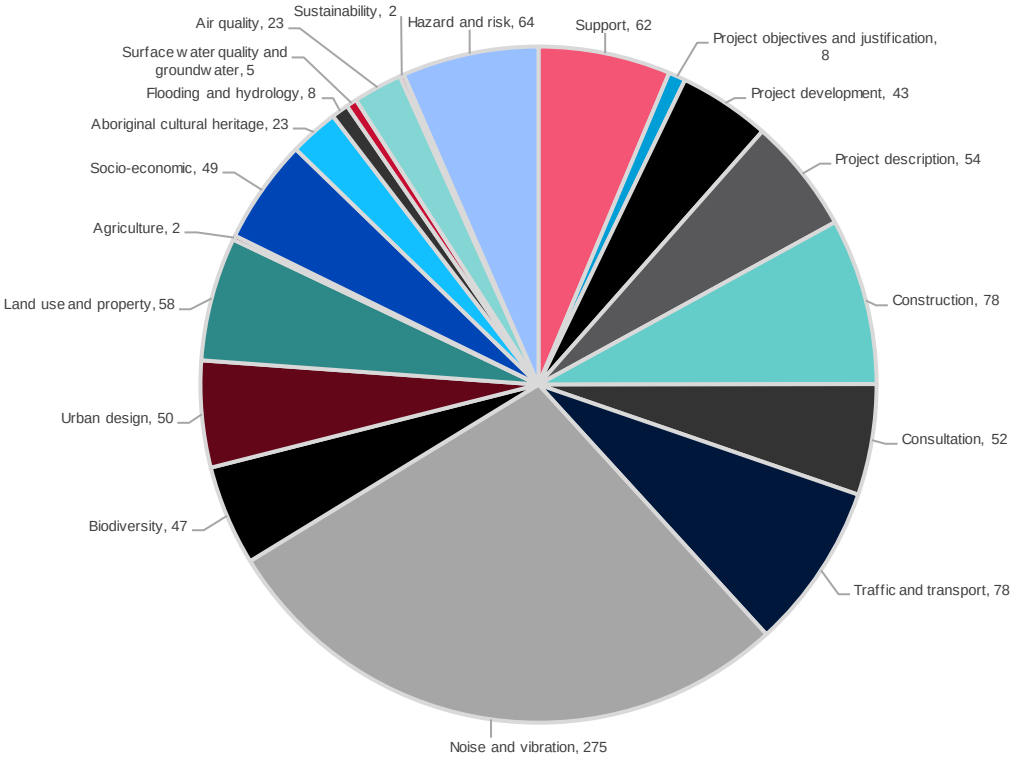


Figure 4-1 Summary of issues raised by category

Figure 4-1 shows the breakdown of the number of community issues raised per issue category. As discussed in **Chapter 2, Submissions received**, of the total submissions received, 21 were from community groups and organisations and 158 from individuals and businesses. Where a category is assigned a number such as construction having 78 issues raised, this does not mean that 78 submissions received raised the issue of construction as one submission may raise a number of issues that relate to the category of construction. As a result, the total number of issues raised is significantly higher than the total number of community submissions as community submissions typically raised several issues across a range of issue categories.

As shown in **Figure 4-1**, the most commonly raised categories by the community were:

- Noise and vibration
- Construction
- Traffic and transport

- Hazard and risk
- Support.

Within the most common issue categories, issues are categorised further into sub-issues. The most common sub-issues for the five most common issue categories are shown in **Figure 4-2** and the ten most common sub-issues are shown in **Figure 4-3**.

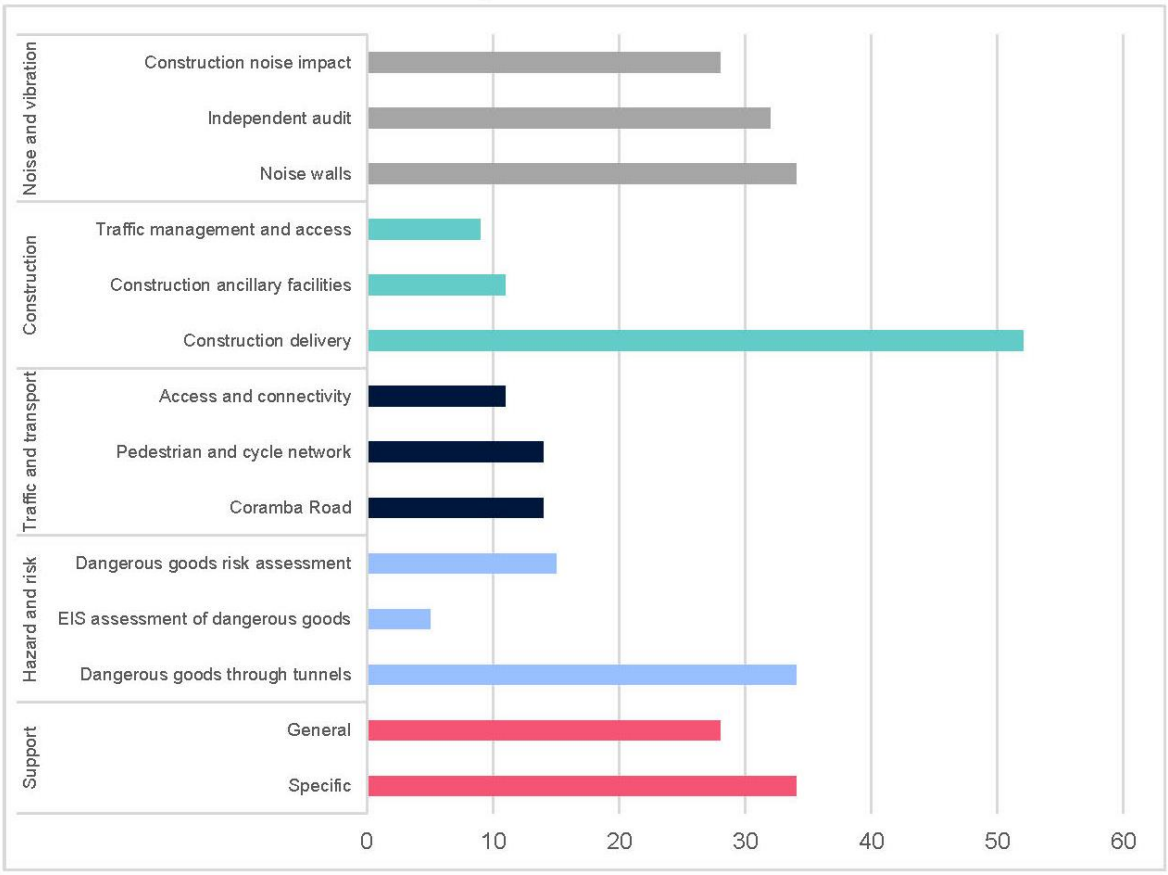


Figure 4-2 Summary of sub-issues from most common issue categories

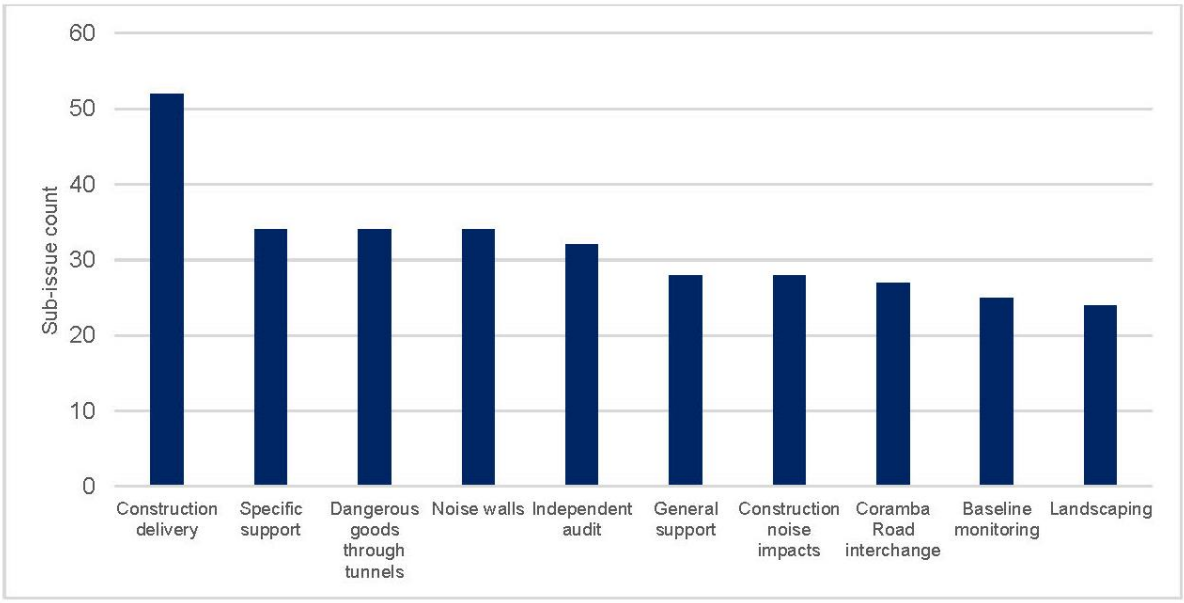


Figure 4-3 Ten most common sub-issues overall for the project

4.1 Support

4.1.1 General support

Submission number(s)

27, 32, 36, 37, 44, 47, 52, 58, 65, 69, 72, 73, 79, 81, 85, 87, 90, 92, 130, 131, 132, 133, 150, 152, 153, 159, 160,175

Issue description

- General support for the project.

Response

Support for the project is noted.

4.1.2 Support for specific project elements

Submission number(s)

13, 15, 17, 19, 20, 23, 24, 30, 33, 34, 38, 39, 41, 43, 56, 61, 75, 78, 80, 83, 91, 94, 100, 103, 117, 121, 124, 129, 137, 146, 158, 164, 165, 184

Issue description

Support for specific elements of the project was received including:

- The incorporation of three tunnels instead of cuttings
- The lowering of the alignment of the bypass, contributing to reduced noise and visual impacts
- The use of low noise pavement, contributing to reduced noise impacts
- The location of ancillary sites along the bypass
- The project corridor location as it allows for the least environmental impact.

Response

Support for specific elements of the project described above is noted.

4.2 Project objectives and justification

4.2.1 Project justification

Submission number(s)

180

Issue

- The project footprint is more valuable for housing and small farms.

Response

It is recognised that there will be negative environmental and social impacts resulting from the construction and operation of the project and these are documented in the impact assessments of Chapter 8, Traffic and transport to Chapter 24, Hazard and risk of the EIS, with Chapter 25, Cumulative impacts of the EIS considering the cumulative impacts. The amenity values for people living and working in the area will be impacted in relation to noise, air quality including dust, visual impact and inconvenience from altered road and access arrangements during construction. People may also experience direct impacts associated with their property or business being acquired, permanent and changes to access arrangements. For farmers there may need to be changes to their business practices and there may be impacts from altered flood behaviour on residences or local roads.

Chapter 12, Land use and property of the EIS and Section 5.6, Land use and property of the Amendment Report, considers the growth, infill and renewal areas within the study area and their relative impacts. These impacts are considered to be minimal. The road corridor for the project has been incorporated into the LEP with a SP2 zoning for infrastructure since 2013. As such the project has been integrated into the economic, industrial and residential growth anticipated for the Coffs Harbour region.

Direct impacts to farms was assessed as part of Chapter 13, Agriculture of the EIS. A total of six banana farms would be critically impacted and would cease operation because of the project. It is considered that the loss of six banana farms out of 111 banana farms within the Coffs Harbour LGA would not have a significant impact on the banana industry in Coffs Harbour.

While some negative environmental and social impacts have been identified, management measures to mitigate any potential longer-term adverse impacts have been considered and included in **Chapter 6, Revised environmental management measures.** In weighing the potential impacts and benefits of the project, the consequences of deferring the project, as outlined in Chapter 29, Project synthesis of the EIS, are greater than the potential impacts on land for housing and small farms.

Submission number(s)

161

Issue

- Since the government commenced due diligence of the project, the feasibility and sensibility of the preferred route does not make sense.

Response

While much has changed since planning for the project began in 2001, there is still a need for the project as detailed in Chapter 3, Strategic justification and project need of the EIS. The anticipated consequences of not proceeding with the project include:

- Worsening traffic congestion within Coffs Harbour would lead to greater delays and further deterioration of travel time reliability for both local and longer distance trips, affecting passenger and freight transport tasks
- Forecast growth in freight traffic, particularly on the key Melbourne, Sydney and Brisbane freight network would lead to greater levels of congestion on the Pacific Highway at Coffs Harbour. The proportion of heavy vehicles and through traffic travelling through Coffs Harbour would likely increase, adversely affecting road safety and amenity within the Coffs Harbour CBD
- The motorist, cyclist and pedestrian casualty rate would continue to be more than three times higher than expected of a road of this class and expected to worsen
- Not addressing the current situation would mean Coffs Harbour would remain as one of two locations on the east coast corridor linking Brisbane, Sydney, Canberra and Melbourne where motorists would be interrupted by traffic signals, and congestion bottlenecks at Coffs Harbour would continue
- Opportunities for economic growth and development within Coffs Harbour would continue to be constrained by the existing highway.

As outlined in Chapter 4, Project development and alternatives of the EIS, the project has a detailed history of investigating and considering alternatives to achieve the objectives of the Coffs Harbour Highway Planning Strategy (CHHPS) (RTA 2001a) and Pacific Highway upgrade program. The preferred option and concept design for the project was identified and refined through an extensive assessment and review process. This was to ensure that it best meets the project objectives, provides value for money and is evaluated against the key performance criteria of function, environment and socio-economic considerations.

It is important to reiterate that the Coffs Harbour Bypass is not a standalone project and complements the wider Pacific Highway upgrade program. As discussed above, part of the purpose of the CHHPS was to address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga. Construction for the Sapphire to Woolgoolga section of the Pacific Highway is now finished and the road is open. As a result, abandoning the proposed project for alternative options would not be within the economic interests of the State or Australian governments.

4.2.2 Project costs

Submission number(s)

44, 50, 141, 151, 172, 180

Issue description

- Although tunnels are a better solution for the project, costs will be significantly increased and raises questions about the value management approach
- The cost of the bypass does not consider value for money
- TfNSW has a history of projects costing more than the original estimates, so costs should not be a reason to dismiss alternative options
- Project costs have not been taken into consideration

- Tunnels have increased costs to the project
- The current proposal has not considered cost, loss of future urban expansion and loss of properties.

Response

As discussed in Chapter 4, Project development and alternatives of the EIS, the preferred option and concept design for the project was identified and refined through an extensive assessment and review process to ensure that it best meets the project objectives, is evaluated against the key performance criteria of function, environment and socio-economic considerations and ultimately provides value for money. Cost was one of the factors considered through the option identification and route selection process. In addition, completion of the project would complement the objectives of the Pacific Highway upgrade program and contribute to realising the full $4.4 – $4.7 billion of program-wide benefits estimated in the Pacific Highway Upgrade Program Economic Appraisal 2011 Update.

Following selection of the preferred corridor, the concept design for the project has been developed and refined to reduce the overall costs, where possible, while maintaining focus on the project objectives. As outlined in Section 4.5, Concept design development (2016-2018) and in Section 4.6, Refined concept design development (2019) of the EIS, value for money has been inherent in the decision making process for the development of the concept design for the project. Value for money has also been a key consideration in the development of the amended design.

The construction, operational and maintenance costs would be higher for the EIS concept design compared to the 2018 concept design. However, this increase in cost has been justified through an extensive comparative assessment process described in Section 4.6, Concept design development of the EIS, which identified significantly improved key outcomes for function, environment and socio-economic evaluation categories in the alternative option when compared to the 2018 concept design. The alternative option aligned better with a number of the Pacific Highway upgrade program objectives including:

- Reduce travel times
- Reduce freight transport costs
- Develop a route involving the community and considering its interests
- Provide a route supporting economic development
- Manage the upgrading of the route in accordance with the principles of ecologically sustainable development.

Although the 2018 concept design including cuttings may have performed better against price criteria, it is clear the current design to include tunnels, better satisfies project objectives, reduces overall environmental impact and addresses community feedback.

In considering whether the project provides value for money, Chapter 3, Strategic justification and project need of the EIS also notes the consequences of deferring the project and potential economic impacts:

- Worsening traffic congestion within Coffs Harbour would lead to greater delays and further deterioration of travel time reliability for both local and longer distance trips, affecting passenger and freight transport tasks
- Forecast growth in freight traffic, particularly on the key Melbourne, Sydney and Brisbane freight network would lead to greater levels of congestion on the Pacific Highway at Coffs Harbour. The

proportion of heavy vehicles and through traffic travelling through Coffs Harbour would likely increase, adversely affecting road safety and amenity within the Coffs Harbour CBD

- The motorist, cyclist and pedestrian casualty rate would continue to be more than three times higher than expected of a road of this class and expected to worsen
- Not addressing the current situation would mean Coffs Harbour would remain as one of two locations on the east coast corridor linking Brisbane, Sydney, Canberra and Melbourne where motorists would be interrupted by traffic signals, and congestion bottlenecks at Coffs Harbour would continue
- Opportunities for economic growth and development within Coffs Harbour will continue to be constrained by the existing highway.

The Far Western Corridor was considered as part of the project alternatives assessment. The Far Western Corridor was dismissed due to severe environmental constraints in terms of known and potential habitats for threatened species and severance of numerous wildlife corridors. Furthermore, the relatively high costs and small traffic attraction of the Far Western Corridor made it an unattractive economic proposal. Instead the Inner Corridor was determined to be the preferred long-term corridor as this corridor would:

- Provide good functional performance (provide substantial road safety improvements and travel time savings) while still providing opportunities to separate through and local traffic
- Provide the best balance between functional, environmental, social and economic factors
- Be lower in cost the other corridor options
- Provide better economic performance than the other corridor options in terms of ability to stage construction and benefit-cost ratios.

As a result of the CHHPS, the identification of the preferred route, allowed CHCC to reserve the route in the LEP to provide planning certainty for CHCC and the local community. The road corridor based on 2008 concept design was incorporated into the LEP with a SP2 zoning for infrastructure, to provide planning certainty for CHCC and the local community. For example, urban release area decisions have been guided by the preferred route, enabling planning for the future urban expansion of Coffs Harbour to progress.

Property costs are considered in the project estimates.

4.3 Project development

4.3.1 Project alternatives

Submission number(s)

51, 54, 61, 65, 69, 103, 111, 161, 165, 168, 169, 172, 180

Issue description

- The project should extend further west to the outskirts of Coffs Harbour to avoid residential areas and impacts on habitat for threatened species in the Newports Creek area
- Preferred route of the bypass should leave existing Pacific Highway north of the Nambucca Heads interchange and rejoin the Pacific Highway above Woolgoolga. This would encourage most of the large freight depots to move out of Coffs Harbour and reduce the number of semitrailers moving through Coffs Harbour
- The proposed route should be redesigned to integrate and connect beach, coast, mountain and valley areas to enhance tourism and economic opportunities. This should include a rail or bus network to take commuter traffic off the highway.

Response

As identified in Chapter 4, Project development and alternatives of the EIS, planning for the project began in 2001 as part of the CHHPS (RTA 2001a). The CHHPS was developed by TfNSW in association with the DPIE and CHCC. There were several phases of investigation because the CHHPS study area focused on two sections, the southern (Coffs Harbour) and northern (Sapphire to Woolgoolga) sections. TfNSW also examined additional corridor options proposed by CHCC and community interest groups.

Parts of some corridors were examined on more than one occasion as they were included in new or revised corridors during these investigations. An initial phase of investigations produced four diverse corridors and was followed by subsequent investigation phases. The investigated corridors and the potential route options were presented in different community update releases and detailed in technical investigation documents prepared by TfNSW. These are available on TfNSW's website (***https://www.pacifichighway.nsw.gov.au/coffsharbourbypass***).

A summary and evaluation of each of the alternative corridors considered for the project as part of the CHHPS is provided in Chapter 4, Project development and alternatives of the EIS. The preferred option and concept design for the project was identified and refined through an extensive assessment and review process to ensure that it best met the project objectives, was evaluated against the key performance criteria of function, environment and socio-economic considerations and ultimately provided value for money.

Inner South 2 (IS2), which is further west of the project in the Newports Creek area, was considered during the route selection phase of the project. However, Inner South 1 (IS1) was selected as the preferred route over IS2. This is because the IS1 route had lower engineering risks and provided better value for money as there would be additional ongoing operational costs associated with a 560 metre long tunnel through the Roberts Hill ridge with the IS2 route. This is discussed further below.

Routes located to the outskirts of Coffs Harbour, such as a route that leaves the existing highway north of Nambucca, would align more with the Coastal Ridge Way or Far Western Corridor. Early investigations examined the key physical features, cost, traffic and economic performance of the

Coastal Ridge Way corridor and assessed its impacts across a range of social and environmental planning issues.

The Coastal Ridge Way and Far Western Corridor are discussed further in **Section 4.3.2** below. A route which leaves the existing Pacific Highway north of Nambucca would result in similar outcomes to the Coastal Ridge Way or Far Wester Corridor, and as such does not merit further consideration.

It is important to reiterate that the Coffs Harbour Bypass is not a standalone project and complements the wider Pacific Highway upgrade program. As discussed above, part of the purpose of the CHHPS was to address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga. Construction for the Sapphire to Woolgoolga section of the Pacific Highway is now finished and the road is open. Additionally, commencing the bypass from a point near Nambucca Heads interchange would abandon around 40 kilometres of Pacific Highway upgrades. As a result, abandoning the proposed bypass route for options which are further west and which start much further south, would not be within the economic interests of the State or Australian governments.

The project is a highway project and not an integrated transport development/master-planning exercise. There are two core functions of the project, as follows:

- Facilitating the movement of freight and people as part of the National Land Transport Network
- Providing efficient access to and from Coffs Harbour.

Investigation of alternative modes of transport and augmentation of existing public transport services within the Coffs Harbour LGA is outside the scope of this project. Notwithstanding, providing a project which achieves the core functions as outlined above, would not prohibit future opportunities to enhance the public transport services for Coffs Harbour.

Submission number(s)

69

Issue description

- The North Coast Railway should be relocated beside the highway as this would avoid the risk of rising sea levels and travelling the long way around Coffs Harbour.

Response

The NSW Government has no current plans to investigate an upgrade of the North Coast Railway through Coffs Harbour. Including provision for this as part of the Coffs Harbour Bypass is outside the scope of this project.

Notwithstanding, railways need much flatter grades than highways, with maximum grades typically less than 2.5 per cent. Given the steep terrain along the alignment of the project, an upgrade of the North Coast Railway through Coffs Harbour would need to be on a substantially different alignment to the project to meet the design requirements for railways.

Submission number(s)

135

Issue description

- Alternative options for a highway upgrade location were dismissed with minimal information provided to the community apart from in some cases costings with minimal detail.

Response

Planning for the project began in 2001 as part of the CHHPS and involved extensive consultation with a wide range of community groups and individuals. Each of the key decisions and recommendations

made as part of the CHHPS and later by TfNSW as the project has developed, have been documented and made available to the community. Community feedback has also been sought extensively since 2001.

The corridors investigated and the potential route options developed since 2001 have been presented in different community update releases and detailed in technical investigation documents prepared by TfSNW. The main reports included:

- Coffs Harbour Highway Planning Strategy – Preliminary Concept Design (RTA 2002a)
- Coffs Harbour Highway Planning: Coffs Harbour Section – Strategy Report (RTA 2004c)
- Coffs Harbour Highway Planning: Coffs Harbour Section – Review of the Coastal Ridge Way Proposal (RTA 2004b)
- Coffs Harbour Highway Planning: Southern and Northern Sections – Coffs Harbour City Council Preferred Corridor Feasibility Assessment (RTA 2004d)
- Coffs Harbour Highway Planning Strategy – Preferred Option Report (RTA 2004a).

These documents and associated community update releases were also supported by numerous feasibility studies, planning strategies, and economic analysis reports. These documents and associated community update releases are located on TfNSW's website (https://www.pacifichighway.nsw.gov.au/coffsharbourbypass).

A detailed summary and evaluation of each of the alternative corridors considered for the project as part of the CHHPS to the release of the EIS is provided in Chapter 4, Project development and alternatives of the EIS.

Submission number(s)

159

Issue description

- The implications of selecting the IS1 route around the southern part of the project should be reassessed. Consideration should be given to altering the route to the IS2 option, or a combination of IS1 and IS2 where the bypass route initially moves further to the west and then returns to enter the proposed Roberts Hill tunnel entry point. This proposal will provide a long-term benefit to the community and reduce the requirement for some at-property noise mitigation.

Response

As identified in Chapter 4, Project development and alternatives of the EIS, IS1 was selected as the preferred route over IS2. This is because the IS1 route had lower engineering risks and provided better value for money as there would be additional ongoing operational costs associated with a 560 metre long tunnel through the Roberts Hill ridge with the IS2 route.

It was also found that the IS1 route had the potential to be refined to further reduce potential noise, visual and other environmental impacts. The overall potential impacts of the IS1 route on likely future land use were similar to the IS2 route and could be mitigated by replanning the development of the North Boambee Valley. CHCC has completed this replanning with the incorporation of the North Boambee Valley (West) urban release area (URA) in the Coffs Harbour Development Control Plan 2015 in March 2019.

Several management measures and strategies have been developed and incorporated into the design to avoid or minimise noise and visual impacts from the project, including through the North Boambee Valley:

- For noise related impacts the measures include low noise pavement along the length of the project, noise barriers (including noise walls or mounds) at specific locations and at-property treatments
- For visual impacts, visual screening has been proposed which includes built elements such as noise barriers (walls and mounds) and vegetation screening.

These measures are considered to provide a reasonable outcome for the project.

With regards to adjusting the alignment to be a combination of IS1 and IS2 routes, there are several constraints that would need to be considered with the key constraints being the Englands Road interchange and Roberts Hill tunnel. Assuming the alignment is unchanged at those two locations, there would be limited opportunity to shift the alignment further west. This would likely only shift by up to about 100 metres west of the existing alignment as it crosses North Boambee Road. While a shift would likely result in some amenity improvements for residential areas in Highlands Estate, it would result in greater amenity and property impacts for residents west of the project in North Boambee Valley and impact the North Boambee Valley (West) URA. It is also likely that low noise pavement, noise walls and at-property treatments would still be needed for properties impacted by the project.

TfNSW does not intend to further investigate shifting the alignment further west.

Submission number(s)

180

Issue description

- Climate change and associated impacts (ie sea level rise, storm surges and coastal erosion) were not taken into consideration when planning the bypass route.

Response

A sensitivity analysis on ocean level effects for Coffs Creek was carried out when developing the 2008 preliminary concept design for the project. This is documented in Coffs Harbour Bypass – Concept Design Report (RTA 2008). As part of the analysis, an assumption was required for the outlet channel capacity because of the dynamic nature of sediment movement at the mouth of the creek. The analysis concluded that tidal conditions for the one per cent annual exceedance probability (AEP) event do not affect the flood levels greatly beyond the Grafton Street Bridge on the existing Pacific Highway.

In addition to this, the sensitivity of the project route to climate change conditions has been assessed in Chapter 17, Flooding and hydrology and Chapter 5 of Appendix O, Flooding and hydrology of the EIS. The assessment showed that flood immunity of the project does not change under the future climate scenarios with the main carriageway remaining trafficable in the one per cent AEP event.

A sensitivity assessment was carried out to assess any changes in impacts to hydrology and flooding due to the proposed design amendments and model updates under future climate conditions. The updated assessment in provided in Appendix H, Updated flooding and hydrology assessment of the Amendment Report. The predicted impacts of the project under the 2050 future climate scenario do not extend to any additional buildings relative to current climate conditions. Under the 2100 future climate scenario, an additional residential building, owned by TfNSW is impacted. The climate change assessment also includes considerations for sea level rise and increased rainfall, as described in Section 2.3 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

4.3.2 Coastal Ridge Way and Far Western Corridor

Submission number(s)

50, 135, 147, 172, 174

Issue description

- The Coastal Ridge Way proposal should be reconsidered as it would require minimal property remediation and result in reduced environmental impacts for the entire community
- The Far Western Corridor should be reconsidered, as it would have beneficial impacts to residents of West Coffs, Korora, and Sapphire as well as flora and fauna
- The Far Western Corridor should be reconsidered as it would have reduced impacts on residential properties and has more favourable outcomes for Aboriginal cultural heritage.
- The Far Western Bypass should be considered instead of the current proposal as it would cost less per kilometre to build and would have no direct impact on Coffs Harbour during construction.

Response

The project has a detailed history of investigating and considering alternatives to achieve the objectives of the CHHPS and Pacific Highway upgrade program. The purpose of the CHHPS was to:

- Address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga
- Plan for future traffic needs within the Coffs Harbour urban area
- Provide planning certainty for CHCC and the community.

Early investigations examined the key physical features, cost, traffic and economic performance of the Coastal Ridge Way corridor and assessed its impacts across a range of social and environmental planning issues. The investigations concluded that the Coastal Ridge Way corridor did not support the principles of ecologically sustainable development, and did not merit further consideration as an option for further development because of:

- The significant topographical constraints and engineering challenges associated with locating the Coastal Ridge Way corridor outside the coastal plain and into the steep and hilly terrain associated with the coastal range
- The poor functional performance
- The high cost and poor economic viability
- The significant adverse impacts on biodiversity.

The Far Western Corridor was also investigated and a combination of factors meant that the Far Western Corridor was not a justified solution and would not be investigated further. As summarised in Table 4-2 in Chapter 4, Project development and alternatives of the EIS, the factors included:

- Average cost per kilometre rates for highway construction was considered high
- Road user cost benefit was considered poor due to the relatively high costs of construction and small traffic attraction of the Far Western Corridor
- The Far Western Corridor was severely constrained in terms of known and potential habitat for threatened species and severance of numerous wildlife corridors.

The Coffs Harbour Highway Planning Strategy – Preferred Option Report (RTA 2004a) provides a comparative assessment of the Coastal Ridge Way and the Far Western Corridor, against the preferred Inner Corridor option. As detailed in **Table 4.3-1**, neither the Coastal Ridge Way option or the Far Western Corridor performed well against the Inner Corridor.

Table 4.3-1 Comparative assessment of Coastal Ridge Way, Far Western Corridor and the Inner Corridor

Feature	Coastal Ridge Way	Far Western Corridor	Inner Corridor
Ability to stage construction	Limited to very limited	Very limited	Good
Economic viability	Very poor	Very poor	Fair
Socio-economic impacts	Low to moderate impacts	Moderate to high impact	Moderate to high impact
Biodiversity impacts	Very high impacts due to impacts on Sherwood Nature Reserves and protected zones in State Forests, threatened flora and fauna corridors	Moderate to very high impacts due to potential impact on Sherwood Nature Reserve, threatened flora and fauna corridors	Low to moderate adverse
Aboriginal cultural heritage impacts	High impacts	Moderate impacts	Low impacts

It is important to reiterate that the Coffs Harbour Bypass is not a standalone project, and complements the wider Pacific Highway upgrade program. As discussed above, part of the purpose of the CHHPS was to address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga. Construction for the Sapphire to Woolgoolga section of the Pacific Highway is now finished and the road is open. As a result, abandoning the proposed bypass route for the Coastal Ridge Way or Far Western Corridor would not be within the economic interests of the State or Australian governments.

4.3.3 Cuttings

Submission number(s)

152

Issue description

- Cuttings should be the preferred option as it would remove congestion from the Coffs Harbour CBD, compared to tunnels. Tunnels will exclude vehicles carrying dangerous goods so those vehicles will still cause congestion and safety risks in the city area.

Response

The use of cuttings to cross the three major ridges was included as part of the 2018 concept design. This design was displayed for community and stakeholder feedback between September and November 2018 to enable the community an opportunity to comment on the refined design before finalising and exhibiting the EIS.

Following consideration of the feedback, the NSW Government announced in January 2019 further design refinements would be investigated including:

- Use of tunnels

- Lowering the vertical alignment of the main carriageways
- Reducing the height of the bridge over North Coast Railway near Shephards Lane
- Use of low noise pavement and vegetated earth mounds to reduce potential noise impacts.

The design investigations largely focused on the design around the three major ridges at Roberts Hill, north of Shephards Lane and west of Gatelys Road. The investigations resulted in the development of an alternative concept design option to the 2018 concept design.

A comparative assessment of the 2018 concept design and alternative concept design was carried out in April 2019 to identify which design performed best overall and aligned with the Pacific Highway upgrade program objectives. The evaluation categories used for the comparative assessment were based on the categories used to assess the route options for the project as part of the CHHPS and options considered during the design development undertaken between 2016 and 2018. The evaluation categories included function, environment, socio-economic and cost considerations.

Following the outcomes of the comparative assessment it was concluded the construction of tunnels compared to cuttings to cross the three major ridges would better avoid and/or minimise impacts on wildlife corridors, reduce direct impacts on koala habitat, minimise impacts to landscape character and visual amenity, reduce impacts to agricultural properties, and reduce impacts on Aboriginal cultural heritage. Further information can be found in Section 4.6, Refined concept design development (2019) of the EIS.

It should be noted that Coffs Harbour itself is a destination for dangerous goods deliveries such as Class 2.1 (flammable gases) and Class 3 (flammable liquids). Therefore, during operation of the project, dangerous goods vehicles would continue to use the existing Pacific Highway to service customers in the Coffs Harbour CBD. In addition, traffic surveys carried out during preparation of the EIS determined that dangerous goods vehicles make up around 0.19 per cent of all vehicles for Coffs Harbour. As such, it is unlikely that this volume of traffic would be a significant contributor to congestion. Refer to Chapter 24, Hazard and risk of the EIS for further detail.

Current policy is that vehicles carrying certified dangerous goods are generally not allowed in tunnels.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

Submission number(s)

32

Issue description

- The inclusion of tunnels requires increases to project costs and ongoing maintenance. TfNSW should have made these disadvantages clear to allow for other alternatives to cuttings to be proposed.

Response

As described above, cuttings across the three major ridgelines, rather than the inclusions of tunnels was considered as part of the 2018 concept design, and considerations included associated projects costs and ongoing maintenance. Review and investigation of options for the cuttings was carried out to determine the best value solution based on four key criteria:

- Value for money (including factors associated with the project)
- Ensuring all vehicles could use the bypass
- Sustainability from an operating and maintenance perspective
- Ensuring delivery in line with publicly stated timeframes.

A range of options were developed for each major ridge crossing which included combinations of cuttings, tunnels and/or land bridges, as described in **Table 4.3-2**. Option 3 was determined to provide considerable cost savings when compared to the base case, when considering both the cost to build and ongoing operation and maintenance of the bypass. In addition to cost savings, Option 3 also presented better traffic and overall function performance. This resulted in Option 3 being chosen as the preferred solution in the 2018 concept design.

Table 4.3.2 Ridge crossing options assessed as part of 2018 concept design

Ridge crossing option	Description
Base Case	This option provided a cut-and-cover tunnel for Roberts Hill ridge and mined tunnels for Shephards Lane and Gatelys Road.
Option 1	This option included cuttings for all locations with 2H:1V batters.
Option 2	This option included mined tunnels for Shephards Lane and Gatelys Road. Roberts Hill ridge included a mined tunnel that acts as land bridge for fauna and flora connectivity.
Option 3	This option included a mined tunnel/land bridge (80 m long) for Roberts Hill ridge, a 2H:1V batter cutting at Shephards Lane, and a 2H:1V batter cutting and a land bridge at Gatelys Road.

However, following community feedback and consultation between September and November 2018, further investigation and a comparative assessment of an alternative concept design that included tunnels was carried out. As discussed in Chapter 4, Project development and alternatives of the EIS, the comparative assessment concluded that the alternative concept design (design that included tunnels, lower gradeline and low noise pavement) performed best against non-price criteria and the 2018 concept design best against price criteria. The alternative concept design aligned better with a number of the Pacific Highway upgrade program objectives including to:

- Reduce travel times
- Reduce freight transport costs
- Develop a route involving the community and considering its interests
- Provide a route supporting economic development
- Manage the upgrading of the route in accordance with the principles of ecologically sustainable development.

Although the 2018 concept design which included cuttings may have performed better against price criteria, it is clear the alternative option, and the current design to include tunnels, better satisfies project objectives, reduces overall environmental impact and addresses community feedback.

4.3.4 Tunnels

Submission number(s)

12, 51, 147, 151, 161, 169

Issue description

- An underground tunnel should be built from Englands Road to Bruxner Park Road as it would be quicker than the current proposed route and would reduce emissions, noise and visual impacts
- The project should include a tunnel under the city with a lower gradeline and quiet, open graded asphalt
- Tunnels cover only a small portion of the bypass and should be redesigned to be longer
- Any agreed tunnels need to protect the environment and the community with regard to minimising noise and vibration impacts, pollution, Aboriginal heritage, livelihood and personal investment.
- To avoid existing issues reoccurring in 10 years, the northern part of the bypass should be downgraded to a local ring road with a new junction and tunnelled alignment further west, towards Woolgoolga.

Response

Longer tunnels, such as a tunnel from Englands Road to Bruxner Park Road or a tunnel under the Coffs Harbour CBD, are not feasible options and do not justify detailed investigation. Notwithstanding the significant construction and operating costs associated with long tunnels, which would make the project economically unviable, there are also several significant engineering constraints which would affect the design of long tunnels. These include:

- One of the key design criteria for tunnel portals is that they need to be above the probable maximum flood (PMF) or the one per cent AEP flood level +0.5 metres (whichever is greater) where ingress of floodwaters would collect at the sag in the tunnel. The Englands Road interchange is located in flood prone land, with parts of the interchange within the extents of the PMF event. This would be a significant constraint for building a tunnel portal
- The project then traverses the North Boambee Valley floodplain and it would not be feasible to construct a tunnel portal within the floodplain. In addition, tunnelling through the floodplain would present a number of engineering challenges and risks due to geology and ground conditions, including tunnel collapse and/or subsidence. This would substantially increase construction and operational costs
- Roberts Hill is the first location where it is feasible to build a tunnel portal, however with the Coramba Road interchange being located within the extents of the PMF event, a tunnel starting on the south side of Roberts Hill would need to end to the south of Coramba Road, which would result in a tunnel similar to what is currently proposed for the project
- It is potentially possible to build a tunnel from south of Shephards Lane through to the proposed northern portal of the Gatelys Road tunnel. This would be a tunnel about 3.3 kilometres long, which would have significant construction costs and ongoing operating costs. A tunnel of this length would need mechanical ventilation and ventilation facilities to manage air quality within the tunnel and for fire and life safety requirements. There are also potential geotechnical risks associated with the existing fault line close to where the project crosses the North Coast Railway.

As identified in Section 4.6, Refined concept design development (2019) of the EIS, an alternative concept design was investigated and adopted for the project following feedback from the community on the 2018 concept design display. One of the key changes adopted for the project was to lower the vertical alignment of the main carriageways to help reduce noise and visual impacts, and to reduce potential impacts on Aboriginal cultural heritage by avoiding impacts on the ridgelines. Changes in gradient included:

- Lowering the southern approach to Shephards Lane ridge from 4.5 per cent to 3.5 per cent
- Lowering the southern approach to Gatelys Road ridge from 3.8 per cent to two per cent
- Lowering the northern approach to Gatelys Road ridge from 4.6 per cent to 3.4 per cent.

Opportunities to lower the alignment further and increase the length of the proposed tunnels are limited because of the constraints driving the design of the project at key locations. These include:

- The southern approach to the Roberts Hill tunnel is on a 3.5 per cent grade, up from the North Boambee Valley. Lowering the approach gradient to the Roberts Hill tunnel would significantly increase the length of the tunnel, increasing construction and operational costs for the project
- The elevation of the project as it approaches Shephards Lane ridge is limited by the North Coast Railway. Sufficient clearance needs to be provided to the railway below the project to maintain operation of the North Coast Railway. This limits how much the project can be lowered at this location. Combined with aiming to keep the project as low as possible near Roselands Estate results in a gradient of about 3.5 per cent on the approach to Shephards Lane tunnel from the south
- The elevation of the project north of Gatelys Road tunnel is driven by the tie-in to the existing Pacific Highway north of Bruxner Park Road and the length of the Gatelys Road tunnel. Lowering the alignment further at this location to achieve a three per cent gradient would significantly increase the length of the tunnel, increasing construction and operational costs for the project.

Submission number(s)

161

Issue description

- A design that lengthens the tunnels, further lowers the gradients and makes greater use of viaducts, could reduce noise impacts (for example, the bypass could be constructed on a viaduct near Roselands Estate to minimise noise and visual impacts).

Response

As identified in Section 4.6, Refined concept design development (2019) of the EIS, an alternative concept design was investigated and adopted for the project following feedback from the community on the 2018 concept design display. One of the key changes adopted for the project was to lower the vertical alignment of the main carriageways to help reduce noise and visual impacts. Changes in gradient included:

- Lowering the southern approach to Shephards Lane ridge from 4.5 per cent to 3.5 per cent
- Lowering the southern approach to Gatelys Road ridge from 3.8 per cent to two per cent
- Lowering the northern approach to Gatelys Road ridge from 4.6 per cent to 3.4 per cent.

Opportunities to lower the alignment further than that proposed in the alternative concept design are limited because of constraints driving the design of the project at key locations. These constraints have been discussed in response to a similar issue relating to lowering the road gradient and project alignment. For more information refer to **Section 4.3.2**.

As discussed in the response above, longer tunnels are not feasible options and do not justify detailed investigation. Notwithstanding the significant construction and operating costs associated with long tunnels, which would make the project economically unviable, there are also several significant engineering constraints which would affect the design of long tunnels.

Several bridges/viaducts have been incorporated into the concept design for the project. These are provided where needed to cross existing roads, property access and creeks, or for existing roads to cross the project. Bridges/viaducts are an integral part of the project and are needed to maintain access across the project, manage potential flood impacts and provide opportunities for fauna connectivity.

With regards to providing more viaducts/bridges, this would increase project costs and would not resolve noise and visual impacts. For example, near Roselands Estate, the project is largely on embankment and there is an earth mound with a four metre high noise wall on top, between the project and Roselands Estate. The combined height of the earth mound and the noise wall will help reduce noise impacts and landscaping of the earth mound would provide visual screening to reduce visual impacts for Roselands Estate. A viaduct at this location would be more visible and would likely have a shorter noise barrier (wind loading would limit the height of the noise wall on the viaduct), likely resulting in greater noise impacts for Roselands Estate.

The Noise Mitigation Guideline (Roads and Maritime Services 2015a) recommends that priority is given to corridor planning and road design where possible before consideration of other design measures. In the first instance, the base terrain for the project has incorporated landscape mounds where feasible by incorporating excess material from the project. For example, the section of the project near Roselands Estate (NCA13) includes a combination of an earth mound and a four metre high noise wall north of the Coramba Road interchange in front of NCA13, to reduce the noise, amenity and visual impacts to the area.

4.3.5 The project is a ring road, not a bypass

Submission number(s)

51, 58, 64, 135

Issue description

- The current design is a ring road rather than a 'bypass'. It has not bypassed Coffs Harbour especially considering the city is expected to continue expanding
- The current design is a ring road rather than a 'bypass'. Rings roads are extremely close to major residential areas and require a high degree of planning
- Every town along the Pacific Highway from Hexham to the Queensland border has been properly bypassed except for Coffs Harbour. The project proposes that heavy vehicles will be less than a kilometre from the west end of Bray Street.

Response

TfNSW acknowledges that some community members believe the project is not a bypass but a ring road. A wide range of potential road corridors were investigated within the CHHPS study area between 2001 and 2004. While corridor options which bypassed Coffs Harbour further to the west

were considered, the Inner Corridor was found to be the preferred long-term corridor option. This was based on the findings of an extensive project development process between early 2001 and the June 2004 release of the Coffs Harbour City Council Preferred Corridor Feasibility Study.

This decision was reviewed by TfNSW and DPIE in late 2004 as part of the process of identifying and confirming a preferred option for the CHHPS. This was documented in the Coffs Harbour Highway Planning Strategy – Preferred Option Report (RTA 2004a). That review reaffirmed the Inner Corridor as the preferred long-term corridor and agreed that route options within the Inner Corridor were the only viable options for the CHHPS as:

- They would have a good functional performance (provide substantial road safety improvement and travel time savings) while still providing opportunities to separate through and local traffic
- Although they have major socio-economic impacts, they would provide the best balance between functional, environmental, social and economic factors
- They would be lower in cost than other options
- Their economic performance was better than the other corridor options in terms of ability to stage construction and benefit-cost ratios.

In September 2008, the preliminary concept design for the project was announced and displayed for community comment. In response to community submissions received during the display, the concept design was further refined. This allowed CHCC to reserve the route in the LEP to provide planning certainty for CHCC and the local community. For example, urban release area decisions have been guided by the preferred route.

4.3.6 Future growth

Submission number(s)

50, 76, 147, 161, 163, 168, 169, 172

Issue description

- The project will compromise the ability of the Coffs Harbour region to grow and it will impact on the development potential
- The proposed route only addresses short-term issues. The Coffs Harbour region will require another solution in the future as the region grows.

Response

Planning for the project began in 2001 as part of the CHHPS (RTA 2001a). The CHHPS was developed by TfNSW in association with the DPIE and CHCC. It involved extensive consultation with a wide range of community groups and individuals. The purpose of the CHHPS was to:

- Address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga
- Plan for future traffic needs within the Coffs Harbour urban area
- Provide planning certainty for CHCC and the community.

As a result of the CHHPS, the identification of the preferred route, allowed CHCC to reserve the route in the LEP to provide planning certainty for CHCC and the local community. The road corridor based on this design was incorporated into the LEP with a SP2 zoning for infrastructure, and as such the project has been integrated into the economic, industrial and residential growth anticipated for the Coffs Harbour region.

Impact to future urban growth areas was given consideration when choosing the preferred route. This was demonstrated in decisions to select Inner North 2 (IN2) route over the Inner North 1 (IN1) route. As discussed in Chapter 4, Project development and alternatives of the EIS, it was found the IN2 route would provide for better use of the natural ridges and would reduce the potential noise and visual impact on properties and proposed urban areas near the project.

Future developments were also assessed in Chapter 12, Land use and property of the EIS. Although the project would impact on land within a number of growth, infill or renewal areas, given the size of these areas and the linear nature of the project, the project would not result in any significant land take on any area. In several instances, the direct impacts are only required for ancillary sites and land would be available for future use in line with the future growth, infill or renewal requirements. There would be no additional direct impacts upon future development as a result of required acquisition, beyond those identified during the construction phase. Impacts on growth, infill or renewal areas are considered to be minimal.

Table 5.6-2 of Section 5.6, Land use and property of the Amendment Report shows the updated impacts to the South Coffs URA and West Coffs Investigation Area due to the amended design, compared to the EIS design. While there would be an overall increase in impacts, these impacts are considered to be minimal and the project would not result in any significant land take on any one growth, infill or renewal land area.

Also, as identified in Chapter 3, Strategic justification and project need of the EIS, one of the key anticipated consequences of not building the project is that opportunities for economic growth and development within Coffs Harbour will continue to be constrained by the existing highway. Building the project would reduce congestion on the existing Pacific Highway through Coffs Harbour, enabling economic growth and development within Coffs Harbour.

To facilitate growth and development within Coffs Harbour, TfNSW will consult with CHCC about the West Coffs Investigation Area during detailed design so that appropriate consideration of the project is provided in any future master-planning (refer to environmental management measure LUP01 in **Chapter 6, Revised environmental management measures**).

Submission number(s)

135

Issue description

- TfNSW has dismissed the major socio-economic impacts of the project, particularly the development and growth of Coffs Harbour as a regional hub and popular place to live.

Response

The construction footprint has been refined and selected based on a staged approach of route selection and alignment revision throughout the CHHPS (RTA 2001a), through to the refinement of the concept design as part of the current phase of the project. The preferred route was identified in 2004. The process of designating land for the project under the LEP (in the SP2 Infrastructure zone) sought to provide CHCC with planning certainty and the community with confidence regarding the growth within Coffs Harbour.

TfNSW recognised the potential socio-economic impacts to Coffs Harbour and its residents and has carried out a range of consultation activities during the development of the design for the project to understand potential impacts and identify ways to mitigate these impacts. Chapter 14, Socio-economic of the EIS assessed the socio-economic impacts with consideration to demographic profile, community values, amenity, and business and industry, including local businesses, agriculture, and tourism. Chapter 12, Land use and property of the EIS assessed the impacts on future development.

These assessments have been updated for the amended design and are assessed in Section 5.6, Land use and property and Section 5.8, Socio-economic of the Amendment Report.

Based on the assessments in the EIS, growth and development of Coffs Harbour is unlikely to be affected by the project. While some people may experience impacts that affect their lifestyle, Coffs Harbour will remain a regional centre and the overall values associated with the area would not be significantly changed by the project.

Conversely, the operation of the project will reduce traffic (particularly heavy vehicles and through traffic) in the Coffs Harbour CBD. If the existing highway function remained in its current location, coupled with forecast population growth, the highway would constrain opportunities for economic growth and development within Coffs Harbour. Furthermore, given Coffs Harbour's substantial population, the range of services it offers and its location about halfway between Sydney and Brisbane, it is still expected to be a key regional centre and destination for a large portion of highway users.

4.4 Project description

4.4.1 Road design

Submission number(s)

44, 69, 102

Issue description

- There should be three lanes along the bypass to provide for increasing traffic levels
- The tunnels should be three lanes rather than two to avoid traffic disruption and delays
- There should be three lanes in each direction from Lyons Road to the northern end of the project to allow for traffic volumes
- The EIS varies between 12 and five metre wide medians. How much of the project will have five metre wide medians?
- The breakdown lanes should be three metre wide to ensure road safety and provide access for emergency services.

Response

As identified in Chapter 5, Project description of the EIS, the project would generally be two lanes in each direction. The locations where a third lane would be provided are as follows:

- On the northbound carriageway between Coramba Road interchange and just north of the Shephards Lane tunnel. The third lane at this location includes an acceleration lane for slow moving vehicles entering from the Coramba Road interchange
- On the southbound carriageway between Korora Hill interchange and just south of the Gatelys Road tunnel. The third lane at this location includes an acceleration lane for slow moving vehicles entering from the Korora Hill interchange.

In addition, the section of the project between Korora Hill interchange and the northern tie-in at Sapphire includes sufficient width for three lanes in each direction in the future. A five metre wide median is proposed for this section and any future widening would need to occur on the outside. There is enough space between the service road on the east and the local access roads on the west to cater for this possible future widening.

Notwithstanding the above, the project has for the most part been developed for two lanes in each direction. As identified in Section 4.5.3 of the EIS, one of the opportunities to improve value for money for the project and sustainability from an operating and maintenance perspective was to reassess the proposed design standards. Reducing median widths was an area which provided these opportunities without unduly impacting the project function and objectives. For example, a narrowed median width would result in less earthworks, reduce the construction footprint compared to a design with wider medians and reduce the scale of ongoing maintenance requirements.

Median width options were developed in early 2018 and an option to include a narrow median (five metres wide) was adopted for 2018 concept design. Although this option allowed no provision for widening the project from four to six lanes through the use of the median, it demonstrated overall value for money and better environmental performance.

Allowing for widening to six lanes in the median was not deemed to be justified as it would not be until about 50-60 years that the need for a third lane would be required. As such, given this timeframe, the

additional expenditure for construction and operation was not considered appropriate even acknowledging potential costs and difficulties associated with widening if needed in the future. Additionally, it was considered there would be further opportunities within the Coffs Harbour road network when the bypass reaches capacity and overall, the narrow median provided better value for money.

Providing three lanes in each direction from Lyons Road to the northern end of the project is outside the scope of the project. As noted above, a value for money decision was made to incorporate a narrow median (five metres wide) with no provision for future widening. In addition to this, an upgrade of the Lyons Road to Englands Road section of the Pacific Highway is outside the scope of this project. The possible future upgrades to the Lyons Road to Englands Road section of the Pacific Highway would be subject to future investigations to be carried out by TfNSW as part of ongoing works to improve the standard of the Pacific Highway between Newcastle and the Queensland border.

The 2018 concept design was displayed for community and stakeholder feedback from September to November 2018. Following consideration of the feedback during this display, the NSW Government announced a series of design refinements, which included the use of tunnels along the project. As such, the typical median for the project was adjusted to accommodate the use of tunnels to cross the major ridges. As identified in Chapter 5, Project description of the EIS, the project would typically include a 12-metre-wide median, with a minimum width of five metres and maximum width of 20 metres. The tunnels at Roberts Hill, Shephards Lane and Gatelys Road are all twin tunnels separated by rock pillars about 12 metres wide, resulting in a wider median near the tunnels. The five-metre-wide median is typically used in locations removed from the tunnels, including:

- From the southern tie-in to north of North Boambee Road (south of the Roberts Hill tunnel)
- Through the Coramba Road interchange (between the Roberts Hill tunnel and the Shephards Lane tunnel)
- From south of Bruxner Park Road to the northern tie in (from north of the Gatelys Road tunnel).

All other areas have a median greater than five metres wide.

As identified in Chapter 5, Project description of the EIS, the nearside shoulder width (referred to as a ‘breakdown lane’ in the submission) would be 2.5 metres and the offside shoulder width would typically be 0.5 metres wide. The project has been designed in general accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards, and TfNSW supplementary documents. In applying these guidelines, road safety has been a key consideration in overall design of the project, and a 2.5 metre wide shoulder is sufficient for road safety requirements and emergency services sufficient for road safety requirements and emergency services.

In addition to the 2.5 metre wide shoulder, emergency stopping bays would be provided near the emergency cross over facilities. Emergency stopping bays would be about six metres wide and long enough to store a B-double. As identified in Chapter 5, Project description of the EIS, emergency cross over facilities would be provided at the following locations, and would be subject to further refinement during detailed design:

- About 700 metres north of North Boambee Road and about 700 metres south of the Roberts Hill tunnel
- About 200 metres south of the southern portal of the Shephards Lane tunnel
- About 200 metres north of the northern portal of the Shephards Lane tunnel
- About 400 metres south of the southern portal of the Gatelys Road tunnel
- About 200 metres north of the northern portal of the Gatelys Road tunnel.

4.4.2 Road gradient

Submission number(s)

141, 143, 159

Issue description

- The maximum road gradient should be reduced to three per cent
- The road gradient should be at a minimum to reduce road noise
- The road gradient between Englands Road interchange and Roberts Hill tunnel should be lowered to reduce impact on Lakes Estates and Bishop Druitt College.

Response

As identified in Section 4.6, Refined concept design development (2019) of the EIS, an alternative concept design was investigated and adopted for the project following feedback from the community on the 2018 concept design display in September to November 2018. One of the key changes adopted for the project was to lower the vertical alignment of the main carriageways to help reduce noise and visual impacts. Changes in gradient included:

- Lowering the southern approach to Shephards Lane ridge from 4.5 per cent to 3.5 per cent
- Lowering the southern approach to Gatelys Road ridge from 3.8 per cent to two per cent
- Lowering the northern approach to Gatelys Road ridge from 4.6 per cent to 3.4 per cent.

Opportunities to lower the alignment further are limited because of the constraints driving the design of the project at key locations. These include:

- The southern approach to the Roberts Hill tunnel is on a 3.5 per cent grade, up from the North Boambee Valley. Lowering the approach gradient to the Roberts Hill tunnel would significantly increase the length of the tunnel, increasing construction and operational costs for the project
- The elevation of the project as it approaches Shephards Lane ridge is limited by the North Coast Railway. Sufficient clearance needs to be provided to the railway below the project to maintain operation of the North Coast Railway. This limits how much the project can be lowered at this location. Combined with aiming to keep the project as low as possible near Roselands Estate results in a gradient of about 3.5 per cent on the approach to Shephards Lane tunnel from the south
- The elevation of the project north of Gatelys Road tunnel is driven by the tie-in to the existing Pacific Highway north of Bruxner Park Road and the length of the Gatelys Road tunnel. Lowering the alignment further at this location to achieve a three per cent gradient would significantly increase the length of the tunnel, increasing construction and operational costs for the project
- The existing Pacific Highway between Kororo Nature Reserve and Kororo Public School has a gradient of about 5.2 per cent. This section of the project is very tightly constrained, and the existing gradient needed to be followed for the project. There is just enough space to fit the service road on the eastern side of the project, the main carriageway (including provision for future widening to six lanes on the outside), and a property access road to maintain access to an existing property south of Kororo Nature Reserve, limiting opportunities to lower the gradient.

The gradient of the project between Englands Road interchange and Roberts Hill tunnel is relatively flat, with gradients ranging from 0.5 per cent to 1.1 per cent to about 600 metres north of North Boambee Road. The gradient of the project adjacent to Bishop Druitt College would be about 0.5 per cent. From about 600 metres north of North Boambee Road, the gradient of the project steepens to 2.8 per cent and then 3.5 per cent on the approach to the Roberts Hill tunnel.

Following exhibition of the EIS, TfNSW has amended several aspects of the project. This was in response to consultation with the community and landowners during the EIS exhibition, submissions received during the EIS exhibition period and continued development and refinement of the concept design and consultation with government agencies. One of the proposed design changes related to reducing the vertical alignment in the North Boambee Valley. The design change was developed to reduce earthworks and the project footprint through the North Boambee Valley floodplain to reduce the loss of floodplain storage as assessed in the EIS. The design change in this location will not change the gradients outlined above.

4.4.3 Median barriers

Submission number(s)

32, 51

Issue description

- Median barrier should be provided along the length of the bypass to prevent head-on crashes
- There should be a 'hard' median barrier to prevent headlight interference and ensure road safety.

Response

As described in Chapter 5, Project description of the EIS, safety barriers such as concrete barrier or wire rope barrier would be provided along the length of the project in line with the Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b). In applying these guidelines, road safety has been a key consideration in overall design of the project, including the consideration of barriers between carriageways.

Headlight glare can result in road user annoyance and where it is excessive could contribute to a road safety issue. Headlight glare and its affect is an issue that is generally investigated during detailed design in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards and TfNSW supplementary documents. Where it is determined to be a potential issue, screening could be installed to minimise the risks to road users.

Submission number(s)

51

Issue description

- Lighting should be provided along the length of the bypass to ensure road safety
- Lighting along the bypass should be installed during the construction phase, otherwise it will increase costs to install lighting during operation.

Response

Lighting would be provided at key locations along the project (typically at the interchanges and the tunnels), however it would not be provided for the full length of the project. This approach is consistent with other sections of the Pacific Highway where lighting is only provided to highlight hazards and intended vehicle paths, and to identify intersection locations. There is also a requirement to minimise light spill which would otherwise create a nuisance for adjacent residences and may also discourage habitat use and disrupt foraging regimes of nocturnal native species.

As identified in Chapter 5, Project description of the EIS, the lighting scheme has been developed in accordance with the Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b) and Category V3 in with AS/NZ 1158 – Lighting for roads and public spaces. Based on the luminance criteria in accordance with Category V3 in with AS/NZ 1158 – Lighting for roads and public spaces, lighting at the interchanges would typically involve fitting the lighting with aeroscreen

visors and positioning lights to avoid light spill outside of the road corridor and upwards into the night sky.

Lighting for the project would be provided in the following locations:

- Along the entry and exit ramps for the Englands Road interchange, along Englands Road between Stadium Drive and the large roundabout under the project carriageways identified as part of the amended design (refer to Chapter 2, Design changes of the Amendment Report), and on the large roundabout under the project carriageways
- On the roundabouts proposed for the Coramba Road interchange, including the approaches to the roundabouts from the entry and exit ramps, Bennetts Road and Coramba Road
- At the Korora Hill interchange, including:
    - The northbound entry ramp and the southbound exit ramp
    - The Bruxner Park Road roundabout west of the main carriageway of the project
    - The roundabout below the northbound entry ramp and the southbound exit ramp
    - The intersection of James Small Drive and the service road.
- Within each of the tunnels. Lighting within and directly adjacent to the tunnels would be based on road geometry and would be designed to comply with the AS/NZ 1158 – Lighting for roads and public spaces, and the International Standard CIE 88-2004: International Commission of Illumination Publication Guide for the Lighting of Road Tunnels and Underpasses
- At the Kororo Public School bus interchange.

The proposed lighting for the project would be developed in more detail during detailed design, consistent with the Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b). The final lighting design for the project would be installed during construction of the project and before the project is opened to traffic.

4.4.4 Englands Road interchange

Submission number(s)

12, 67, 84, 100, 141

Issue description

- Englands Road interchange should be redesigned to reduce traffic lights
- Englands Road interchange should be simplified to reduce the large footprint
- Englands Road interchange should be redesigned in consultation with CHCC so that it can be integrated with local roads, decrease disruption to nearby residents and improve traffic flow.

Response

Following the exhibition of the EIS, the design of the Englands Road interchange was amended to reduce the number of traffic lights and address community concerns that the interchange design was too complex and difficult to navigate. Chapter 2, Design changes of the Amendment Report discusses the changes to the Englands Road interchange. An artist's impression of Englands Road interchange is shown below in **Figure 4.4-1.**

Figure 4.4-1 Artist's impression of Englands Road interchange looking north-west

The main changes to the design include:

- A revised alignment for the northbound exit ramp and the new one-way local access road, located on the western side of the project, to reduce impacts on the Coffs Coast Resource Recovery Park
- A roundabout about 116 metres in diameter under the project carriageways to provide a connection between Englands Road, Isles Drive, the northbound entry ramp and the southbound exit ramp. The roundabout would replace the two sets of traffic lights along Englands Road on either side of the project proposed in the EIS
- Lowering the alignment of the carriageways by 5.7 metres to reduce the height of the project to help manage visual and noise impacts. A new fauna underpass about 80 metres in length would be constructed about ten metres north of the existing fauna underpass to accommodate lowering of project carriageways and to improve connectivity for koalas by aligning better with the identified koala corridor. The underpass would be constructed prior to the existing underpass being demolished and would have the same dimensions as the existing fauna underpass (ie 2.8 metres high, 5.5 metres at the base)
- Minor adjustments to the operational water quality basins to accommodate changes to the interchange design.

As discussed in **Section 4.7.7** of this report, traffic lights are a safe and effective means of managing high volumes of traffic through intersections, particularly where there are a range of different turning movements (such as the Englands Road, Stadium Drive and Pacific Highway intersection). Other intersection forms, such as roundabouts, are not as efficient in managing high volumes of traffic.

This is demonstrated in Chapter 8, Traffic and transport of the EIS with the assessment of the Englands Road, Stadium Drive and Pacific Highway intersection. The existing roundabout intersection

operates at a level of service D (2016) during the evening peak. This means the average delay per vehicle would be between 43 and 56 seconds. There would be limited stable flow and restrictions in movement for drivers. This performance would continue to deteriorate as traffic volumes increase over time.

With the project in place, the intersection, which would have traffic signals, would operate at a level of service C 20 years after opening (2044). This means the average delay per vehicle would be between 29 and 42 seconds and there would be limited stable flow conditions through the intersection. This is a significant improvement when compared with the existing intersection.

The amended design at the Englands Road interchange has reduced the number of traffic lights. Despite the proposed design change, traffic lights are still proposed at Englands Road interchange to allow for the safe navigation of vehicles, provide signalised crossings for pedestrians and cyclists, and provide sufficient traffic capacity at the interchange to facilitate the safe and efficient distribution of traffic. This is required to meet the design requirements set out in Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime 2015b), Austroads guidelines, Australian Standards, and TfNSW supplementary documents. The change at Englands Road interchange is further discussed in Chapter 5.3 Traffic and transport, Chapter 5.4 Biodiversity and Chapter 5.12 Surface Water Quality of the Amendment Report.

It should also be noted that TfNSW has engaged in consultation and discussions with CHCC to produce the amended design. TfNSW will continue to engage with CHCC and businesses within Coffs Coast Resource Recovery Park during detailed design to identify opportunities to reduce temporary construction impacts on the operation of the waste management facilities.

4.4.5 Coramba Road interchange

Submissions number(s)

37, 82, 125, 126

Issue description

- Coramba Road interchange is not necessary as the bypass is only a short distance and access to Coffs Harbour is not required here.

Response

The Coramba Road interchange is located roughly midway between the two main interchanges which provide access to and from Coffs Harbour from the north and from the south (Korora Hill interchange and Englands Road interchange). It provides access between the existing road network at Coramba Road and the project. It is an important local access link to the project for residents in the west Coffs Harbour area and it helps to reduce congestion on the existing highway through Coffs Harbour by providing an alternative route for local trips. It also provides an important link to the project for emergency management in the event of an incident in the tunnels.

Community feedback from the display of the 2008 preliminary concept design in mid-late 2016 covered a range of issues including comments about the proposed interchanges at Coramba Road. The main concern was noise associated with Coramba Road interchange with vehicles using on/off ramps and capacity of Coramba Road to facilitate traffic to and from the project.

A review of the need for and location of interchanges was carried out in February 2017 in response to these concerns. The purpose of the review was to confirm whether the connection strategy presented in the preliminary concept design (with interchanges at Englands Road, Coramba Road and Korora Hill) would provide the best outcomes for the project and for Coffs Harbour.

Alternative connection strategies were identified considering two primary functions of the Pacific Highway at Coffs Harbour:

- Facilitating the movement of freight and people as part of the National Land Transport Network
- Providing efficient access to and from Coffs Harbour.

The alternative connection strategies comprised different locations of interchanges and a reduced number of interchanges. These strategies were identified considering the land use context for Coffs Harbour, including travel patterns to access key locations and activity centres, and the existing road network within Coffs Harbour. The focus of the investigation was to identify the number of interchanges needed and where interchanges should be located to best provide access to and from Coffs Harbour, considering functional, environmental and socio-economic factors, while providing value for money.

Four connection strategy options were identified, and these are described in **Table 4.4-1**. Preliminary designs were developed for each option based on the 2008 preliminary concept design. The key differences between the options were the number of, and locations for, interchanges to connect the project to the existing road network in Coffs Harbour.

Table 4.4-1 Alternative connection strategies considered for the project

Connection strategy option	Description
Option A	Option A was consistent with the connection strategy presented in the 2008 preliminary concept design with interchanges at Englands Road, Coramba Road and Korora Hill.
Option B	Option B included two grade-separated interchanges, at Englands Road and Korora Hill, and no interchange at Coramba Road.
Option C1	Option C1 had two grade-separated interchanges at Englands Road and Gatelys Road, and no interchange at Coramba Road. It also includes a four-lane connection road linking the Gatelys Road interchange with the Arthur Street overpass on the existing Pacific Highway (at Park Beach Plaza).
Option C2	Option C2 had two grade-separated interchanges at Englands Road and Gatelys Road/Korora Hill, and no interchange at Coramba Road. The interchange at Gatelys Road/Korora Hill would be split with south facing ramps at Gatelys Road and north facing ramps at Korora Hill. It also included a two-lane connection road linking the south facing ramps at the Gatelys Road interchange with the Arthur Street overpass on the existing Pacific Highway (at Park Beach Plaza).

An options evaluation workshop was held to assess the alternative connection strategies in February 2017 and consisted of representatives from TfNSW and CHCC. The evaluation process comprised an assessment of each option against function, environment, socio-economic and cost categories.

The evaluation criteria used for the assessment were based on the evaluation criteria developed to assess the route options for the project as part of the CHHPS, which are outlined in the Coffs Harbour Highway Planning Strategy – Preferred Option Report (RTA 2004).

The outcome of the assessment was Option A (the connection strategy presented in the 2008 preliminary concept design) would on balance, provide the best outcomes for the project. Additional

access to the project at Coramba Road would result in better outcomes in terms of community severance and accessibility, and better opportunities for emergency management and access. A summary of the outcomes from this assessment is provided in **Table 4.4-2**.

Table 4.4-2 Summary of outcomes from the assessment of connection strategies

Evaluation category	Key outcomes
Function	• All options would provide traffic congestion relief to the existing Pacific Highway with similar levels of access to key activity centres in Coffs Harbour • Option A would have the highest traffic volumes on the bypass south of Coramba Road, providing the greatest relief to traffic congestion on the section of the existing Pacific Highway south of Albany Street and Option C1 would have the highest traffic volumes on the bypass north of Coramba Road, providing the greatest relief to traffic congestion on the northern end of the existing Pacific Highway • Option A would provide route flexibility and better opportunities for emergency management as it would have three interchanges • Option A would provide an opportunity to stage the project with the potential to defer construction of the Coramba Road interchange • Option A would have the largest decrease in vehicle hours travelled and largest increase in average travel speeds.
Environment	• All options would have a similar level of environmental impact from the factors considered in the assessment • Option C1 and Option C2 could potentially have additional impacts on wildlife corridors because of the new connection road between Gatelys Road interchange and Mastracolas Road.
Socio-economic	• Option A would be consistent with current planning identified in the Coffs Harbour LEP, whereas Option C1 and Option C2 would be inconsistent • Potential impacts for Option A and Option B would be largely focused around the road reserve corridor incorporated into Coffs Harbour and the existing Pacific Highway, compared with Option C1 and Option C2, which introduce new potential impacts associated with the new connection road between Gatelys Road interchange and Mastracolas Road • Option A would allow improved accessibility to the bypass with the provision of an interchange at Coramba Road • Option A and Option B would impact fewer residential, commercial and agricultural properties • Option A would have the greatest reduction of traffic on the existing Pacific Highway south of Albany Street and provide additional access to the bypass at Coramba Road, potentially resulting in better outcomes in terms of community severance.
Cost	• Option B would provide the best overall performance for this category. However, it was noted that all options would have similar construction costs and operational and maintenance costs.

Submission number(s)

12, 62, 63, 67, 72, 78, 82, 83, 84, 100, 103, 106, 115, 117, 121, 123, 133, 146, 162, 163, 166, 167, 182

Issue description

- Coramba Road interchange should be redesigned into a donut design or similar to reduce the overall footprint and impacts on residents of Roselands Estate and others within West Coffs.

Response

The design of the Coramba Road interchange is a refinement of the 2008 preliminary concept design documented in the Coffs Harbour Bypass – Concept Design Report (RTA 2008), which comprised two roundabouts either side of the main carriageway to provide access between the bypass (via the entry and exit ramps), Coramba Road and Bennetts Road.

The 2008 preliminary concept design was used to inform the design of the Bennetts Road and Spagnolos Road detention basins which were installed by CHCC as part of broader flood protection works for the Coffs Creek catchment. The design of the Spagnolos Road detention basin was developed considering the project. The ultimate flood storage capacity of the basin considered the loss of storage that would occur once the project was built. The Bennetts Road detention basin was designed to adjoin the future Coramba Road interchange to maximise the potential flood storage capacity within the Bennetts Road detention basin.

These two detention basins form two of the key constraints for the Coramba Road interchange, as the design of the interchange sits neatly between the two basins. Other key constraints include Roselands Estate, Coffs Creek and Roberts Hill tunnel (which governs the vertical and horizontal alignment of the main carriageway through this zone and influences the design of the northbound exit ramp and the southbound entry ramp). Coffs Creek is a key constraint for defining the footprint of the interchange. The elevation of the main carriageway of the project through the Coramba Road interchange is governed by flood levels in Coffs Creek and the need to keep the main carriageway of the project flood free in a one per cent AEP event. The Coramba Road overpass has been designed to be as close as possible to the low point in the main carriageway of the project, to minimise the elevation of Coramba Road and limit the footprint of the interchange.

TfNSW acknowledges alternative designs for the Coramba Road interchange, such as a ‘donut’ style interchange, are potentially feasible considering the constraints at this location. As identified in Chapter 29, Project synthesis of the EIS, the design of the project would continue to be refined during detailed design and would be guided by the key principles developed during the concept design and EIS phase. Some flexibility has been provided in the concept design to:

- Allow for refinement during detailed design to consider alternative construction techniques
- Allow for refinement in response to submissions received following the exhibition of the EIS
- Minimise environmental impacts
- Respond to improved technologies or materials
- Improve value for money.

The final design of Coramba Road interchange may therefore vary from the concept design described in Chapter 5, Project description of the EIS and Chapter 2, Design changes of the Amendment Report. Any further design refinements would need to be reviewed for consistency with the assessment contained in the EIS and the updated assessment contained in the Amendment Report.

This would also include relevant environmental mitigation measures, environmental performance outcomes and any future conditions of approval. If design refinements are not consistent, approval would be sought from the Minister for Planning and Public Spaces for any such modification in accordance with the requirements of Division 5.2 of the EP&A Act.

TfNSW will investigate alternative designs for the Coramba Road interchange, including a 'donut' style interchange, during detailed design. The investigation will consider issues raised in submissions on the EIS and would be guided by the key principles developed during the concept design and EIS phase. Any refinements to the design of the Coramba Road interchange design would need to be consistent with the function of the interchange described in the EIS.

4.4.6 Korora Hill interchange

Submission number(s)

12, 22, 53, 61, 67, 76, 79, 84, 100, 103, 115, 141, 163

Issue description

- Korora Hill interchange should be redesigned to reduce traffic lights, reduce costs, improve safety and to simplify the design
- The design of the Korora Hill interchange should be redesigned to align with the Pacific Bay Resort Masterplan. The preference would be that all site traffic enters and exits onto James Small Drive and then through the Korora Hill interchange. Pacific Bay Resort welcomes consultation and input into the redesign
- Korora Hill interchange should be redesigned to increase road safety, particularly at Charlesworth Bay Road and entry to the Banana Coast Caravan Park.

Response

The design of Korora Hill interchange was amended following the exhibition of the EIS. The design changes are described below and in Chapter 2, Design changes of the Amendment Report. Design changes were carried out to:

- Address CHCC and community feedback on the design of the interchange
- Provide more direct access to and from Coffs Harbour
- Improve traffic flows and reduce delays by removing two sets of traffic lights
- Improve way finding and functionality by simplifying the design and improving connectivity with the local road network
- Improve access to existing properties near the proposed interchange
- Reduce potential impacts on traffic during construction of the interchange
- Reduce the footprint of the interchange.

The proposed design changes to the Korora Hill interchange are listed below and an artist's impression of the interchange is shown in **Figure 4.4-2**:

- A southbound exit ramp from the project to the existing Pacific Highway via a bridge (BR 19) over a roundabout at the intersection of Bruxner Park Road, the service road and slip lanes to and from the existing Pacific Highway. A left slip lane would be provided from the southbound exit ramp to provide access to James Small Drive, the service road and Bruxner Park Road

- A northbound entry ramp from the existing Pacific Highway to the project via a bridge (BR 19) over a roundabout at the intersection of Bruxner Park Road, the service road and slip lanes to and from the existing Pacific Highway. The northbound entry ramp would pass beneath the project (below BR 18)
- A northbound exit ramp from the project to Bruxner Park Road. A new roundabout would be provided at the intersection of the exit ramp and Bruxner Park Road
- A bridge (BR 17) would carry the project over Bruxner Park Road. Property accesses would be retained for existing properties south of Bruxner Park Road between the project and the existing highway. The property access from West Korora Road proposed in the EIS would no longer be required, as property access is retained from Bruxner Park Road
- A southbound entry ramp from Bruxner Park Road to the project
- A new roundabout would be provided below the northbound entry ramp and the southbound exit ramp to provide access between Bruxner Park Road, the service road, James Small Drive, and the existing Pacific Highway and replace two sets of traffic lights
- James Small Drive would join the service road via a T-intersection
- Traffic lights would be provided at the intersection of the existing Pacific Highway and Charlesworth Bay Road to provide safe access for traffic from Charlesworth Bay Road travelling north.

Figure 4.4-2 Korora Hill interchange artist's impression looking north

Traffic lights would be provided at the intersection of the existing Pacific Highway and Charlesworth Bay Road to provide safe access for traffic from Charlesworth Bay Road travelling to Bruxner Park Road, the service road, James Small Drive (via the service road), and the project via the southbound entry ramp.

Access to the Pacific Bay Resort would be unchanged because of the project, with access to the road network continuing to be provided via Charlesworth Bay Road/Bay Drive. Providing a new connection from the resort to James Small Drive is outside the scope of this project. Providing traffic lights at the intersection of the existing Pacific Highway and Charlesworth Bay Road would improve access to the existing highway for traffic from Charlesworth Bay Road, including traffic from the Pacific Bay Resort.

TfNSW has consulted with representatives of Pacific Bay Eastern Lands who own Pacific Bay Resort regarding the amended Korora Hill interchange. Chapter 4, Consultation of the Amendment Report provides a summary of the consultation and issues raised. Pacific Bay Eastern Lands have provided their support for the amended design.

Access to the Banana Coast Caravan Park would be modified with the proposed changes to the Korora Hill interchange outlined in Chapter 2, Design changes of the Amendment Report. However, it would largely be the same as the existing access arrangements. A comparison between the existing access arrangements and the access arrangements with the project in place is provided in **Table 4.4-3**.

Table 4.4-3 Change in access arrangements with the project in place

Existing access arrangements	Change in access with the project in place
Left in and left out access only from the Pacific Highway, near the intersection of the Pacific Highway and Charlesworth Bay Road.	Left in only access would be provided about 70 m to the south of the Pacific Highway and Charlesworth Bay Road intersection. A new left out only access would be provided about 70 m north of the Pacific Highway and Charlesworth Bay Road intersection.
Southbound traffic accessing the caravan park needs to use the existing turn-around facility at the Big Banana, then travel north along the existing Pacific Highway to turn left into the caravan park.	There would be no change.
Traffic leaving the caravan park to travel south needs to turn left onto the Pacific Highway (travelling north) and use the u-turn facility about 400 m north of the Charlesworth Bay Road.	Access to the u-turn facility would no longer be available, instead vehicles would need to use the roundabout below the northbound entry ramp and the southbound exit ramp to turn around to travel south. This would result in about 400 m additional distance that would need to be travelled.

As identified in environmental management measure TT07, existing access will be maintained during construction. Where that is not feasible or reasonable, temporary alternative access arrangements will be provided following consultation with affected property owners (refer to **Chapter 6, Revised environmental management measures**).

4.5 Construction

4.5.1 Construction ancillary facilities

Submission number(s)

30, 176, 177

Issue description

- Unsolicited proposal to use Jungs Quarry as a construction ancillary facility for the project. The quarry is close to the project and has existing facilities for rock crushing in a well buffered location to reduce noise impacts
- Property located at the south-eastern side of the Stadium Drive and Pacific Highway intersection is ideal for use as construction ancillary facility.

Response

TfNSW appreciates the offer to use the Jungs Quarry as a construction ancillary facility for the project. As described in Chapter 6, Construction of the EIS, several ancillary facility sites would be needed to build the project. When investigating a site, TfNSW uses several criteria to help determine whether a site would be acceptable based on environmental, community and construction related criteria. One of the key criteria is whether the site is located within or next to land where the project is being carried out. This requirement is used to generally contain amenity impacts to the construction footprint, minimise unnecessary construction vehicles on the existing local road network and minimise construction costs. While the final use, locations and layout of ancillary facilities will be determined by the construction contractor, at this stage the use of the Jungs Quarry as a construction ancillary facility is not considered suitable.

While the site is located at the south-eastern side of the Stadium Drive and Pacific Highway intersection and would generally meet the criteria used to determine a site is acceptable to be used as a construction ancillary facility, this construction zone already has a number of suitable sites available.

In addition to this, two new ancillary sites have been identified in this area. These sites are located on land already owned by TfNSW and land available for lease from CHCC and are considered suitable for possible construction ancillary sites (refer to Chapter 3, Construction updates of the Amendment Report). While the final use, locations and layout of ancillary facilities will be determined by the construction contractor, at this stage, given the availability of suitable sites in this area, the use of the property located at the south-eastern side of the Stadium Drive and Pacific Highway intersection is not required.

Submission number(s)

90, 112, 114, 150

Issue description

- With regards to ancillary site 2C, any leveling required for the site should ensure the hill is retained to protect the western side from noise and other pollutants.

Response

Construction ancillary site 2C is located between the North Coast Railway and the project and its proposed uses include a secondary site compound, crushing plant and stockpile site. This means site 2C would be used to support tunnelling activities and storage of materials in addition to processing rock material from cuttings to make suitable material for use as engineered fill for the proposed

embankments. Pollutants and waste from construction activities would be managed in accordance with an overarching CEMP and complemented by the various sub-plans included in **Chapter 6, Revised environmental management measures**. Key sub plans which will contain site-specific environmental management measures to manage potential pollutants include:

- Noise and Vibration Management Plan (NVMP)
- Soil and Water Management Plan (SWMP)
- Air Quality Management Plan (AQMP)
- Waste Management Plan (WMP).

The final use, locations and layout of ancillary facilities will be determined by the construction contractor. However, consistent with environmental management measure NV08, the design of the site will consider how best to manage impacts on adjacent sensitive receivers. This could include retention of the ridgeline or use of alternative shielding where possible.

Submission number(s)

105, 135, 161, 169

Issue description

- It is not clear what the ancillary site located off North Boambee Road will be used for and how access to it will be provided. What mitigation measures will be put in place to reduce impacts on surrounding properties?
- Concern relating to ancillary site 2E at Mackays Road and its impact on surrounding properties.

Response

Chapter 6, Construction of the EIS, including Tables 6-8 to 6-10, includes details on the construction ancillary site 1G, located off North Boambee Road, and construction ancillary site 2E at Mackays Road.

Site 1G is proposed as a main site compound, concrete batch plant, asphalt batch plant, crushing plant and stockpile site. The multiple use of this site is highly desirable as crushing plants should be located in the vicinity of concrete batching plants. The site is around 400 metres north of North Boambee Road and would be accessed via North Boambee Road using the land already acquired for the project.

Site 2E is proposed as a secondary site compound, crushing plant and stockpile site. In Chapter 6, Construction of the EIS, it was proposed the site would be accessed via Mackays Road. In response to CHCC's submission on the access via Mackays Road, TfNSW will investigate alternative construction access arrangements, for this area of the project during detailed design as part of the process to develop the TMP. As a result, environmental management measure TT06 has been revised to reflect this commitment. The TMP will confirm the construction access arrangements for the project and will include but not be limited to site specific traffic control measures (including signage) to manage and regulate traffic movement, consultation and community notification requirements and monitoring requirements to ensure the traffic control measures and access arrangements satisfy the plan's objectives.

Mitigation and management measures will be implemented to minimise impacts associated with the project's construction ancillary sites in accordance with an overarching CEMP and complemented by the various sub-plans included in **Chapter 6, Revised environmental management measures.** Key sub-plans which will contain site-specific environmental management measures to manage potential impacts include:

- NVMP
- TMP
- SWMP
- Construction Flood Management Plan (CFMP)
- AQMP
- WMP.

Additionally, there are several environmental management measures specifically relating to construction ancillary sites. These include:

- NV01 – Placement and operation of ancillary facilities will include measures to minimise noise and vibration impacts during construction
- NV08 – The design of the site will consider how best to manage impacts on adjacent sensitive receivers through maximising the distance to primary noise sources in the design of ancillary facilities
- FF14 – Threatened species habitat will not be cleared for the purposes of ancillary facilities
- UD04 – Ancillary facilities will be managed to minimise visual impact
- UD05 – Boundary fencing will be installed around ancillary facilities that are adjacent to residential areas for the duration of site establishment and construction
- LUP03 – Ancillary facilities will be rehabilitated to their pre-construction condition (where reasonable and feasible)
- SE01 – Procedures for consulting with property owners prior to any site establishment activities at ancillary sites
- FH01 – Ancillary facilities will be considered in the CFMP.

The final use, locations and layout of ancillary facilities will be determined by the construction contractor(s). However, consistent with the above management plans and environmental management measures, the establishment and operation of the ancillary facilities will be managed to minimise impacts on nearby properties.

4.5.2 Construction delivery

Submission number(s)

12, 17, 27, 37, 38, 39, 46, 56, 58, 61, 62, 63, 72, 76, 77, 78, 80, 81, 83, 84, 85, 87, 95, 100, 103, 104, 106, 115, 117, 121, 123, 127, 129, 131, 133, 135, 137, 138, 139, 141, 143, 145, 146, 147, 156, 161, 162, 164, 165, 169, 175, 182

Issue description

- A 'construct only' contract requested over other methods to ensure certainty for the community
- The project must be conditioned to ensure the tunnels and their length cannot be changed.

Response

As described in Chapter 6 of the EIS, TfNSW will consider and select the most suitable procurement method for project construction delivery. To facilitate this decision, TfNSW are in the process of developing a procurement strategy. Due to the size and complexity of the project, more than one

project contract is expected to be awarded. Before tenders are advertised, the community and industry will be briefed on the procurement strategy. It is important to note that the overall design and function of the project will not change whatever the form of the contract. The inclusion of the three tunnels at Roberts Hill, north of Shephards Lane and west of Gatelys Road will be a key contractual requirement under any form of the contract chosen to the deliver the project.

Construction of the project would need to comply with the approval for the project including any conditions which would be informed by the EIS, Amendment Report and Submissions Report including **Chapter 6, Revised environmental management measures**. Relevant State and Australian government legislation will need to be complied with and any licences or permits obtained (see Chapter 2, Assessment process of the EIS for further details). TfNSW would be responsible for overseeing the construction, including inspections, monitoring and auditing work performed by the construction contractor(s).

4.5.3 Construction staging

Submission number(s)

172

Issue description

- Construction phase is likely to take longer than five years and the realistic completion date will be closer to 2026 not 2024.

Response

Construction of the project is expected to take four to five years to complete. As detailed in Chapter 6, Construction of the EIS, the construction program is indicative only and may change based on further work during detailed design and changes to construction methods and/or materials as well as wet weather periods. The community would be kept informed of timing as the construction program is refined after project approval.

Submission number(s)

47, 132, 157

Issue description

- Korora Hill interchange should be constructed without delay due to safety and traffic congestion concerns at the existing intersection
- The construction of the project should commence as soon as possible.

Response

Following the exhibition of the EIS, the concept design for the Korora Hill interchange has changed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. Some of the reasons for the proposed design changes were to improve traffic flows and reduce delays by removing two sets of traffic lights, and to improve wayfinding and functionality by simplifying the design. As a result of the proposed design changes, motorists, pedestrians and cyclists would experience improved safety at this location.

Certain construction works would need to be carried out as soon as possible after project approval (ie enabling work) and before the main construction work. Enabling work for major infrastructure is typically carried out before the start of main construction work to ‘make ready’ the key construction sites and/or minimise disruptions to traffic and the community and/or to remove conflicts and bring about road user safety benefits as early as possible. Potential enabling work activities are outlined in

Table 6-2 of Chapter 6, Construction of the EIS. Korora Hill interchange does not meet the definition of enabling work and would be delivered as part of the main construction program.

As discussed in Chapter 6, Construction of the EIS the project is proposed to start in 2020 subject to project approval and funding availability. Initial work would likely include site establishment and pre-construction activities as described in Section 6.4.1, Pre-construction and site establishment of the EIS.

Submission number(s)

135

Issue description

- Staging methods and routes for construction access and transportation of equipment, personnel and construction supplies, have not been provided.

Response

Potential construction staging methods and construction access routes have been considered in various sections of the EIS. Staged delivery of the project is considered in Section 6.2.2 of the EIS. Construction traffic staging is discussed and assessed in Section 8.3.5 of the EIS, and construction access routes are discussed and assessed in Section 6.8.1 and Section 8.3.3 of the EIS respectively.

Following exhibition of the EIS, further consideration was given to construction access requirements for the project. Two new construction access roads were identified for the project, Gatelys Road and Buchanans Road. The purpose of these two new construction access roads are described in Chapter 3, Construction updates of the Amendment Report and the new construction accesses are assessed in Section 5.2, Traffic and transport, Section 5.3, Noise and vibration and Section 5.8, Socio-economic of the Amendment Report. **Figure 4.5-1** shows the updated construction access routes.

Construction staging for the project and construction access requirements (including the transportation of equipment, personnel and construction supplies) are subject to further investigations as part of the detailed design to be developed for the project and will be confirmed by TfNSW and the construction contractor(s) before construction starts. Mitigation measures will be implemented in accordance with an overarching CEMP and complemented by the various sub-plans.

As identified in environmental management measure SE01, a Community Liaison Implementation Plan will also be prepared and implemented before construction. The plan will be based on the draft Community Consultation Framework in Appendix D of the EIS. The plan will include information on potential construction impacts and timing and how the community will be notified of upcoming work.

Legend

- Construction footprint
- Alignment
- North Coast Railway
- Watercourse
- Construction zone
- Potential construction access
- Additional potential construction access

Coffs Harbour Bypass
Construction access routes
Figure 4.5-1

0 0.5 1 1.5 km

Scale @A4: 1:50,000
GDA 1994 MGA Zone 56

N

4.5.4 Construction work hours

Submission number(s)

69

Issue description

- Out of hours work should be undertaken 24 hours a day to reduce the duration of the construction phase.

Response

Construction noise is of considerable concern for community members of Coffs Harbour. The recommended standard hours for construction outlined in the NSW Interim Construction Noise Guideline (DECC 2009b) have been adopted for the project and are outlined in **Table 4.5-1**. However, the Interim Construction Noise Guideline also recognises there are some situations where specific construction work may need to be carried out outside of the recommended standard construction hours.

As discussed in Chapter 6, Construction of the EIS, there are several activities which may need to be undertaken outside of standard hours because of technical, safety and/or environment and community related issues. Table 6-13 of the EIS provides justification for the activities and likely locations. The majority of these activities would be carried out between Korora Hill and Sapphire (ie not the greenfield section of the project) because of the need to coordinate work with existing Pacific Highway traffic (about 30,000 vehicles per day at this location), road occupancy licence restrictions needed to minimise road user delays and traffic queuing, and the need to consider safety of construction personnel and road users.

The exception to this would be the proposed tunnelling activities. As discussed in Chapter 6, Construction of the EIS a 24-hour work cycle is proposed for tunnel excavation work. This was proposed to be undertaken Monday to Saturday and was described in the EIS as likely being undertaken in 12-hour shifts based on a 24-hour work cycle eg 6am to 6pm and 6pm to 6am. The tunnelling activities would result in a combination of audible and inaudible noise. The exception to this would be blasting which would be undertaken in accordance with the recommended hours. For the 12-hours shifts from 6pm to 6am the proposed tunnelling activities would only cause inaudible noise (ie noise that is no more than 5 dB(A) above the rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC 2009b)).To ensure government agencies and the community are fully informed of what is proposed to occur and when, further details have been provided in **Chapter 5, Clarifications, corrections and further information** regarding the out of hours tunnel excavation work.

Table 4.5-1 Standard construction hours

Work type	NSW Interim Construction Noise Guideline
Normal construction	• Monday to Friday: 7am to 6pm • Saturday: 8am to 1pm • Sunday and public holidays: no work.
Blasting	• Monday to Friday: 9am to 5pm • Saturday: 9am to 1pm • Sunday and public holidays: no blasting.

4.5.5 Traffic management and access

Submission number(s)

159

Issue description

- Access to the Coffs Coast Resource Recovery Park via Englands Road will be affected, however the EIS was not clear on how access would be managed during and after construction.

Response

The potential direct property impacts to Coffs Coast Resource Recovery Park have been reduced from those described in the EIS and the access arrangements simplified with the Englands Road interchange design changes described in Chapter 2, Design changes of the Amendment Report. These changes include a revised alignment for the northbound exit ramp and a new one-way local access road, located on the western side of the project, to reduce impacts on the Coffs Coast Resource Recovery Park. The changes are the result of ongoing consultation with CHCC.

As identified in environmental management measure TT06, a TMP will be prepared and implemented as part of the CEMP. The plan will include measures (eg restricted delivery hours, staging and programming, speed limit restrictions and traffic controls) to manage additional vehicle movement impacts on the existing road network, particularly at access points to the proposed construction ancillary sites and construction access roads such as Englands Road which are relevant to Coffs Coast Resource Recovery Park.

In addition, as identified in environmental management measure TT07, existing property access will be maintained during construction. Where that is not feasible or reasonable, temporary alternative access arrangements will be provided. As described in environmental management measure SE06, ongoing consultation with CHCC and businesses within Coffs Harbour Resource Recovery Park will be undertaken to identify opportunities to reduce construction impacts on the operation of the waste management facilities. As such, maintaining access to the Coffs Harbour Resource Recovery Park would be a key consideration during consultation.

As described in Chapter 3, Construction updates of the Amendment Report, new construction ancillary facility site 1A is proposed within the Coffs Coast Resource Recovery Park. Site 1A is located within an area no longer being used as part of landfill operations. Operation of site 1A would be negotiated with CHCC as part of a lease agreement and TfNSW would ensure construction traffic and deliveries would not impact the operation of Coffs Coast Resource Recovery Park (refer to Section 5.8, Socio-economic of the Amendment Report and environmental management measure SE06 in **Chapter 6, Revised environmental management measures**).

Submission number(s)

66, 160

Issue description

- Concern for the redirection of traffic onto access roads during construction which increases risks for road safety
- It is understood that the project has to maintain four lanes of travel north and south during construction which would mean the highway will be moved onto the local road. This will add to the inconvenience, noise and disruption.

Response

Safety is of significant importance to TfNSW. The majority of the existing Pacific Highway would be open for the duration of construction. When traffic needs to be redirected to build the project, traffic management measures will be implemented to reduce road safety risks for road users and construction workers. As identified in environmental management measure TT06, a TMP will be prepared and implemented during construction. The plan will include measures such as clear signage to direct and advise road users of the detour route and other traffic control measures to manage and regulate traffic movement.

Construction traffic management measures are outlined in Section 8.3.5 of Chapter 8, Traffic and transport of the EIS. Much of the project would be able to be constructed with minimal direct disruption to existing Pacific Highway traffic, however there are some locations where construction activities would interact with the existing Pacific Highway traffic. Construction activities associated with these areas would be completed in stages with multiple traffic switches likely to maintain through-traffic on existing roads as there are no appropriate alternative temporary routes or diversions to the existing Pacific Highway.

In addition, speed restrictions and traffic controls would be required to manage traffic during construction of the sections of the project where works are to be carried out along the existing Pacific Highway (ie from the southern tie-in to Englands Road interchange, and from Korora Hill interchange to the northern tie-in). This would likely include a 40 km/h speed limit during daytime construction and two lanes of traffic in each direction being maintained in accordance with any road occupancy licence requirements.

The use of any local roads to assist with traffic switches would be managed in accordance with the TMP. Potential noise impacts associated with traffic switches would be managed in accordance with the NVMP where relevant. Refer to environmental management measure NV01 in **Chapter 6, Revised environmental management measures** for further detail regarding the NVMP.

Submission number(s)

9, 10, 73, 99, 136, 179

Issue description

- Property access will be impacted during construction of the project

Response

Existing access to properties will be maintained during construction, as identified in environmental management measure TT07. Where that is not feasible or reasonable, temporary alternative access arrangements will be provided following consultation with the affected property owners. As identified in environmental management measure TT06, a TMP will be prepared and implemented as part construction. The TMP will also include measures to maintain access to properties and include requirements and methods to consult and inform the local community of impacts on the local road network. Refer to **Chapter 6, Revised environmental management measures** for further detail on TT06 and TT07.

4.6 Consultation

4.6.1 Consultation process

Submission number(s)

64, 76, 110, 135, 141, 143

Issue description

- General complaint regarding the lengthy consultation process
- The progress of the project has not followed a logical methodology and has resulted in poor project outcomes
- There has been no meaningful engagement by TfNSW or acceptance of community input
- Those that are directly affected by the project have had no direct consultation in over two years
- Consultation and feedback with the community has been poor
- Why were the long-term property owners in the West Korora Valley not consulted regarding their local knowledge in relation to flooding and environmental issues?

Response

The consultation process for the project since 2016 has been determined by the development of the concept design, environmental investigations, community consultation, changes to the design as a result of community feedback and project funding. TfNSW is committed to ensuring the best possible outcome for the project and construction is still anticipated to start at the end of 2020.

Community and stakeholder engagement carried out for the project for the period between early 2016 up to EIS exhibition is detailed in Chapter 7, Consultation of the EIS. This consultation has been guided by TfNSW's Community and Stakeholder Engagement Plan (CSEP) prepared for the project which establishes the approach and objectives for community and stakeholder engagement. The engagement objectives for the project are to:

- Provide information about the EIS and concept design process to stakeholder groups and community members
- Provide opportunities for TfNSW to engage with people and groups to better understand the real and perceived impacts and benefits of the project
- Provide opportunities for interested people and groups to learn about the EIS as it progresses so they can make informed submissions during the EIS public comment period
- Address the consultation requirement of the SEARs
- Seek feedback from the community and gather information that would be useful when developing the detailed design.

The EIS and concept design process began in early 2016. Consultation carried out during preparation of the EIS is detailed in Section 7.2.3 of Chapter 7, Consultation of the EIS. TfNSW has undertaken ongoing community engagement in the development of the concept design and EIS. The consultation built on earlier consultation processes for the project, ensuring stakeholders and the community were informed and able to provide input to the EIS.

In addition to ongoing engagement, feedback was sought from the community in August and September 2016 on the 2008 preliminary concept design. This was due to the length of time between the initial preliminary concept design display in 2008 and the expected change in community since this time. During this additional display, TfNSW received 77 items of written feedback, one petition, six letters received through the local Federal Member of Parliament's office and responded to 45 emails and 53 calls to the project information line.

The concept design was progressed and prior to finalising the EIS, feedback was sought between September and November 2018 on the 2018 concept design. During the 2018 concept design display, TfNSW received 813 submissions. The clear feedback from the community was a preference for tunnels over cuttings and land bridges. TfNSW listened to the Coffs Harbour community and refined the 2018 concept design which then formed the basis of the EIS (see Chapter 4, Project development and alternatives of the EIS for further detail).

Specific engagement activities undertaken during preparation of the EIS included:

- Engagement (meetings, phone calls and letters) with individual landowners directly impacted by the project (2016 to date)
- Correspondence (meetings, site visits, phone calls and email correspondence) with key government agencies (2016 to date)
- Stakeholder briefings, site visits and meetings (2016 to date)
- Community information line and email address established for inquiries (2016 to date)
- Project website to provide consistent information (2016 to date)
- Interactive web portal to show the boundaries of the project corridor and key features (2016 and 2019 to date)
- Static displays providing information about the project at key locations in Coffs Harbour (August/September 2016 and September/November 2018)
- Local media advertisements inviting feedback to the 2008 preliminary concept design (August 2016)
- Community update (insert in the Coffs Harbour Advocate, posted and emailed to registered stakeholders, TfNSW website updates, provided at community information sessions, letterbox drop to properties within 500 metres of the project corridor) inviting feedback to the 2008 preliminary concept design (August 2016)
- Community information drop-in sessions at Coffs Harbour (August/September 2016)
- Community pop-up displays at Harbourside Markets and Park Beach Plaza (August/September 2016)
- Business and community surveys (community update newsletter, local media, interactive web portal, TfNSW website updates, business phone and online survey, briefings and meetings) to understand the community's expectations, knowledge and concerns (November/December 2016 and May/June 2018)
- Local media advertisements inviting feedback to the 2018 concept design (September 2018)
- Community update (posted and emailed to registered stakeholders, letterbox drop to properties within 500 metres of the project corridor, posted to over 16,000 residences in the Coffs Harbour area) inviting feedback to the 2018 concept design (September to November 2018)

- Project summary report printed and made available at display locations (September to November 2018)
- Community information displays of the 2018 concept design at Coffs Harbour (September/October 2018)
- Community pop-up displays of the 2018 concept design at Coffs Central and Park Beach Plaza (November 2018)
- Online and paper feedback surveys of the 2018 concept design available online or via the project website and also in hardcopy at the community and pop-up displays (October/November 2018)
- Community display office opened (November 2018 to date)
- Establishment of a Community Consultative Committee for the project to provide a forum for discussion between TfNSW and representatives of the Coffs Harbour community, stakeholder groups and Coffs Harbour City Council on issues directly relating to the project (January 2019 to date).

The above engagement activities gave the Coffs Harbour community opportunities to participate in the ongoing design development and environmental assessment of the project. The issues raised during the EIS preparation are summarised in Section 7.3 of Chapter 7, Consultation of the EIS. These issues were investigated and considered as part of the development of the project, with design elements incorporated to address concerns raised and reduce potential environmental impacts where reasonable and feasible.

To guide future ongoing communication and consultation during construction of the project a draft Community Consultation Framework has been prepared and was provided in Appendix D of the EIS. The strategy will enable appropriate consideration and balancing of community and stakeholders' issues to achieve best project outcomes.

As stated in Chapter 7, Consultation of the EIS, ongoing two-way communication will be carried out during detailed design and construction. This will effectively address and manage issues as they emerge and support the delivery of best outcomes for the project, stakeholders and the broader community. The draft Community Consultation Framework will be the basis for developing a Community Liaison Implementation Plan. This plan will provide specific information relating to community involvement during construction and the opening of the project including consultation tools, activities and timing for each project element and specific issue (more detailed requirements of the plan are provided in Section 7.4.2 of the EIS).

4.6.2 Community submissions on the 2018 concept design

Submission number(s)

12, 14, 75, 80, 82,123, 141, 162, 182

Issue description

- Submissions were made for the 2018 preferred concept design, but no response was received
- There has been no consultation with North Korora Estate residents, including a response on the submission made relating to the 2018 concept design. The submission on the 2018 concept design needs to be considered and meaningful engagement with North Korora Estate residents undertaken
- There has been no attempt to address community concerns in regard to all three interchanges, especially Coramba Road interchange

- There has been no change to the interchange designs even after the number of concerns raised during the concept design display in 2018. A number of concerns have not been addressed including noise impacts, use of traffic lights and minimising footprint.

Response

The clear feedback from the community during the 2018 concept design display was a preference for tunnels over cuttings and land bridges, and concerns over operational noise. Following consideration of the feedback, the NSW Government announced in January 2019 further design refinements would be investigated before finalisation and exhibition of the EIS including:

- Use of tunnels
- Lowering the vertical alignment of the main carriageways
- Reducing the height of the bridge over North Coast Railway near Shephards Lane
- Use of low noise pavement and vegetated earth mounds to reduce potential noise impacts.

Given the work required to respond to the above design refinements, and the community's preference for the EIS to be displayed in 2019, the project team was unable to undertake detailed investigations of other design related issues raised as part of the 2018 concept design display. Notwithstanding, Section 7.3 of Chapter 7, Consultation of the EIS summarised all the submissions of the 2018 concept design display. Consideration was given to all the issues raised as part of the design development and environmental assessment of the project, where reasonable and feasible.

Concerns raised by North Korora Estate residents (ie Coachmans Close, Fernleigh Avenue and Pine Brush Crescent properties) regarding the treed reserve during the 2018 concept design display were considered in Chapter 5, Project description, Chapter 10, Biodiversity and Chapter 14, Socio-economic of the EIS. However, this issue and others raised in their submission on the 2018 concept design have been considered further in **Section 4.13.2.**

In addition, consultation with a representative of the North Korora Estate residents was undertaken on 23 April 2020. This included discussion on and a presentation of the preliminary investigation to understand the potential impacts of shifting the alignment of the project further west, away from Coachmans Close. It was advised in this discussion that shifting the alignment to address the community's concern was not a reasonable outcome and would not be pursued further. This was because of additional property acquisition (and associated socio-economic impacts), impact to the existing dual carriageway highway at Sapphire and subsequent substantial additional project costs.

Following exhibition of the EIS, TfNSW also carried out further investigations on a number of design amendments, in particular the Korora Hill and Englands Road interchanges. The design of both interchanges has addressed feedback provided on the 2018 concept design display as well as submissions received on the EIS, community consultation and continued development and refinement of the concept design and consultation with government agencies. This includes reducing the number of traffic lights and the footprint of both interchanges. The interchanges along with other design changes were displayed for community comment in November and December 2019. Other engagement activities included a community information display, pop-up display, residential door knock, social media engagement, and meetings and briefings with key stakeholders.

However, the design investigations following exhibition of the EIS did not consider the Coramba Road interchange. It is acknowledged a number of submissions on the EIS raised concern over the current interchange design. **Section 4.4.5** provides consideration of the issues raised by the community.

Further detail on the amended Korora Hill and Englands Road interchange designs can be found in Chapter 2, Design changes of the Amendment Report.

4.6.3 Lack of transparency and trust

Submission number(s)

12, 27, 75, 81, 88, 95, 103, 122, 124, 127, 128, 139, 147, 151, 164, 181

Issue description

- The lack of transparency by TfNSW has resulted in a loss of trust amongst the community. This was demonstrated by a reluctance to provide detail on project decisions, provide relevant information and documents despite being requested and the manner in which the EIS was displayed (including a short exhibition period and location of pop-up display locations)
- The DPIE needs to ensure that the community is dealt with promptly, honestly and transparently by TfNSW
- There is a lack of trust in the community regarding project development and design decisions.

Response

TfNSW recognises there is a perceived lack of trust and transparency in the Coffs Harbour community. During the preparation of the EIS, the design was being progressed in parallel and complete details of the design were still to be progressed. When TfNSW were able to provide the community with information about the project, this was undertaken as detailed above in **Section 4.6.1.** Project information is also available on the project website, interactive web portal or by visiting the community display office in Coffs Harbour.

Chapter 4, Project development and alternatives of the EIS provides a summary of the project development history since 2001 as part of the CHHPS (RTA 2001a). It also describes the extensive consultation and community engagement that was undertaken to identity the preferred route and ensure planning certainty for CHCC and the community by incorporating the road corridor in the Coffs Harbour LEP 2013.

Details on project development decisions since 2016 are also included Chapter 4, Project development and alternatives of the EIS. In particular, the design investigations and development decisions regarding the 2018 concept design are provided in Section 4.5 of Chapter 4, Project development and alternatives of the EIS. The main purpose of this phase of project development was to assess project features within the road reserve corridor documented in the Coffs Harbour Bypass – Concept Design Report (RTA 2008). Project features that were investigated during this time included interchange location, crossings of the major ridges and design standards. Key criteria to help guide decision making for this phase of the project included:

- Value for money (considering both the capital cost of construction and operational and maintenance cost)
- Ensuring all vehicles could use the bypass
- Sustainability from an operating and maintenance perspective
- Ensuring delivery in line with publicly stated timeframes.

The EIS was exhibited by DPIE for 47 days from 11 September to 27 October 2019. The exhibition period meets the requirements of Schedule 1 of the EP&A Act. Schedule 1 states that 28 days is the minimum public exhibition period for an EIS for State significant infrastructure under Division 5.2 of the Act. The exhibition period was extended for the EIS to allow for the NSW school holidays between 30 September and 11 October 2019. During the EIS exhibition in September and October 2019, a 12-

page summary document was printed and distributed to the Coffs Harbour community to ensure key issues were communicated.

During the EIS exhibition, pop-up displays were placed at Bunnings Warehouse Coffs Harbour, Park Beach Plaza, Coffs Central, Toormina Gardens and Moonee Market. TfNSW engaged Roy Morgan Research to undertake market research on Coffs Harbour's preferred consumer interests, behaviours and recreational activities. This research informed the locations of the EIS pop-up display locations. Bunnings Warehouse was selected as a pop-up display location to strategically reach community members on a Saturday morning. This would increase project awareness and notify members of the community of the EIS on display. The research also found shopping as a key recreational activity with local shopping centres identified as the community's preferred shopping venues. Again, the varied geographical locations of the major local shopping centres were selected as pop-up display locations.

In recognising there has been community concern about the project in Coffs Harbour, TfNSW has developed and implemented a Communications and Engagement Action Plan to supplement the CSEP. The purpose of the action plan is to ensure any misconceptions about the project are addressed moving into the next phase of the project. As such, the action plan has identified the need for proactive communications and engagement activities such as a subscription drive to target a wider community, a monthly project newsletter to all stakeholders on the database, quarterly community pop-up displays, improved social media and partnerships with key stakeholders to ensure consistent communication.

4.6.4 Misrepresentation of information

Submission number(s)

116, 161

Issue description

- When visiting pop-up information stalls, residents were told different information, specifically in relation to the potential noise wall at Coachmans Close. It appears that most residents are told incorrect information and as a result, are unaware the impact the project will have on their lives and property value
- TfNSW has misrepresented impacts by providing incorrect images and showing landscaping and noise mitigation where it has not been confirmed. This has misled and confused residents about the real outcomes of the project.

Response

During the EIS preparation, the design is at a concept stage only. As such, the design is indicative of the project at the time of community display. This is normal for projects of this size and complexity. If the project is approved, the design is refined ready for construction. This includes confirming specific details about landscaping and noise mitigation.

During the EIS exhibition period, TfNSW team representatives were available to discuss key features of the project at the pop-up displays. The interpretation of information by the community is out of TfNSW control. TfNSW can only discuss the information available at the time of display through the use of display posters, information flyers and the information published on the project website.

4.6.5 Accessibility and adequacy of information

Submission number(s)

115, 135, 141, 156, 174

Issue description

- It was difficult to make a submission as the website was confusing to navigate. The website seems to have been set up to purposely deter residents to make submissions
- TfNSW has made it difficult for the community to access reports and information about the project
- Lack of detailed and adequate data provided
- TfNSW presented information in a sanitised and skewed manner and as a result does not represent visual or environmental impacts accurately
- The exhibition period was not long enough to review the lengthy EIS.

Response

The EIS was displayed on the NSW Government major project website which is managed by DPIE. All major projects including State significant infrastructure and State significant development projects are displayed on this website in NSW. TfNSW also provided an overview of the EIS and chapter summaries via the project's interactive web portal (https://v2.communityanalytics.com.au/rms/coffs) with links to the major project website. The web portal also provided an interactive map to allow users to search geographically for issues that they were interested in. In addition to the websites, the EIS was also made available in hard copy at seven locations including four locations in the Coffs Harbour LGA. These included the TfNSW project display office, Coffs Harbour City Council chambers, Harry Bailey Memorial Library and the Toormina Library.

While the major project website is managed by DPIE, TfNSW assisted community members making submissions on the EIS. This included preparation of specific 'How to make a submission' fact sheets as part of the EIS display material and advice and guidance at the community information displays, pop-up displays and TfNSW project display office.

The EIS was prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) dated June 2016 and revised in October 2017. This required a detailed assessment of the project under Division 5.2 of the EP&A Act. As the project is also a controlled action under the EPBC Act, a separate approval is required from the Australian Minister for the Environment. The EIS includes extensive environmental investigations to adequately satisfy the SEARs and any requirements of the EPBC Act.

As previously discussed, the EIS was exhibited by DPIE for 47 days from 11 September to 27 October 2019. The exhibition period meets the requirements of Schedule 1 of the EP&A Act. Schedule 1 states that 28 days is the minimum public exhibition period for an application for development consent for State significant development. The exhibition period was extended for the EIS to allow for the NSW school holidays between 30 September and 11 October 2019.

Submission number(s)

115

Issue description

- Despite a request from a community member, TfNSW has failed to produce 3D tiles which were on display for the 2018 community update.

Response

TfNSW refined the concept design following the display of the 2018 concept design as a result of feedback received from the community. As such, the 3D tiles of the cuttings included in the 2018 concept design are no longer relevant. The project now includes tunnels at the three major ridges.

Submission number(s)

156

Issue description

- The pop-up information stalls were inconveniently located away from the residents being affected.

Response

During the EIS exhibition, pop-up displays were placed at Bunnings Warehouse Coffs Harbour, Park Beach Plaza, Coffs Central, Toormina Gardens and Moonee Market. TfNSW engaged Roy Morgan Research to undertake market research on Coffs Harbour's preferred consumer interests, behaviours and recreational activities. This research informed the locations of the EIS pop-up display locations. Bunnings Warehouse was selected as a pop-up display location to strategically reach community members on a Saturday morning. This would increase project awareness and notify members of the community of the EIS on display. The research also found shopping as a key recreational activity with local shopping centres identified as the community's preferred shopping venues. Again, the varied geographical locations of the major local shopping centres were selected as pop-up display locations.

Submission number(s)

136

Issue description

- Community member feels unsure and uninformed about what to expect with the proposed access once the project has been built.

Response

There are a number of ways members of the community can contact the project team to discuss such issues as future access arrangements. This includes contacting the project team via telephone or email or dropping into the TfNSW display office at 11a Park Avenue.

However, due to the Australian and NSW government's response to coronavirus (COVID-19) and to ensure the safety of our staff and Coffs Harbour community, we will be postponing face to face interactions including the closure of the project display office until further notice. During this time, the project team will be contactable on 1800 550 621 or email coffsharbourbypass@rms.nsw.gov.au.

4.6.6 Future consultation

Submission number(s)

27, 78, 83, 84, 91, 97, 110, 129, 141, 167, 171

Issue description

- Detailed design could be developed in consultation with the community
- Further community consultation is required on the detailed design
- How much notice will the community receive before the actual commencement of works?
- There is a need to actively engage and fully inform residents going forward
- There should be opportunity for more consultation when the detailed design is complete.

Response

As discussed in Section 7.4 of Chapter 7, Consultation of the EIS, TfNSW will continue to liaise with stakeholders and the community during the detailed design, construction and operation phases of the project.

The aim of ongoing communications and consultation are to provide the community with:

- Accurate and accessible information about the processes and activities associated with the project
- Information in a timely manner
- Appropriate avenues for providing comment or raising concerns and to ensure the community are aware of how to engage with the project team
- A high level of responsiveness to community issues and concerns throughout development and delivery of the project.

Community involvement would continue as part of the construction and delivery of the project. A draft community consultation framework has been prepared (refer to Appendix D, Draft community consultation framework of the EIS) and will be the basis for developing a Community Liaison Implementation Plan to guide community and stakeholder involvement during detailed design, construction and leading up to project opening.

TfNSW supports the Australian and NSW government's response to coronavirus (COVID-19) and to ensure the safety of our staff and Coffs Harbour community, we will be postponing face to face interactions including the closure of the project display office until further notice. During this time, the project team will be contactable on 1800 550 621 or email coffsharbourbypass@rms.nsw.gov.au.

4.7 Traffic and transport

4.7.1 Traffic volumes

Submission number(s)

50

Issue description

- Requests for more information on traffic volumes on the existing highway for the current year and during construction broken down by vehicle type.

Response

Existing daily traffic volumes (vpd) on the Pacific Highway (2016 data) with and without construction traffic is provided in **Table 4.7-1**. These values have been sourced from Table 6 and Table 29 in Appendix F, Traffic and transport assessment of the EIS. The base model adopted for the assessment was developed in 2016. The traffic count datasets for the area-wide model were sourced during that year and as such, it is the most current traffic count data information available for area-wide analysis and current year traffic volumes cannot be provided. However, as described in Appendix F, Traffic and transport assessment of the EIS, the 2016 traffic data is considered current for the purposes of the traffic and transport assessment.

Table 4.7-1 Daily traffic volumes (2016) with and without construction traffic

Location	Without construction traffic		With construction traffic	
	Total vehicles (vpd)	Heavy vehicles (vpd)	Total vehicles (vpd)	Heavy vehicles (vpd)
Pacific Highway (south of Englands Road)	36,000	5,040	36,490	5,240
Pacific Highway (north of Bruxner Park Road)	30,000	4,500	30,560	4,750

As detailed in Table 6-7 of Chapter 6, Construction of the EIS, several vehicle types are anticipated depending on the construction activity. Heavy vehicle traffic during construction would consist of a mix of truck and dog, tipper trucks and concrete trucks dependent on the construction material being hauled. Table 8-8 of the EIS provides the peak light and heavy vehicle construction volumes on the Pacific Highway at a location south of Englands Road and north of Bruxner Park Road. The increase in traffic volumes on the Pacific Highway because of the addition of construction traffic represents increases of less than five per cent of existing daily traffic volumes. This is a low level of impact. Noticeable impacts to travel time or level of service on the existing Pacific Highway would not be expected.

Submission number(s)

57

Issue description

- Concerned about increases in traffic during construction.

Response

Chapter 8, Traffic and transport of the EIS and Chapter 6 of Appendix F, Traffic and transport assessment of the EIS considered the daily traffic volume increases anticipated on the existing road network during construction. Existing daily traffic volumes on the local road network with and without construction traffic is presented in Table 29 in Appendix F, Traffic and transport assessment of the EIS. The resulting daily traffic increase, with construction vehicles, have been assessed against the relevant nominated design capacity of local streets based on their designated road function and type. On those roads (eg Englands Road, Mackays Road, Bray Street, West Korora Road, Bruxner Park Road and James Small Drive) where the predicted daily volumes, with construction traffic, are less than their nominated design capacity, construction traffic is not anticipated to trigger adverse traffic impacts.

As identified in environmental management measure TT06 in **Chapter 6, Revised environmental management measures**, a TMP will be prepared by the construction contractor(s) as part of the Construction Environmental Management Plan to manage construction traffic and mitigate any potential traffic impacts. This will include measures to manage traffic impacts on local roads where it has been identified there may be an increase in traffic demands beyond the nominated design capacity. The TMP will be prepared in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c) before commencement of construction.

In addition, to minimise impacts on the local road network, haulage of excavated material would be carried out along the project corridor as soon as practicable. Haulage of materials would also consider peak travel hours and times, particularly during school and public holiday periods, to minimise the potential for delays on the existing Pacific Highway and local roads.

Submission number(s)

57, 97, 136, 153

Issue description

- Concerned that the forecast traffic volumes are low and will have potential impacts to noise modelling and intersection design
- Concerned about traffic volumes on Sawtell Road interchange and on/off ramps
- Concerned the number of vehicles shown in the display materials is too low and misrepresents the traffic that will actually use the highway
- Concerned the traffic volume projections presented in the EIS at Coramba Road are insufficient compared to what will occur during operation.

Response

Traffic modelling for the project was carried out using a three-tiered approach with a regional strategic model (CHSTM) being used to provide forecast traffic demands for the modelled area. A more detailed project specific network model (CHTM) was then completed to predict the traffic distribution on the road network and performance of the road network with and without the project. A detailed intersection capacity analysis was also carried out using microsimulation and intersection models.

The CHTM and the CHSTM were developed with consideration to the Traffic Modelling Guidelines (Roads and Maritime Services 2013c). The CHSTM and CHTM have been calibrated and validated using the guideline criteria outlined in the Traffic Modelling Guidelines (Roads and Maritime Services 2013c) for highway assignment models and the New Zealand Transport Authority Transport Model Development Guidelines (NZTA 2014). Calibration and validation has been carried out to match the base model results to observed traffic survey data collected between June 2016 and May 2017 (including origin-destination, travel time and traffic counts). Once the base models were confirmed to accurately represent the existing situation, future model scenarios were developed, with forecast demands based on land-use assumptions and predicted population and employment growth sourced from DPIE and CHCC.

The CHTM assigns traffic demands (sourced from the CHSTM) to the road network to provide predictions of traffic volumes and delays on various road links and turns, including Coramba Road. Through the use and development of both CHTM and CHSTM models, projected traffic volumes for Coramba Road and the entire project have been determined within acceptable and approved limits (noting the inherent margin of error associated with the modelling process). Additional information on Coramba Road is provided in **Section 4.7.4**.

Traffic volumes using Sawtell Road to access the Pacific Highway are projected to increase by about 100 vehicles each way during the peak hours in 2024 once the project is open to traffic. However, the CHTM predicts the intersections at the Pacific Highway/Sawtell Road interchange would continue to operate with similar levels of delay to existing conditions.

Notwithstanding this, environmental management measure TT11 provides for a review of operational network performance to be undertaken within 12 months from the opening of the project to confirm the operational traffic and transport impacts of the project on the surrounding road network. This assessment will be carried out at particular interchange locations and on Coramba Road. Refer to **Chapter 6, Revised environmental management measures** for more information.

Submission number(s)

153

Issue description

- Concerned for school traffic at the roundabout intersection of James Small Drive and the new service road.

Response

The intersections of James Small Drive have been assessed in terms of level of service and the intersections are anticipated to operate at ‘very good’ and ‘stable’ levels of service. Secondly, the proposed design changes would contribute to reduced traffic at these intersections, further reducing traffic congestion at these intersections.

As described in Chapter 8, Traffic and transport of the EIS, level of service refers to a method of assessing intersection performance. Table 8-5 in Chapter 8, Traffic and transport of the EIS provides a description of level of service criteria, ranging from A (very good) to F (unsatisfactory).

Following the exhibition of the EIS, the concept design for the Korora Hill interchange and Kororo Public School bus interchange has changed, and the proposed design changes are documented in Chapter 2, Design changes of the Amendment Report. Access to the Kororo Public School bus interchange is now proposed via the service road instead of from James Small Drive, which would affect the volume of traffic using James Small Drive. The effect of these design changes on traffic and transport is documented in Section 5.2, Traffic and transport of the Amendment Report.

The traffic and transport assessment carried out for the James Small Drive intersections with the service road for the amended design indicates the following:

- James Small Drive (north)/service road roundabout would operate at a level of service A, 20 years after opening (based on a nominal opening year of 2024). An intersection with a level of service A means that it would have free flowing traffic virtually unaffected by other road users
- The James Small Drive (south)/service road T-intersection would operate at a level of service C, 20 years after opening. An intersection with a level of service C indicates that it would have a stable flow of traffic with some manoeuvres restricted.

The assessment indicates both intersections of James Small Drive and the service road would operate effectively 20 years after opening. The proposed design changes would result in a reduction in traffic volumes on the southern end of James Small Drive (reduced from 4000 vpd in the existing case to 3600 vpd with the project in place (in 2024).

Submission number(s)

69, 172

Issue description

- The project will outgrow itself in five years and will not support increased traffic volumes
- This proposed route was only to be a short-term fix of the traffic congestion in Coffs Harbour.

Response

Two key objectives of the project relate to accommodating future growth and associated increase in traffic volume in the Coffs Harbour Region. These are to provide travel time savings for local traffic, and business vehicles/freight and to provide sufficient road capacity to meet traffic demand on the Pacific Highway. Estimated travel times were modelled considering expected population growth in the Coffs Harbour Region. The project meets these objectives as documented in Table 3-9 of EIS Chapter 3, Strategic justification and project need.

Appendix F, Traffic and transport assessment of the EIS details the modelling approach for the CHTM. The approach followed was a typical four-step strategic modelling process by which the number of trips is estimated and distributed among origin and destination zones based on land-use and demographics; then divided according to mode of travel and assigned to the road network. The CHSTM produces forecast traffic volumes for the morning peak, daytime off-peak, afternoon peak and nighttime off-peak periods. The CHSTM was used to produce forecast traffic demands based on land-use assumptions and predicted population and employment growth sourced from DPIE, the North Coast Employment Land Review (March 2015) and Coffs Harbour Land Use and Employment Strategies (CHCC 2009). Modelling is then completed for an assumed opening year (2024), then 10 years later, 2034 and 10 years later again, 2044.

Following the exhibition of the EIS, design changes have been proposed to the project (refer Chapter 2, Design changes of the Amendment Report). The traffic modelling has been updated to reflect the proposed design changes. This supplementary traffic assessment is detailed and discussed in Appendix A, Supplementary traffic and transport assessment of the Amendment Report. The assessment demonstrates that all three interchanges will continue to operate with acceptable levels of service over the design horizon assessed (ie up to 2044).

Submission number(s)

57

Issue description

- If the traffic forecast between Shephards Lane and Robin Street is to increase by 500 vpd by 2024, will this mean an increase in traffic by 100 vpd on Shephards Lane? Shephards Lane is already congested in peak periods.

Response

Following the exhibition of the EIS, design changes have been proposed to the project (refer Chapter 2, Design changes of the Amendment Report). The traffic modelling has since been updated to reflect the proposed design changes. As detailed in Table 2, Appendix A, Supplementary traffic and transport assessment of the Amendment Report, there is a predicted localised increase in traffic demands on Coramba Road between Shephards Lane and the project, with a predicted decrease of daily traffic demands on Coramba Road east of Shephards Lane.

This change in travel patterns suggests an increase in demands on Shephards Lane on the approach to Coramba Road. Peak hourly volumes have been extracted from the CHTM to understand the potential impacts of the project to traffic conditions on Shephards Lane during peak periods. The project is estimated to change traffic flows on Shephards Lane as follows, when compared to the “without the project” scenario:

- 2024 morning peak (8 - 9 am): increase by 32 vehicles per hour
- 2024 evening peak (4 - 5 pm): increase by 28 vehicles per hour
- 2044 morning peak (8 - 9 am): increase by 42 vehicles per hour
- 2044 evening peak (4 - 5 pm): decrease by 54 vehicles per hour.

Based on the outputs from the CHTM, traffic volumes are anticipated to increase by up to 42 vehicles per hour when compared to 'without the project'. This small increase in traffic volumes (ie less than one vehicle per minute during the morning peak hour) is not expected to adversely impact traffic operations on Shephards Lane north of Coramba Road.

Additionally, it can be demonstrated that during the evening peak hour, the project is predicted to result in a minor decrease in the peak hour traffic demands on Shephards Lane.

4.7.2 Local roads

Submission number(s)

96

Issue description

- The design should include improvements to local roads and not only building the bypass.

Response

As identified in Chapter 8, Traffic and transport of the EIS and updated in Chapter 5.2, Traffic and transport of the Amendment Report, there are several local and access road upgrades proposed for the project. These upgrades are needed to accommodate the project and maintain connections on the existing road network that would be directly affected by the project. TfNSW does not propose upgrades to local and access roads beyond those identified in the EIS.

In addition, the introduction of the bypass would result in significant reductions in traffic volumes on the existing Pacific Highway and local roads, including for example Hogbin Drive, Stadium Drive, Isles Drive, Bray Street, Coramba Road (east of Shephards Lane) and James Small Drive. The reduction in volume, coupled with optimisation of signalised intersections, would improve the amenity, operation and performance of these local roads, with associated improvements in delay and travel times anticipated. This is discussed further in Chapter 8, Traffic and transport of the EIS and Section 5.2, Traffic and transport of the Amendment Report.

Submission number(s)

160, 179

Issue description

- Concerned about traffic volumes increasing on Coachmans Close and that this will change from a local road to a significant service road
- Request for predicted traffic volumes on the service road near Coachmans Close.

Response

Coachmans Close would remain a local access road with access to the broader road network via Opal Boulevard, as is the current situation. The service road, located immediately west of Coachmans Close, will carry local traffic and would provide a link for the local road network between Korora and Sapphire (including areas west of the project) to the existing Pacific Highway in the south, and to Solitary Islands Way in the north. No direct link between the service road and Coachmans Close is proposed.

As a result of the above, traffic modelling for the project indicates there would be a negligible change to traffic volumes on Coachmans Close. The predicted daily volumes on the service road near Coachmans Close are 3700 vpd in 2024 and 4400 vpd in 2044.

4.7.3 Access and connectivity

Submission number(s)

42, 55, 101, 105, 147, 149, 163

Issue description

- Concerned by complicated highway route options for West Kororo Basin residents with no direct access to the highway, particularly the need to travel north before being able to head south into Coffs Harbour
- Accessing the highway is complicated for West Kororo Basin residents and there should be an extension of the local access road on the western side of the project, from Old Coast Road to Korora Hill interchange
- There should be entry and exit ramps for North Boambee Road
- There is no direct access to the identified future growth area of North Boambee Valley.

Response

James Small Drive, Old Coast Road, Opal Boulevard and Seaview Close currently all intersect with the existing Pacific Highway at unsignalised, priority (stop or give-way) controlled, at-grade intersections. The service road proposed as part of the project would remove these four intersections along the existing Pacific Highway, reducing the number of conflict points to improve safety along this section of highway.

A new local access road would be provided west of the project between Old Coast Road and Seaview Close. An underpass below the project would be provided near Fernleigh Avenue to connect the new local access road with the new service road. Providing a separate local road system with access to the highway via the service road and the Korora Hill interchange significantly reduces the number of conflict points in this section of highway, improving road safety.

West Kororo Basin residents would need to access the new local access road via Old Coast Road, travel north along the new local access road to use the underpass near Fernleigh Avenue to connect to the service road. From there, residents can travel south along the service road to access Coffs Harbour.

The section of the project between Korora Hill interchange and Sapphire is tightly constrained, particularly the section between Kororo Nature Reserve and Kororo Public School. There is not enough space to fit both a service road west of the project and a service road east of the project through this zone. The service road is located on the eastern side of the project because it would provide a direct link between Solitary Islands Way and the existing highway near James Small Drive and provide access to the Kororo Public School bus interchange. Note the design of the Kororo Public School bus interchange has been amended following the exhibition of the EIS so that access to the bus interchange would be via the proposed service road instead of from James Small Drive. This design change avoids the need for buses accessing the bus interchange to travel along James Small Drive, avoiding the risks associated with buses interacting with pedestrians and vehicles along James Small Drive. The design changes are documented in Chapter 2, Design changes of the Amendment Report.

Following the exhibition of the EIS, the concept design for the Korora Hill interchange has also changed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. The design has been amended to simplify the interchange and improve wayfinding for motorists. The amended design provides more free flow movement between the existing highway into

Coffs Harbour and the bypass for traffic travelling to and from the north. It also provides greater separation between highway traffic (both the bypass and the existing highway) and local road movements on Bruxner Park Road, James Small Drive and the proposed service road.

As identified in Chapter 5, Project description of the EIS, interchanges are proposed at Englands Road, Coramba Road and Korora Hill. An interchange at Englands Road would provide better access to the existing road network and key destinations in the south of Coffs Harbour than an interchange at North Boambee Road. An interchange at Englands Road would provide better access between Coffs Harbour and the existing Pacific Highway south of Englands Road, the Isles Drive industrial area, the Coffs Harbour Health Campus, and Coffs Harbour airport (via Stadium Drive). An interchange at North Boambee Road would be too close to the proposed interchange at Englands Road and there would be potential flooding risks associated with entry and exit ramps from the bypass to North Boambee Road.

North Boambee Valley East and West URAs would continue to be accessed via North Boambee Road once the bypass is operational. As per current arrangements, access to North Boambee Road would be via the Pacific Highway at a signalised intersection.

Submission number(s)

159, 163, 168

Issue description

- Concerned about the increase of traffic at the Isles Drive/Pacific Highway intersection due to the lack of a connection between Isles Drive and Englands Road
- Concerned about traffic and movements at Isles Drive
- There is poor access to the Isles Drive Industrial Estate, particularly for B-doubles.

Response

Following the exhibition of the EIS, the concept design for the Englands Road interchange has been amended and the proposed design is documented in Chapter 2, Design changes of the Amendment Report.

The new design for the Englands Road interchange enables vehicles to turn right from Englands Road into Isles Drive and allows vehicles to turn right from Isles Drive into Englands Road. This design change maintains existing movements into and out of Isles Drive and avoids the need for vehicles to exit Isles Drive via the Isles Drive and Pacific Highway intersection.

Traffic volumes of vehicles using the existing Pacific Highway to access Isles Drive are expected to decrease once the bypass is open to traffic. It is predicted that some of the traffic which currently turns right from the existing Pacific Highway into Isles Drive would reroute to the bypass and access Isles Drive via the Englands Road interchange. This would result in improved traffic performance for the intersection and decreased queuing in the right-turn lane in question. The expected change in traffic volumes would also offer the opportunity to adjust signal timings to provide more time to critical movements if required. The amended design is predicted to improve the level of service of the Isles Drive and existing Pacific Highway intersection when compared with the EIS design, improving from a level of service D for the EIS design to a level of service C for the amended design (refer to Section 5.2, Traffic and transport of the Amendment Report).

As discussed above, the amended design for the Englands Road interchange enables vehicles to turn right from Englands Road into Isles Drive and allows vehicles to turn right from Isles Drive into Englands Road. This design change maintains existing B-double movements into and out of Isles Drive. TfNSW is not proposing to modify the approved B-double network at this location.

Submission number(s)

163

Issue description

- Suggests the removal of the service road from the project at Korora as it serves no properties.

Response

The service road would be provided to the east of the project, connecting Solitary Islands Way with the underpass to Seaview Close, Opal Boulevard, James Small Drive and the existing Pacific Highway near Bruxner Park Road. It is needed to provide a link for the local road network between Korora and Sapphire (including areas west of the project) to the existing Pacific Highway in the south, and to Solitary Islands Way in the north. The service road removes the need for James Small Drive, Korora School Road, Opal Boulevard and Seaview Close to directly connect with the 110km/h Pacific Highway at unsignalised intersections.

This arrangement and removal of at-grade priority (stop or give-way) controlled intersections along the high-speed Pacific Highway would improve safety by reducing the number of conflict points along the highway. The service road would provide a speed environment consistent with local residential areas, therefore minimising speed differentials, reducing long approach delays and improving efficiency at intersections with local roads.

Following the exhibition of the EIS, the concept design for the Kororo Public School bus interchange has been amended so that access to the school and bus interchange would be via the proposed service road instead of from James Small Drive. The service road would provide access to the Kororo Public School parking (including staff), kiss-and-drop zone, and the Kororo Public School bus interchange. Additionally, the service road would provide access to several townhouses which are currently accessed via Korora School Road. These amendments are further discussed in Section 5.2, Traffic and transport of the Amendment Report.

4.7.4 Coramba Road

Submissions number(s)

12, 60, 67, 71, 75, 84, 95, 96, 115, 125, 126, 151, 170, 180

Issue description

- Coramba Road and the Shephards Lane roundabout needs to be upgraded, particularly the section from Shephards Lane to Coramba Road interchange, to accommodate the additional traffic movements and avoid additional congestion
- Shephards Lane roundabout should be redesigned as it is confusing and difficult to navigate
- Concerned about traffic volume projections at Coramba Road and that it will increase safety risks by exacerbating existing speed issues
- Congestion issues at Coramba Road are already significant and establishing an interchange here will only exacerbate the issue
- Safety concerns for the road design at Coramba Road west of the Coramba Road interchange in an area which has already been marked for Federal Black Spot funding
- Concerned about traffic volume projections at West High Street, the condition of the existing Coramba Road and increase in heavy vehicles.

Response

Following the exhibition of the EIS, the design of the Englands Road interchange and the Korora Hill interchange has been amended to simplify the designs and improve wayfinding for motorists. The amended design would result in some changes to traffic patterns along the project, including some increases and decreases in traffic volumes along different sections of Coramba Road (refer to Section 5.2, Traffic and transport of the Amendment Report).

For example, the proposed design changes at the Korora Hill interchange will improve traffic flow and reduce delays for most movements, except for those motorists entering the project southbound from the Pacific Highway south of the interchange. As such the overall increase in traffic demands on the bypass is slightly lessened on the northern section with some motorists travelling to/from the catchment located near Bray Street are now predicted to find it more attractive to access the project through the Coramba Road interchange instead of the Korora Hill interchange, resulting in a predicted increase in traffic volumes on Coramba Road, between Shephards Lane and the project, of about 500 vpd. This results in total increase of 1100 vpd[1] when compared to the existing situation.

Further analysis of predicted traffic volumes and recent crash history along Coramba Road has been carried out in response to the issues raised. The analysis involved a review of historic crash data for the five-year period from 2014 to 2018, sourced from the Centre for Road Safety (NSW Government 2018), and a review of the predicted traffic volumes along Coramba Road for the amended design. Based on this analysis, there are three distinct sections of Coramba Road which are potentially affected by the project. These sections are shown in **Figure 4.7-1** and include the section west of the project, the section between the project and Shephards Lane, and the section east of Shephards Lane.

A summary of the review of traffic volumes and historic crash data for each section of Coramba Road is provided in **Table 4.7-2**.

Table 4.7-2 Coramba Road historic crash data and discussion

Road section	Traffic volumes and historic crash data and discussion
Coramba Road west of the project	• There has been a total of 16 crashes west of the project on Coramba Road for the five-year period from 2014 to 2018 • The existing crash rate for this section of Coramba Road is 40.4 crashes per 100 million vehicle kilometres travelled (mvkt) • The proposed design changes are anticipated to result in negligible difference in daily volumes along this portion of Coramba Road • TfNSW understands this section of Coramba Road has been identified for funding under the Black Spot Program provided by the Australian Government • The project would not contribute to existing safety issues at this location, because there would be little change in traffic volumes as a result of the project. Upgrading this section of Coramba Road to address existing safety issues is outside the scope of this project

[1] An increase of 600 vpd was reported in Table 14, Appendix F, Traffic and transport assessment of the EIS. A further 500 vpd for the amended design brings the total increase to 1100 vpd.

Road section	Traffic volumes and historic crash data and discussion
Between the project and Shephards Lane	• There has been a total of three crashes on this section of Coramba Road for the five-year period from 2014 to 2018. One of those crashes is within the construction footprint at the intersection of Bennetts Road and Coramba Road, which would be upgraded as part of the project • Given the low crash history, in this section of Coramba Road, the existing crash rate is 12.6 crashes per 100 mvkt • As per Section 5.2, Traffic and transport of the Amendment Report, traffic volumes along this section of Coramba Road are predicted to increase by up to 1100 vpd (compared to 'without the project') at 2024 compared with an increase of 600 vpd reported in the EIS • Based on the established crash rate, the predicted increase in demands would result in a less than 0.1 increase to the anticipated number of crashes on Coramba Road between Shephards Lane and the project • Although traffic volumes are predicted to increase, it is along the section of Coramba Road with the least number of crashes, and as a result, the increase in traffic volumes are not predicted to exacerbate existing safety issues (whether they be due to existing alignment, existing carriageway widths or existing speed limits) to the extent that an upgrade of Coramba Road is warranted by the project.
East of Shephards Lane	• There has been a total of 16 crashes on this section of Coramba Road for the five-year period from 2014 to 2018 • The existing crash rate for this section of Coramba Road is 45.1 crashes per 100 mvkt • Traffic volumes are predicted to decrease by about 1700 vpd (compared to 'without the project') at 2024, compared with a decrease of about 1800 vpd reported in the EIS (refer to Section 5.2, Traffic and transport of the Amendment Report). This negligible difference in predicted demands (between the EIS and amended design) equates to less than one per cent of daily traffic demands ('without the project' at 2024) on this section of Coramba Road • Given the existing crash rate on this section of Coramba road, even with the slight increase in demands (as compared to the EIS), the project will continue to result in a decrease of 0.5 to 0.6 crashes at 2024 and 2044 compared to 'without the project' at these assessed years • Traffic modelling predictions indicate the Coramba Road interchange would not be used as a major access to the CBD with less than 15 per cent of traffic using the interchange for access to/from the CBD, consistent with the predictions described in the EIS. The interchange would provide an access point for local traffic in western Coffs Harbour • In terms of congestion, the part of Coramba Road (West High Street) which currently experiences the highest delays is at the Robins Street roundabout. As detailed in in Section 5.2, Traffic and transport of the Amendment Report, at this section of Coramba Road, the project is predicted to reduce daily traffic volumes by up to 1700 vehicles as compared to 'without the project'

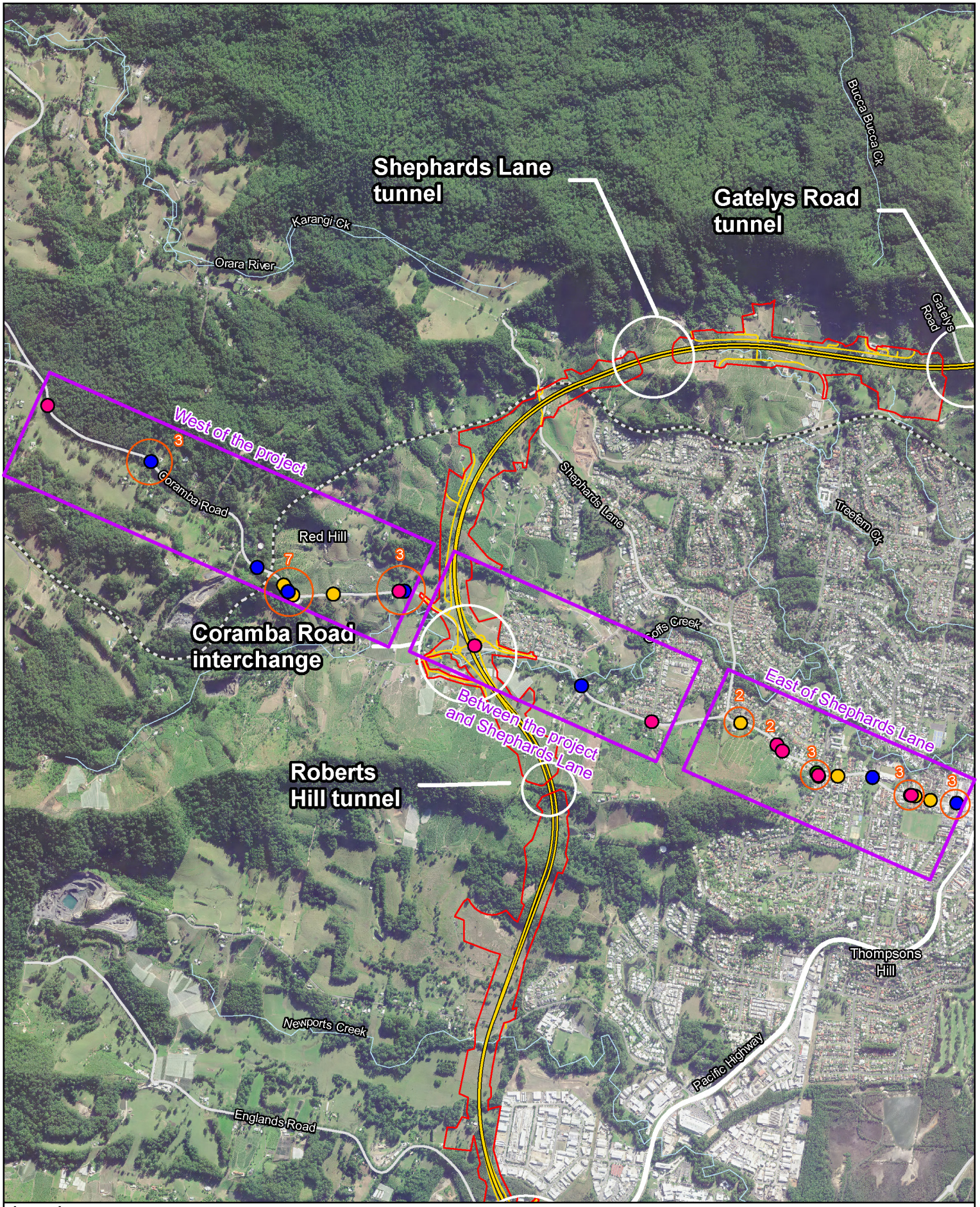
Road section	Traffic volumes and historic crash data and discussion
	• Traffic volumes on West High Street are predicted to decrease as a result of the project. The anticipated reduction in traffic volumes along West High Street along with other changes in travel patterns on the Coffs Harbour road network means there would likely be no negative impact to traffic conditions during peak periods as a result of the project • Potential for future crashes would be reduced because of decreased traffic volumes predicted along this section of Coramba Road, which would result in an overall improvement in road safety at this location.

Based on the existing crash rates on Coramba Road, the analysis demonstrates less than a 0.1 increase in the number of crashes on Coramba Road is anticipated as a result of the proposed design changes and the associated shifts in traffic demand. As shown, the predicted localised increase in traffic volumes on Coramba Road to the east of the project, does not result in a significant increase in the predicted number of crashes, given that the increased traffic volumes occur on the section of Coramba Road with a low crash history.

With regards to the Coramba Road and Shephards Lane roundabout, given the relatively minor changes in travel patterns and traffic volumes at this location, an upgrade of the roundabout is outside the scope of this project.

Notwithstanding the changes in traffic volumes, environmental management measure TT11 provides for a review of operational network performance to be undertaken within 12 months from the opening of the project to confirm the operational traffic and transport impacts of the project on the surrounding road network. This assessment will be carried out at particular interchange locations and on Isles Drive and Coramba Road. For more information, refer to **Chapter 6, Revised environmental management measures.**

As detailed in Section 6.7.4, Appendix F, Traffic and transport assessment of the EIS, Coramba Road is nominated as a construction access road. With appropriate mitigation measures, to be addressed in the TMP, construction traffic is not anticipated to trigger adverse traffic impacts. However, TT08 will address any damage resulting from construction (not normal wear and tear). Refer to **Chapter 6, Revised environmental management measures** for further detail.



Coffs Harbour Bypass
Crash locations – Coramba Road (2014-2018) Source: Centre for Road Safety, NSW Government
Figure 4.7-1

With the introduction of the project, the proportion of heavy vehicles on Coramba Road are not predicted to be significantly impacted. As per Table 6, Appendix F, Traffic and transport assessment of the EIS, the existing proportion of heavy vehicles on Coramba Road is between four and nine per cent, equating to around 400 to 480 heavy vehicles. As shown below in **Table 4.7-3**, the predicted number and proportion of heavy vehicles on Coramba Road is anticipated to, in most scenarios assessed, reduce when compared to 'without the project' in 2024 and 2044.

Table 4.7-3 Coramba Road heavy vehicle volumes

Coramba Road section	Scenario	2024 No. heavy vehicles (daily)	2024 % Heavy vehicles of daily total	2044 No. heavy vehicles (daily)	2044 % Heavy vehicles of daily total
West of the project	Without the project	399	6%	431	6%
West of the project	With project	395	6%	421	6%
Between the project and Shephards Lane	Without the project	437	5%	493	6%
Between the project and Shephards Lane	With project	395	4%	504	5%
East of Shephards Lane	Without the project	406	4%	502	4%
East of Shephards Lane	With project	257	3%	347	3%

4.7.5 Traffic lights

Submission number(s)

12

Issue description

- It should be a condition of approval that there are no traffic lights at any interchange.

Response

Traffic lights are a safe and effective means of managing high volumes of traffic through intersections, particularly where there are high conflicting demands of different turning movements and unbalanced flows, such as at the intersection of Englands Road and Stadium Drive. Additionally, traffic lights provide an opportunity for protected and prioritised crossing locations for vulnerable road users, including pedestrians and cyclists.

Roundabouts are an effective form of intersection control that can slow traffic and improve vehicle flow. When compared to signalised intersections, the number of conflict areas are reduced, and the incidence of head-on collisions is also reduced. However, once conflicting traffic demands at a roundabout become unbalanced or too high, delays and congestion at the intersection negatively impact on the safety and efficiency of its operation. As such, upgrading to traffic lights can then be warranted.

Following the exhibition of the EIS, the design of the Englands Road and Korora Hill interchanges were amended to reduce the number of traffic lights and address community concerns that the interchange designs were too complex and difficult to navigate. These changes include amending the type of intersection control from traffic lights to a roundabout at both the Englands Road and Korora Hill interchanges.

While the number of traffic lights at each interchange is reduced at each interchange, traffic lights are still needed at the Pacific Highway/Englands Road/Stadium Drive intersection and at the Pacific Highway/Charlesworth Bay Road intersection. The need for traffic lights at these two intersections are outlined below:

- **Pacific Highway/Englands Road/Stadium Drive intersection**: The existing roundabout intersection operates at a level of service D (2016) during the evening peak. This means the average delay per vehicle would be between 43 and 56 seconds, there would be limited stable flow and restrictions in movement for motorists. This performance would continue to deteriorate as traffic volumes increase over time. With the project in place, the upgraded intersection (with traffic lights), would operate at a level of service C 20 years after opening (2044). This means the average delay per vehicle would be between 29 and 42 seconds and there would be limited stable flow conditions through the intersection. This is a significant improvement when compared with the existing roundabout
- **Pacific Highway/Charlesworth Bay Road intersection**: Providing traffic lights at this intersection would improve operation of the intersection from a level of service F (ie traffic volumes exceed intersection capacity resulting in unstable flow, high delays and extensive queueing) to level of service A at 2044. Providing traffic lights means motorists entering or exiting Charlesworth Bay Road have dedicated phases and no longer need to wait for a gap in the Pacific Highway stream of traffic. This reduces delays significantly for these turning movements and improves road safety at this intersection. The traffic lights also provide protected and signalised crossing points for pedestrians and cyclists.

Providing traffic lights at these two intersections would provide sufficient capacity for the effective operation of each intersection, facilitate the safe and efficient distribution of traffic and provide protected signalised crossings for pedestrians and cyclists. This is required to meet the obligations set out in Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards and TfNSW supplementary documents.

4.7.6 Road safety

Submission number(s)

135

Issue description

- Concern for tight turning circles at interchanges and integration into the existing roads and bike routes.

Response

As identified in Chapter 5, Project description of the EIS, the project has been designed in general accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards, and TfNSW supplementary documents. This includes ensuring interchange intersections have been designed to allow for the turning manoeuvres of the design vehicles, continuity of existing cycle routes through interchanges and integration with the existing road network.

Following the exhibition of the EIS, the concept design for the Englands Road interchange and the Korora Hill interchange have been amended. The proposed design changes are anticipated to result in improvements to the local cycle network, including the provision of off-road shared pathways at the newly proposed Korora Hill interchange roundabout. Refuge areas would also be proposed on roundabout approaches, to ensure cyclists are only required to cross one to two lanes of traffic at a time. The location of the crossing points on approach to the intersections would ensure that vehicle speeds are minimised (as compared to the high speeds on the bypass) as motorists would either be turning into or out of the roundabout.

Submission number(s)

66, 92, 120

Issue description

- Concern about the lack of crash proof barrier between the access road and Coachmans Close, which would also prevent exposure to headlights and minimise noise
- Increased risks to safety as vehicles may use the underpass near Coachmans Close and veer off the access road into properties
- Safety concern for road users leaving the road at the underpass at Fernleigh Avenue
- Safety concern for underpass road alignment opposite property and request realignment of underpass to Fernleigh Avenue.

Response

The project has been designed in general accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards and TfNSW supplementary documents. In applying these guidelines, road, pedestrian and cyclist safety has been a key consideration in the overall design of the project.

The project does not have any hazardous elements within the clear zone of the service road near Coachmans Close which trigger the need for a traffic barrier to be installed. This will be reviewed during detailed design in conjunction with a headlight screening assessment for the opposing traffic between Coachmans Close and the service road.

In addition, the short length of road for the underpass near Fernleigh Avenue and the close proximity of the two intersections either end of the underpass results in a low speed environment and a very low probability of an errant vehicle travelling straight through towards Coachmans Close. There is no benefit or need to realign the underpass to match the alignment of Fernleigh Avenue.

The location of the underpass near Fernleigh Avenue is governed by the crossing of Pine Brush Creek and the tie-in to the existing dual carriageway highway at Sapphire. These two locations influence the vertical and horizontal alignment through this area, which limits the locations where there is enough space to provide the vertical clearance needed for an underpass, limiting opportunities to align the underpass with Fernleigh Avenue.

Submission number(s)

51

Issue description

- Concern that there will be 'headlight dazzle' for drivers on sections of the bypass which are curved.

Response

Headlight glare can result in road user annoyance and where it is excessive could contribute to a road safety issue. Headlight glare and its affect is an issue that is generally investigated during detailed design in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards and TfNSW supplementary documents. Where it is determined to be a potential issue, screening could be installed to minimise the risks to road users.

Submission number(s)

26

Issue description

- Access onto service road from residential driveway north of Kororo Public School would not be safe as drivers will be speeding.

Response

TfNSW has discussed access to the property north of Kororo Public School with affected residents following the exhibition of the EIS. TfNSW will incorporate a turning head as part of the detailed design to address concerns about reversing onto the service road. A sketch of the proposed turning head is provided in **Figure 4.7-2** and the design will be developed further during detailed design in consultation with affected residents. As identified in Chapter 5, Project description of the EIS, the service road will have a posted speed limit of 60km/h or less to allow safe entry and exit for residents.

Figure 4.7-2 Sketch of proposed turning head for residential property north of Kororo Public School

4.7.7 Englands Road interchange to southern tie-in

Submission number(s)

31, 97, 158

Issue description

- Concerns raised for the safety of motorists entering and exiting the Boambee Palms and Holiday Park, in particularly in the absence of a merge on-ramp
- Request for two-way service road at Lindsay Transport to Englands Road. Currently the entry and exit at Lindsay Transport is unsafe due to proximity to interchange.

Response

TfNSW acknowledges there are potential safety issues associated with existing property accesses on the section of the Pacific Highway between Englands Road and Sawtell Road, and that the project has the potential to exacerbate these potential safety issues. These property accesses are at the interface between the project and the Lyons Road to Englands Road section of the Pacific Highway upgrade which was completed in 2001. As part of the Lyons Road to Englands Road upgrade, property accesses were generally restricted to left-in/left-out movements.

There are several constraints which affect the design of property accesses along this section of the Pacific Highway, including access to Boambee Palms and Holiday Park, Lindsay Transport and other properties between Englands Road and Sawtell Road. Key constraints include:

- Any potential future upgrade of the Lyons Road to Englands Road section of the Pacific Highway may result in reconfiguration of existing property accesses and changes to interchange arrangements at Sawtell Road
- Proximity of the north facing ramps at the Sawtell Road interchange and the proposed northbound exit ramp and southbound entry ramp for the Englands Road interchange. Closely spaced entry and exits on motorways can create safety issues associated with vehicles accelerating to join the motorway close to where other vehicles are decelerating to leave the motorway
- Space available to provide alternative property access arrangements within the existing road corridor
- Potential impacts on biodiversity, including koala habitat on both side of the existing highway and known koala corridors.

During detailed design, TfNSW will investigate alternative access arrangements for Boambee Palms and Holiday Park, Lindsay Transport and other properties with access to the existing Pacific Highway between Englands Road and Sawtell Road. The investigation will be carried out in consultation with CHCC and affected property owners to determine reasonable and feasible design solutions that address the safety concerns identified above. Any decision to proceed with a design solution would be subject to funding availability and consideration of environmental constraints, project objectives and value for money (refer to environmental management measure TT13 in Chapter **6, Revised environmental management measures**).

4.7.8 Pedestrian safety

Submission number(s)

82, 93, 96, 161, 169

Issue description

- Concerned by falls from height for pedestrians in the vicinity of Coachmans Close and proposes a noise wall to manage the risk
- Concerned generally for pedestrian safety in Coffs Harbour during construction
- Concerned by traffic volumes and pedestrian/children's movement to and from schools
- Concerned for safety of students using buses at the intersection of Coramba Road and Spagnolos Road during construction and following completion of the project.

Response

In response to the issue relating to pedestrians falling from height in the vicinity of Coachmans Close, this is an issue that is generally investigated during detailed design in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards and TfNSW supplementary documents. Where it is determined to be a potential issue, fencing could be installed to minimise the risks to pedestrians.

As identified in environmental management measure TT06, a TMP will be prepared by the construction contractor(s) in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c) before the start of construction. The TMP will consider the management of construction traffic and mitigate any potential traffic impacts, including a pedestrian and cyclist management plan to ensure access is maintained where it is safe and feasible during construction. Refer to **Chapter 6, Revised environmental management measures** for further information.

Following the exhibition of the EIS, the concept designs for the Kororo Public School bus interchange, Luke Bowen footbridge and Coramba Road bus stop have been further developed. Design changes at these locations would improve safety for pedestrians and school children as they commute to and from Kororo Public School, Bishop Druitt College and other schools within the area.

Near Kororo Public School, pedestrian access to the car park on the western side of the project would be provided along the full length of the property access road to Old Coast Road, and between the car park and Luke Bowen footbridge. The path provides pedestrians a designated place in the road corridor, separated from vehicles. The predictability of pedestrian movements and separation from vehicles, minimises the risk of pedestrians being struck by vehicles. Additionally, the provision of a new formalised path should minimise the risk of incidents for pedestrians as they access the Kororo Public School and the Kororo Public School bus interchange.

The relocation of the Luke Bowen footbridge closer to the existing footbridge means that school children and pedestrians would have less distance to walk to reach the main entrance of the school compared to the EIS. This bridge would provide a pedestrian and cyclist connection between Old Coast Road and the proposed service road next to Kororo Public School.

In relation to the Coramba Road bus stop, the proposed design would provide a safe, accessible and formalised area for multiple buses to stop at once. The new school bus stop would be on the northern side of Coramba Road, about 50 metres east of Spagnolos Road. A shared user path would be provided to connect Spagnolos Road and the new bus stop. Having all buses pick up passengers on the northern side of Coramba Road, regardless of the direction the buses will travel, and the provision of a dedicated share user path, provides a bus stop consistent with the existing bus stop on Coramba Road. The amended design also reduces the need for school children and pedestrians to cross the road and in turn increases safety.

As identified in environmental management measure TT06, a TMP will be prepared in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c) before commencement of construction. The TMP will consider the management of construction traffic and mitigate any potential impacts for students accessing the school bus stop on Coramba Road during construction.

4.7.9 Pedestrian and cycle network

Submission number(s)

135

Issue description

- Mitigation measures are requested for public transport and cycle paths during construction.

Response

Environmental management measures were considered during preparation of the EIS. Those relating to public transport and cycle paths are:

- TT01: Consultation will be carried out with the public transport/school bus operators during detailed design to ensure changes to bus stops are communicated to bus users before construction starts and during construction of the project. Impacts will be mitigated through traffic control measures to be detailed in the construction TMP
- TT06: A TMP will be prepared by the construction contractor(s) in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c) before commencement of construction. The TMP will consider the management of construction traffic and mitigate any potential traffic impacts, including a pedestrian and cyclist management plan to ensure access is maintained where it is safe and feasible during construction
- TT10: As discussed in **Section 3.1, Coffs Harbour City Council**, TfNSW will continue to consult with CHCC on a strategy for pedestrians and cyclists during the development of the detailed design.

Further detail is provided in **Chapter 6, Revised environmental management measures**.

Submission number(s)

12, 29, 35, 51, 52, 53, 66, 103, 113, 155, 161, 167, 169

Issue description

- Requests for pedestrian and cycle paths to be provided which link to numerous points of interest within Coffs Harbour, eg Sapphire Beach, Sealy Lookout, Macauleys Headland and Big Banana, link to the CBD, or are provided along the project length
- Requests cycle path as part of the project with a link between Gatelys Road and Coramba Road
- Requests segregated and simple cycle path at Korora Hill interchange to enable cyclists to safely access and transit the interchange, and to provide recreational access to Bruxner Park Road
- Concerned there is not appropriate infrastructure to improve safety for pedestrians and cyclists
- Requests pedestrian and cycle path in west Coffs Harbour
- Requests pedestrian underpass at Fernleigh Avenue to allow pedestrians to safely cross under the highway

- Anticipating bus travel arrangements to and from Coffs Harbour requires access from both sides of the highway, will there be safe pedestrian access provided near Coachmans Close?
- Requests pedestrian path at Russ Hammond Close for quick access to James Small Drive
- Requests a wider shoulder for bicycle lanes along Englands Road interchange to Lyons Road.

Response

As identified in Chapter 5, Project description of the EIS, provision has been made for pedestrians and cyclists where the project directly intersects with the existing road and pedestrian and cycle network. Provision of pedestrian and cycle paths outside the extents of the project and/or on adjacent private property is outside the scope of the project.

The proposed design for the Englands Road interchange and the Korora Hill interchange has been amended and would result in improvements to the local cycle network. Off-road shared pathways are to be provided for people who cycle at the newly proposed Englands Road and Korora Hill interchange roundabouts. Refuge areas would also be proposed on roundabout approaches to ensure cyclists (and pedestrians) are only required to cross one to two lanes of traffic at a time. The location of the crossing points on approach to the intersections would ensure that vehicle speeds are minimised (as compared to the higher speed on the bypass) as drivers would either be turning into or out of the roundabout.

The proposed design change at the Korora Hill interchange also includes the provision of traffic lights at the intersection of the existing Pacific Highway and Charlesworth Bay Road. Signalised pedestrian crossings would be provided at the proposed traffic lights, enabling pedestrians (and cyclists) to safely traverse the intersection.

As identified in Section 5.3.10 of the EIS, the existing shared user path located east of the existing Pacific Highway between north of Stadium Drive and the southern extent of the project would be reinstated on the eastern side of the project. Signalised pedestrian crossings would be provided at the proposed traffic lights at the intersection of Stadium Drive, Englands Road and the existing Pacific Highway. These crossings would enable pedestrians (and cyclists) to safely traverse the intersection.

A 2.5-metre-wide shared user path would be provided on the eastern side of the service road for cyclists and pedestrians. The shared user path would be provided between Solitary Islands Way at Sapphire (near Coachmans Close) to the existing Pacific Highway near the Korora Hill interchange.

A pedestrian path would be provided through the underpass near Fernleigh Avenue to provide access between the service road and the new local access road on the western side of the project near Seaview Close.

The concept design for the Coramba Road bus stop has been developed since the exhibition of the EIS and includes a pedestrian path linking the bus stop (on Coramba Road) with Spagnolos Road. This pedestrian path would enable pedestrians to access the bus stop via the existing laneway off Tiffany Close.

The proposed design for the Kororo Public School bus interchange and the Luke Bowen footbridge has been amended since the exhibition of the EIS and includes a new car park on the western side of the project near the Luke Bowen footbridge. Pedestrian access to the car park would be provided along the full length of the property access road to Old Coast Road, and between the car park and Luke Bowen footbridge. The path provides pedestrians a designated place in the road corridor, separated from vehicles. The predictability of pedestrian movements and separation from vehicles, minimises the risk of pedestrians being struck by vehicles. Additionally, the provision of a new formalised path should minimise the safety risks for pedestrians as they access the Kororo Public School and the bus interchange.

TfNSW will continue to consult with CHCC on a strategy for pedestrians and cyclists during the development of the detailed design, including opportunities to provide a pedestrian connection between the service road and James Small Drive via Russ Hammond Close. This commitment to consult with CHCC has been reflected in an additional environmental management measure TT10 in **Chapter 6, Revised environmental management measures**.

4.7.10 Parking

Submission number(s)

171

Issue description

- Opposes additional car parking area near Kororo Public School and adjoining properties on Fern Tree Place as it is not expected to be used.

Response

The parking proposed as part of the project near the Kororo Public School has been designed based on the results of a parking survey, carried out between Wednesday 30 November to Friday 2 December 2016, and in consultation with the school. The survey demonstrated an existing demand for about 100 parking spaces during the peak period on Korora School Road, Old Coast Road and the property access road near Kororo Nature Reserve. Parking provided for the school as described within Chapter 8, Traffic and Transport of the EIS aimed to maintain parking for the existing demand. The car parking area identified in the EIS south of the school and adjoining Fern Tree Place forms part of the relocated bus interchange. Because of the space needed for buses to manoeuvre within the bus interchange, removal of the car parking spaces would have little effect on the size of the bus interchange.

Following the exhibition of the EIS, the concept design for the Kororo Public School bus interchange has been amended so that access would be via the proposed service road instead of from James Small Drive. This design change would avoid the need for buses to travel along James Small Drive, removing risks associated with buses interacting with pedestrians and vehicles along James Small Drive. However, the proposed amendments to the Kororo Public School bus interchange would also result in further encroachment towards the existing properties on Fern Tree Place.

The amended design incorporates a mix of off-street and on-street parking bays, and a high turnover kiss-and-drop zone to supply the anticipated parking demands of the Kororo Public School. As design progresses, further liaison with SI NSW and Kororo Public School would be carried out by TfNSW to confirm parking arrangements and requirements.

4.7.11 Public transport services

Submission number(s)

11, 153

Issue description

- Concerned about the Kororo Public School bus interchange connection to James Small Drive and believes it should connect to the service road
- Supportive of the design changes and bridge and bus bay at Kororo Public School bus interchange. Requests specific detailed design elements for school delivery car park, pedestrian pathways, signage, lighting, barriers and shelter.

Response

Following the exhibition of the EIS, the concept design for the Kororo Public School bus interchange has been amended and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. The design of the bus interchange has been amended so that access would be via the proposed service road instead of from James Small Drive. This design change would avoid the need for buses to travel along James Small Drive, removing risks associated with buses interacting with pedestrians and vehicles along James Small Drive.

- The design change to the Kororo Public School bus interchange includes:
- The existing bus interchange located near Kororo Nature Reserve would be relocated to just south of Kororo Public School with access provided via the service road
- The bus interchange would have capacity for eight 12.5 metre long buses (parked nose to tail) with bus shelters provided adjacent to the bus bays
- The bus interchange would include capacity for 30 staff car park spaces
- Pick up/drop off bays would be provided within the bus interchange, accessed via the service road. The 'kiss-and-drop zone' would be separated from the bus bays via a barrier.

The design of the bus interchange will be developed further during detailed design. This will include confirmation of signage and lighting requirements, extents of barriers and fencing, location and extent of bus shelters and access paths to the school. TfNSW will continue to engage in consultation with the Kororo Public School and SI NSW during development of the detailed design and into construction.

In addition, as identified in environmental management measure TT02, confirmation of final parking arrangements near Kororo Public School will be investigated during detailed design in consultation with Kororo Public School and SI NSW (refer to **Chapter 6, Revised environmental management measures**).

Submission number(s)

173

Issue description

- How is the Coramba Road bus stop and adjacent noise barriers going to work if the bus shelter stays in the same location and the bus stop is 12 metres higher?

Response

As identified in Chapter 5, Project description of the EIS, the design of the Coramba Road interchange required the removal of the existing informal school bus stop at the intersection of Coramba Road and Spagnolos Road, and that the bus stop would likely be reinstated further east along Coramba Road.

The concept design for the Coramba Road bus stop has been developed since the exhibition of the EIS (refer to Chapter 2, Design changes of the Amendment Report). The design includes a pedestrian path to link the bus stop (on Coramba Road) with Spagnolos Road. This pedestrian path would enable pedestrians to access the bus stop via the existing laneway off Tiffany Close.

There would be a gap in the proposed noise barrier on the north side of Coramba Road to provide the pedestrian link between the bus stop and Spagnolos Road. The gap would consist of two overlapped noise walls to provide a continuous barrier for noise mitigation. The bus stop would also include a new bus shelter.

A preliminary crime prevention through environmental design (CPTED) assessment was prepared for the bus stop and is documented in Appendix A of Appendix E, Supplementary urban design,

landscape character, visual impact assessment of the Amendment Report. The assessment identified that while access points and sight-lines provide clear access and visibility of users from Coramba Road, there should still be some consideration given to the access towards Spagnolos Road. The assessment also noted there are some potential surveillance concerns with any space between the bus stop, noise wall and rear boundary which is shared with adjacent private properties. Several design considerations have been suggested for consideration during detailed design, such as incorporation of adequate lighting and electronic security, restriction of access to any spaces surrounding the bus stop, and easily maintained materials to reduce anti-social behaviour and ensure community pride in the space.

4.7.12 Speed limits

Submission number(s)

91, 99, 153, 160

Issue description

- Information presented in the EIS is unclear regarding traffic speeds, pavement types and traffic numbers
- Requests that the speed limit for the proposed service road at Korora be a minimum of 80km/h to minimise impact of the loss of the northern connection to the Pacific Highway
- Request for information on the speed limit that will be adopted for the service road near Coachmans Close
- Requests 60km/h speed limit along the service road adjacent to Coachmans Close at Korora
- The speed limit along Seaview Close should be limited to 60km/h.

Response

Information on speed limits can be found in Section 5.2 of Chapter 5, Project description of the EIS. The posted speed limit on the bypass would be 110 km/h and the posted speed limit on the service road at Korora (including near Coachmans Close) would be 60 km/h or less. The posted speed limit for other local access roads (including near Seaview Close) would be 60km/h or less. During detailed design, TfNSW will consult with CHCC about the posted speed limit to be adopted for other local access roads to be constructed as part of the project.

Information on the type of pavement proposed to be used can be found in Section 5.3 of Chapter 5, Project description of the EIS. Low noise pavement, consisting of open graded asphalt, would be provided from the southern tie-in to the northern extent of the project, excluding the extent of the tunnels.

Predicted traffic volumes for the project, the existing Pacific Highway and some key local roads are provided in Chapter 8, Traffic and transport of the EIS. Updated traffic volumes can be found in Section 5.2, Traffic and transport of the Amendment Report.

4.7.13 Street name changes

Submission number(s)

65, 73, 99

Issue description

- Request the local road on the western side of the highway at Korora is named 'Seaview Way'.

Response

Naming of streets and specifically adopting ‘Seaview Way’ as the name of the local access road on the western side of Korora have yet to be determined. The naming and renaming of roads is a process that typically involves consultation with the community. TfNSW will consult with CHCC regarding responsibility for street names of any new roads or repurposed roads as part of the project handover. The selection of names must comply with the policies and guidelines of the Geographical Names Board of NSW in accordance with Section 162 of the *Roads Act 1993*.

4.8 Noise and vibration

4.8.1 Community interaction

Submission number(s)

110, 115, 135

Issue description

- Concerned the noise modelling is generic and not representative of typical noise levels. The headphone simulation at the pop-up information stalls did not accurately represent the noise impacts.

Response

The headphone simulation is an estimated reproduction of the operational noise impacts of the project. It is a computer-based simulation which imitates the likely operational noise impacts when compared with the existing environment, where possible. This was provided for the community as a guide only, so they could gain an understanding of the comparative noise impacts. It was not intended to replace the assessment and presentation of potential operational noise impacts presented in Chapter 9, Noise and vibration and Appendix G, Noise and vibration assessment of the EIS.

The noise modelling undertaken as part of the EIS and updated as part of Amendment Report due to the proposed design changes and submissions following exhibition of the EIS, has been prepared in accordance with the SEARs and in accordance with TfNSW's Procedure for Preparing an Operational Traffic and Construction Noise and Vibration Assessment Report (Roads and Maritime Services 2014c). The predicted operational noise levels of the project are presented in Appendix B, Updated noise and vibration assessment of the Amendment Report and are summarised and discussed in Section 5.3, Noise and vibration of the Amendment Report.

4.8.2 Independent audit

Submission number(s)

12, 25, 62, 63, 72, 74, 78, 80, 81, 82, 83, 84, 100, 103, 106, 115, 117, 119, 121, 123, 124, 127, 133, 139, 140, 141, 144, 146, 162, 164, 170, 182

Issue description

- Information about noise levels in the EIS are impossible to decipher and the threshold noise levels and their application is challengeable. There is a need to see independent and simpler information on current noise levels, so the right noise mitigation is implemented
- An independent noise audit should be undertaken before, during and after construction to assess the original noise measurements and modelling, and the impact of increased traffic noise impacts during construction. TfNSW should carry out additional noise measurements and introduce the findings as a condition of approval.

Response

The noise and vibration assessment carried out to support the EIS has been updated and documented within Appendix B, Updated noise and vibration assessment report of the Amendment Report. This updated assessment incorporates and responds to proposed design changes, submissions from agency and community and ongoing consultation.

Both assessments have been carried out in accordance with the requirements of the SEARs for the project. These requirements also refer to the relevant noise and vibration guidelines to be followed, including for noise monitoring and modelling. Sections 3.1 and 4.5 of Appendix B, Updated noise and vibration assessment of the Amendment Report outline the criteria and methodology used to prepare and inform the noise and vibration assessments.

The predicted noise and vibration levels of the project during construction and operation are presented in Appendix J and Appendix G of both Appendix G, Noise and vibration assessment of the EIS and Appendix B, Updated noise and vibration assessment report of the Amendment Report. The noise impacts are discussed in Section 9.4 of Chapter 9, Noise and vibration of the EIS and Section 5.3.4 of Section 5.3, Noise and vibration of the Amendment Report.

The level of detail and complexity of the assessment is needed for both criteria derivation and prediction of noise levels to adequately respond to the requirements of the guidelines prescribed by the SEARs. Substantial review of reporting and communication has been carried out to distil key messages while adequately demonstrating compliance with assessment parameters.

Both the EIS and Amendment Report have undergone substantial review and evaluation from both external and TfNSW noise specialists. Further assessment reports detailed below for the project will also undergo a high level of scrutiny as the project progresses into delivery and operation as follows:

- During detailed design, the operational noise mitigation measures, including noise barriers and at-property treatments, would be confirmed. This would be undertaken through updated noise modelling for the detailed design (refer to environmental management measure NV11)
- At-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts (refer to environmental management measure NV07)
- During the initial 12 months of operation of the project, an operational noise review will be carried out to confirm the operational noise impacts identified during the EIS development and detailed design. This will be based on an updated traffic survey and carried out in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and Practice Note viii of the Environmental Noise Management Manual (RTA 2001b). The review will assess the actual noise performance compared to the predicted noise performance. The performance and effectiveness of noise and vibration mitigation measures would also be assessed and where deficiencies are identified, recommendations for additional feasible and reasonable measures would be provided (refer to environmental management measure NV12).

The above environmental management measures and processes are consistent with the likely approval conditions for the project and reflect requirements for other similar State significant infrastructure projects. It is likely the project would be required to submit regular construction compliance reports which among other matters detail any non-compliance with conditions of approval including relating to noise and vibration management. These reports will be made publicly accessible via the project website. An auditing program of the project as a whole would also be required and would be subject to DPIE's review and approval before implementation.

For more information on environmental management measures, refer to **Chapter 6, Revised environmental management measures**.

4.8.3 Noise guidelines

Submission number(s)

12, 100, 103, 115, 130

Issue description

- The NSW Road Noise Policy (2011) should be upgraded to reflect the Roads and Maritime Services Noise Mitigation Guideline 2015 Section 3 – Policy principles 5, ie incidental benefits from the noise mitigation designed for qualifying receivers should be recognised at all receivers within a community where noise levels exceed World Health Organisation (WHO) guidelines
- Concerned that the noise targets used in this EIS is not a reflection of international best practice for the prevention of disease arising from noise pollution. Specifically, attention should be given to:
    - WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise
    - Quality of Life, Wellbeing and Mental Health and the 2018 Environmental Noise Guidelines for the European Region.
- It is recommended that prior to approval a quantitative assessment of sleep disturbance be conducted with respect to appropriate criteria in the reference to best practice including enHealth 2018 and WHO 2009, 2011, 2018
- From a longer-term perspective it is clear that the referenced TfNSW traffic noise policies need to be revisited to address the intent of the SEARs as the current TfNSW policies and procedures with respect to traffic noise are not adequately contemporary. It is clear that the noise criteria adopted needs to be adjusted to accommodate for areas with high truck volumes and low background noise levels
- Questions whether enough research been done on the impacts to sleep disturbance from overnight noise.

Response

The operational noise assessment has been carried out in accordance with the SEARs and all relevant guidelines listed under Section 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report.

The NSW Road Noise Policy (DECCW 2011) is a NSW Environmental Protection Authority (EPA) managed policy developed in 2011 that defines the noise criteria to be used in assessing the impact of road traffic noise from existing roads, new road projects, road redevelopment projects and new traffic-generating developments. Section 5.4 of the Road Noise Policy also provides a summary of research into sleep disturbance from maximum noise events. It is also acknowledged that enHealth and WHO documents include additional studies of the impacts of noise on sleep disturbance, however neither document provides definitive assessment criteria for sleep disturbance impacts from road traffic noise.

The Noise Mitigation Guideline (Roads and Maritime Services 2015a) was developed in 2015 and is TfNSW's application of the NSW Road Noise Policy. The Noise Mitigation Guideline was prepared in consultation with the EPA. Any requests to review the NSW Road Noise Policy should be directed to EPA.

The Noise Mitigation Guideline specifically considers the recommendations of the WHO guidelines[1] to determine feasible and reasonable assessment of noise mitigation measures and target reasonable and equitable outcomes for the community. The façade noise level of 45 dB(A) is considered representative of the WHO Night Noise Guidelines for Europe (WHO 2009). This is specifically used in the noise barrier assessment methodology to determine a feasible and reasonable barrier design height as indicated in Appendix H of Appendix B, Updated noise and vibration assessment of the Amendment Report.

As noted in the Noise Mitigation Guideline, this does not equate to all noise sensitive receivers having a target of 45/50 dB(A). Rather, incidental benefits from the noise mitigation designed for qualifying receivers should be recognised at all receivers within a community where noise levels exceed WHO guidelines.

Through the design process and by incorporating tunnels into the project with lower and flatter grades, eliminating tighter curves and integrating the project with the natural terrain, the project has already implemented design measures to help reduce peak noise events/engine brake noise.

4.8.4 Development applications

Submission number(s)

12, 17, 27, 74, 88, 119, 122, 124, 127, 128, 135, 139, 140, 141, 151, 164, 181

Issue description

- Some housing estates are treated differently from other housing estates due to TfNSW relying on the fact that development application conditions for residential subdivisions should have considered in-built noise mitigation for future properties. However, at the time of application, applicants could not have been aware of the noise impacts of the project
- Excluding houses for treatment on the basis that development application conditions should provide for in-built noise mitigation is unfair. These houses should be assessed to determine if at-property treatments are needed to mitigate noise impacts. If found to require treatment, mitigation should be installed before construction starts
- TfNSW has indicated CHCC should not have approved the western developments. It is unclear whether properties built after 2004 are considered for noise mitigation
- The development application process meant that properties within 400 metres of the bypass needed to be referred to the TfNSW for comment and concurrence, and properties advised to consider noise mitigation for the project. Awareness of the likelihood of increased noise levels after the highway is completed, as stated in development plans, does not quantify how much these levels are likely to increase nor any redress against the impact these levels may have
- Noise mitigation measures should be the responsibility of TfNSW rather than CHCC.

Response

As identified in Chapter 4, Project development and alternatives of the EIS, planning for the project began in 2001 as part of the Coffs Harbour Highway Planning Strategy (CHHPS). The CHHPS was developed by TfNSW in association with the DPIE and CHCC. It involved extensive consultation with a wide range of community groups and individuals.

[1] Facade noise levels of 50 dBA day and 45 dBA night are considered representative of the WHO Guidelines for Community Noise (1999) for outdoor areas and the WHO Night Noise Guidelines for Europe (2009) threshold levels.

The purpose of the CHHPS was to:

- Address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga
- Plan for future traffic needs within the Coffs Harbour urban area
- Provide planning certainty for CHCC and the community.

In September 2008, the preliminary concept design for the project was announced and displayed for community comment. In response to community submissions received during the display, the concept design was further refined. This allowed CHCC to reserve the route in the Coffs Harbour local environmental plan (LEP) to provide planning certainty for CHCC and the local community. The road corridor based on this design was incorporated into the Coffs Harbour LEP with a SP2 zoning for infrastructure.

One of the objectives of the CHHPS was to provide planning certainty for CHCC and the community. As such, the identification of the preferred route has allowed for planning certainty for the urban release areas within Coffs Harbour and has allowed consent authorities to include consideration of the project within development application consent conditions.

During the development of the EIS and accompanying noise assessment, TfNSW identified the approved residential subdivisions in various stages of development along the project alignment. These included:

- Elements Estate, near the Englands Road interchange
- Highlands Estate, near North Boambee Road
- The Lakes Estate, near North Boambee Road
- Sunset Ridge Estate, near Shephards Lane
- Pacific Bay Eastern Lands, near James Small Drive
- Korora Residential Subdivision, near Opal Boulevard.

The development application consent conditions were reviewed to determine whether the proponent of the development and/or residents were required to ensure an adequate level of noise protection. Depending on the wording of the development application consent conditions, a risk-based approach was applied. Further detail can be found in the updated noise and vibration assessment prepared as part of the Amendment Report (see Appendix B, Updated noise and vibration assessment of the Amendment Report) including wording of the development application consent conditions.

Where the wording of the development application consent conditions for an approved residential subdivision clearly identified the need for at-property treatment to mitigate future noise impacts from the project and how mitigation should be applied, TfNSW considered these receivers to already have adequate at-property noise mitigation. Where the development application consent conditions for an approved residential subdivision did not include a requirement for at-property treatments or the wording was unclear, receivers predicted to exceed the noise criteria were considered for at-property treatments.

Noise attenuation for any future subdivisions within existing urban release areas identified in Coffs Harbour Development Control Plan 2015 would be the responsibility of the developer. Therefore, these were not considered as part of the assessment.

Notwithstanding, TfNSW considered all approved residential subdivisions when identifying the need for at source noise mitigation options. As such, a low noise pavement has been included from the southern to the northern extent of the project, excluding the extent of the tunnels. There are eight reasonable and feasible noise barriers identified along the extent of the project ranging in height from

4.5 metres to five metres. As such, the predicted noise impacts at the approved residential subdivisions have been reduced by including low noise pavement and noise barriers.

4.8.5 Roselands Estate

Submission number(s)

12, 27, 75, 82, 83, 84, 106, 115, 117, 121, 122, 123, 133, 135, 140, 146, 162, 170, 182

Issue description

- Roselands Estate is not mentioned in the EIS. Noise assessment needs to consider construction and operation noise impacts on Roselands Estate and provide guidance with regards to appropriate noise mitigation measures during and post construction
- Why is Roselands Estate different to other subdivisions?

Response

The following points discuss where Roselands Estate was considered as part of the EIS noise and vibration assessment and continues to be considered in Appendix B, Updated noise and vibration assessment report of the Amendment Report:

- Roselands Estate is included in NCA13 as part of the identification of all sensitive receivers within the extents of the study area of the project shown in Appendix B of Appendix B, Updated noise and vibration assessment report of the Amendment Report
- The noise survey carried out to determine existing road traffic noise levels for validation of the EIS operational noise model, described in Section 2.1 of the Appendix B, Updated noise and vibration assessment report of the Amendment Report, included a location within Roselands Estate (Location 4)
- Predicted noise levels for each receiver in Roselands Estate are provided in Appendix G of the Updated noise and vibration assessment report under the assessment of properties of NCA13
- Roselands Estate is considered for the following noise mitigations measures:
    - Implementation of low noise pavement as summarised in Section 4.8.1 of the Updated noise and vibration assessment report of the Amendment Report
    - Noise barrier assessment carried out for noise wall NW_NCA13_SB_01 summarised in Section 4.8.2 of the Updated noise and vibration assessment report of the Amendment Report. A 4.5 metre noise wall is recommended as part of the outcome of the noise barrier assessment to mitigate noise impacts on Roselands Estate
    - At-property treatments are considered for seven residential receivers and one child care facility in NCA13 where the predicted noise levels exceed the criteria for the sensitive receiver after implementing low noise pavement and the recommended noise wall as summarised in Section 4.8.3 of Appendix B, Updated noise and vibration assessment report of the Amendment Report.

It is noted that Roselands Estate was not considered as part of the development application discussion in Section 4.3.1 of Appendix B, Updated noise and vibration assessment report of the Amendment Report as the location is not subject to staged construction. As such, Roselands Estate was considered as per other established areas of the project and eligible for at-property treatment if so determined during the noise assessment.

4.8.6 Baseline monitoring

Submission number(s)

12, 25, 26, 27, 88, 90, 91, 103, 110, 119, 122, 124, 127, 139, 144, 146, 151, 156, 159, 164, 181, 182

Issue description

- Concerns that baseline noise monitoring has not been processed sufficiently to exclude non-traffic noise data, particularly during the 5am to 7am period, and the consequences this would have for the operational noise assessment and outcomes
- The noise monitoring location for the Lakes Estate (NCA06) does not provide representative noise levels and current measurements exceed acceptable noise levels. Future noise assessments/measurements should be located at the centre of the Lakes Estate to provide a representative measure
- Request for an acoustic study to determine background traffic noise at residence on Shephards Lane, as the background traffic noise is expected to be much lower than 30 dB
- Noise monitoring validation 10 at Coachmans Close does not indicate the noise levels affecting the majority of Coachmans Close as it is close the existing highway. As such, there is a misrepresentation of noise impacts
- TfNSW claimed undertaking baseline noise measurements at a property within NCA15. However, no notification of the monitoring or request to enter the property was received. It is requested that the baseline noise measurements be undertaken again in the presence of the property owner
- Due to the number of affected residents, concerned that there are not enough validation points to provide accurate predictions of noise impacts.

Response

The noise and vibration assessment carried out to support the EIS (Appendix G, Noise and vibration assessment of the EIS) has been updated and documented within Appendix B, Updated noise and vibration assessment report of the Amendment Report. Both assessments were carried out in accordance with the requirements of the SEARs for the project. These requirements refer to the relevant noise and vibration guidelines to be followed, including for noise monitoring and modelling. Sections 4.5 and 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report outline the methodology and criteria used to prepare and inform the noise and vibration assessments.

Both the EIS and Amendment Report have undergone substantial review and evaluation from both external and TfNSW noise specialists.

Noise monitoring for the project was carried out in accordance with the requirements of the SEARs and Australian Standards (AS 2702 Acoustic Methods of Measurement of Road Traffic Noise). It is important to note that the long-term noise monitoring data collected for the project was used for two purposes, as follows:

- Baseline noise monitoring locations were used to identify existing background noise levels, including non-traffic noise sources, which are used to derive assessment criteria for the construction noise assessment and the industrial noise assessment
- Validation noise monitoring locations were used to validate the baseline noise model for the operational noise assessment. Validation noise monitoring locations were all located near existing main roads such as, the existing Pacific Highway, North Boambee Road and Coramba Road as locations where road traffic noise is the dominant noise source. The validated baseline noise model was then used to extrapolate existing road traffic noise contribution to the existing noise environment at locations remote from these noise monitoring locations.

In addition to long-term unattended noise monitoring, short-term attended noise monitoring was carried out at all long-term monitoring locations to confirm and further analyse long-term measurement data. Site notes and observations, including road traffic noise contribution, were recorded during attended noise surveys and are summarised in Appendix C of Appendix G, Noise and vibration assessment of the EIS and Appendix B, Updated noise and vibration assessment report of the Amendment Report.

The noise monitoring survey was conducted at 21 locations across Coffs Harbour and is considered representative of the noise environment throughout the project. Locations were chosen taking into account representative areas of potential construction and operational noise impact as well as specific areas of the project raised by the community as particularly sensitive to noise. Additional monitoring is not considered to be required.

For each of the noise monitoring locations, in addition to adverse weather conditions, extraneous noise data has been excluded by identifying noise periods that show a significant variation from the monitoring trend at each location. This process also includes analysis of the 5am to 7am periods. This has been identified in the noise monitoring graphs in Appendix D of Appendix B, Updated noise and vibration assessment report of the Amendment Report as greyed out periods of time. It is noted that such trends are subject to a higher variance at rural locations (eg remote from day noise sources such as road traffic). In cases where there was not a clear emerging pattern that indicated an extraneous event affecting the noise monitoring, data was considered characteristic of the noise environment and representative of long-term background noise levels that may typically occur in rural areas.

A noise monitor is only capable of measuring the total noise levels from the logging location where it is installed, which will include contribution from all noise sources in the surrounding acoustic environment both from traffic noise and non-traffic noise. In the absence of sound recordings, it is not possible to definitively confirm noise contribution beyond attempting to discern patterns in the recorded data. Sound recordings are not typically used unattended noise monitoring.

Validation noise monitoring locations were used to confirm that operational noise modelling predictions were within acceptable tolerance as per the requirements of the Noise Model Validation Guideline (Roads and Maritime Services 2018b). The full noise model validation process is summarised in Section 4.6 of Appendix B, Updated noise and vibration assessment report of the Amendment Report.

The validated baseline noise model was used to determine the predicted contribution of road traffic noise from existing roads, which are then used to determine the assessment criteria in accordance with the Noise Criteria Guideline (Roads and Maritime Services 2015d) and the NSW Road Noise Policy (DECCW 2011). A minimum of 30 dB(A) baseline noise level contribution from road traffic noise is adopted for sensitive receivers removed from existing main roads in accordance with the Noise Criteria Guideline (Roads and Maritime Services 2015d). It is important to note that the baseline noise monitoring results do not influence the assessment criteria for the operational noise assessment.

In response to specific locations raised in the Submission ID 159 for the Lakes Estate area, there are two monitoring locations near NCA06: Validation Location 2, used to characterise receivers near existing sources of traffic noise (eg North Boambee Road); and Baseline Location 3, used to characterise receivers away from traffic noise sources. These noise monitoring locations are considered to be representative of NCA06. Additional monitoring is not considered to be required.

Baseline noise monitoring Location 6 is also considered in the assessment near residences along Shephards Lane. The measured rating background level at this location is in fact lower than 30 dB(A) as shown in Table 3 of Appendix B, Updated noise and vibration assessment report of the

Amendment Report. In accordance with provisions of the guidelines, a minimum background noise level of 30 dB(A) is to be adopted in the event that lower noise levels are measured.

Validation noise monitoring locations, such as Location 10 near Coachmans Close, were used to confirm operational noise modelling predictions were within acceptable tolerance as per the requirements of the Noise Model Validation Guideline (Roads and Maritime Services 2018b). The full noise model validation process is summarised in Section 4.6 of Appendix B, Updated noise and vibration assessment report of the Amendment Report. The validated baseline noise model was used to determine the predicted contribution of road traffic noise from existing roads at each location for the existing and future opening and design year scenarios.

Property access agreements were sought prior to the noise monitoring surveys and signed agreements were received from residents at all privately-owned noise monitoring locations (including baseline noise monitoring location 6 (on NCA15) which was signed on 14 June 2016).

Submission number(s)

12

Issue description

- What is the process for identifying the houses to receive at-property treatment? Many of the noise measurements seem very different to what are experienced.

Response

Assessment has been carried out in accordance with all relevant guidelines (listed in Section 3.1 of Appendix B, Updated noise and vibration assessment report of the Amendment Report). A consistent approach to assessing whether a receiver should be considered for additional mitigation measures as a result of the traffic noise impacts from a road development is provided by TfNSW in the Noise Mitigation Guideline (Roads and Maritime Services 2015a). Appendix G1 of the updated noise and vibration assessment report provides details of the predicted noise levels and assessment for each noise sensitive receiver. It also provides aerial maps with noise contours (Appendix G2.4) indicating receivers which qualify for consideration for at-property treatment.

As identified in Chapter 9, Noise and vibration of the EIS, the assessment methodology for operational noise impacts involved the following activities:

- Identify all sensitive receivers within the extents of the noise model (ie 600 metres either side of the project construction footprint). This includes existing sensitive receivers and known future sensitive receivers, such as future residential buildings yet to be built in approved residential subdivisions
- Determine predicted unmitigated noise levels from the operation of the project at each noise sensitive receiver and identify noise sensitive receivers where the predicted unmitigated noise levels would exceed the noise criteria
- Develop at-source noise mitigation measures to reduce noise levels from the operation of the project at each sensitive receiver. At-source mitigation measures identified for the project comprise a combination of low noise pavement and noise walls. These have been developed to reduce noise levels for all sensitive receivers, including existing sensitive receivers and known future sensitive receivers
- At-property treatments were then considered where the predicted noise levels exceed the noise criteria at existing noise sensitive receivers and noise sensitive receivers within approved residential subdivisions (discussed in Section 4.3.1 of Appendix B Updated noise and vibration

assessment) where architectural noise mitigation requirements are excluded from the development application conditions of approval.

The operational noise assessment carried out for the project considers predicted traffic volumes on the project, including predicted traffic volumes on service roads and adjacent connector roads such as Coramba Road. These predicted traffic volumes have been considered when determining the potential road noise impacts and consequently for determining the proposed mitigation measures for the project.

With respect to predicted and measured operational noise levels, it is important to be aware of specific acoustical indices and time periods that are used to determine the noise environment for each time period. For example, a 9 hour energy average index ($L_{Aeq(9hr)}$) is used to define the operational noise impact during the night-time period. The instantaneous sound pressure level will fluctuate across the 9 hour period (ie some periods will be quieter than others) and the L_{Aeq} index will be different to other statistical index (such as L_{A90}, which is used to represent the background level). For example, noise levels during the morning peak can be significantly louder than during the middle of the night. Noise monitoring for the project has been carried out in accordance with the requirements of the SEARs and Australian Standards (AS 2702 Acoustic Methods of Measurement of Road Traffic Noise).

Submission number(s)

12

Issue description

- The EIS does not provide any evidence to support the values assigned as 'unmitigated night no build' for the operational noise results. There is no evidence of sampling to show the modelled baseline figures are accurate
- Baseline modelling of residences with almost identical noise environments have different results, eg 12 Tamara Close and 15 Safrano Place.

Response

Validation noise monitoring locations used to confirm operational noise modelling predictions were within acceptable tolerance as per the requirements of the Noise Model Validation Guideline (Roads and Maritime Services 2018b). The full noise model validation process is summarised in Section 4.6 of Appendix B, Updated noise and vibration assessment report of the Amendment Report.

The validated baseline noise model was used to determine the predicted contribution of road traffic noise from existing roads, which are then used to determine the assessment criteria in accordance with the Noise Criteria Guideline (Roads and Maritime Services 2015d). A minimum of 30 dB(A) baseline noise level contribution from road traffic noise is adopted for sensitive receivers removed from existing main roads in accordance with the Noise Criteria Guideline (Roads and Maritime Services 2015d) and NSW Road Noise Policy (DECCW 2011). It is important to note that the baseline noise monitoring results do not influence the assessment criteria for the operational noise assessment.

Both residences noted in the submission are part of NCA13. 12 Tamora Close is located west of Roselands Drive and 15 Safrano Place is located east of Roselands Drive. Attended and unattended measurements were carried out adjacent to 12 Tamora Close and considered representative for noise sensitive receivers adjacent to Coramba Road east of Spagnolos Road.

No build scenario noise levels at 12 Tamora Close are lower than no build noise levels at 15 Safrano Place because 12 Tamora Close is further away from Coramba Road (ie the main road traffic noise

source in the no build situation). Intervening shielding is also accounted for in the terrain model and residential fences incorporated as required for noise model validation.

Submission number(s)

12

Issue description

- Modelled baseline night-time noise levels (no build) along Coramba Road are significantly above measured noise levels for a number of residences. The modelled results for the mitigated build scenario is about 1.3 dB(A) higher than the no build scenario, which seems incorrect given the predicted change in traffic volumes near the Coramba Road interchange. In quiet areas, such as NCA 16, it appears noise from birds has not been taken out. In elevated areas in quiet areas, the modelled baseline noise levels are 10 dB(A) more than measured noise levels
- Night measurements at facades and submitter's own noise measurements are very different from the baseline from the model, even taking account of bird noise
- Existing noise levels do not appear accurate (compared with submitter's measurements), and existing noise levels at night is skewed by noise from the 5am to 7am period.

Response

The measured noise levels provided in the Submission ID 12's attachments align with the noise monitoring survey provided in Appendix B, Updated noise and vibration assessment report of the Amendment Report. Noting the submission attachment provided the average noise level over one night time period and the noise survey provided in the noise and vibration assessment averages the noise levels over a period of seven days.

Note differences between the predicted noise levels in the year of opening or design and current measurements are expected, as the predictions are based on a forecasted increase in traffic volumes for both the no build and build scenarios as well as other environmental factors (eg effectiveness of existing local fencing around receivers).

With respect to increase in noise levels when comparing no build to mitigated build scenarios, the significant benefit of noise mitigation measures (ie low noise pavement and noise barriers) needs to be taken into account. This will often result in a lower noise level for mitigated build scenario than for the no build scenario notwithstanding the expected increase in road traffic. It is noted that a doubling in road traffic would be expected to result in about a 3 dB increase in noise levels whereas the cumulative benefit of noise mitigation is usually well in excess of this. Results for each receiver are provided in Appendix G of Appendix B, Updated noise and vibration assessment of the Amendment Report.

The predicted noise levels provided in the Appendix B, Updated noise and vibration assessment of the Amendment Report are predictions exclusively of traffic noise contribution at all noise sensitive receivers, including NCA16. A minimum 30 dB(A) baseline noise level contribution from traffic noise is established for assessment purposes, this generally applies to receivers far away from modelled traffic noise sources.

4.8.7 Noise monitoring validation

Submission number(s)

12, 26, 64, 103, 109, 116, 117, 121, 122, 123, 124, 139, 144, 151, 155, 164, 179, 181

Issue description

- The night-time readings for houses away from the existing Pacific Highway seem very high and it appears there is a lot of night-time noise on local roads, which is contrary to what is the norm
- Concerned the night-time noise readings for a house (the side facing the local street) are higher than other sides of the house. Including local traffic noise means this facade, which has large windows, will not be treated[2]
- There are inconsistencies in the determination of road traffic noise on different facades within quiet areas, leading to inconsistencies in determining baseline noise levels.

Response

Operational noise modelling of existing baseline scenarios has considered all significant road traffic noise sources and noise levels at every façade of all noise sensitive receivers. Following exhibition of the EIS, several design and construction changes have been made to the project. An updated noise and vibration assessment report (refer to Appendix B, Updated noise and vibration assessment of the Amendment Report) has been prepared in accordance with the SEARs to assess the potential impacts of the project. The updated noise assessment includes changes to the operational noise assessment methodology, including:

- Local roads (streets) with very low traffic volumes that were previously considered in the EIS assessment are now excluded in the noise model for the amended design. These roads have been excluded in response to concerns raised in EIS submissions listed above about the effect of considering the contribution of local roads on noise levels at sensitive receivers. These roads are Shephards Lane, Roselands Drive, Spagnolos Road, Willian Sharp Drive and Mackays Road.

Noise levels presented in Appendix G, Noise and vibration assessment of the EIS are predictions exclusively of road traffic noise contribution and are based on modelled road traffic data used in the validated acoustic model. It is noted that a minimum 30 dB(A) baseline noise level contribution from road traffic noise is established for assessment purposes in accordance with the Noise Criteria Guideline (Roads and Maritime Services 2015d). Noise measurements and processing has been carried out in accordance with the relevant guidelines and policies required by the SEARs. Baseline measurements are not used to determine noise sensitive receiver assessment criteria. This is done using the validated acoustic model to define the existing road traffic noise contribution.

In determining qualification for at-property treatment, individual contributions from new, redeveloped and existing roads at each façade of noise sensitive receivers has been considered in accordance with Noise Criteria Guideline and Noise Mitigation Guideline (Roads and Maritime Services 2015a) as required by the SEARs.

For example, for areas with low traffic noise impacts such as NCA14, NCA15 and NCA16 (where 26 Brennan Court is located), the main source contribution of existing road traffic noise in the baseline noise model is Coramba Road. Differences in baseline model results for different facades of sensitive receivers are because of a combination of the proximity of the sensitive receiver to Coramba Road, existing topography and shielding from adjoining properties.

[2] This issue is in relation to the property at 26 Brennan Court, Coffs Harbour.

4.8.8 Assessment of peak noise events

Submission number(s)

12, 26, 68, 103, 130, 159

Issue description

- There needs to be a quantitative assessment of the predicted maximum noise events in terms of quantity and noise levels at different distances along the route
- The noise assessment is based on average noise levels, however people respond to individual peaks in noise, such as truck braking
- Noise from heavy vehicles have not been addressed. The noise assessment considers noise from engines, exhaust brakes and tyre noise, however it does not discuss the excessive mechanical noise from B-doubles travelling at speed
- The noise assessment gives short attention to noise levels from trucks (a major issue in annoyance and sleep disturbance) where maximum noise levels are only addressed in a qualitative way. Roads and Maritime Services noise policy has not been updated to address the issue of truck noise and therefore the policy does not adequately address the SEARs
- There is no meaningful assessment of truck noise. Concerned about impacts of sleep disturbance from truck noise. There is no evidence residences are not experiencing maximum internal noise levels above 50-55 dB(A).

Response

The maximum noise level assessment has been assessed qualitatively in Section 4.10 of Appendix B, Updated noise and vibration assessment of the Amendment Report for greenfield areas, and quantitatively in Appendix I of Appendix B, Updated noise and vibration assessment of the Amendment Report for areas adjacent to existing road traffic noise sources.

Assessment of maximum noise levels has been carried out in accordance with provisions of the Environmental Noise Management Manual (RTA 2001b) where it is possible to carry out measurements of existing maximum noise exposure. Predicted noise impacts based on this quantitative assessment to locations where maximum noise impacts from road traffic are not currently a feature of the noise environment is not feasible as there is no road traffic to measure.

To supplement qualitative information for greenfield areas, Table 38 of Appendix B, Updated noise and vibration assessment of the Amendment Report summarises the outcome of research produced by the Transportation Research Board (Donovan, Gurovich, Plotkin, Robinson and Willian 2009). This research provides detailed measurement results for a total of 59 heavy vehicles pass bys for a range of speeds and a range of scenarios including stationary, coast down and compression braking.

Through the design process and by incorporating tunnels into the project with lower and flatter grades, eliminating tighter curves and integrating the project with the natural terrain, the project has already implemented design measures to help reduce peak noise events/engine brake noise.

Additional heavy vehicle correction factors were applied to the operational noise model for the project to provide further detail in representation of noise from heavy vehicles. The corrections applied are based on an article written by Peng J and others, titled “A six-category heavy vehicle noise emission model in free-flowing condition” (Peng J. et al 2019). These correction factors were derived by comparing model results for heavy vehicles from the Road Traffic Noise Prediction Model (Sakamoto 2013) (also known as the ASJ-RTN model) and Acoustic Source Modelling of Nordic Road Vehicles (Jonasson 2006) (also known as the Nord2005 model) source emission models.

4.8.9 Transitional zones

Submission number(s)

12

Issue description

- Applying the transitional zone for NCA13 does not provide reasonable and equitable outcomes for the community
- Traffic volumes will be significantly different near Coramba Road with the bypass in place, which will affect night-time noise levels. The residences in NCA13[3] will not receive a fair and equitable outcome if the transition zone approach is applied to the noise assessment.

Response

The aim of the transition zone is to ensure noise criteria change smoothly along the road between two road types (eg new and redeveloped or redeveloped and existing). Noise criteria have been established in accordance with the Noise Criteria Guideline (Roads and Maritime Services 2015d) which establishes target criteria across defined time periods for different receiver types (ie 15 hour, nine hour, one hour). Establishment of noise criteria considers the differences in traffic volumes and relative contribution between different road types such as the intersection of the project and Coramba Road. Therefore, it is appropriate the transitional criteria are applied.

4.8.10 Amphitheatre effect

Submission number(s)

12, 25, 67, 80, 111, 115, 135, 136, 159

Issue description

- Concerned about noise impacts on local neighbourhoods east of the project, elevated properties west of the project (from Roberts Hill to Shephards Lane tunnel) and Bishop Druitt College, due to the amphitheatre effect (ie noise reflection against topography plus direct noise from the project)
- Concerned about the consideration of the amphitheatre effect related to the proposed noise mitigation strategies, particularly around costs associated with at-property treatments
- Without other Pacific Highway projects to compare with, how can TfNSW determine the predicted noise levels when Coffs Harbour is uniquely situated between two hills that are 500 metres apart?

Response

It is acknowledged that the topography surrounding Coffs Harbour is unique and includes significant changes in elevation. It is understood that the term ‘amphitheatre effect’ has been used to describe reflections from surrounding topographical features.

The acoustic model for the project incorporates the existing terrain topography and distribution of relevant ground absorption parameters to represent absorptive and reflective surfaces throughout the study area used for the assessment. Due to limitations associated with the prediction algorithm, this study area has been limited to 600 metres either side of the project as discussed in Section 4.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report. The predictions of operational road traffic noise for all properties, including those on the western side of the project, are considered to be robust within the constraints of modelling algorithms used.

[3] NCA13 located around Coramba Road.

To supplement natural limitations in the modelling algorithms, the potential for exceedances of operational noise criteria will be investigated again during detailed design. Updated traffic and noise monitoring and modelling will be carried out to confirm requirements for any additional mitigation including at-property treatments.

Additionally, during the initial 12 months of operation of the project, an operational noise review will be carried out to confirm the operational noise impacts identified during the EIS development and detailed design. This will be based on an updated traffic survey and carried out in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and Practice Note viii of the Environmental Noise Management Manual (RTA 2001b). The review will assess the actual noise performance compared to the predicted noise performance, in other words, noise measurements will be assessed against updated noise predictions to validate the operational noise review. As identified in environmental management measure NV12, the performance and effectiveness of noise and vibration mitigation measures will also be assessed and where deficiencies are identified, recommendations for additional feasible and reasonable measures would be provided (refer to **Chapter 6, Revised environmental management measures**).

4.8.11 Consideration of existing features in noise model

Submission number(s)

26, 103, 112, 135

Issue description

- The noise assessment does not take into consideration noise levels inside the property or specific architecture of properties
- Each property shows a new plantation of trees to hide the visual effect of the project. Do the anticipated noise levels take into account the proposed landscaping?

Response

The noise and vibration assessment has been carried out in accordance with the NSW Road Noise Policy (DECCW 2011), specifically Section 2.5.4, Table 7 which states that the noise level should be assessed at one metre from the façade and at a height of 1.5 metres from the floor. Where it is determined at-property treatments are needed because the predicted noise levels at the façade exceed the noise criteria, TfNSW will consult with affected property owners and each property will be inspected to determine the appropriate at-property treatments needed to meet the Noise Mitigation Guideline (Roads and Maritime Services 2015a) criteria.

With respect to noise attenuation from vegetation, the Noise Model Validation Guideline (Roads and Maritime Services 2018b) advises against the use of vegetation (eg proposed landscaping) in the prediction of noise impacts as it may not be permanent. Its use to assist in reducing noise levels is also not quantifiably supported by evidence. Plantations of trees have therefore not been incorporated into the acoustic model beyond the ground absorption factors assigned to the terrain.

4.8.12 Use of CoRTN model

Submission number(s)

130

Issue description

- The CoRTN model works reasonably well in areas where there is a high percentage of light vehicles. However, the model fails to adequately address issues such as the frequency of engine noise, truck acceleration and deceleration and braking activities in cases where trucks are a major contributor to noise. It is noted the noise assessment attempts to calibrate the model for trucks and includes a validation process, however the validation locations do not include locations where trucks are a major contributor to noise. Recommend the operational noise assessment is reviewed to address issues related to truck noise and modelling techniques. The review should consider the impact of truck noise and its characteristics.

Response

Calculation of Road Traffic Noise (CoRTN) modelling has been adopted for the project as being an industry standard methodology as accepted in the NSW Road Noise Policy (DECCW, 2011). In response to Appendix B4 of the policy, additional heavy vehicle correction factors were applied to the operational noise model for the project to provide further detail in representation of noise from heavy vehicles. The corrections applied are based on an article written by Peng J and others, titled “A six-category heavy vehicle noise emission model in free-flowing condition” (Peng J. et al 2019). These correction factors were derived by comparing model results for heavy vehicles from the ASJ-RTN and Nord2005 source emission models.

The baseline noise model for the project was also validated against measured highway traffic noise including situations in which percentage of heavy vehicles is greater than 10 per cent.

4.8.13 Construction noise impacts

Submission number(s)

12, 17, 27, 34, 49, 54, 57, 63, 73, 75, 80, 88, 102, 109, 119, 122, 124, 127, 128, 133, 139, 140, 151, 164, 170, 178, 179, 181

Issue description

- Concerned about impacts of construction noise and vibration during construction. There is no noise wall proposed to mitigate these construction impacts. Noise mitigation should be installed before construction starts
- Construction noise levels seem very high and there is no treatment for all houses affected by this noise. This is unfair as property owners or developers were not told to include noise mitigation for construction
- Noise levels should be monitored and fines issued when appropriate levels are exceeded
- Property owner concerned with the location of a construction ancillary site close to property, particularly relating to construction traffic noise and noise from activities such as crushing. Requests ongoing consultation regarding ancillary site management.

Response

It is acknowledged that construction noise and vibration impacts have the potential to be significant during construction of the project. Outcomes of the construction noise assessment are summarised in Section 5.2.1 and Section 5.2.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report.

The noise impact during the construction of the project to nearby receivers depends on the level of noise, distance to the nearest receiver and the duration of the works. In addition, based on feedback during the EIS exhibition, additional construction scenarios have been included in the updated noise and vibration assessment to provide information for both typical and worst-case impacts to noise sensitive receivers.

Notwithstanding, as identified in Section 9.5 of the EIS and included in **Chapter 6, Revised environmental management measures**, a Noise and Vibration Management Plan (NVMP) will be prepared and implemented during construction (see environmental management measure NV01). It will be prepared in accordance with the details provided in the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) and the Interim Construction Noise Guidelines (DECC 2009b). The NVMP constitutes the main process for managing construction noise and vibration impacts and will identify:

- All potential significant noise and vibration generating activities associated with the activity
- Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, respite periods, staging placement and operation of ancillary facilities, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generation activity
- A monitoring program to assess performance against relevant noise and vibration criteria
- A process for implementation of respite periods to provide residents with respite from ongoing impact
- Arrangements for consultation with affected receivers, including notification and complaint handling procedures
- Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.

Also, an Out of Hours Work Procedure (see environmental management measure NV06) will be included as part of the NVMP to manage any variations to the standard construction hours. The procedure will follow the approach in the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) and the Interim Construction Noise Guideline (DECC 2009b), and include consideration of:

- Scheduling of noise intensive or high noise impact work to evening periods where feasible, using alternative plant and equipment and/or construction techniques to minimise noise
- Notifying in advance likely out of hours work
- Using of temporary noise barriers and including acoustic sheds around tunnel portals
- Providing representative noise monitoring and negotiating agreements with the community
- Offering reasonable and temporary alternative accommodation or an act of good will.

With respect to mitigation measures beyond those covered by the NVMP, it is acknowledged that a combination of noise barriers and at-property treatments comprise some of the mitigation measures to reduce noise levels from operational noise impacts of the project at each sensitive receiver. Given the proposed location of noise barriers with respect to the bypass, it is unlikely that it would be practicable

to install them early in the construction program. Where reasonable and feasible, at-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project. Priority for at-property treatments will be given to receivers that are predicted to have high level exceedances (eg those closest to the construction footprint, including properties close to ancillary facilities). Residents who are eligible would be contacted during the pre-construction phase of the project following project approval.

As identified in environmental management measure NV08, ancillary facilities will be located as far as practical from receivers and designed to ensure primary noise sources are at a maximum distance from residences (where reasonable and feasible), with solid structures (sheds, containers, etc.) placed between residences and noise sources (and as close to the noise sources as is practical). Refer to **Chapter 6, Revised environmental management measures**.

TfNSW will also consult with property owners close to proposed ancillary facilities before establishment of the ancillary facilities.

As described in environmental management measures SE01, consultation will be undertaken with potentially affected residences prior to the commencement of and during work in accordance with Community Liaison Implementation Plan. The Community Liaison Implementation Plan would be used to provide specific and timely information in relation to the affected community during construction, notifying the community of upcoming works.

4.8.14 Construction vibration impacts on buildings

Submission number(s)

9, 10, 12, 49, 62, 86, 99, 105, 115, 116, 135, 136, 141, 146, 147, 159, 165, 173, 179

Issue description

- Concerned about construction vibration and blasting causing structural damage to properties
- Concerned about the lack of information on remediation to homes during construction and operation
- A pre-construction condition survey is requested for prevention of damage of all nearby buildings before, during and after construction. Any cosmetic or structural property damage as a result of construction work should be repaired by TfNSW
- Respondent requests environmental management measure NV03 is changed so that building condition surveys are conducted for buildings and other structures within 150 metres of vibration generating activities before commencement of construction
- Vibration during construction will also have a detrimental effect on properties located above the project with potentially subsidence in many places.

Response

Section 5.3 and 5.4 of Appendix B, Updated noise and vibration assessment of the Amendment Report considers vibration impacts for standard construction activities and for blasting, respectively.

Minimum safe working distances for typical construction activities are summarised in Section 5.3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report. These are considered worst-case screening buffers for safe working distances. As stated by environmental management measure NV04, where vibration generating activities will be carried out within minimum working distances for cosmetic damage, vibration monitoring will be undertaken. Where monitoring indicates an exceedance of cosmetic damage criteria, alternative low-vibration work practices will be investigated and implemented where reasonable and feasible.

Preliminary calculations have been carried out to determine indicative maximum instantaneous charge for blasting to comply with Australian Standards (AS 2187.2 Explosives - Storage and use, Part 2: Use of explosives).

In addition to the indicative predictions summarised in Appendix B, Updated noise and vibration assessment of the Amendment Report, environmental management measures identified to mitigate the impact of damage to buildings from vibration have been listed below:

- Environmental management measure NV01 states that a NVMP will be prepared and implemented during construction and in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) and the Interim Construction Noise Guidelines (DECC 2009b)
- In accordance with NV10 a Blast Management Strategy will be prepared as part of the NVMP. The strategy will aim to demonstrate that all blasting will be carried out in a manner that will not generate unacceptable noise and vibration impacts or pose a significant risk of impact to residences and sensitive receivers
- In accordance with NV03, building condition surveys will be conducted for buildings and other structures within certain distances of vibration generating activities before commencement of construction. A report will be provided to the relevant property owner.

For further information, refer to **Chapter 6, Revised environmental management measures**.

Since the exhibition of the EIS, NV03 has been amended to include the distances outlined in **Table 4.8-1**. As indicated above, where buildings are located within the distance from the construction activity specified, a building condition survey will be undertaken.

Table 4.8-1 Distance from construction activity required to conduct a building condition report

Construction activity	Distance from construction activity
Blasting operations	500 metres
Pile driving	250 metres
Excavation by hammering or ripping	100 metres
Vibrating compaction > 7 tonne plant	50 metres
Vibrating compaction < 7 tonne plant	25 metres
Demolition of structures	50 metres

In regard to the risk of subsidence from vibrations, a similar issue was raised by other members of the community and a response is provided in **Section 4.16, Surface water quality and groundwater**. The risk of landslides and subsidence was assessed in Chapter 20, Groundwater and Chapter 24, Hazard and risk of the EIS. Subsidence is the excessive movement of the ground caused by soil compressing under a weight, and soil swelling and contracting due to changes in the moisture content.

The main subsidence risks for the project are at the tunnels and could be because of:

- Soil consolidation, or settlement, due to groundwater drawdown
- Tunnelling through the major ridges.

Due to the stiffness of the underlying bedrock, subsidence is unlikely to occur. However, and as per environmental management measures HZ06, a Surface Settlement Monitoring Program will be prepared and implemented before and during construction to identify whether the project is resulting

in adverse subsidence impacts. In the unlikely event that subsidence is deemed to cause building and/or property damage as a result of the project, the damage would be repaired at no cost to the owner.

Submission number(s)

116, 179

Issue description

- TfNSW declined responsibility for damage incurred to a number of properties on Coachmans Close and Fernleigh Avenue last time. Damage needs to be repaired and an indemnity provided for future damage from the bypass.

Response

The above issue relates to construction of the Sapphire to Woolgoolga Pacific Highway upgrade project which was opened to traffic nearly six years ago. TfNSW are investigating the issue and have undertaken consultation with the submitter who raised the concern (Submission ID 116). TfNSW will make good structural damage to properties which have been found to be caused as a result of construction activities.

4.8.15 Operational noise impacts

Submission number(s)

54, 71, 95, 110, 128, 138, 146, 162, 173

Issue description

- Concerned about constant noise both day and night and the impacts this will have on home life
- Concerned about noise impacts for residents living near Coramba Road interchange
- Noise impacts from the project and bridges proposed near the property are outside the acceptable noise levels in the guidelines
- To mitigate noise impacts, the proposed route should include two bridges north of North Boambee Road, rather than the current three bridges
- Mitigation will need to be provided to property because of the increased noise, the impact of which is understated
- The population in Coffs Harbour has progressively moved west resulting in thousands of impacted properties. TfNSW has not quantified this total of noise and vibration impacts
- The data suggests background noise levels at the submitter's property are between 30 and 35 dB when they are actually closer to 20 dB or less. As such the predicted operational noise levels of 50 to 56 dB is understated and noise impacts will be greater.

Response

It is acknowledged that noise impacts may be significant in some locations during the operation of the project. Outcomes of the operational noise assessment are summarised in Section 4.7 and design of feasible and reasonable noise mitigation in Section 4.8 of Appendix B, Updated noise and vibration assessment of the Amendment Report. The operational noise impacts from the project to nearby receivers will depend on multiple factors, including the road traffic noise source, distance to the nearest receiver, and any intervening shielding. Perceived impact will also be influenced by a relative change in operational noise level in particular for areas with a low existing background noise level.

The operational noise assessment has been carried out in accordance with the SEARs and all relevant guidelines listed under Section 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report. Assessment of noise mitigation for the project has been carried out in accordance with the NSW Noise Mitigation Guideline (Roads and Maritime Services 2015a) and is the application of the NSW Road Noise Policy (DECCW, 2011). The primary guiding principle of the Noise Mitigation Guideline is that communities should receive reasonable and equitable outcomes. Assessment criteria in the NSW Road Noise Policy have been set approximately at the point at which 90 per cent of residents are not highly annoyed by the noise.

The evaluation, selection and design of feasible and reasonable noise mitigation measures has been carried out in accordance with provisions of the Noise Mitigation Guideline. Definitions of feasibility and reasonableness are provided in Section 2 of the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and Section 3.3 of the NSW Road Noise Policy.

With regards to noise impacts from bridges, low noise pavement will be used on all bridges and bridge joints would be designed so that there is minimal tyre impact noise on the joints where reasonable and feasible. In addition, following exhibition of the EIS, several design and construction changes have been made to the project, including the North Boambee Valley vertical alignment design change (refer to Chapter 2, Design changes of the Amendment Report for further details). One of design amendments in North Boambee Valley includes changing BR 05 from a 62 metre long bridge to a bank of culverts, reducing the number of bridges in this area from three to two.

In addition to Appendix B, Updated noise and vibration assessment of the Amendment Report, further assessment reports detailed below for the project will be developed as the project progresses into delivery and operation, and there will continue to be a high level of scrutiny of the noise impacts associated with this project:

- During detailed design, the operational noise mitigation measures, including noise barriers and at-property treatments, would be confirmed. This would be carried out through updated noise modelling for the detailed design (refer to environmental management measure NV11)

  At-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts (refer to environmental management measure NV07)
- During the initial 12 months of operation of the project, an operational noise review will be carried out to confirm the operational noise impacts identified during the EIS development and detailed design. The review would assess the actual noise performance compared to the predicted noise performance (refer to environmental management measure NV12). The performance and effectiveness of noise and vibration mitigation measures would also be assessed and where deficiencies are identified, recommendations for additional feasible and reasonable measures would be provided (refer to environmental management measure NV12).

For further information, refer to **Chapter 6, Revised environmental management measures**.

Submission number(s)

159

Issue description

- Even after noise mitigation, noise impacts at Lakes Estate and Bishop Druitt College will still exceed Noise Criteria Guideline levels.

Response

TfNSW acknowledges there would be noise impacts to several properties in the Lakes Estate and Bishop Druitt College as a result of the project. As identified in Section 9.4 of Chapter 9, Noise and vibration of the EIS and Section 4.8 of Appendix B, Updated noise and vibration assessment of the Amendment Report, low noise pavement and a noise wall on the eastern side of the project are proposed to reduce operational noise levels near the Lakes Estate and Bishop Druitt College. Where the predicted noise levels at the façade exceed the noise criteria, at-property treatments are to be investigated, including at Bishop Druitt College and several properties in the Lakes Estate.

Submission number(s)

12

Issue description

- Residences at $L_{(A)eq}$ night levels of 61 and 64 are left unmitigated and this has unacceptable health impacts which has not been justified in the EIS.

Response

It is noted that existing traffic noise sources rather than the project are the main contributing noise sources at all receivers with predicted noise levels greater than 60 dB(A) and not identified for consideration of at-property treatment. All properties that are predicted to experience 'acute' noise levels as defined in the Noise Mitigation Guideline (Roads and Maritime Services 2015a) (ie 60/65 dB(A)) are considered for mitigation in accordance with the principles of the guideline.

The procedure to determine whether a receiver qualifies for consideration of additional mitigation is provided in Section 3.1.3 of Appendix B, Updated noise and vibration assessment of the Amendment Report.

The Noise Abatement Program is the mechanism by which high noise exposure from existing roads is addressed. The Noise Abatement Program is aimed at providing noise mitigation treatment for dwellings and noise sensitive land-uses such as schools, hospitals and churches that are exposed to high levels of road traffic noise. Access to the Noise Abatement Program is subject to certain eligibility criteria.

All of the eligibility criteria must be met before a property can be placed on a waiting list for noise mitigation treatment:

- The property is classified as a 'sensitive receiver' such as a residence, school, church or hospital
- The property is impacted by noise from an existing State road and the road is not subject to any approved upgrades within a reasonably foreseeable time frame (eg one to two years)
- External noise levels are at least 65 dBA during the day or 60 dBA during the night at the property (the daytime noise level is the average noise level between 7am and 10pm, and the night-time noise level is the average noise level between 10pm and 7am)
- Treatment of the property is deemed cost-effective, equitable and practical
- Building development was approved before January 1, 2009.

Further detail on the Noise Abatement Program can be found at: *https://www.rms.nsw.gov.au/about/environment/reducing-noise/noise-abatement-program.html*.

4.8.16 Operational vibration impacts

Submission number(s)

105, 115, 135, 147, 159

Issue description

- Concerned about the operational vibration impacts on nearby buildings from large B-doubles using the project, particularly in the vicinity of the tunnels. There is little information in the EIS on immediate and long-term effects of vibration on sleep disturbance and building damage.

Response

The operational vibration impacts have been addressed under Section 4.11 of Appendix B, Updated noise and vibration assessment of the Amendment Report. Vibration levels during operation are not expected to be above perceptible levels at nearby sensitive receivers.

4.8.17 Noise mitigation measures

Submission number(s)

110, 112, 114, 128, 141, 150

Issue description

- Provide clarity with regards to the procedure to determine which houses should be treated for noise
- Effective noise mitigation for properties is needed before, during and after construction
- Follow-up noise assessments are needed during construction and operation
- There should be a sound study on 263A and 263E Shephards Lane both before and after construction and during operation.

Response

The operational and construction noise assessments have been carried out in accordance with the SEARs and all relevant guidelines listed below and under Section 3 of Appendix B, Updated noise and vibration assessment of the Amendment Report:

- NSW Road Noise Policy, DECCW, 2011
- Noise Criteria Guideline, Roads and Maritime Services, 2015
- Application Notes – Noise Criteria Guideline, Roads and Maritime Services, 2015
- Noise Mitigation Guideline, Roads and Maritime Services, 2015
- Noise Model Validation Guideline, Roads and Maritime Services, 2018
- Environmental Noise Management Manual, RTA, 2001
- Noise Wall Design Guideline, Roads and Maritime Services, 2016
- Interim Construction Noise Guideline, DECC, 2009
- Noise Policy for Industry, EPA, 2017
- Assessing Vibration: a technical guideline, DEC, 2006
- BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2, BSI, 1993

- DIN 4150: Part 3-1999 Structural vibration – Effects of vibration on structures, Deutsches Institute fur Normung, 1999
- AS 2187.2: Explosives - Storage and Use, Part 2: Use of explosives
- BS 6472: Part 2 - Guide to evaluation of human exposure to vibration in buildings. Blast induced vibration 200
- Australia and New Zealand Environment Conservation Council (ANZECC) Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration 1990
- Swedish Standard SS 460 48 66 - Vibration and shock – Guidance Levels For Blasting-Induced Vibration In Buildings 2011
- Report 429: Ground-borne vibration caused by mechanised construction works. Transport Research Laboratory 2000
- Australian Standards (AS 2702 Acoustic Methods of Measurement of Road Traffic Noise)
- ISO 9613 Acoustics — Attenuation of Sound during Propagation Outdoors.

Assessment of noise mitigation for the project has been carried out in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a). Construction noise and vibration has been assessed in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) which aligns with the principles of the Interim Construction Noise Guidelines (DECC 2009b).

The predicted noise levels of the project during operation and construction are presented respectively in Appendix G and Appendix J of Appendix B, Updated noise and vibration assessment report of the Amendment Report and Appendix G, Noise and vibration assessment of the EIS. Receivers exceeding the operational noise criteria after implementing at-source noise mitigation are considered for at-property treatment. The noise impacts are summarised and discussed in Section 5.3, Noise and vibration of the Amendment Report.

Chapter 6, Revised environmental management measures identifies the mitigation measures to be implemented to minimise the impacts of the project. Environmental management measure NV01 states that prior to construction commencing, a NVMP would be prepared and implemented during construction and in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) and the Interim Construction Noise Guidelines (DECC 2009b).

The NVMP constitutes the main process for managing construction noise and vibration impacts during construction and will identify:

- All potential significant noise and vibration generating activities associated with the activity
- Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, respite periods, staging placement and operation of ancillary facilities, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generation activity
- A monitoring program to assess performance against relevant noise and vibration criteria
- Process for implementation of respite periods to provide residents with respite from ongoing impact
- Arrangement for consultation with affected receivers, including notification and complaint handling procedures

- Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.

As identified in environmental management measure NV11, the operational noise mitigation measures, including noise barriers and at-property treatments, will be confirmed during detailed design. This would be determined through updated noise modelling reflective of the detailed design. At-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts (refer to environmental management measure NV07).

As stated in environmental management measure NV12, an operational noise review will be carried out 12 months after the opening of the project to confirm the operational noise impacts identified during the EIS development and detailed design. This review will be based on an updated traffic survey at the time (once traffic flows have stabilised) and will be in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and Practice Note viii of Environmental Noise Management Manual (RTA 2001b). The review will assess the actual noise performance compared to the predicted noise performance. The performance and effectiveness of noise and vibration mitigation measures will also be assessed and where deficiencies are identified, recommendations for additional feasible and reasonable measures would be provided (refer to **Chapter 6, Revised environmental management measures**).

The above environmental management measures and processes are consistent with the likely approval conditions for the project and reflect requirements for other similar sized State significant infrastructure projects. An auditing program of the project as a whole would likely be required and would be subject to DPIE's review and approval before implementation.

The additional noise monitoring and assessments described above would cover the entire study area, including 263A and 263E Shephards Lane, as these properties are located in NCA15.

Submission number(s)

16, 109, 116

Issue description

- The project will have adverse impacts on Submission ID 16's property, however no noise mitigation is proposed
- Concerned about the predicted traffic volume on the service road between Korora Hill interchange and the northern end of the project. This will not be a 'local road' but a major thoroughfare.

Response

The operational noise assessment has been carried out in accordance with the SEARs and all relevant guidelines listed under Section 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report. The evaluation, selection and design of feasible and reasonable noise mitigation measures has been carried out in accordance with provisions of the Noise Mitigation Guideline (Roads and Maritime Services 2015a). Definitions of feasibility and reasonableness are provided in Section 2 of the Noise Mitigation Guideline and Section 3.3 of the NSW Road Noise Policy (DECCW 2011).

Operational noise mitigation strategies are proposed based on existing and future approved noise sensitive receivers including for example the approved DA subdivision identified as Elements Estate. The project is proposing to include a noise wall extending in front of the noise sensitive receivers which are part of NCA03. NCA03 encompasses the property identified in Submission ID 16.

The operational noise assessment carried out for the project considers predicted traffic volumes on the project, including predicted traffic volumes on the service road between Korora Hill interchange and the northern end of the project. These predicted traffic volumes have been considered when determining the potential road noise impacts and consequently for determining the proposed mitigation measures in the area. The forecasted average hourly traffic volumes on the service road are only about 10 per cent of the traffic expected on the main alignment. The traffic volumes used for the noise assessment are provided on Appendix F of Appendix B, Updated noise and vibration assessment of the Amendment Report.

4.8.18 Alternative noise mitigation measures

Submission number(s)

67, 103

Issue description

- Further research should be done into noise mitigation techniques including vehicle design, road pavements and materials used for noise walls
- Curved noise walls should be installed to reflect noise back onto the road
- Noise walls should be installed along the entire length of the project and should be sound absorbing
- Suggest the transparent noise wall proposed for the bridge over the North Coast Railway is replaced by a solid noise wall.

Response

The operational and construction noise assessments have been carried out in accordance with the SEARs and all relevant guidelines listed under Section 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report. These guidelines and prediction methodologies represent the current industry standard approach to assessing noise and vibration impacts from road traffic.

The level of detail adopted for the noise and vibration assessment is commensurate with the concept design stage of development. Further detailed analysis of noise mitigation measures will be carried out during detailed design and will include refinement of noise barrier profiles and materials.

The materials used for the construction of noise walls require careful consideration of the durability, weathering, vandal proofing, graffiti, safety, fire retardance, etc. to ensure the effectiveness of the noise barrier. Further guidance regarding materials is provided in TfNSW's quality assurance specification R271 Structural Design and Construction of Noise Barriers (Roads and Maritime Services 2018d).

Addressing road traffic noise at the source is generally applied via the Australian Design Rules (ADR) and in-service standard for vehicles. These measures, including regulation of engine and exhaust noise levels, are being updated and are outside the scope of the project.

Research relating to design of noise levels is actively carried out by vehicle manufacturers to comply with environmental requirements for the global market. In terms of new vehicles, noise emissions and vehicle safety are addressed by the ADR which are design standards administered by the Federal Government for all new vehicles sold in Australia. The ADRs are generally performance based and cover issues such as occupant protection, structures, lighting, noise, engine exhaust emissions, braking and a range of miscellaneous items. The Australian Government is part of an international convention that seeks to ensure design rules are consistent throughout the world. Also, the Protection

of the Environment Operations (Noise Control) Regulation 2017 (Noise Control Regulation) sets out maximum permissible noise levels and the regulatory framework for motor vehicles and aims to prevent high noise levels from vehicles caused by lack of maintenance, deliberate tampering or inappropriate use. The EPA is responsible for administering these regulations.

As well as the offences in the Noise Control Regulation noted above, NSW Police can issue penalty infringement notices for breaches of the following Road Rules related to vehicle noise. These are part of the 2008 Rules made under the *Road Transport (Safety and Traffic Management) Act 1999*. Rules 224, 291 and 291-1 relate to unnecessary use of a motor vehicle horn, unnecessary revving a vehicle causing noise and the requirement that the engine of a stationary vehicle be turned off to prevent noise, other than for stoppages in traffic or examinations due to engine malfunction.

Consistent with international standards, the ADRs focus on engine noise when stationary or accelerating and are not capable of addressing engine compression brake noise. Furthermore, it is important to note that there is currently no internationally accepted measure or standard to capture the subjective annoying 'barking' character of compression brake noise, in which the pulsating nature of the noise has been found to be the source of annoyance rather than the standard volume or loudness measure. TfNSW has been working with the National Transport Commission and national jurisdictions to develop a national, in-service standard that would reliably detect excessive engine brake noise and its source. This work remains ongoing.

4.8.19 Speed reductions

Submission number(s)

12, 115, 135

Issue description

- Higher speed limits and gradients will increase noise impacts
- The project is very close to many residential communities and a lower speed limit (80 or 90 km/h) would make a huge difference to noise levels.

Response

Final design speed for the project is the outcome of a multidisciplinary approach to design, considering multiple inputs and potential ramifications. As identified in Chapter 5, Project description of the EIS, the project has been designed in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards and TfNSW supplementary documents. The posted speed limit for the project is 110 km/h, which has been adopted for the efficient movement of people and freight around Coffs Harbour.

While there may be a difference in the predicted noise profile with a lower posted speed, decreasing the speed would reduce the functionality of the project and introduce potential safety risks.

4.8.20 Tunnel noise

Submission number(s)

99, 136

Issue description

- Tunnels should be fully enclosed with concrete barriers to reduce potential for noise to travel
- Concerned about tunnels funnelling noise from the highway traffic echoing off the tunnel walls, increasing the impact at resident homes.

Response

Tunnel design considerations are discussed in Chapter 5, Project description of the EIS. The noise from vehicles travelling through the tunnel is expected to be largely mitigated by the tunnel structure as it provides a full enclosure of the noise sources (vehicles travelling through the tunnel). It is acknowledged there will be noise emissions from the tunnel portals as these are required to allow traffic to flow through the structure.

Noise impacts from tunnels have been considered in the noise modelling methodology. Section 4.5 of Appendix B, Updated noise and vibration assessment of the Amendment Report states the following with respect to tunnel noise:

- Tunnel portals were incorporated into the model via implementation of four-point sources at the tunnel openings
- Sound power levels for tunnel portals were calculated in accordance with the NORD2000 methodology
- Propagation of tunnel portal noise was calculated in accordance with ISO 9613 Acoustics — Attenuation of Sound during Propagation Outdoors.

Final design of tunnel portals is the outcome of a multidisciplinary approach to design, considering multiple inputs and potential ramifications.

4.8.21 Low noise pavement

Submission number(s)

44, 104, 141

Issue description

- Why is low noise pavement used everywhere except in the tunnels?
- Low noise pavement should be used for residential areas
- Open grade asphalt surfacing should be used as road surfacing to suppress noise.

Response

In accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a), a low noise pavement surface (open grade asphalt) was investigated where groups of four or more closely spaced noise sensitive receivers, including residential areas, were identified to qualify for consideration of additional noise mitigation. This was carried out before investigating the implementation of noise barriers. In addition, a project decision was made to adopt low noise pavement for the full length of the project, excluding the extent of the tunnels, to address community concerns raised on the 2018 concept design (refer to Chapter 4, Project development and alternatives of the EIS for further information).

Final design of the tunnels, including road surface type, is the outcome of a multidisciplinary approach to design, considering multiple inputs and potential ramifications and safety risks. Due to safety concerns, TfNSW does not permit the use of open grade asphalt in tunnels because of the increased risk of fire. However, it is noted that tunnels will mitigate noise from the road by virtue of the noise source being enclosed. Noise emissions from tunnel portals have been accounted for in the model and mitigation measures considered accordingly, as described above in **Section 4.8.20**.

4.8.22 Mitigation for existing highway noise

Submission number(s)

26, 50, 103, 141, 166

Issue description

- No consideration has been given to residences that are more than 600 metres from the project
- The project will not address existing noise issues affecting residents between the Big Banana and Arthur Street
- Noise walls should be used along the project from Northern Beaches (Korora) to Park Beach Plaza
- Previous Pacific Highway upgrade construction noise abatement for houses south and north of Coffs Harbour (outside the extents of the project) are still the subject of unsatisfactory consequences
- There are residents who qualify for noise mitigation due to existing high noise levels, which will continue once the project has been built.

Response

The study area for the project is described in Section 4.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report and shown graphically in Appendix B of the same document.

The noise assessment study area extends to a maximum width of about 600 metres either side of the project. This distance is based on the limit of accuracy of the road traffic noise model used for the assessment and is in accordance with the NSW Road Noise Policy (DECCW 2011). The potential for exceedances beyond 600 metres for the rural areas of the project will be investigated during detailed design with further traffic and noise monitoring and modelling being undertaken to confirm requirements for additional mitigation including at-property treatments.

All feasible and reasonable mitigation strategies have been assessed in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) for all noise sensitive receivers within the study area, including a number of residential noise sensitive receivers in the Northern Beaches of Coffs Harbour (Korora). Residents between the Big Banana and Arthur Street near Park Beach Plaza are outside the study area for the project.

For existing areas outside the extents of the project (such as those adjacent to the existing Pacific Highway), the Noise Abatement Program is aimed at providing noise mitigation treatment for dwellings and noise sensitive land-uses such as schools, hospitals and churches that are exposed to high levels of road traffic noise. Access to the Noise Abatement Program is subject to certain eligibility criteria.

All of the eligibility criteria must be met before a property can be placed on a waiting list for noise mitigation treatment:

- The property is classified as a 'sensitive receiver' such as a residence, school, church or hospital
- The property is impacted by noise from an existing State road and the road is not subject to any approved upgrades within a reasonably foreseeable time frame (eg one to two years)
- External noise levels are at least 65 dBA during the day or 60 dBA during the night at the property (the daytime noise level is the average noise level between 7am and 10pm, and the night-time noise level is the average noise level between 10pm and 7am)
- Treatment of the property is deemed cost-effective, equitable and practical
- Building development was approved before January 1, 2009.

Further detail on the Noise Abatement Program can be found at: *https://www.rms.nsw.gov.au/about/environment/reducing-noise/noise-abatement-program.html*.

Section 4.7.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report notes that many receivers aligning the existing Pacific Highway (including those between the Big Banana and Arthur Street) are expected to experience a reduction in operational noise impacts because of the rerouting of vehicles to the project.

4.8.23 At-property treatments

Submission number(s)

9, 10, 12, 37, 82, 99, 103, 129, 179

Issue description

- At-property treatments need to be installed before construction starts.
- Concerned about how Queenslander style house will be treated to protect us from noise during and after construction
- The close proximity of the works will result in significant noise disruption for resort guests, as such noise mitigation is needed to allow a reasonable standard of guest accommodation.
- Residents have not been contacted regarding any potential treatment prior to construction, or when the build is completed. When will this occur?
- At-property treatments should be undertaken before construction, not when construction has finished.

Response

At-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts (refer to environmental management measure NV07). For the purposes of this environmental management measure, early construction phases of the project would typically mean within nine to 12 months following commencement of construction, where reasonable and feasible.

The operational noise mitigation measures, including noise barriers and/or at-property treatments, will be confirmed during detailed design. Once confirmed, an inspection will be coordinated with the property owner and carried out at a suitable time. Further consultation with property owner will determine the property conditions and feasible and reasonable measures to be considered for the at-property treatment.

In accordance with the SEARs and all relevant guidelines listed under Section 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report, commercial receivers have been incorporated in construction noise and vibration assessments. In accordance with the provisions of the NSW Road Noise Policy (DECCW 2011) and Noise Criteria Guideline (Roads and Maritime Services 2015d) commercial receivers are not considered to be noise sensitive receivers for the purpose of designing feasible and reasonable noise mitigation.

Locations identified containing temporary accommodation (eg hotels, resorts and caravan parks) have been included in the analysis of noise mitigation and are addressed in Section 4.3.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report. At-property treatments, where required, have been restricted to permanent residential accommodation buildings (eg commercial manager and permanently residing caravan users) when assessing eligibility for consideration of additional noise mitigation. This approach to assessment is in accordance with standard TfNSW approach and takes into account reasonable mitigation being provided for residents experiencing long-term road traffic noise exposure.

For further information, refer to **Chapter 6, Revised environmental management measures**.

4.8.24 Noise walls

Submission number(s)

31, 36, 41, 45, 51, 59, 61, 65, 66, 85, 89, 90, 93, 97, 98, 99, 101, 102, 104, 105, 109, 112, 114, 116, 118, 134, 148, 150, 154, 160, 171, 174, 179, 183

Issue description

- Noise mitigation measures should be built on top of earthworks
- The proposed noise walls are not long enough and do not extend far enough to mitigate noise and visual impacts
- Traffic volumes are forecast to increase substantially over the next decade and that justifies the need for noise walls and asphalt pavement along the submitter's eastern boundary
- What sound barriers, type and heights will be used for the project?
- Additional noise walls are requested to be considered at the following locations:
  - Western side of the project near Shephards Lane
  - Extension further south of existing relocated noise wall near Korora Hill
  - Eastern side of the highway near Opal Cove Resort
  - Western side of highway near Seaview Close
  - In front of all residences at North Sapphire Beach
  - Western side of the project across greenfield areas
  - Between Coachmans Close and the service road
  - Western side of the project near North Boambee Road
  - Relocation of Englands Road noise wall.

Response

The operational and construction noise assessments have been carried out in accordance with the SEARs and all relevant guidelines listed under Section 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report. The Noise Mitigation Guideline (Roads and Maritime Services 2015a) provides a methodology to determine feasible and reasonable noise mitigation for road traffic noise projects. Section 4.8.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report describes the methodology followed to determine feasible and reasonable locations for at-source noise mitigation.

Before carrying out a final noise barrier analysis, opportunities were identified where excess material from the project could be repurposed as landscape berms to further reduce noise impacts. An updated terrain model with the earth berms in place was then used to re analyse optimum noise wall heights and resulting at-property treatment requirements. Landscape mounds were included as part of the design of the project between North Boambee Road and Roberts Hill tunnel, between Coramba Road interchange and the overpass of the North Coast Railway and between Shephards Lane tunnel and Gatelys Road tunnel.

Following the inclusion of earth mounds and low noise pavement, a feasible and reasonable noise barrier assessment was carried out at all locations where four or more receivers were identified as exceeding the noise criteria in the Noise Criteria Guideline (Roads and Maritime Services 2015d). Definitions of feasible and reasonable can be found in Section 3.3 of the NSW Road Noise Policy (DECCW 2011) and Section 2 of the Noise Mitigation Guideline (Roads and Maritime Services 2015a). Assessment was based on predicted noise levels for the forecasted traffic volume 10 years

from the year of opening (identified in the assessment as the design year, 2034) to account for the increase in traffic volumes.

The outcome of the noise barrier assessment recommended six new noise walls ranging in height between 4.5 and five metres and the relocation of two existing noise walls affected by the construction footprint. Table 36 in Section 4.8.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report provides details of the location and extent of each one of the proposed noise walls included as part of the at-source operational noise mitigation strategies for the project.

With respect to the specific locations identified in the submissions, the following was considered across various areas of the project to determine whether including a noise wall as part of the project was considered feasible and reasonable:

- A noise wall was not considered along the western side of the project near Shephards Lane (NCA15) as there are no cases of four or more closely spaced receivers qualifying for consideration of additional noise mitigation. The residential noise sensitive receivers as part of NCA15 are spaced about 100 metres apart. Receivers exceeding the noise criteria are instead considered for individual at-property treatment assessment
- An extension further south of the existing relocated noise wall near Korora Hill was not considered as there are no cases of four or more closely spaced receivers qualifying for consideration of additional noise mitigation beyond the existing barrier extent. This area is already exposed to noise from the existing Pacific Highway. However, it is recommended that the existing barrier is relocated and set to a five metre top of height and that remaining receivers exceeding the noise criteria are considered for individual at-property treatment assessment
- A five metre noise wall has been included on the eastern side of the project near Opal Cove Resort. This noise wall is identified as NW_NCA26_SB_01 in Table 36 in Section 4.8.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report
- As discussed in Section 4.8.2 of the Appendix B, Updated noise and vibration assessment of the Amendment Report, a noise wall was not considered to be reasonable and feasible along the western side of the existing Pacific Highway near Seaview Close as the barrier would be required to be located above the service road and built on top of a retaining wall between 3.3 metres and 7.2 metres in height. This would become a safety hazard for construction and maintenance, and it would not effectively treat all sensitive receivers within NCA27 and NCA29 as receivers would still require at-property treatment. Receivers exceeding the noise criteria are instead considered for individual at-property treatment assessment
- Noise sensitive receivers affected by noise from the existing Pacific Highway located at North Sapphire Beach are outside the study area of the project. For existing areas outside the extents of the project (such as those adjacent to the existing Pacific Highway), the Noise Abatement Program is aimed at providing noise mitigation treatment for dwellings and noise sensitive land-uses such as schools, hospitals and churches that are exposed to high levels of road traffic noise. Access to the Noise Abatement Program is subject to certain eligibility criteria as described in previous responses above
- Noise walls were not considered along the western side of the project across NCA15, NCA17 and NCA19 as there are no cases of four or more closely spaced receivers qualifying for consideration of additional noise mitigation. The residential noise sensitive receivers as part of NCA15 are generally spaced about 100 metres apart. Receivers exceeding the noise criteria are instead considered for individual at-property treatment assessment

- A noise wall was not considered between the service road and Coachmans Close. The relocated existing noise wall across this area in front of NCA28 was relocated to mitigate the noise from the main alignment of the project. Relocating the existing noise wall on the outside of the service road would not effectively mitigate the noise from the highway as the top of height would be near road level of the highway. A secondary noise wall behind the currently proposed NW_NCA28_SB_01 was not considered feasible or reasonable because the current traffic noise exposure of receivers at NCA28. Additionally, it is worth noting the predicted noise levels based on the forecasted traffic volumes on the service road are below the traffic noise contribution from the project. Receivers exceeding the noise criteria and not located behind the proposed noise barrier (such as those on the hill surrounded by Coachmans Close) are instead considered for individual at-property treatment assessment
- A noise wall assessment was carried out for the western side of the project near North Boambee Road (NCA08). This noise wall is identified as NW_NCA08_NB_01 in Table 36 in Section 4.8.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report. It was not considered a feasible and reasonable noise mitigation option for the noise sensitive receivers identified for consideration of additional noise mitigation because the maximum noise barrier height of eight metres provided only a marginal noise level reduction. Receivers exceeding the noise criteria are instead considered for individual at-property treatment assessment
- There was no existing noise wall identified near Englands Road on the western side of the existing Pacific Highway (NCA02 and NCA04). However, low noise pavement is considered for the section of the project south of Englands Road and noise sensitive receivers exceeding the noise criteria are instead considered for individual at-property treatment assessment.

For further information, refer to **Chapter 6, Revised environmental management measures**.

4.8.25 Error in EIS reporting

Submission number(s)

37, 159

Issue description

- The impact on each individual property cannot be determined as the ‘operational noise result’ tables shown in Appendix G of the EIS aren’t comparable to the ‘operational noise contour’ maps
- There is an anomaly presented in the noise assessment in that properties closer to the bypass (east of Shephards Lane) seem to have lower noise impacts than properties further away.

Response

Individual property ID on maps in the EIS have been updated to three-digit labels in response to this issue. The updated maps and tables can be found in Appendix B, Updated noise and vibration assessment of the Amendment Report. Additionally, a review of property addresses has been carried out to provide further detail where possible to identify multiple receivers part of the same address by unit number (such as receivers part of the Five Islands Drive residential area).

With respect to noise impact from the project at different properties and different facades, differences in noise model results are the result of a combination of the proximity of the sensitive receiver to the road noise source, changes in topography and elevation of the receivers, and shielding from adjoining properties. The noise contour maps provide a good indication of how noise propagates across the study area. Please note that receiver buildings are shown as a two-dimensional indication of the location of each individual noise sensitive receiver. However, the noise assessment also considers the topography of the area and dwellings which may be located further away from the project but may

also be located at a higher level relative to neighbouring properties in the noise model, therefore resulting in a higher noise exposure because of a reduction in shielding.

4.8.26 Review by DPIE

Submission number(s)

12

Issue description

- Submitter requests DPIE noise specialist reviews this submission before it is provided to TfNSW, to ensure the issues raised are adequately addressed to meet the SEARs.

Response

The methodology for addressing issues raised is discussed in **Chapter 2, Submissions received**. Each submission was examined individually to identify and understand issues raised. The content of each submission was reviewed and allocated against key issue categories (such as noise and vibration) and sub-issues (such as construction noise impacts). Submissions frequently raised issues which aligned with several key issue categories. The issues in each submission were extracted and collated, enabling the grouping and summarising of similar submissions which were then responded to with an overarching response. These are documented in the Submissions Report. This means that while the exact wording of a particular submission may not be presented in the issue summary in this report, the intent of each individual issue raised is captured and responded to.

In assessing the project for approval, DPIE will review the issues summarised in this report, in conjunction with the responses prepared by TfNSW. In assessing the project for approval, DPIE would consider the adequacy of the responses and the extent to which the responses address issues raised by government agencies and community members.

4.9 Biodiversity

4.9.1 Methodology and assessment

Submission number(s)

12, 167

Issue description

- Why is Pine Brush Creek used as a fauna crossing but was not assessed as a significant biodiversity link in the EIS?
- Lindsay's cutting fauna underpass has not been shown on map as a koala corridor in Figure 3.1 of Appendix H, Biodiversity assessment report of the EIS
- Not all regional corridors and connections have been assessed, including Kororo Nature Reserve and Pine Brush Creek
- Although the lowland subtropical environment is not listed under the EPBC Act, most rainforest areas within Coffs and Korora Basin contain pockets of remnant vegetation. These pockets are significant to the local areas in terms of sources of seed for natural distribution, genetic diversity and food sources for animals
- Ancillary site footprints should be amended to avoid native vegetation with hollow bearing trees, threatened species and riparian areas.

Response

The biodiversity assessment carried out to support the EIS has been updated and documented within Appendix C, Updated biodiversity assessment report of the Amendment Report. This updated assessment incorporates and responds to proposed design changes, submissions from agency and community and ongoing consultation.

Both the biodiversity assessment included in Appendix H, Biodiversity assessment report of the EIS and Appendix C, Updated biodiversity assessment report of the Amendment Report have been prepared in accordance with the Framework for Biodiversity Assessment (FBA) (OEH 2014a).

The definition and mapping of regional corridors and connections is taken from the FBA and includes areas with specific definitions, as defined in Table 17 of the FBA. These are:

- State significant biodiversity links:
  - An area identified by the assessor as being part of a State significant biodiversity link and in a plan approved by the Chief Executive, OEH or
  - A riparian buffer 50 metre either side of a sixth order stream or higher or
  - A riparian buffer 50 metre around an important wetland or an estuarine area.
- Regionally significant biodiversity links:
  - An area identified by the assessor as being part of a regionally significant biodiversity link and in a plan approved by the Chief Executive, OEH or
  - A riparian buffer 20 metre either side of a fourth or fifth order stream or
  - A riparian buffer 30 metre around a regionally significant wetland.
- Very large area biodiversity link:

  - Links areas of native vegetation in moderate to good condition that are greater than 5000 hectares in total and
  - Width of vegetation in moderate to good condition that is connecting the area is greater than 500 metres.
- Large area biodiversity link:
  - Links areas of native vegetation in moderate to good condition that are greater than or equal to 1000 hectares and greater than or equal to 5000 hectares in total, or
  - Areas greater than 5000 hectares in total and width of vegetation in moderate to good condition that is connecting the area is greater than 100 metres and less than 500 metres.
- Local area biodiversity link:
  - Links areas of native vegetation in moderate to good condition that are greater than or equal to 250 hectares and 30 metres and greater than 1000 hectares in total, or
  - Areas greater than 1000 hectares in total and width of vegetation in moderate to good condition that is connecting the area is greater than 30 metres and less than 100 metres.

The Kororo Nature Reserve and Pine Brush Creek do not meet any of these definitions from the FBA. However, the Pine Brush Creek riparian corridor has been identified as a fauna connectivity location in both Appendix H, Biodiversity assessment report of the EIS and the Appendix C, Updated biodiversity assessment report of the Amendment Report. This is because of the presence of reasonable quality riparian vegetation and the connection to the Kororo Nature Reserve to the west and areas of native vegetation to the east. This connectivity feature is shown in Table 2.1 and Figure 3 of the Appendix C, Updated biodiversity assessment report of the Amendment Report.

The fauna underpass referred to as “Lindsay’s cutting” is a dedicated fauna underpass located to the south of Englands Road interchange at Chainage 10150 of the project. The fauna underpass has been identified as a regionally significant biodiversity link on Figure 3.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report. As a result of the amended Englands Road interchange the dedicated fauna underpass will need to be reconstructed about ten metres north of the existing fauna underpass to accommodate lowering of project carriageways. The underpass would be constructed prior to the existing underpass being demolished and would have the same dimensions as the existing fauna underpass (ie 2.8 metres high, 5.5 metres wide at the base). The new location is anticipated to improve connectivity for koalas by aligning better with the identified koala corridor.

All areas of vegetation within the study area have been mapped and assessed in accordance with the FBA to determine the locations and extent of native vegetation and fauna habitat. Vegetation has been mapped as either a plant community type (PCT) or as urban native/exotic (non-native) vegetation. As part of this assessment, about 2.37 hectares of vegetation was identified as rainforest which includes PCT 670 and PCT 1302.

- PCT 670 was recorded in the area of Mackays Road and was identified as potentially conforming to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened ecological community (TEC) Lowland Rainforest of Subtropical Australia, however the vegetation within the area does not meet the listing requirements
- PCT 1302 is listed as the TEC Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregion under the BC Act. This assessment of the PCTs within the study area takes into account the significance of the vegetation within the local area including habitat for threatened flora and fauna species.

To minimise impacts on vegetation within the study area the construction footprint has been refined and modified as part of design development to avoid as much vegetation clearing as possible. Additionally, several mitigation measures have been outlined within Appendix D, Updated threatened species management plan of the Amendment Report. These measures are not exclusively for threatened species and include mitigation measures for all flora and fauna species including habitat exclusion zones, clear demarcation of clearing limits and a range of other measures to protect flora and fauna within the vicinity of the project. Several environmental management measures have been identified in **Chapter 6, Revised environmental management measures** to minimise the impacts to biodiversity as a result of the project.

Most ancillary site boundaries have adopted the surveyed cadastral boundaries. Sites assessed in both the EIS and the Amendment Report were chosen based on several factors. These include, but are not limited to:

- Property ownership (ie TfNSW owned land preferred)
- Distance from receivers
- Not requiring vegetation clearing
- Be located more than 50 metres from a waterway (refer to Chapter 3, Construction updates of the Amendment Report for further detail).

Due to site constraints, availability of land for ancillary sites is limited. The final dimensions and uses to occur within ancillary sites will be confirmed during detailed design and construction phases. As far as practical native vegetation and hollow-bearing trees will be retained within these areas. An additional environmental management measure has been included to ensure threatened species habitat will not be cleared for the purpose of ancillary facilities. Refer to environmental management measure FF14 in **Chapter 6, Revised environmental management measures**.

4.9.2 Guidelines

Submission number(s)

12, 167

Issue description

- Office of Water guidelines have not been considered for riparian buffers regarding realignment of watercourses and aquatic habitat. Any inconsistencies with the guidelines should be addressed. Additionally, controlled activities should also apply to terrestrial works (in accordance with the guidelines), considering the spread of Singapore daisy through the Sapphire-Corindi area by previous construction activities.

Response

As discussed in **Section 3.8, Water Group, DPIE**, the project has been developed in accordance with the Guidelines for Controlled Activities on Waterfront Land – Riparian Corridors (DPI 2018).

As identified in Chapter 5, Project description of the EIS, the project crosses several waterways and the concept design has been developed to minimise potential impacts on waterways. Waterway realignment and adjustment is needed when a project crosses an existing waterway and the cross drainage requirements and nature of existing channels result in the need to realign or adjust the waterway to maintain drainage and flow characteristics. In addition to the realignment or adjustment, scour protection may extend into the waterway channels to ensure bridges and banks are protected from potential stability and scour risks.

As identified in Section 10.4 of the EIS, protection and enhancement of vegetated riparian zones will be carried out to improve opportunities for fauna movement and aquatic habitat will be protected in accordance with mitigation measures of the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 (DPI 2013) and with reference To Guidelines For Controlled Activities On Waterfront Land – Riparian Corridors (DPI 2018). These requirements have been captured in environmental management measure FF05 and FF24 respectively (see **Chapter 6, Revised environmental management measures**).

The detailed design of any required waterway realignments and/or adjustments will be developed in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 (DPI 2013) and Guidelines for Instream Works on Waterfront Land (DPI 2012), including the Guidelines For Riparian Corridors On Waterfront Land. Detailed design of waterway realignments and adjustments will be developed in consultation with Regions, Industry, Agriculture and Resources Group (RIARG), DPIE.

These requirements from the Guidelines for Controlled Activities on Waterfront Land – Riparian Corridors (DPI 2018) are captured in environmental management measure FF03, FF05 and FH04 in **Chapter 6, Revised environmental management measures**. These management measures relate to the retention and restoration of appropriate riparian buffers. These include measures to retain existing riparian vegetation where possible, the use of soft engineering solutions like landscape treatments to provide scour protection and where possible enhance the condition of riparian vegetation to maintain or improve hydrological and ecological functions of these corridors. These management measures have been proposed to maintain riparian buffers.

As identified in environmental management measure FF21, weed species, including Singapore daisy will be managed in accordance with Guide 6: Weed management of The Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a) and Guide 7: Pathogen Management (RTA 2011a), refer to **Chapter 6, Revised environmental management measures**.

4.9.3 Field survey results

Submission number(s)

12, 167

Issue description

- Absence of forest owls including powerful owl and barking owl, or gliders recorded within survey results raises questions as to the accuracy of the March 2016 field surveys
- Data collection for aquatic and threatened species was conducted in May and October. Coffs Harbour has a dry spring season. There is concern that streams and groundwater springs on Bruxner Park Road ridgeline have not been captured due to the timing of the survey
- The EIS findings are questionable that the TEC Lowland Rainforest of Subtropical Australia, listed under the EPBC Act does not occur in the study area. It is extremely unlikely that there are 20 woody weed species in the area. The vegetation species list from the survey should be provided as evidence.

Response

The powerful owl *Ninox strenua*, barking owl *Ninox connivens*, masked owl *Tyto novaehollandiae*, sooty owl *Tyto tenebricosa*, squirrel glider *Petaurus norfolcensis* and yellow-bellied glider *Petaurus australis* were identified as candidate threatened fauna species that required targeted surveys. Threatened fauna surveys were conducted for the target species across nine separate field campaigns during spring 2016, March 2017, winter 2017, spring/summer 2017-2018 and autumn 2018. All terrestrial and aquatic field surveys were carried out in accordance with the relevant

methods as defined by the NSW Government guidelines. Survey effort and seasonality considerations were taken into consideration when designing the field survey method.

Two survey methods specifically targeted owl species including nocturnal spotlight surveys and nocturnal call playbacks. Nocturnal spotlight surveys were carried out over 140 person hours across 27 sites and nocturnal call playback was carried out across 16 call playback sites over 21 hours. These surveys were carried out in November 2016, March 2017 and additional spotlight in May 2018.

Glider species were surveyed for using the nocturnal spotlight survey and nocturnal call playback as discussed for the owl species, as well as arboreal elliott B trapping. Arboreal elliott B trapping was carried out across 240 trap nights over six sites in November 2016.

These surveys were carried out in accordance with the Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004) and are considered to be adequate for the detection of owl and glider species. The fauna survey effort is shown on Figure 8.1 to Figure 8.7 of Appendix C, Updated biodiversity assessment report of the Amendment Report. Further detail on terrestrial fauna surveys is in Section 4.2.2 of Appendix C, Updated biodiversity assessment report of the Amendment Report.

The aquatic surveys took place over four days in September 2016 and five days in May 2018 and were timed to represent a post-wet season (May) and dry season periods. Conditions during both seasons were considered nominal for the aquatic systems within the study area and suitable to address potential impacts from the project. All major or moderate class waterways were holding water at the time of the survey and only one highly modified unnamed ephemeral stream, site 3.2 in North Boambee Valley was dry at the time of survey. The level of assessment is considered adequate to address the aims of the survey and represent the aquatic ecological values associated with waterways within the construction footprint.

For a lowland rainforest community to meet the definition of the Lowland Rainforest of Subtropical Australia TEC under the EPBC Act, it must meet the listing requirements for key diagnostic characteristics and condition class requirements defined in the listing advice prepared by the Department of Agriculture, Water and Environment (DAWE) (Commonwealth of Australia 2011).

Across the study area there were four patches of lowland rainforest PCTs that were subject to flora surveys, including vegetation plots to measure floristics, structure and condition. Although it is confirmed that these areas are rainforest PCTs, the patches of lowland rainforest assessed did not meet the required criteria for canopy cover or native species richness, as defined in the listing advice. Full floristic surveys were undertaken in November 2016, April 2017, April 2018 and January 2020. These surveys were undertaken in accordance with the FBA (OEH 2014a).

Under the listing advice, for patches that are between 0.1 and one hectares in size, species richness must be equal to or over 40 woody species listed in Appendix A of the listing advice, and for patches between one and two hectares the species richness is more than or equal to 30 woody species listed in Appendix A of the listing advice. The emergent/canopy/subcanopy cover must be more than or equal to 70 per cent. **Table 4.9-1** summarises the native woody species richness and canopy cover to show where they do not meet the key diagnostic criteria for the EPBC Act listed Lowland Rainforest of Subtropical Australia TEC.

Table 4.9-1 Key diagnostic criteria for the EPBC Act listed Lowland Rainforest of Subtropical Australia TEC

Patch location	Size (ha)	Number of woody species from Appendix A of listing advice	Canopy cover (projective foliage cover)
Isolated patch at Treefern Creek	0.69	20 woody species recorded (24 total species listed in Appendix A recorded)	54%
Isolated patch at Bruxner Park Road	0.20	21 woody species recorded (24 total species listed in Appendix A recorded)	44%
Riparian patch at Coramba Road	0.99	11 woody species recorded (13 total species listed in Appendix A recorded)	79%
Single isolated patch north of Mackays Road	0.49	14 woody species recorded (17 total species listed in Appendix A recorded)	30%

4.9.4 Disruption and impacts to flora and fauna

Submission number(s)

12, 49, 54, 67, 161, 167, 169, 180

Issue description

- Concerned unique natural attributes of the region including biodiversity and microclimate will be destroyed by the project
- Concerned about remnant bushland and fauna surviving the severance and construction of the project. Particularly, concerned about the successful relocation of animals such as koalas
- General concerns about the disruption and impacts to native flora and fauna
- The project impacts on the only remaining remnant bushland in Coffs Harbour, which is home to an array of flora and fauna
- Due to the project, mutton birds (ie wedge-tailed shearwaters) will be impacted, especially young birds becoming disorientated by headlights
- Although great care is taken, animals are wounded or killed in the process of constructing a highway
- Ongoing roadkill monitoring needs to be reviewed, as planting of non-suitable species resulted in the death of around 50 fruit bats in the past month on the Sapphire to Woolgoolga section of the Pacific Highway
- Clearing of habitat in Newports Creek will heavily disturb fauna in the area.

Response

The biodiversity assessment for the project addresses the SEARs for the project and biodiversity impacts have been assessed through implementation of the FBA (OEH 2014a) and with reference to the NSW Biodiversity Offsets Policy for Major Projects (OEH 2014b). The impacts to biodiversity have

been informed by rigorous field investigations to understand the existing conditions, species and habitats across the study area. Appendix H, Biodiversity assessment report of the EIS and Appendix C, Updated biodiversity assessment report of the Amendment Report has followed the 'avoid, minimise and offset' hierarchy to address impacts to biodiversity.

As outlined in Chapter 10, Biodiversity of the EIS, project design and development has been sympathetic to biodiversity constraints and high priority areas for avoidance and minimisation of impacts have been identified. There is further scope for flexibility and refinement at the detailed design stage, allowing for further avoidance and/or minimisation of impacts on biodiversity values.

Appendix C, Updated biodiversity assessment report of the Amendment Report and Appendix D, Updated threatened species management plan of the Amendment Report outline design, construction and post-construction mitigation measures to minimise potential impacts to biodiversity. These include measures to address indirect impacts to adjacent, retained habitats such as fauna exclusion fencing and dust, noise and light management. The management of these impacts will also be subject to monitoring and corrective actions applied during construction.

Several environmental management measures outlined in the EIS aim to minimise impacts to native flora and fauna. These measures have been revised since exhibition of the EIS and are provided in **Chapter 6, Revised environmental management measures**, including:

- Impacts associated with the removal of threatened fauna habitat are addressed through environmental management measures FF03, FF05 and FF14. These measures provide for the protection and enhancement of areas of native vegetation and fauna habitat by minimising impacts through the detailed design phase, where reasonable and feasible. Particular focus will be given to avoiding and minimising the removal of hollow bearing trees, native vegetation in riparian zones and native vegetation from known fauna connectivity corridors and near proposed fauna crossing structures. Environmental management measure FF14 provides for additional controls associated with temporary impacts to threatened fauna habitat associated with ancillary sites, with a commitment made to not clear associated habitats in these areas
- Measures to manage and minimise impacts to native vegetation will be implemented in accordance with FF09, which states that the limits of clearing within the construction footprint will be delineated using appropriate signage and barriers, identified on site construction drawings and communicated to construction staff during induction
- FF15 states that fauna connectivity structures will be designed and constructed to facilitate safe fauna passage across the project in accordance with the locations and design principles detailed in Appendix C, Updated biodiversity assessment report of the Amendment Report
- Environmental management measure FF19 states that any fauna encountered during construction will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a)
- Indirect impacts associated with weeds, noise, light and vibration to adjacent and retained areas of flora and fauna habitats will be managed in accordance with environmental management measures FF21, FF22 and FF23. These measures require the implementation of Guide 6: Weed management of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a) and Guide 7: Pathogen Management (RTA 2011a) during construction activities. Specific protocols will be prepared and implemented to manage, Chytrid fungus, Phytophthora and Myrtle Rust. Noise, light and vibration impacts will be managed through the detailed design phase to minimise light and noise spill into adjacent habitats

- Impacts to aquatic habitat and changed hydrological regimes are addressed in environmental management measures FF24, FF25, FF26, FF27, FF28 and FF29. These measures require the protection of adjacent aquatic habitats and riparian vegetation communities through the detailed design and construction phases. Environmental management measure FH04 states that the detailed design of waterway realignments and adjustments will consider the retention of existing riparian vegetation where possible, including retention of tree stumps where trees are removed.

Fauna connectivity measures to reduce the impacts associated with habitat fragmentation and to maintain landscape connectivity to the east and west of the project are outlined in Appendix D, Updated threatened species management plan of the Amendment Report. The measures include identifying target species movement requirements, locations for fauna connectivity structures and developing design criteria that the structures would need to meet. Sixteen locations have been identified along the 14 kilometre alignment where connectivity structures can be placed to meet the required mitigation measures to minimise the impacts of fragmentation.

Fauna connectivity structures include retained ridgelines over tunnels, dedicated fauna underpasses, waterway bridge crossings, road and rail bridges incorporating fauna underpasses, combined fauna and drainage underpasses and glider poles. These structures and the road corridor would be designed to include fauna fencing, as specified in environmental management measure FF16 in **Chapter 6, Revised environmental management measures**, to encourage movement of all fauna species towards the structures and exclude native fauna from the road infrastructure. Revegetation works within the indicative road corridor would also be undertaken to connect entry/exit points of the connectivity structures to retained native vegetation and ecological corridors on either side of the alignment, where reasonable and feasible. These connectivity structures would be to assist all fauna and not just targeted threatened species. Further detail on the fauna connectivity strategy is located in the Appendix I, Threatened species management plan of the EIS and updated in Appendix D, Updated threatened species management plan of the Amendment Report.

Appendix C, Updated biodiversity assessment report of the Amendment Report identifies potential indirect impacts on wedge-tailed shearwaters associated with light pollution. Although the addition of lights may pose a potential indirect impact to the species over time, because of the closer proximity of Coffs Harbour CBD to Muttonbird Island Nature Reserve and the significantly greater volume of artificial light production, the impact to wedge-tailed shearwaters because of the light pollution caused by the project is considered negligible. Notwithstanding, future design phases will also consider lighting design to minimise upward light spill from the project as described in environmental management measure FF22.

Appendix D, Updated threatened species management plan of the Amendment Report provides construction phase mitigation measures to minimise impacts to fauna during clearing and construction works. These measures will include:

- **Construction induction and training:** Induction and training will be conducted with all contractors and other staff that will be working in the area of known and potential threatened flora and fauna habitat. This training will highlight to staff the threatened species and their habitats to allow them to clearly identify them on site should they be located
- **Fauna rehabilitation protocol:** The Project Ecologist will be present on site to capture and relocate any fauna species that may be encountered. The trapping and relocating of fauna will be carried out in accordance with Guide 9: Fauna Handling of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a) and the NSW Code of Practice for Injured, Sick of Orphaned Protected Fauna (OEH 2011a)

- **Pre-clearing surveys:** Pre-clearing surveys will be carried out before the commencement of clearing operations to identify habitat features, such as hollows and nests, and to identify and delineate exclusion zones
- **Clearing procedures:** Clearing of vegetation and habitat features will be done in a two-stage process following the completion of the pre-clearance surveys. Under scrubbing, the removal of non-habitat trees would be done first. Habitat trees are to be removed at least 48 hours after the removal of non-habitat trees. Any habitat features, including hollows, large woody debris and bushrock are to be salvaged and stockpiled during construction for later use for habitat restoration activities
- **Temporary fencing and fauna management:** Installation of temporary fauna fencing will be required if existing fauna fencing at the southern end of the project on the Pacific Highway is removed during construction
- **Koala specific management measures:** Additional mitigation measures for koalas will be implemented during construction phase and are outlined in Section 6.3.7 of Appendix D, Updated threatened species management plan of the Amendment Report, with further detail provided in the response in **Section 4.9.5** below.

As outlined in Appendix D, Updated threatened species management plan of the Amendment Report, roadside surveys will be carried out twice a year along the alignment of the project to identify and record roadkill during the first three years following opening of the project. Surveys for incidental road kill information will be collected from TfNSW road maintenance crews. This will allow further analysis of areas outside the fenced sections of the project and allow a review of fencing or connectivity structures. Further, collection of road kill reports from CHCC and wildlife care organisations (such as WIRES) where available will be used in the monitoring program to aid in identifying any further sections of the road regularly attributable to threatened mammal road mortalities.

The planting of fruit and nectar providing plants that led to the deaths of fruit bats on the Sapphire to Woolgoolga section of the Pacific Highway, was a result of the noise wall blocking their flight trajectory and causing fruit bats to fly into traffic. These plants have since been removed. For this project, a concept design landscaping plan has been developed as part of Appendix J, Urban design, landscape character and visual impact assessment of the EIS and updated in Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report. This landscaping plan includes plant mixes and locations. To address the issue reported on the Sapphire to Woolgoolga section of the Pacific Highway, fruit and nectar providing plants will not be planted between noise walls and the edge of the highway. As identified in environmental management measure UD01, an Urban Design and Landscape Plan (UDLP) which will be prepared to support the detailed design of the project and will include proposed landscaped areas, including species to be used (refer to **Chapter 6, Revised environmental management measures**).

The design of bridge crossings at Newports Creek will assist with providing long-term retention of fauna habitat and connectivity functions in this area. As identified in environmental management measure FF03, native vegetation and fauna habitat removal will be minimised through detailed design where reasonable and feasible. Particular focus will be given to avoiding and minimising the removal of hollow bearing trees, native vegetation in riparian zones and native vegetation from known fauna connectivity corridors and near proposed fauna crossing structures. This management measure is outlined in **Chapter 6, Revised environmental management measures.**

Additional environmental management measures will be implemented to minimise impact to giant barred frog including, bridging areas of known habitat at Newports Creek and its southern tributary,

pre-clearance surveys prior to earthworks, and installation of frog proof fences in areas of known and potential habitat.

While some vegetation, including the trees along Newports Creek is required to be removed, the majority of the vegetation in the area has been avoided. The remaining vegetation will still function as a fauna corridor and several environmental management measures have been proposed to minimise the impacts, including FF03 as described above.

4.9.5 Impacts to koala

Submission number(s)

12, 67, 135, 161, 167, 169

Issue description

- Concerned about the low success rate of koala relocation
- Impacts on koalas will be significant due to destruction of habitat and koala corridors
- There should be more mitigation to facilitate koala movement using the bypass corridor, such as planting of koala food trees along the corridor and position fauna fences as close as possible to the road to maximise space for fauna corridors
- How will the koala corridor to the east of the project, bordering the Elements Estate development, be affected by the project?
- Connectivity measures outlined do not address some areas of high koala movement.

Response

The relocation of koalas, or any fauna species, prior to clearing being carried out is not proposed as part of the project as a mitigation measure to translocate populations of fauna. The only relocation that may occur will be completed immediately prior to or during clearing activities to mitigate injury associated with these works. In accordance with environmental management measure FF19, any fauna encountered during construction will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a).

As described in the response to the CHCC submission in **Section 3.1.12**, extensive work has been carried out to assess the impact of the project on koalas and koala habitat. Threatened fauna surveys were conducted for the candidate fauna species across several separate field campaigns during winter (August) 2016, spring (October and November) 2016, autumn (March 2017), spring (November) 2017, summer (January and February) 2018 and autumn (May) 2018. The surveys were undertaken in accordance with relevant State and Australian government guidelines.

For the koala, targeted surveys were completed using nocturnal spotlighting, nocturnal call playback and the spot assessment technique (SAT) to assess koala activity levels within the construction footprint. The nocturnal spotlight survey was carried out in accordance with the Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004), which states a minimum effort of one hour and one km on two occasions up to 200 hectares of stratification unit, walking at about one km per hour on two separate nights. Spotlighting was carried out by two observers using a 50-100 Watt head or hand-held torches. Spotlighting was completed across 27 sites and totalled 140 person hours.

The nocturnal call playback was carried out in accordance with the Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004), which states that two sites per stratification unit up to 200 hectares, additional site per 100 hectares above the initial 200 hectares. Each site must have the session conducted twice on separate nights. Calls of gliders, koala and owls were played during

standard call playback sessions including an initial 10 minute listening, five minutes of playing a species call followed by five minute listening period. Nocturnal call playback was completed across 16 sites and totalled 21 hours.

The EPBC Act Referral Guidelines for the Vulnerable Koala (Commonwealth of Australia 2014) were followed using the SAT technique outlined in Phillips and Callaghan (2011). Each koala SAT survey included a koala scat search within one metre around the base of thirty trees greater than 10 centimetres in diameter at breast height (Phillips and Callaghan 2011). A total of 38 SATs were completed, including additional SATs carried out in the wider landscape to assess koala activity to the east and west of the construction footprint. Refer to Figure 8 of Appendix C, Updated biodiversity assessment report of the Amendment Report for the field survey effort including locations of koala SATs, spotlighting and call playback.

The results of the koala SAT survey indicated that koala activity was generally found to be low, with only two of the 38 surveys recording a medium or high level of activity. Additionally, only nine of the 38 SAT surveys recorded any koala activity. Despite this, the study area is known to support areas of potential koala habitat and suitability for the species was confirmed within the construction footprint.

The habitat mapping and koala corridor presented in Appendix H, Biodiversity assessment report of the EIS and updated in Appendix C, Updated biodiversity assessment report of the Amendment Report was prepared based on detailed vegetation mapping and habitat assessments across the project construction footprint and surrounding landscape. Koala corridors, locations of koala SAT surveys and koala records within the study area are shown on Figure 10 and koala habitat polygons are shown on Figure 11 of Appendix C, Updated biodiversity assessment report of the Amendment Report.

As a result, several environmental management measures targeting threatened fauna are proposed in **Chapter 6, Revised environmental management measures** of this report. These include:

- Environmental management measure FF02, includes preparation of a Flora and Fauna Management Plan (FFMP) to be implemented as part of the Construction Environmental Management Plan. The FFMP will build upon the strategies outlined in the Threatened Species Management Plan (TSMP) and identify detailed site-specific and species-specific mitigation measures and management protocols to be implemented before, during and after all construction activities to further avoid or reduce impacts on threatened biodiversity. This plan will include specific measures for managing impacts to koalas, including contractor inductions, pre-clearing surveys, provisions to allow koalas to move on of their own accord and relocation to adjacent areas of habitat as a last resort
- FF15: Fauna connectivity structures will be designed and constructed to facilitate safe fauna passage across the project in accordance with the locations and design principles detailed in Appendix C, Updated biodiversity assessment report of the Amendment Report
- FF16: Permanent fauna fencing, including specific fencing for the koala will be progressively installed as fauna connectivity structures become operational in consultation with a suitably qualified and experienced ecologist.

In addition, several mitigation measures have been outlined in Appendix D, Updated threatened species management plan of the Amendment Report that target koala. The TSMP outlines pre-construction and design management measures, construction management measures and operational management measures that will be incorporated to avoid and minimise the impacts to koala. Pre-construction management measures include permanent fauna connectivity structures, 15

of which specifically target the koala, and permanent fauna exclusion fencing including specific koala fencing. Construction management measures include koala specific management measures such as:

- Induction training all contractors and project staff working in areas of known and potential koala habitat in the project area. This training will identify areas of koala habitat, crossing zones and key threats to the species. The importance of following the clearing and rehabilitation protocols will be made clear to all project personnel
- Pre-clearing surveys undertaken by an ecologist to include daylight canopy search surveys of the scheduled clearing area prior to vegetation clearing (i.e. early in the morning prior to the commencement of vegetation clearing activities) to identify trees in which a koala is present and any adjacent trees with overlapping crowns
- Suspension of clearing works if a koala is found during clearing operations to allow the animal to move out of the construction site on its own volition. In the event that a koala remains in the clearing site for more than 48 hours, it will be captured and relocated by the Project Ecologist to the nearest area of habitat identified as suitable for koala release and where the individual is at no risk of further harm
- Each tree identified as being a risk to a koala if felled, will not be felled, damaged or interfered with until the koala has moved from the clearing site. Koalas will only be physically moved if necessary in accordance with Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011)
- If any koalas are observed showing signed of disease, WIRES must be contacted and direction taken from a wildlife carer on any actions to salvage the animal.

Habitat restoration and landscape design will be carried out in accordance with the UDLP for the project (refer to environmental management measure UD01 in **Chapter 6, Revised environmental management measures**). This will include the provision of replacement foraging resources for target threatened fauna, including plants that provide copious nectar and fruits in locations that will not lead to an increased risk of roadkill, where appropriate and targeting areas that are located within or nearby:

- Regional and local biodiversity links/fauna corridors
- Areas adjacent to existing threatened flora and fauna habitats and riparian zones
- CHCC mapped koala habitat and environmental protection zones.

Operational management measures include a monitoring program to determine the effectiveness of mitigation measures and inform further actions for adaptive management. Monitoring will be carried out at Gatelys Road and Roberts Hill ridgelines as well as at seven fauna connectivity structures along the project. A range of monitoring methods will be used at each of monitoring points. Refer to Section 8 of Appendix D, Updated threatened species management plan of the Amendment Report for further detail on the monitoring program. Monitoring methods have been proposed that are suitable for the detection of koalas, including the use of transect monitoring and SAT surveys to assess koala activity levels.

Significant efforts have been taken by TfNSW to first understand the potential impacts of the project on threatened species, including koala, and then avoid and minimise the potential impacts. There may be further opportunity to lessen the impact to koala habitat during detailed design.

The koala habitat identified to the east of the project, bordering Elements Estate has been mapped as a koala corridor in Figure 10 of Appendix H, Biodiversity assessment report of the EIS and in

Appendix C, Updated biodiversity assessment report of the Amendment Report. As a result of the proposed design changes at Englands Road interchange, the existing fauna underpass would be removed and replaced with a new fauna underpass 10 metres north of the existing underpass. The new fauna crossing would be built before the existing underpass is removed. The underpass dimensions will match the existing dimensions, which are 2.8 metres high and 5.5 metres wide at the base. The underpass will be about 80 metres long. This underpass will specifically target koalas.

4.9.6 Clearing of vegetation

Submission number(s)

12, 41, 48, 64, 167

Issue description

- The amount of clearing proposed is significant. Clearing should be minimised to that absolutely necessary
- Concerned for loss of wildlife habitat and scope of preventative mitigation measures
- Concerns that old growth remnant rainforest will be cleared for the Korora Hill interchange. This small area has trees of significant age and deserves protection as the last remnant trees of this type within Korora
- How is it possible for TfNSW to clear environmental protection land (specifically 7A zoned land in West Korora Valley) when landholders would be fined? This protected area is important habitat for koalas and birds.

Response

The construction footprint defines the likely extent of the area required for construction and operation of the project. This includes the area required for all work such as temporary and permanent drainage structures, permanent waterway realignments, ancillary facilities and access roads.

The construction footprint has been refined and selected based on a staged approach of route selection and alignment revision throughout the Coffs Harbour Highway Planning Strategy (CHHPS) (RTA 2001a), through to the refinement of the concept design as part of the current phase of the project. Chapter 4, Project development and alternatives of the EIS provides a summary of option development and identifies alternatives considered during the CHHPS and initial corridor identification. The initial phase of the CHHPS included identification and assessment of corridor options for the future upgrading of the Pacific Highway that were spread across the Coffs Harbour LGA. Four alignment options were considered for the project. The Far Western, Outer and Central corridors were severely constrained in terms of known and potential habitat for threatened species and severance of numerous wildlife corridors. By contrast, the Inner Corridor had a relatively low impact on biodiversity as it passed through largely cleared lands and any adverse effects on wildlife corridor were anticipated to be mitigated.

Since announcement of the preferred option for the project, measures to avoid and minimise these impacts have been fully explored throughout the development of the concept design and EIS preparation and will continue to be revisited as the design progresses to detailed design. Project design and development of the project assessed in the EIS has been iterative with biodiversity constraints being communicated to the design team including identification of high priority areas for avoidance and minimisation of impacts. Refer to Chapter 10, Biodiversity of the EIS for further detail.

The construction footprint for the project, typically incorporates a 15 metre buffer from the edge of the design extent and any proposed ancillary facilities. The construction footprint is the area proposed to

be impacted, cleared and/or disturbed during construction. The 15 metre buffer either side of the design extents would account for indirect impacts to retained habitats, native vegetation and other biodiversity values.

The construction footprint has been established to minimise vegetation clearing while providing sufficient room to allow the project to be constructed in a safe and efficient manner. The construction footprint would be subject to refinement during detailed design and construction. Some factors that could affect the final construction footprint include the location and size of sedimentation basins, the construction methodology and arrangements made with directly affected landowners. This approach is consistent with other Pacific Highway upgrade projects and TfNSW projects in general.

A Biodiversity Offset Strategy (BOS) has been prepared and is included as Appendix C of Appendix C, Updated biodiversity assessment report of the Amendment Report, and includes a calculation of offset credits based on this broad construction footprint.

Additionally, TfNSW has committed to minimising the clearing required for the project where reasonable and feasible including at interchanges such as the Korora Hill interchange. As identified in environmental management measure FF03 and FF14, native vegetation and fauna habitat removal will be minimised through detailed design where reasonable and feasible. Environmental management measure FF14 provides for specific protection of native vegetation providing habitat for threatened fauna in ancillary sites. Particular focus will also be given to avoiding and minimising the removal of hollow bearing trees, native vegetation in riparian zones and native vegetation from known fauna connectivity corridors and near proposed fauna crossing structures. These management measures are outlined in **Chapter 6, Revised environmental management measures**

The Korora Hill interchange has been amended as part of the proposed design changes outlined in Chapter 2, Design changes of the Amendment Report. Appendix C, Updated biodiversity assessment report of the Amendment Report outlines the plant community types that will be impacted by the project. Figure 4.6 of Appendix C, Updated biodiversity assessment report of the Amendment Report shows the PCTs that would be impacted at the Korora Hill interchange. As outlined, vegetation clearing has been avoided and minimised where possible, however where impacts cannot be avoided a biodiversity offset is proposed.

TfNSW is required to assess the impacts of the project under the EP&A Act. Wherever possible, impacts have been avoided through the process described in the above response. Where there are impacts, mitigation measures have been proposed to lessen the impacts. The impacts to land zoning, including land zoned as environmental conservation are discussed in Chapter 12, Land use and property of the EIS. Where there are impacts to native flora and fauna that cannot be mitigated, biodiversity offsets are proposed for the residual impacts. Additionally, the assessment of the project as critical State significant infrastructure is under a different planning pathway to Part 4 developments that would need to consider Coffs Harbour LEP requirements.

4.9.7 Fauna connectivity

Submission number(s)

135

Issue description

- Proposed mitigation will be ineffective as the proposed wildlife crossing corridors cannot link back into remnant bushland as it will be destroyed.

Response

Chapter 10, Biodiversity of the EIS identifies that fragmentation of habitats is a considered risk to local biodiversity values that may result from the project. This impact has been mitigated through several design and construction phase mitigation measures, including a fauna connectivity strategy, retention of native vegetation where possible and commitments to use native revegetation within the road corridor as part of the landscaping strategy.

The fauna connectivity strategy is described in detail in Appendix D, Updated threatened species management plan of the Amendment Report. It includes identification of fauna movement corridors across the landscape and locations for crossing structures. The strategy has taken into account the existing fauna movement corridors across the project area, which were identified from the following desktop sources, detailed in Section 2.2.2 and Figure 3 of Appendix C, Updated biodiversity assessment report of the Amendment Report:

- One 'regionally significant biodiversity link' in the form of fifth order waterway riparian buffer zone associated with Newports Creek
- Seven 'regionally significant biodiversity links' identified as separate sub-regional corridors, all forming part of the 'Coffs Harbour Koala links', in the Northern Rivers Regional Biodiversity Management Plan (DECCW 2010)
- Several 'local area biodiversity links', including:
    - Riparian vegetation associated with Jordans Creek and tributaries which connect vegetation of the coastal plain with that of the escarpment in the north of the study area
    - Vegetation running south east from Shephards Lane and following the North Coast Railway
    - Vegetation connecting vegetation of the escarpment foothills along Roberts Hill to vegetation of the coastal plain of North Boambee Valley
    - Riparian vegetation of Newports Creek in the North Boambee Valley.

The results of the desktop assessment of potential fauna corridors, was complemented by the field surveys carried out as part of the EIS to define fauna corridors that cross the project area. During the design process opportunities to provide fauna connectivity structures have been identified. These are described in Section 5.3.1 of Appendix D, Updated threatened species management plan of the Amendment Report and include a wide range of structure types, including:

- Retained ridgelines over tunnels
- Dedicated fauna underpasses (culverts)
- Combined waterway bridges incorporating fauna underpasses
- Combined road bridges incorporating fauna underpasses
- Combined rail bridge incorporating fauna underpasses
- Combined fauna and drainage underpasses (culverts)
- Glider poles.

These structures have been proposed based on the requirements of the target species, the alignment and condition of fauna corridors and the design and topographic constraints of the project. Sixteen locations have been identified along the 14 kilometre alignment where connectivity structures can be placed, as identified in Table 6 and shown in Figure 5 of Appendix D, Updated threatened species management plan of the Amendment Report.

The location and final details of these structures will be subject to detailed design, however specifications to inform the design of each structure type have been defined in Table 7 to Table 12 of Appendix D, Updated threatened species management plan of the Amendment Report. These design specifications have been developed with reference to previous Pacific Highway upgrade projects, incorporating lessons learnt from previous monitoring of installed structures.

In addition to threatened terrestrial species known to be impacted by habitat fragmentation as a result of the project, requirements for fish passage have also been considered during the design development. In accordance with the RIARG, DPIE guidelines, fish passage will be required on all Class 1, 2 and 3 waterways. This will include bridge crossings over Pine Brush Creek, which is the only Class 1 waterway assessed within the study area. Where culverts are proposed on Class 2 and 3 waterways, fish passage elements will be included in the design.

During detailed design, TfNSW will investigate opportunities to carry out revegetation works adjacent the ridgelines on land within the indicative road corridor. Any revegetation works of Roberts Hill, Shephards Lane and Gatelys Road ridgelines needs to balance existing land uses and property ownership. Existing agricultural land will remain as agricultural land and some ridges have easements for utilities or property access. As such, fauna movement across these ridges will be maintained based on current conditions supplemented by any opportunities to carry out revegetation works adjacent to the ridgelines on land within the indicative road corridor.

TfNSW will consult with CHCC regarding the proposed revegetation works in these areas as part of the development of UDLP.

Submission number(s)

12, 167

Issue description

- Recommendation for an additional location for a fauna crossing in the vicinity of Spagnolos Road
- Bridges and culverts need to be supplemented by rope and poles for arboreal animals.

Response

This issue has also been raised by CHCC and as part of the amended design several opportunities to include a fauna underpass in the vicinity of Spagnolos Road have been investigated. The amended design does not include a road underpass west of Spagnolos Road and options were considered to provide an alternative structure for fauna connectivity in this location. However, constraints associated with topography, design levels and hydrology have made designing a functional fauna underpass in this location challenging.

The current design for flood mitigation at this location requires a reduced culvert opening to manage afflux in residential areas downstream of the Spagnolos Road detention basin. The design includes three 1.5 metre diameter pipe culverts that extend for about 130 metres. Flood modelling of increases in the cross-sectional area of the culverts in this location indicates there would be afflux on properties downstream.

The design considered alternative options to co-locate a fauna crossing in this location, however the dimensions of the crossing would be too small for koalas, especially given the likely 130 metre length of the underpass. Due to requirements to limit the opening of the culvert in this section, to manage flood impacts, it was not possible to increase the culvert width and height to make the opening more favourable to koalas.

Notwithstanding the above, TfNSW will continue to investigate strategies to manage fauna connectivity issues associated with design at this location during detailed design.

As per LUP03 in Chapter 26, Summary of environmental management measures of the EIS and **Chapter 6, Revised environmental management measures** ancillary sites will be rehabilitated to their pre-construction condition (where reasonable and feasible) and managed in accordance with Appendix B of Appendix J, Urban design, landscape character and visual impact assessment of the EIS.

A fauna connectivity strategy was developed for the project as part of the EIS and has been updated for the Amendment Report. Design principles for each of the fauna connectivity structures is also outlined within Appendix D, Updated threatened species management plan of the Amendment Report. Following the design principles, fauna furniture and resting poles will be incorporated into dedicated fauna underpasses and combined fauna and drainage underpasses. Waterway bridges incorporating fauna underpasses are not proposed to include fauna furniture and resting poles.

There is limited evidence to suggest that ropes or raised ledges placed through underpass structures are used by arboreal mammals, with a lack of peer reviewed studies proving their effectiveness. The placement of ropes through culverts will also have substantial maintenance issues associated with potential blockages of drainage structures. Provision for glider poles has been included at a location assessed as having a high historical glider usage towards the southern end of the project. These have been provided despite the targeted field investigations described in Appendix C, Updated biodiversity assessment report of the Amendment Report not recording any gliders.

4.9.8 Monitoring of fauna connectivity structures

Submission number(s)

48

Issue description

- After construction, monitoring of fauna movement is important. To achieve this, rotating cameras should be mounted to fauna crossings to record movement throughout the day and night
- Specific information is required relating to:
    - What fauna species will use fauna crossings
    - How will TfNSW know what fauna species will use these crossings?

Response

Appendix D, Updated threatened species management plan of the Amendment Report outlines a monitoring program to determine the effectiveness of mitigation measures and inform further actions for adaptive management. The success of mitigation measures will be evaluated against performance indicators and corrective management actions or contingency plans will be applied where poor performance or failing measures are detected.

The objectives of the monitoring program for fauna connectivity structures are to ensure fauna crossing structures are effective at facilitating the movements of target species and to identify structure usage by exotic predators. Monitoring of selected structures will commence during the first high detection season for the target species following construction completion and will be carried out biannually (twice a year) for the target species on the third and fifth years following construction.

Monitoring at Gatelys Road and Roberts Hill ridgelines will likely include the following systems:

- Motion-detecting cameras with infrared flash installed within suitable fauna movement corridors on the ridgelines

- Observational audio and visual bird census, spotlighting and active searches during intensive monitoring periods
- Scat searches to be conducted when checking hair tube and camera traps
- Transect monitoring/SAT surveys undertaken within adjacent habitat on both sides of the tunnels.

Underpass monitoring will be carried out at the following representative underpass structures along the project alignment:

- Chainage 11650 - Bridge crossing across unnamed tributary of Newports Creek
- Chainage 12000 - Bridge crossing Newports Creek
- Chainage 12800 - Dedicated fauna underpass
- Chainage 16600 - Bridge crossing over North Coast Rail Line
- Chainage 17800 - Combined road bridge incorporating fauna underpass
- Chainage 20150 - Culvert crossing across tributary of Jordans Creek
- Chainage 22450 - Bridge underpass under Pine Brush Creek.

The monitoring of the underpass structures will likely include:

- Motion-detecting cameras with infrared flash installed at either end of the structures. Cameras will operate continuously for a period of eight weeks during autumn/winter and eight weeks during summer
- Observational audio and visual frog census, spotlighting and active searches during intensive monitoring periods
- Scat searches within crossing structures including five metres from the entrance
- Transect monitoring/SAT surveys carried out within adjacent habitat on both sides of the structures.

Performance indicators and corrective actions for fauna connectivity structures are described in Section 8.1.3 of Appendix D, Updated threatened species management plan of the Amendment Report. If during operation, target threatened mammals are found to be unable or unwilling to use designated fauna crossing structures, it would be assumed as a mitigation fail. Should this be identified, other provisional options and contingencies will be developed and implemented where research and/or monitoring identifies that additional or alternative measures are required.

The fauna connectivity structures that are proposed for the project are outlined in Table 6 of Appendix D, Updated threatened species management plan of the Amendment Report. This table outlines the site number, the design chainage, the connectivity structure type and a description, indicative dimensions and target species of the structures. The following fauna species are specifically listed as target species for the fauna connectivity structures:

- Koala *Phascolarctos cinereus*
- Spotted-tail quoll *Dasyurus maculatus maculatus*
- Common planigale *Planigale maculata*
- Giant barred frog *Mixophyes iterates*
- Pale-vented bush hen *Amaurornis moluccana*

- Gliders.

It is important to note that while these species are listed as target species, it is anticipated a wide range of fauna will use the connectivity structures.

4.9.9 Maintenance of fauna connectivity structures

Submission number(s)

12, 167

Issue description

- Culverts need regular maintenance as weed infested entrances impede access and provide cover for feral predator species. Culverts need a maintenance plan.

Response

It is acknowledged fauna connectivity structures require maintenance to be effective for the target species. TfNSW will include maintenance of these structures in their programmed maintenance activities.

Appendix D, Updated threatened species management plan of the Amendment Report outlines the goals of mitigation measures, including fauna connectivity structures such as culverts, and the corrective actions to be carried out as necessary. One such mitigation goal listed is to maintain exclusion fencing and connectivity structures for the life of the project, to enable target fauna usage and minimise road kill. Fauna connectivity structures will be maintained as part of routine highway maintenance following construction completion to remove debris and replace damaged furniture. Additionally, annual inspection of underpass structures targeting koalas will be carried out before the start of the breeding season each July to confirm any maintenance required for the functioning of these structures for koala movement.

If a single road kill of a threatened species is recorded, a maintenance check is to be performed within five days of the reported road kill incident. Any fence or structure found to be damaged during a maintenance check would be repaired and the need for additional fencing would be reviewed.

Refer to Section 7.3 of Appendix D, Updated threatened species management plan of the Amendment Report for further detail.

4.9.10 Environmental management measures

Submission number(s)

12, 135, 142, 167

Issue description

- General concerns regarding effectiveness of environmental management measures for protection of flora and fauna
- Mitigation measures to address environmental destruction and disturbance are not provided and those that are will not be reasonably effective
- The EIS does not provide measures to monitor or mitigate present and future impacts on biodiversity
- No environmental mitigation measures have been proposed for remnant bushlands (including Mackays Road or Bruxner Park Road) or koala habitat.

Response

TfNSW commits to applying mitigation measures to reduce impacts to biodiversity during future design and construction and operational phases of the project. These measures are summarised in Table 9.1 of the Appendix C, Updated biodiversity assessment report of the Amendment Report. These measures provide standard mitigation to biodiversity measures that have been proven effective at managing and minimising impacts to biodiversity on similar projects, as well as more specific mitigation measures tailored to the biodiversity values associated with the project.

TfNSW has years of monitoring data from previous road upgrade projects that has allowed it to improve and update its mitigation measures. The range of environmental management measures defined in **Chapter 6, Revised environmental management measures** associated with flooding and hydrology, surface water quality and groundwater will also contribute to protecting the biodiversity features of the study area. In addition to this experience, the specific environmental management measures for biodiversity have been assessed for their effectiveness in Table 9.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report.

Additional detail on the mitigation measures and monitoring requirements to reduce and identify impacts to threatened flora and fauna are provided in Appendix D, Updated threatened species management plan of the Amendment Report, and include:

- Setting out roles and responsibilities for the implementation and updating of the plan
- A description of the threatened flora and fauna species known to occur and be impacted by the project
- Description of potential impacts to threatened flora and fauna as a result of the project
- Established mitigation goals and targets for the management of threatened flora and fauna
- Management measures specific to threatened flora and fauna to be investigated and/or refined during the design and pre-construction, construction and operational phases of the project
- A monitoring program to assess the success of management measures and inform adaptive management.

The purpose of the monitoring programs is to provide robust information in order to draw sound conclusions around the effectiveness of mitigation measures and inform further actions for adaptive management. The success of mitigation measures will be evaluated against performance indicators and the corrective management actions or contingency plans would be applied where poor performance or failing measures are detected.

The monitoring program methodologies may be subject to modification and refinement during the course of the program and would be dependent on the ongoing results, access to monitoring sites or outcomes of corrective management actions or contingency plans. As described in Section 8 of Appendix D, Updated threatened species management plan of the Amendment Report, monitoring will include:

- Fauna connectivity structure monitoring
- Exotic predator control
- Artificial microbat roost sites and nest boxes
- Water quality monitoring.

The clearing of the patch of lowland rainforest in the Mackay property cannot be avoided. The impacts to this patch of mapped PCT 1302 (White Booyong - Fig subtropical rainforest of the NSW North

Coast Bioregion) have been assessed in accordance with the FBA (OEH 2014a) and the offset credits calculated.

As described in environmental management measure SE05, seed collection and salvage of representative species within the planted rainforest impacted by the project near Mackays Road will be carried out before construction where reasonable and feasible. The purpose of the seed collection and salvage is to re-establish a portion of the rainforest within adjacent landscaping associated within the project. Where possible, the location would allow for access from the realigned Mackays Road/new local access roads. See **Chapter 6, Revised environmental management measures** for further detail.

Submission number(s)

12, 105, 167

Issue description

- Protection of riparian zones to support fauna movement is needed for species such as spotted-tail quoll and pale-vented bush hen. How will riparian zones be maintained post-construction and longer term?
- What measures are being put in place to protect fauna around construction sites?
- Ancillary sites should be rehabilitated post-construction.

Response

The vegetated riparian zones will be protected and enhanced to improve opportunities for fauna movement, including for the spotted-tailed quoll and pale-vented bush hen, as identified in environmental management measure FF05 in **Chapter 6, Revised environmental management measures.** Additionally, specific measures targeting threatened species including spotted-tailed quoll and pale-vented bush hen have been listed in Appendix D, Updated threatened species management plan of the Amendment Report. Fifteen fauna connectivity structures target the spotted-tailed quoll and 10 structures target the pale-vented bush hen.

Details on proposed revegetation within the construction footprint will be provided in the UDLP prepared to support the detailed design of the project. The plan will include the location and identification of proposed landscape areas including the species to be used and procedures for monitoring and maintaining landscaped or rehabilitated areas. Further information is detailed in UD01 in **Chapter 6, revised environmental management measures**.

Details on the management of fauna during construction are outlined in Appendix D, Updated threatened species management plan of the Amendment Report. These procedures will be further refined by TfNSW and the construction contractor(s) before and during construction. The implementation of these procedures will also be relevant to non-threatened fauna, such as ground-dwelling birds, echidnas and snakes.

Environmental management measures to minimise risks associated with native fauna interactions with construction activities have been defined in **Chapter 6, revised environmental management measures**. FF09 and FF18 require that limits of clearing within the construction footprint will be delineated using appropriate signage and barriers, identified on site construction drawings and communicated to construction staff during induction. Vegetation and habitat features to be retained, such as hollow-bearing trees, will be clearly identified and protected by suitable fencing, signage and/or markings. This measure will provide required separation between construction activities and clear signage so that all construction staff are aware of adjacent habitat areas. Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the Biodiversity

Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a), in accordance with environmental management measure FF18.

Environmental management measure FF14 also requires that threatened species habitat at ancillary sites is retained and protected. The above measure described in FF09 will also be relevant to management of threatened species at ancillary sites, with measures implemented to ensure adjacent habitat areas in these sites are fenced and signed.

Permanent and temporary fauna fencing will also be installed in accordance with FF16 and FF17. Permanent fauna fencing will be progressively installed as fauna connectivity structures become operational in consultation with a suitably qualified and experienced ecologist. This progressive installation will assist with removing fauna from construction sites and allowing them passage through the work site.

Submission number(s)

17

Issue description

- A motion sensor lighting system should be installed so that when there is no road activity, lighting automatically adjusts to reduce impacts on night-time fauna disturbance.

Response

Appendix C, Updated biodiversity assessment report of the Amendment Report assessed the impacts of lighting from the project to native fauna. The assessment found sections of the project are already subject to impacts from artificial lighting. However, as the design includes the installation of lighting for traffic safety, there is likely to be a degree of light spill to vegetation immediately adjacent to the project, concentrated at on and off ramps and interchanges and is likely to impact upon native biota within these sections of the study area. Lighting used during construction and operation of the project would be designed as downlights and be directed inwards wherever practicable so as to limit light spill into nearby areas of remnant vegetation.

Light spill may discourage habitat use and disrupt foraging regimes of nocturnal native species. However, the vast majority of the project is located within semi-agricultural areas and the amount of remnant vegetation is generally limited to small patches or riparian corridors. These areas will be avoided and impacts mitigated where reasonable and feasible.

The lighting scheme has been developed in accordance with the Upgrading the Pacific Highway - Design Guidelines (Roads and Maritime Services 2015b) and Category V3 in with Australian Standards (AS/NZ 1158 – Lighting for roads and public spaces).

Although the addition of lights may pose a potential direct impact to native species over time, because of the close proximity of Coffs Harbour CBD and the existing level of artificial light production, the impact to native species as a result of the light pollution is considered likely to be minimal.

The detailed design will consider lighting design to minimise amount of light spill into adjacent fauna habitat, as described in environmental management measure FF22 of **Chapter 6, revised environmental management measures**.

4.9.11 Biodiversity Offset Strategy

Submission number(s)

12, 161, 167, 169

Issue description

- Concerned use of offsets will still result in a net reduction of bushland and permanent loss of wildlife
- Concerned that vegetation offsets will be not be local, and of no benefit to the remnant vegetation of the Lowland Subtropical Rainforest within the Korora basin and North Boambee Valley
- The offset program only proposes to obtain land that is already covered in bush, rather than cleared land for regeneration. This will result in a net loss of remnant bushland and the loss of flora and fauna
- Recommendations for the offset strategy include consulting with CHCC to identify best habitat corridors, acquire private land that is next to biodiversity links, riparian buffers and nature reserves and restore creeks (eg Pine Brush Creek, Newports Creek, Coffs Creek and Treefern Creek).

Response

A similar issue was raised by CHCC regarding the offset strategy and a response has been provided in **Section 3.1, Coffs Harbour City Council**.

A BOS has been prepared and is included as Appendix C of the Appendix C, Updated biodiversity assessment report of the Amendment Report. The BOS has been prepared in accordance with the requirements of the relevant State and Commonwealth guidelines and TfNSW has consulted with all relevant agencies. The BOS has been prepared in accordance with the requirements of the *Threatened Species Conservation Act 1995* and the FBA (OEH 2014a). Biodiversity impacts have been assessed and documented in accordance with the FBA and the NSW Biodiversity Offsets Policy for Major Projects (OEH 2014b).

This process also meets the requirements of any offsets required under the EPBC Act. The project has also been referred under the EPBC Act referral (2017/8005) and deemed a controlled action to be assessed under the Bilateral agreement made under section 45 of the EPBC Act relating to environmental assessment between the Commonwealth of Australia and the State of New South Wales. The bilateral agreement endorses the FBA and the NSW Biodiversity Offsets Policy as accredited processes.

The BOS identifies the impacts associated with the project and presents these impacts through offset credits generated using the BioBanking Credit Calculator. TfNSW has made significant progress in sponsoring landholders to participate in the former BioBanking scheme and the current Biodiversity Offset Scheme, as well as using its own residual land portfolio as a source of credits. TfNSW has also purchased a property for this project for use as an offset. TfNSW has investigated the purchase and management of several sites so that offset credits can be generated that cover the impacts associated with the project. These sites will be subject to Biodiversity Stewardship Agreements which will allow for their ongoing protection and management of these sites for biodiversity conservation.

Biodiversity offsets have been calculated using the FBA which has been endorsed by the Australian Government as part of the EPBC Act assessment bilateral agreement.

4.9.12 Weed management

Submission number(s)

12, 167

Issue description

- Mitigation measures regarding spread of noxious weeds should be changed
- The use of locally native and low maintenance plants in landscaping works and prevention of weeds is important for the project
- Guide 6: Weed management of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a) and Guide 7: Pathogen Management (RTA 2011a) needs to be reviewed due to creation of weed issues on other upgrade projects
- Landscaping failures on the Sapphire to Woolgoolga project should be taken into consideration due to portions left in a weed dominated state.

Response

As described in environmental management measure UD01, a UDLP will be prepared for the project during detailed design, in consultation with CHCC and in accordance with best practice guidelines. The UDLP will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the EIS. This will include location and identification of proposed landscaped areas (such as proposed landscaping on earth mounds and cut batters) and the species to be used at these locations. It will also include procedures for monitoring and maintaining these landscaped areas to manage weed infestation and ensure the landscaping establishes.

The concept design planting strategy for the project aims to replicate and maintain the natural character of the area by revegetating with vegetation communities native to the area. Vegetation clearing would be minimised where possible and native planting would be provided to help with screening of residences, structures and built elements over time. The planting strategy is based on plant communities identified in the biodiversity assessments. Additionally, the planting of native species forms an integral part of the embedded design mitigation to lessen the visual impact of the project.

Procedures for the reinstatement of native vegetation and habitats within the construction footprint will be detailed in the UDLP prepared to support the detailed design of the project. The plan will include the location and identification of proposed landscape areas including the species to be used and procedures for monitoring and maintaining landscaped or rehabilitated areas. Further information is provided in environmental management measure UD01 in **Chapter 6, Revised environmental management measures**.

Weed control has been identified as a construction phase risk within the EIS and Appendix C, Updated biodiversity assessment report of the Amendment Report and Appendix D, Updated threatened species management plan of the Amendment Report. As identified in environmental management measure FF21, biosecurity risk and weed species will be managed in accordance to Guide 6: Weed management of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a) and Guide 7: Pathogen Management (RTA 2011a). These guides are considered to contain best practice methods for weed management and biosecurity risk. TfNSW recognises weed management is an ongoing issue and following TfNSW's Biodiversity Guidelines ensures that weed management is monitored to improve the success of the weed control.

4.9.13 Restoration programs

Submission number(s)

12, 167

Issue description

- The project provides an opportunity to repair riparian health near the highway such as Newports Creek, Coffs Creek, Treefern Creek, Jordans Creek and Pine Brush Creek. TfNSW should assist CHCC with the ongoing projects to repair and expand habitat corridors and riparian corridors in the Coffs Basin
- There are opportunities to support riparian restoration programs being undertaken in CHCC reserves adjacent to all major creek lines to increase biodiversity outcomes. Supporting opportunities to regenerate the environment should be a condition of approval.

Response

The project design has allowed for the long-term protection and restoration of riparian zones on most of the named creeks that the alignment crosses through the provision of bridge crossings. This crossing type has reduced impacts compared to culverts and allows for the protection or restoration of a functioning riparian zone. The following mitigation measures have been recommended in Appendix C, Updated biodiversity assessment report of the Amendment Report to protect these riparian zones where bridge crossings have been provided.

- Bridges should be designed with a natural substrate at the abutment
- Scour protection associated with the entries and exits to bridges should accommodate and provide for the safe and effective passage of fauna
- A minimum width of three metres is to be retained between the toe of the scour protection or the abutment and the edge of the road to maintain fauna passage
- Bridges should be designed (height, carriageway separation) to allow sufficient light and moisture to encourage growth of vegetation between the structures, with a minimum height of 1.5 metres allowed for terrestrial fauna passage.

Revegetation works should be completed as soon as practicable following bridge construction and include restoration of a natural, vegetation community underneath the bridge structure. Where possible, the revegetation works is to match the PCT of the retained vegetation communities. Planting underneath the bridge structures should include the use of groundcovers, with shrubs to be used when the height and light penetration allow for larger species to establish. All planted species should be known to occur in the relevant PCT retained on either side of the bridge.

Details on proposed revegetation within the construction footprint will be provided in the UDLP prepared for the project (see environmental management measure UD01). The UDLP will include opportunities for the restoration of riparian zones within the construction footprint where reasonable and feasible and would be prepared in consultation with CHCC.

As identified in Section 9 of Appendix C, Updated biodiversity assessment report of the Amendment Report, protection and enhancement of vegetated riparian zones will be carried out to improve opportunities for fauna movement and aquatic habitat will be protected in accordance with mitigation measures of the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 (DPI 2013) and with reference to Guidelines for Controlled Activities on Waterfront Land – Riparian Corridors (DPI 2018). These requirements are reflected in environmental management measure

FH04, FF05 and FF24 respectively within **Chapter 6, Revised environmental management measures**.

4.10 Urban design, landscape and visual amenity

4.10.1 Urban design principles

Submission number(s)

12

Issue description

- The urban design principles of the project should be made a condition of approval. Artists impressions do not portray any attempt to follow key vision and principles of the Urban Design Strategy, especially principle three with the proposed noise attenuation approach.

Response

The urban design principles for the project were developed as part of preparing Appendix J, Urban design, landscape character and visual impact assessment of the EIS. Following the exhibition of the EIS, a number of proposed design and construction changes have been developed in response to feedback from stakeholders and the community, landowner discussions and further development of the concept design to improve functionality and minimise environmental impacts where possible. The proposed design and construction changes are documented in Chapter 2, Design changes of the Amendment Report. The amended design has been assessed within Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report. This updated assessment incorporates and responds to proposed design changes, submissions from CHCC and community and ongoing consultation.

Both assessments have been carried out in accordance with the requirements of the SEARs for the project and in line with urban design guidelines, including:

- Beyond the Pavement – Urban Design Policy, Procedures and Design Principles (Roads and Maritime Services 2014b)
- Upgrading the Pacific Highway Urban Design Framework (Roads and Maritime Services 2013b)
- EIA N04 Practice Note: Guidelines for Landscape Character and Visual Impact Assessment (Roads and Maritime Services 2018a)
- AS4282‑1997 Control of the obtrusive effects of outdoor lighting (Standards Australia 1997)
- Bridge Aesthetics: Design Guidelines to improve the appearance of bridges in NSW (Roads and Maritime Services 2019)
- NSW Sustainable Design Guidelines Version 4.0 (Roads and Maritime Services 2017a)
- Crime Prevention and the Assessment of Development Applications Guidelines (DUAP 2001)
- Crime Prevention through Environmental Design (CPTED) (Queensland Government 2007)
- Technical Guideline for Urban Green Cover in NSW (OEH 2015)
- Healthy Urban Development Checklist (Department of Health 2009)
- Landscape Design Guidelines (Roads and Maritime Services 2017b)
- Tunnel Urban Design Guideline (Roads and Maritime Services 2017c)
- Noise Wall Design Guideline: Design guidelines to improve the appearance of noise walls in NSW (Roads and Maritime Services 2016b)
- Shotcrete Design Guideline: Design guidelines to improve the appearance of shotcrete in NSW (Roads and Maritime Services 2016c)
- Water Sensitive Urban Design Guideline (Roads and Maritime Services 2017d).

Appendix J, Urban design, landscape character and visual impact assessment of the EIS covers both the concept urban design response for the project as well as the landscape character and visual impact assessment (LCVIA). As depicted in **Figure 4.10-1** and included as Figure 11-1 of Chapter 11, Urban design, landscape and visual amenity of the EIS, development of the urban design and landscape strategy and carrying out the LCVIA is an iterative process. The LCVIA draws upon the urban design vision, objectives and principles and the landscape and urban design concept developed as part of the urban design and landscape strategy. Similarly, the urban design and landscape strategy draws upon key issues, constraints and mitigations identified in the LCVIA. The iterative process ensures that key issues, constraints and mitigations from the LCVIA are integrated into the urban design and landscape strategy and also into the design for the project.

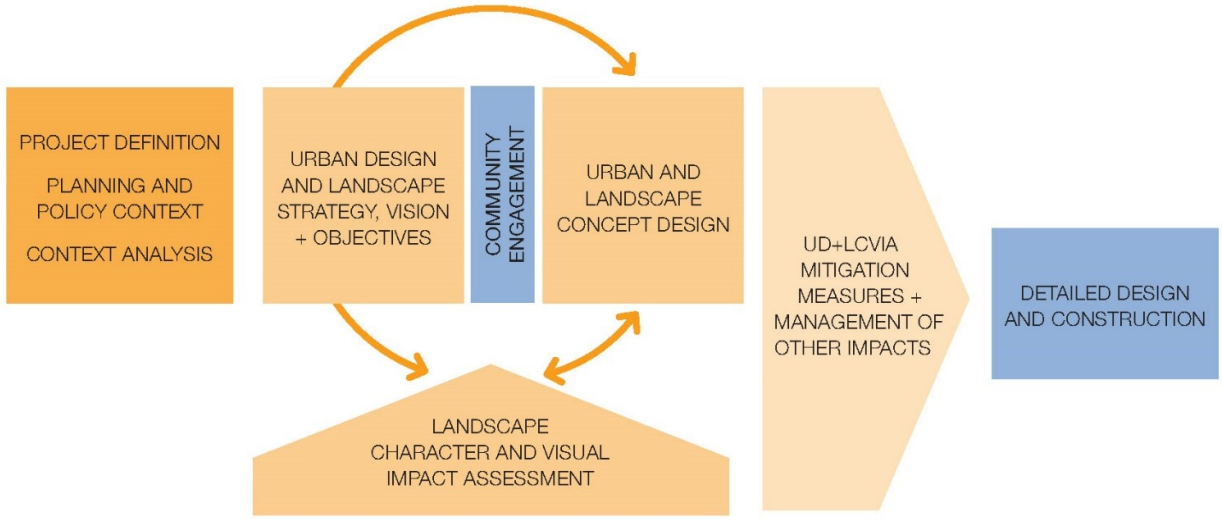


Figure 4.10-1 Overview of iterative process adopted for the urban design and landscape strategy and the LCVIA

Throughout the process of developing the urban design concept and the LCVIA, numerous assessments were carried out and included:

- Site inspection to identify sensitive views and existing landscape character
- Identifying key viewpoints and potential visual impacts
- Identifying the potential impact of the project on the landscape
- Identifying strategies to be incorporated into the design to avoid and minimise potential visual and landscape impacts.

Chapter 2, Methodology of Appendix J, Urban design, landscape character and visual impact assessment of the EIS outlines the criteria and methodology used to inform the assessment.

Table 11-2 of Chapter 11, Urban design, landscape character and visual amenity of the EIS describes the urban design objectives and principles, and then demonstrates how these were applied in developing urban design treatments for locations along the project. An extract from Table 11-2 is replicated below in **Table 4.10-1** for urban design objective three.

Table 4.10-1 Urban design objective three (extract from Table 11-2 of Chapter 11, Urban design, landscape character and visual amenity of the EIS)

Urban design objective	Summary of urban design principle	Urban design treatments
Provide an enjoyable, interesting highway	Elements along the project should be legible yet memorable and provide a positive visual experience for road users Consideration of public open space and future developments should be incorporated into the design Consider opportunities for artistic work, drawing attention to and celebrate the physical, historical and cultural landmarks.	Planting of native vegetation and enhancement of the natural landscape has been provided at the key interchanges along the project to create a sense of arrival and departure and a memorable experience for road users, particularly at interchange locations. The design of bridges and tunnels has been maximised to fit with the surrounding landscape and enhance local heritage significance and preserving Aboriginal cultural heritage where possible

The potential impact from operational road traffic noise on the community is a significant issue and extensive noise mitigation has been incorporated into the design to help manage at-source noise impacts, including low noise pavement, earth mounds and noise walls. TfNSW acknowledges these features of the project will limit views from the highway, particularly towards the east, however these are essential elements of the project needed to mitigate potential noise impacts on the community. The urban design concept attempts to balance screening views of the project and enhancing views from the project. Opportunities to enhance views from the project incorporated into the urban design concept include:

- The use of transparent noise walls to enable views out from proposed bridges. Transparent walls are used in areas where views from the highway to the adjacent landscape or distant coast are possible. They are also used on road bridges and on approach to Coffs Harbour
- Through North Boambee Valley where views can be maintained towards the existing landscape to the west of the project through the use of low ground cover/grassland planting. The project would be elevated through the North Boambee Valley, on embankments and bridges, providing opportunities for elevated views to the west
- Through Mackays Road Valley where views can be maintained towards the rural landscape to the west of the project through the use of low ground cover/grassland planting.

As described in environmental management measure UD01, an Urban Design Landscape Plan (UDLP) will be prepared for the project during detailed design, which will further respond to the urban design vision and objectives for the project. The UDLP will be prepared in consultation with CHCC and in accordance with best practice guidelines.

Submission number(s)

12, 167

Issue description

- Landscape design should be planned in consultation with the CHCC Bush Regeneration team.

Response

As described in environmental management measure UD01, an UDLP will be prepared during detailed design in consultation with CHCC and other relevant government agencies to further develop the urban design and landscape design for the project and in response to detailed design investigations. The UDLP will be prepared in accordance with the relevant best practice guidelines. Similar to other Pacific Highway upgrade projects and TfNSW State significant infrastructure projects, the UDLP would be made available for community feedback before finalisation. Feedback from the Australian Association of Bushland Regeneration and other similar community interest groups would be welcome during this period.

4.10.2 Landscape and visual amenity strategy

Submission number(s)

12

Issue description

- Solid concrete walls contradict the landscape design approach of maintaining sight lines and safety through responsive landscape design.

Response

The potential impacts of road traffic noise on the community is a significant issue and extensive noise mitigation has been incorporated into the design to help manage at-source noise impacts, including low noise pavement, earth mounds and noise walls. TfNSW acknowledges these features of the project will limit views from the highway, particularly towards the east, however these are essential elements of the project needed to mitigate potential noise impacts on the community. The urban design concept seeks to balance screening views of the project and enhancing views from the project.

Chapter 4 of Appendix J, Urban Design, landscape character and visual impact assessment of the EIS describes the noise attenuation approach for the project. The noise attenuation approach lists the order of priority for noise treatments as follows:

- Vegetated noise mounds
- Combination mound/wall
- Transparent noise walls
- Solid noise walls.

The preferred noise attenuation treatment is vegetated noise mounds, as they provide a more sympathetic response to the existing landscape character, maintain sight lines and create a natural visual buffer. However, vegetated mounds require a significant width of land and reasonable height. In instances where there are space constraints, a noise wall, or a combination of mound and noise wall may be required.

Transparent noise walls allow permeability across the corridor and support the visual connectivity of places. They can be used to retain views out over the landscape and mitigate any overshadowing of new works on adjacent properties. Where the opportunity arises, transparent noise walls will be used. As stated in Chapter 11, Urban design, landscape and visual amenity of the EIS, the use of transparent panels would need to be considered in conjunction with the potential for associated glare impacts which could result in road user safety concerns or nuisance impacts to adjacent residential properties.

Additionally, solid walls are necessary when there is a need to restrict views to the highway for visual amenity reasons. Solid noise walls are not standalone elements and would have complementary planting to assist with visual impacts. Solid noise walls are used in areas where there is not enough space for mounds, there are no significant views to landscape or landmark features.

Appendix J, Urban Design, landscape character and visual impact assessment of the EIS has a number of specific design criteria to assist with the potential visual impact of the noise walls (subject to detailed design). These include recommendations for patterned/textured noise walls on the highway and/or residential side noise walls or painted walls to create visual interest and help navigate the road corridor, and vegetated areas adjacent to noise walls (where possible) to soften the visual impacts of the walls and provide visual screening.

Submission number(s)

12

Issue description

- By adding 20 to 25 metres of length to the end of each tunnel, the tops of the tunnels could be gently sloped to better achieve the desired landscaped outcome with the highest chance of success as early as possible.

Response

As described in Chapter 4 and Chapter 5 of Appendix J, Urban Design, landscape character and visual impact assessment of the EIS, tunnel design has been considered in line with Tunnel Urban Design Guideline (Roads and Maritime Services 2017c). Tunnel portals would be designed to sympathetically tie back into the natural landscape adjacent to the portal, retaining existing vegetation where possible and enable flora and fauna connections along existing ridgelines. Relevant design criteria for the tunnel portals is as follows:

- Design all tunnel features as a suite of elements with distinct ‘whole of project’ identity and tie in with surrounding landscape and natural features
- Design portal areas to minimise disturbance and provide continuous landscape and environmental corridors above the project
- Provide neat, simple and refined design features and provide considered integration of design elements, to avoid ‘clutter’
- Retain or reinstate vegetation, trees or other green infrastructure as part of the approach and to the portal area to maximise the user’s experience of the landscape before entering the tunnel.

The following design applications would be employed and aid in achieving the desired landscaped strategy:

- Planting the batter slopes as early as practical
- Placing topsoil to depth required to achieve planting cover, density and height required
- Using advance sized planting where required to achieve the established vegetation cover of the portal slopes
- The use of specially prepared / detailed planter beds
- The use of a different planting mix / shrub type species including any other good / innovative ideas for achieving landscaping on difficult slopes
- The use of low walls to achieve the 2H:1V slopes that are not visible from road users and the local community

- Painting of the low walls with a darker recessive colour.

As identified in **Section 4.3, Project development**, there are limited opportunities to increase the length of tunnels because of existing constraints. Notwithstanding this, it could be possible to increase the length of the tunnels to provide a gentler slope at the portals, however the urban design and landscape approach outlined above would help integrate the tunnel portals into the existing landscape and the additional costs of adding 20-25 metres to each portal would not be reasonable. TfNSW is confident that the solution will achieve the desired landscape outcomes.

4.10.3 Landscaping

Submission number(s)

12, 167

Issue description

- Landscape design approach needs to consider planting suitable species and mitigating the likelihood of accidental introduction of invasive species
- There is a need to consider the future maintenance requirements of certain species as the high rainfall and good soil fertility will result in periods of rapid plant growth (including weeds), especially in areas of high light levels.

Response

The landscape strategy and concept for the project is discussed in Chapters 4 and 5 of Appendix J, Urban design, landscape character and visual impact assessment of the EIS. The landscape strategy was developed in accordance with the Landscape Design Guidelines (Roads and Maritime Services 2017b) and Beyond the Pavement (Roads and Maritime Services 2014b). The strategy establishes key criteria, one of which is to consider how maintenance and irrigation can be kept to a minimum.

Following the exhibition of the EIS, the landscape design has been updated and changes are described in Chapter 2 of Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report. Species within plant communities have been updated in response to detailed comments provided in the CHCC submission on the EIS, discussed in **Section 3.1.13**. Particular changes have been made in consideration of a number of factors including maintenance requirements, species suitability for the Coffs Harbour region and mitigating the likelihood of introducing invasive weed species. This includes the removal of the following plant species:

- Blueberry ash *Elaeocarpus reticulatus*
- Blackbutt *Eucalyptus pilularis*
- Giant white bird of paradise *Strelitzia nicolai*
- Pink melicope *Melicope elleryana*
- Lilly pilly *Acmena smithii*
- Native frangipani *Hymenosporum flavum* to be replaced with Golden penda *Xanthostemon chrysanthus*.

And the introduction of native species to the portal mix, including:

- Grevillea moonlight, *Grevillea*
- Coconut ice, *Grevillea*.

As described in environmental management measure UD01, a UDLP will be prepared for the project during detailed design, in consultation with CHCC and in accordance with best practice guidelines. The UDLP will include location and identification of existing vegetation and proposed landscaped areas, including species to be used and procedures for monitoring and maintaining landscaped areas. The UDLP would be made available for community feedback before finalisation. For further details on what will be included as part of the UDLP, refer to **Chapter 6, Revised environmental management measures**.

Submission number(s)

12

Issue description

- Address inconsistent name of low-growing shrub *Zieria smithii* rather than headland *Zieria prostrata* within Appendix J, Urban design, landscape character and visual impact assessment of the EIS.

Response

Headland *Zieria prostrata* is noted in Appendix J, Urban design, landscape character and visual impact assessment of the EIS as there is a known record of *Zieria prostrata* within 500 metres of the construction footprint in the NSW Government's BioNet database. The inclusion of *Zieria prostrata* within the Appendix J, Urban design, landscape character and visual impact assessment of the EIS is correct.

Submission number(s)

12, 27, 77, 88, 90, 122, 124, 127, 139, 146, 151, 156, 164, 165, 181

Issue description

- During revegetation, only local native species should be planted to ensure the least disturbance to flora and fauna
- For revegetation purposes, only local species that are compatible with existing species should be used
- Potential ancillary site 2C, near Shephards Lane, must be remediated by planting native vegetation.

Response

Appendix J, Urban design, landscape character and visual impact assessment of the EIS discusses the overall landscape strategy for the project. The strategy aims to integrate the design through revegetation and preservation of existing landscape patterns. The strategy also aims to maintain natural ridgelines and work with the existing landforms by minimising excavation, cuttings and raised structures. Opportunities to preserve the existing landscape character have been identified through selection and structuring of planting.

The planting strategy for the project also aims to replicate and maintain the natural character of the area by using vegetation communities native to the area for revegetation planting. Vegetation clearing would be minimised where possible and native planting would be provided to help with screening of residences, structures and built elements over time. The planting strategy is based on plant communities identified in the biodiversity assessments and has recently been updated following consideration of issues raised within the CHCC submission on the EIS (see **Section 3.1.13**). Further information on the plant communities is available in Appendix J, urban design, landscape character and visual impact assessment report of the EIS and updated in Appendix E, Supplementary urban design, landscape character and visual impact assessment report of the Amendment Report.

With regards to revegetating ancillary site 2C, there are several environmental management measures in place to minimise the removal of native vegetation and manage the rehabilitation of disturbed areas following construction, including:

- Environmental management measure LUP03 states that ancillary sites will be rehabilitated to their pre-construction condition where reasonable and feasible
- Environmental management measure FF14 ensures that threatened species habitat would not be cleared for the purposes of ancillary facilities. These areas would be identified, and limits of clearing delineated before construction.

As described in environmental management measure UD01, a UDLP will be prepared for the project during detailed design, in consultation with CHCC and in accordance with best practice guidelines. Any revegetation as part of rehabilitating the site would be carried out in accordance with the UDLP. For further details on what will be included as part of the UDLP, refer to **Chapter 6, Revised environmental management measures.**

Submission number(s)

53, 65, 66, 90, 99, 112

Issue description

- To reinstate visual amenity, additional landscaping is required along the service road to the submitter's property on Seaview Close
- At the pop-up information stalls, it was identified that new trees will be planted to mitigate visual impacts from the bypass at the submitter's property
- Property owner requests that the entrance to the property is suitably revegetated due to the loss of vegetation and driveway length.

Response

Details on the proposed revegetation for the proposed local access road near Seaview Close have been provided in the planting design concepts plans in Chapter 2 of Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report. Planting of open forest mix is proposed along this section of the project, with street tree planting to match the existing rural road setting. The open forest mix consists of various native trees, shrubs and grasses. The complete species list has been updated in response to the CHCC submission on the EIS (refer to **Section 3.1.13**).

With regard to the interactive display at the pop-up information stall, TfNSW acknowledges that this was an error and that these trees would not be planted where indicated. Where land needs to be acquired for the project, property owners have already been contacted by TfNSW in accordance with the property acquisition process. As discussed in **Section 4.11, Land use and property** of this report, all property acquisition will be carried out in accordance with the Land Acquisition Information Guide (Roads and Maritime Services 2014a), Fact Sheet: Property Acquisition of Subsurface Lands (Roads and Maritime Services 2015c) and the *Land Acquisition (Just Terms Compensation) Act 1991*. Refer to LUP02, **Chapter 6, Revised environmental management measures**.

Any requests for property adjustments will be negotiated with the property owner. Similar issues were raised by members of the community and have been discussed in **Section 4.11, Land use and property**. As detailed in environmental management measure TT07, existing property accesses impacted by the project would be reinstated in consultation with affected landowners. Design of property access would be developed in consultation with the affected property owner through the property acquisition process and incorporated into the design for the project during detailed design.

This would include reinstatement of existing drainage infrastructure, letterboxes, pavement areas/concrete pads disturbed by the property adjustment and suitable revegetation.

4.10.4 Visual amenity impacts

Submission number(s)

12, 101, 105, 161, 168, 169

Issue description

- The project will impact the green, urban area of Coffs Harbour and the design will not reduce impacts.
- The Korora Hill interchange will impact the visual amenity of the Korora Basin which is a location where the Great Dividing Range connects to the Pacific Ocean.
- Visual impacts will increase as the bypass will now be at eye level to the submitter's property which sits elevated above North Boambee Road. Will the project provide some sort of vegetation buffer between property and the highway?
- The project should be conditioned to investigate options of providing scenic views of the coastline (eg a viewing area).

Response

TfNSW understands and appreciates the community's connection to the visual amenity of the Coffs Harbour region because of the scenic coastal and rural views. Accordingly, the urban design strategy aims to reduce impacts on the natural landscape as much as possible. As described in Appendix J, Urban design, landscape character and visual impact assessment of the EIS, the overarching urban design strategy of the project is to ensure that the project is sensitively, both physically and visually, integrated with its surrounding topography, landscape and urban setting, seeking to minimise visual impact and maximise the scenic and dramatic road user journey experience. Particular landscape principles would be implemented to achieve integration with the natural landscape and roads, including:

- Enhancing long distance and district wide views
- Framing views along the corridor
- Retention of existing ridgelines and vegetation where possible.

The planting strategy for the project aims to replicate and maintain the natural character of the area by using vegetation communities native to the area for revegetation planting. Vegetation clearing would be minimised where possible and native planting would be provided to help with screening of residences, structures and built elements over time. The planting strategy is based on plant communities identified in the biodiversity assessments and has been updated in response to the CHCC submission on the EIS (refer to **Section 3.1.13**). Further information on the plant communities is available in Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report.

Following the exhibition of the EIS, the concept design for the Korora Hill interchange has been amended and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report assesses these proposed design change for impacts on visual amenity in the Kororo basin and foothills. The assessment acknowledges this area holds important visual amenity significance and accordingly the design of the Korora Hill interchange has aimed to

create a sense of arrival or departure as the northern gateway to Coffs Harbour. The landscape design narrative would interpret the escarpment meeting the coastline through plant selection and arrangements. Retaining walls would provide an identifiable gateway to Coffs Harbour.

Chapter 3 of Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report provides a landscape character impact assessment. The updated assessment considers the proposed design changes at Korora Hill interchange and the impact this would have on the landscape character zone of the Kororo basin and foothills. The proposed design change would result in an impact consistent with the EIS design.

In relation to the properties on North Boambee Road, the landscape character impacts and visual impacts were assessed as part of Chapter 6 and Chapter 7 of Appendix J, Urban design, landscape character and visual impact assessment of the EIS, and updated in the Chapter 3 of Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report.

The project would be elevated through the North Boambee Valley, on embankments and bridges to keep the project out of flood prone land, with little natural shielding of the project for residents to the west of the project. Views from the project to the rural landscape to the west would be promoted through the use of low ground cover/grassland planting, and tree groupings would be planted on embankments to provide screening to nearby residents west of the project. Riparian planting mixes, characterised by coastal paperbark swamp community, would be planted around creek crossings to continue the green ribbons of vegetation along creek lines which are characteristic of the North Boambee Valley.

In relation to achieving coastal views for the project, the concept plans within Chapter 2 of Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report, identify opportunities for coastal views. Englands Road interchange presents three opportunities for views to the ocean. As can be seen on the concept plans, views northbound from Gatelys Road tunnel to the ocean would not be possible because the topography of the area (ie existing ridgeline south of Bruxner Park Road) would block views from the tunnel toward the ocean.

With regards to viewing areas, the provision of viewing areas is outside the scope of the project.

Submission number(s)

86, 92, 109, 120

Issue description

- The green outlook from Coachmans Close properties will be replaced by a view of the service road, highway underpass and the bypass itself. This will have a major impact on visual amenity, lifestyle and property value
- Property at Coachmans Close will be severely impacted by views of the bypass and noise wall. The proposed screening of grass and 'park style trees' is insufficient to block views of the noise wall
- The headlights from vehicles using the highway underpass near Coachmans Close will impact nearby properties. The underpass should be moved a few metres in line with Fernleigh Crescent
- There should be solid barrier at Coachmans Close to ensure greater road safety and screening of headlights. The barrier should also be vegetated.

Response

A similar issue was raised by the CHCC and community members, and a response is provided in **Section 3.1.13**.

TfNSW acknowledges CHCC and the community's concern regarding the loss of vegetation and amenity at Coachmans Close. Additional information has been prepared to provide an indication of what the project would look like from Coachmans Close in response to these concerns. Refer to **Section 3.1.13** of the CHCC response for figures. The additional information provided includes:

- Before and after artist's impression from two locations along Coachmans Close. The first is from the top of Coachmans Close looking towards the south (refer to **Figure 3.1-2** for the existing view, and **Figure 3.1-3** for the view with the project). The second from near Fernleigh Avenue, looking towards the south (refer to **Figure 3.1-4** for the existing view and **Figure 3.1-5** for the view with the project)
- Cross sections at two locations along Coachmans Close showing the relationship between Coachmans Close and the service road, including the width available for vegetation screening between the two roads (refer to **Figure 3.1-6** and **Figure 3.1-7**). These cross sections highlight the varying width available for between the two roads, which range from about 10 metres at its widest and about 1.5 metres at its narrowest.

The key constraints driving the design of the project near Coachmans Close are Kororo Nature Reserve, Kororo Public School and the tie-in to the existing dual carriageway highway at Sapphire. The effect of these key constraints on the concept design is outlined below:

- The section of the project between Kororo Nature Reserve and Kororo Public School is very tightly constrained. There is just enough space to fit the service road on the eastern side of the project, the main carriageway (including provision for future widening to six lanes), and a property access road to maintain access to an existing property south of Kororo Nature Reserve
- The service road is needed on the east side of the project as it provides an important link between Solitary Islands Way and the existing highway near James Small Drive, and to provide access to the Kororo Public School bus interchange
- There is not enough space to fit another service road on the west side of the project to connect Old Coast Road and Korora Basin Road with Bruxner Park Road. Access to the broader road network for residents west of project along Old Coast Road and Korora Basin Road would be via the underpass to the service road near Fernleigh Avenue
- The location of the underpass near Fernleigh Avenue is governed by the crossing of Pine Brush Creek and the tie-in to the existing dual carriageway at Sapphire. These two locations influence the vertical and horizontal alignment through this area, which limits the locations where there is enough space to provide the vertical clearance needed for an underpass
- The tie-in to the existing dual carriageway at Sapphire sets the northern extent of the project.

TfNSW acknowledges the vegetation within this area is of importance to the community and provides screening value. As illustrated in **Figure 3.1-3**, Coachmans Close north of Fernleigh Avenue, vegetation would be retained where possible to assist with screening views towards the project. During detailed design, an arborist assessment will be carried out to confirm the extent of vegetation that could be retained along Coachmans Close within the construction footprint. This commitment has been captured as environmental management measure UD10 (refer to **Chapter 6, Revised environmental management measures**).

As the road descends to the south and the space narrows, it is anticipated that shrub planting would be provided to screen lower level views from the adjacent properties, as illustrated in **Figure 3.1-5**. As identified in environmental management measure UD01, a UDLP will be prepared to support the detailed design of the project. The plan will include identification of existing vegetation and proposed

landscape areas, including areas along Coachmans Close. As part of this plan TfNSW will explore the opportunities to provide shrub planting in the form of a maintained hedge to allow the screening value to improve over time.

A response has also been provided in **Section 4.13, Socio-economic** on amenity impacts at Coachmans Close.

The concept design for the project has been developed to minimise the potential amenity impacts on nearby residences along this section of the project, including residences on Coachmans Close. Measures to minimise the potential impacts on nearby residences which have been incorporated into the concept design for the project include:

- Provision of low noise pavement on the main carriageway and a noise wall between the main carriageway and Coachmans Close to reduce noise impacts
- Retaining walls are proposed for the main carriageway to minimise the footprint of the project and reduce the amount of existing vegetation that would need to be cleared to build the project
- Landscape planting is proposed between Coachmans Close and the service road to help reduce the visual impacts of the project and to help reduce headlight glare from vehicles using the underpass and the service road.

Submission number(s)

65, 73, 86, 99

Issue description

- Concerned the relocation of overhead power lines and wires will impact on visual amenity and value of properties that currently have unobstructed ocean views. Underground utilities are preferred.

Response

TfNSW is committed to preparing a strategy for managing utilities in detailed design, including the location of power lines. Section 5.3.16 of Chapter 5, Project description of the EIS provides information on utility services. Details of existing utility services and requirements for their potential relocation or protection will be finalised during detailed design in consultation with the utility service providers. Given the scope of work potentially required, it is likely that any relocation or protection would occur as a pre-construction activity (and may require work outside of the standard working hours).

As stated in environmental management measure LUP04, the following strategy for managing utilities will be implemented before construction in consultation with the relevant utility providers:

- Further detailed utility investigations (revised ‘Dial before you Dig’ queries and/or potholing will be carried to confirm location of buried services)
- Detailed utility design will be carried out in accordance with the relevant utility providers requirements
- Relocation or protection work will be carried out in a manner that minimises environmental impacts and addresses the relevant utility service providers requirements and construction methods.

As described above, issues such as visual amenity will be considered in the development of the strategy for managing utilities. Opportunities to relocate power lines underground would be investigated in consultation with the relevant utility provider.

Submission number(s)

73, 99, 171

Issue description

- Consideration should be given to vegetation or adjusting the noise mound in front of the underpass near Seaview Close to provide more privacy from traffic
- There should be screening against headlights to prevent impact to homes with glass windows
- To ensure privacy, appropriate screening should be installed during construction and operation. Concern for the loss of visual amenity associated with the potential removal of existing physical and vegetative barriers during project construction.

Response

As discussed in Chapter 11, Urban design, landscape and visual amenity of the EIS, vegetation clearing would be minimised where possible and native planting would be provided to help with retaining privacy and screening of residences, structures and built elements over time. Embedded mitigation, including screen planting, noise walls and mounds are proposed at various viewpoints along the bypass to reinstate privacy and reduce visual impacts of the bypass. Embedded mitigation for each viewpoint detailed in Appendix J, Urban design, landscape character and visual impact assessment of the EIS and additional and updated viewpoints in Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report.

In regard to adjusting the noise mound at Seaview Close, there is no existing or proposed noise mound at the underpass near Seaview Close. Notwithstanding, at locations where noise mounds are proposed they will be vegetated where reasonable and feasible (refer to **Section 4.10.6**). However, depending on the steepness of the slope and underlying rock, it may not be possible to revegetate cut batters, and these would be left as natural rock. Where possible, flatter slopes would be adopted, to provide maintenance and vegetation establishment while also seeking to replicate the surrounding natural topography and balance cut and fill.

Adjacent to Seaview Close, an open forest planting mix is proposed, which would provide a continuous canopy, diversifying the driver experience and providing a sense of scale that would aid in reducing the potential impact of the road on the surrounding communities. It is characterised by a tall open canopy of blackbutt (*Eucalyptus piluaris*) with a grassy understorey.

Landscape planting is proposed to help reduce the visual impacts of the project and to help reduce headlight glare from vehicles. Planting design concept are provided in Chapter 2 of Appendix E, Supplementary urban design, landscape character and visual impact assessment and detail the proposed planting along the project.

Environmental management measure UD04 provides that the construction areas and ancillary construction sites will be managed to minimise visual impacts, including appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials. Additionally, TfNSW have committed to screening around ancillary sites adjacent to residential areas as a new environmental management measure, UD05. The boundary fence will be designed to minimise visual impacts on nearby sensitive receivers. Refer to **Chapter 6, Revised environmental management measures**.

4.10.5 Opal Cove Resort

Submission number(s)

28, 53

Issue description

- Access changes to Opal Cove Resort will require the removal of 16 well established Ficus trees lining the resort entry. Can the new entrance include a new avenue of trees to link with the present?

Response

Consultation has begun with affected business operators and property owners at Opal Cove Resort to address the concerns raised above. Further engagement will include investigation into design opportunities to minimise impact on the row of established trees that line the entrance to the resort, as well as property access. TfNSW will continue to engage with relevant property owners through the detailed design phase.

4.10.6 Earthworks, landform and slope stabilisation

Submission number(s)

12

Issue description

- Integrated vegetated mounding presents issues with successful plant establishment and weed growth with high maintenance over the long-term
- Revegetation of the large rock fill and cut batters with grasses and shrubs could require too much maintenance.

Response

Integrating cut and fill was discussed in Chapter 4 of Appendix J, Urban design, landscape character and visual impact assessment of the EIS. To integrate the project with the surrounding landscape fill embankment and cut batters would be revegetated from the edge of the road corridor to the construction footprint, where reasonable and feasible. Vegetated mounds provide a low visual impact and support the transition between new and existing landscape. They would assist in achieving seamless corridor topography and a 'green' corridor journey experience. Vegetated mounds also provide an opportunity for the re-use of excavated material and screen planting.

However, depending on the steepness of the slope and underlying rock, it may not be possible to revegetate cut batters, and these would be left as natural rock. Where possible flatter slopes would be adopted to provide maintenance and vegetation establishment while also seeking to replicate the surrounding natural topography and balance cut and fill.

As described in environmental management measure UD01, a UDLP will be prepared for the project during detailed design, in consultation with CHCC and in accordance with best practice guidelines. The UDLP will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the EIS. This will include location and identification of proposed landscaped areas (such as proposed landscaping on earth mounds and cut batters) and the species to be used at these locations. It will also include procedures for monitoring and maintaining these landscaped areas to manage weed infestation and ensure the landscaping establishes. For further details on what will be included as part of the UDLP, refer to **Chapter 6, Revised environmental management measures.**

As described in environmental management measure FF21, weed species would be managed in accordance with Guide 6: Weed Management of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a).

Submission number(s)

12

Issue description

- The use of shotcrete should be avoided
- There is a need to demonstrate how the project will avoid steep batters subsequently exposing rock and using shotcrete and rock bolts.

Response

Detail on the urban design strategy for the project is described in Chapter 4 of Appendix J, Urban design, landscape character and visual impact assessment of the EIS. The project's design has focused on the integration of cutting and embankment slopes to respond to the surrounding topography where possible. The design acknowledges the potential geological constraints in this regard and explores opportunities to vary the surface finish. This allows topsoil to be retained on slopes and vegetation to be established over time.

In developing the urban design strategy for the project, specific principles and design responses have been developed for cut batters to integrate the project with the surrounding landscape. The following design responses have been developed to minimise the potential use of shotcrete and rock bolts:

- Cut batters would generally be at a slope of 2H:1V. While steeper slopes may be achievable from a stability perspective, flatter slopes have been adopted where possible to provide maintenance and vegetation establishment while also seeking to replicate the surrounding natural topography and to balance cut and fill
- The bottoms of cuttings will allow adequate space for planting to soften the immediate impact of the cutting where possible
- Cut batter treatments for medium and high strength rock that requires blasting would include over-blasting the rock and backfill to achieve a 2H:1V gradient where possible. This approach would avoid rock faces requiring shotcrete and rock bolts
- Batter benches can be used to assist with stability, geotechnical and maintenance considerations.

Notwithstanding, if shotcrete is required for stability or to minimise construction extents, the criteria described in the shotcrete avoidance and mitigation strategy as part of the Appendix J, Urban design, landscape character and visual impact assessment of the EIS would be applied. This includes consideration of the colour, consistency and texture to ensure it is sensitive to the existing landform and character and application of TfNSW's Shotcrete Design Guideline: Design Guideline to Improve the Appearance of Shotcrete in NSW (Roads and Maritime Services 2016c).

4.11 Land use and property

4.11.1 Property access

Submission number(s)

25, 97

Issue description

- Access to the property near Englands Road interchange is not properly or clearly defined and the property owner requests an access driveway from the service road to the property
- Proposed changes in property access on Mackays Road is inconvenient, as it is much longer than the existing access.

Response

As discussed in Chapter 8, Traffic and transport of the EIS, existing property accesses impacted by the project would be reinstated in consultation with affected landowners. Design of property access would be developed in consultation with the affected property owner through the property acquisition process and incorporated into the design for the project during detailed design. Access to properties on the western side of the existing Pacific Highway would have their property access connected to the one-way local access road located on the western side of the upgraded highway. The local access road has been included to improve road safety and separate through and local traffic at this location.

As result of the construction of the project between Shephards Lane tunnel and Gatelys Road tunnel, a new local access road would need to be provided west of the project to provide access between Mackays Road and the properties located west of the project. Mackays Road would be realigned for about 600 metres parallel and east of the project to provide a connection to an underpass of the project. It is anticipated that this would result in an additional 700 metres travel for Submission ID 25 compared to their existing access. While this may result in an inconvenience due to the extra travel time, this section of Mackays Road would be sealed as part of the project which would result in improved safety conditions.

Submission number(s)

168

Issue description

- Impact to the Englands Road Waste Management Facility within the Coffs Coast Resource Recovery Park will cause problems for the disposal of bulky goods.

Response

Following exhibition of the EIS, TfNSW has amended several aspects of the project. This was in response to consultation with the community and landowners during the EIS exhibition, submissions received during the EIS exhibition period, continued development and refinement of the concept design, and consultation with government agencies. The potential direct property impacts to Coffs Coast Resource Recovery Park have been reduced with the amended Englands Road interchange design described in Chapter 2, Design changes of the Amendment Report. These changes include a revised alignment for the northbound exit ramp and one-way local access road, located on the western side of the project. These changes would reduce impacts on the Coffs Coast Resource Recovery Park and have been the subject of ongoing consultation with CHCC.

As identified in environmental management measure TT06, a TMP will be prepared and implemented as part of construction. The plan will include measures (eg restricted delivery hours, staging and programming, speed limit restrictions and traffic controls) to manage additional vehicle movement impacts on the existing road network, particularly at access points to the proposed construction ancillary sites and construction footprint access roads such as Englands Road. In addition, and as identified in environmental management measure TT07, existing access will be maintained during construction. Where that is not feasible or reasonable, temporary alternative access arrangements will be provided following consultation with CHCC and business operators in the Coffs Coast Resource Recovery Park. Refer to **Chapter 6, Revised environmental management measures** for further detail on TT06 and TT07.

Access to the Coffs Coast Resource Recovery Park would be improved during operation when compared to the design described in the EIS. This is because of the proposed design changes at Englands Road interchange. Changed impacts to the Coffs Coast Resource Recovery Park are discussed further in Section 5.6, Land use and property and Section 5.7, Socio-economic of the Amendment Report.

Submission number(s)

103, 108

Issue description

- The Five Islands Drive development within Pacific Bay Resort has limited access. A second exit on to Breakers Way and James Small Drive would be desirable. However, this should not be at the expense of losing access to Charlesworth Bay Road
- The proposed access to a proposed nine-lot subdivision via Old Coast Road is inadequate. The access will limit the development potential of the land and the road is too narrow for the safe access and movements of firefighting vehicles. Access needs to be appropriate for the future needs of the land.

Response

As identified in Chapter 8, Traffic and transport of the EIS, existing property accesses impacted by the project would be reinstated in consultation with affected property owners.

Access to properties along Five Islands Drive would be unchanged because of the project, with access to the road network provided via Resort Drive/Bay Drive to Charlesworth Bay Road. Providing a new connection from Five Islands Drive to Breakers Way and James Small Drive is outside the scope of this project.

Following the exhibition of the EIS, the concept design for the Korora Hill interchange has been amended and the proposed design change is documented in Chapter 2, Design changes of the Amendment Report. The design change includes provision of traffic lights at the intersection of the existing Pacific Highway and Charlesworth Bay Road. This will improve access to the existing highway for traffic from Charlesworth Bay Road, which would include traffic from Five Islands Drive.

TfNSW has a responsibility to, where reasonable and feasible, retain existing access to properties. Where this is not feasible or reasonable, an alternative access will be provided following consultation with the affected property owners. However, providing and integrating additional property access routes for future developments is outside the scope of TfNSW's obligations. The proposed access via Old Coast Road to the property south of the Kororo Nature Reserve maintains the existing level of access provided for that property.

Submission number(s)

99

Issue description

- Any replacement property access must be made of high standard and made of concrete. Passing bays should also be included consistent with the subdivision development application the property owner has commenced.

Response

As discussed in Chapter 8, Traffic and transport of the EIS, existing property accesses impacted by the project would be reinstated in consultation with affected landowners. Design of property access would be developed in consultation with the affected property owner through the property acquisition process and incorporated into the design for the project during detailed design. Providing and integrating additional property access routes for future developments is outside the scope of TfNSW's obligations.

4.11.2 Property acquisition

Submission number(s)

73, 171

Issue description

- Partial acquisition of property means almost 50 per cent of land is acquired plus a cottage
- How much of the Fern Tree Place community property has been acquired and at what price?

Response

All property acquisition, including compensation assessment will be carried out in accordance with the Land Acquisition Information Guide (Roads and Maritime Services 2014a), Fact sheet: Property Acquisition of Subsurface Lands (Roads and Maritime Services 2015c) and the *Land Acquisition (Just Terms Compensation) Act 1991*. Refer to environmental management measure LUP02 in **Chapter 6, Revised environmental management measures**.

The application of the above TfNSW property acquisition guidelines includes the appointment of a Personal Manager Acquisitions to assist each of the landowners, residents and commercial tenants affected by acquisition for the project. The Personal Manager Acquisitions would work with the landowners, residents and commercial tenants to offer them assistance and support throughout the process.

Regarding the issue of partial acquisition which will also impact a cottage, there has been no change in acquisition requirements as outlined in Appendix K1, Property impacts of the EIS. Acquisition negotiations have commenced for this property.

Chapter 2, Design changes of the Amendment Report, describes the proposed changes at Kororo Public School bus interchange. The change in construction footprint at this location now requires the acquisition of about 0.53 hectares of Fern Tree Place community property. Further assessment of land use impacts on Fern Tree Cove community property is detailed in Section 5.8, Socio-economic of the Amendment Report.

Submission number(s)

103

Issue description

- TfNSW should be required to acquire a property that cannot be economically mitigated from noise impacts, visual impacts or other impacts.

Response

Under the *Land Acquisition (Just Terms Compensation) Act 1991*, only properties required for the construction of the project can be acquired. In accordance with this legislation, compensation is only payable where the whole or a part of the property is acquired for the project. The consideration of potential environmental impacts of the project on surrounding properties and the requirement, where necessary, for mitigation measures is considered through the EIS process.

In some exceptional circumstances, mitigation measures may not provide a solution to a property owner's hardship circumstances that are further impacted by a road project. In these cases, an owner may request TfNSW purchase their residential property under exceptional hardship.

The exceptional hardship land purchase process responds to residential property owners, in the vicinity of a road project, who have a serious and pressing need to sell their property because of exceptional personal circumstances but are unable to do so because of a negative impact on their property as a result of the road project. The owner's exceptional personal circumstances must be demonstrated and must be capable of constituting real and disproportionate hardship. In such circumstances, TfNSW may make an offer to purchase the property, in its absolute discretion, following a request from the property owner.

Further detail can be found in TfNSW's Exceptional Hardship Land Purchase Guideline (Roads and Maritime Services 2016d), available via the following link: ***https://www.rms.nsw.gov.au/documents/about/land-acquisition/exceptional-hardship-land-purchase-guidelines.pdf***

Submission number(s)

176

Issue description

- Property owner requests TfNSW consider acquisition of property for future emergency services.

Response

The NSW Department of Communities and Justice, Office of Emergency Management has a long-term plan for emergency services across NSW. The respondent is encouraged to contact the Office of Emergency Management for consideration of their property for the purposes of future emergency services.

Under the *Land Acquisition (Just Terms Compensation) Act 1991*, only properties required for the construction of the project can be acquired. In accordance with this legislation compensation is only payable where the whole or a part of the property is acquired for the project. The consideration of potential environmental impacts of the project on surrounding properties and the requirement, where necessary, for mitigation measures is considered through the EIS process.

Submission number(s)

97

Issue description

- Where acquisition of a property is required, property owners should be compensated in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.

Response

As identified in Section 5.3.17, Property access and acquisition of the EIS, land needed for the construction of the project would be acquired in accordance with the Land Acquisition Information Guide (Roads and Maritime Services 2014a), the *Land Acquisition (Just Terms Compensation) Act 1991*, and the land acquisition reforms announced by the NSW Government in 2016, which can be viewed online at:

https://www.finance.nsw.gov.au/sites/default/files/NSW_Government_Response.pdf

Refer to environmental management measure LUP02 in **Chapter 6, Revised environmental management measures**.

4.11.3 Property adjustments and utilities

Submission number(s)

65, 73, 99, 173

Issue description

- Requests connection to town water supply during construction. The loss of the water licence as a result of the project would incur higher costs for future water use at the property
- Concerned that there will be loss of power and water while utility pipes are removed during construction
- Stormwater drains are currently located underneath the driveway and will be acquired by TfNSW. These will need to be replaced further along the remaining driveway to ensure adequate drainage is achieved
- Power services should not be affected by the project and there must be sufficient drainage and replacement of letterboxes as part of acquisition process.

Response

Impacted water sources will be restored, replaced, relocated or compensated for in consultation with affected property owners as part of the property acquisition process. Should the project result in the loss of existing water licence, this would either be replaced or compensated for. Opportunities to connect existing properties to town water supply is considered outside the scope of the project.

As identified in Chapter 5, Project description of the EIS, several utilities are in or next to the construction footprint for the project and would need to be protected or relocated. Details of existing utility services and requirements for their potential relocation or protection will be confirmed during detailed design in consultation with the utility service providers. Given the scope of work potentially required, it is likely that any relocation or protection would occur as a pre-construction activity and would also require work outside of the standard working hours to minimise disruption to traffic and disturbance to surrounding residences and businesses.

As identified in environmental mitigation measure LUP04, the following strategy will be implemented before construction in consultation with the relevant utility providers:

- Further detailed utility investigations (revised 'Dial before you Dig' queries and/or potholing will be carried out to confirm the location of buried services)
- Detailed utility design will be carried out in accordance with the relevant utility providers requirements
- Relocation or protection work will be carried out in a manner that minimises environmental impacts and addresses the relevant utility service providers requirements and construction methods.

Refer to **Chapter 6, Revised environmental management measures** for further detail on LUP04.

As discussed in Chapter 8, Traffic and transport of the EIS, existing property accesses impacted by the project would be reinstated in consultation with affected landowners. Design of property access would be developed in consultation with the affected property owner through the property acquisition process and incorporated into the design for the project during detailed design. This would include reinstatement of existing utility connections and drainage infrastructure, letterboxes, and existing pavement areas/concrete pads disturbed by the property adjustment and/or utility protection/relocation works.

4.11.4 Property value

Submission number(s)

28, 42, 54, 67, 71, 86, 92, 109, 116, 120, 135, 136, 147, 160, 161, 168, 169, 173, 179, 180, 183

Issue description

- Concerns that the project will reduce existing property value because of impacts, including:
  - Changes in accessibility to the suburb with complicated routes to get in and out of the neighbourhood
  - Increased noise impacts because of the proximity of the motorway to existing residences
  - Loss of amenity because of vegetation clearing adjacent to Coachmans Close.

Response

TfNSW recognises neighbouring property owners near to the project may be impacted. A number of environmental management measures included in **Chapter 6, Revised environmental management measures** have been provided to manage the types of impacts that could affect these properties such as noise and visual impacts. Future movements in property values are difficult to forecast as they are subject to many variables, including specific attributes of the property, local amenity and accessibility, demand and supply factors and other wider changes in the property market.

4.11.5 Development potential

Submission number(s)

16, 25, 105, 161, 169, 174

Issue description

- Property owner has plans for future development. Due to the project, there are concerns related to the ability to sell or develop the property because of anticipated flooding, noise and visual amenity impacts

- Property owners, especially farmers, are being deprived of development and business opportunities for their properties. Their investments and their future financial security are being compromised
- The project has compromised the property owner's financial security by reducing the potential to develop private land as the project separates the property in half. No provisions for the movement of livestock, farming maintenance or services have been made
- The southbound on ramp of Englands Road interchange has extensive encroachment on Lot 21 DP 564457, resulting in adverse impacts and reduced development potential
- The project reduces potential to develop private land
- Constructing the project will impact the development and growth potential of Coffs Harbour including the value and desirability of real estate.

Response

As identified in Chapter 4, Project development and alternatives of the EIS, planning for the project began in 2001 as part of the Coffs Harbour Highway Planning Strategy (CHHPS) (RTA 2001a). The CHHPS was developed by TfNSW in association with the DPIE and CHCC. It involved extensive consultation with a wide range of community groups and individuals. The purpose of the CHHPS was to:

- Address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga
- Plan for future traffic needs within the Coffs Harbour urban area
- Provide planning certainty for CHCC and the community.

In September 2008, the preliminary concept design for the project was announced and displayed for community comment. In response to community submissions received during the display, the concept design was further refined. This allowed CHCC to reserve the route in the LEP to provide planning certainty for CHCC and the local community. The road corridor based on this design was incorporated into the LEP with a SP2 zoning for infrastructure. The design of the project sought to contain the project within the designated corridor. The small percentage of land outside of the designated corridor was guided by optimising the design to minimise impact on residential, industrial, and agricultural land, and fragmentation and sterilisation of land.

The changes to the zoning of the corridor were undertaken to give planning certainty to CHCC and the community. All planning decisions since the designation of the corridor such as the development of urban release areas and other areas have considered the road corridor.

As identified in Chapter 4, Project development and alternatives of the EIS, planned residential development areas within the Coffs Harbour region were taken into consideration when developing the preferred route. Future developments that were identified in the North Coast Regional Plan, or the Local Growth Management Strategy were also assessed in Chapter 12, Land use and property of the EIS. Given the size of these development areas, the project would not result in any significant land take on any one growth, infill or renewal area land. In several instances, the direct impacts are only required for ancillary sites during construction, and land would be available for future use in line with the future growth, infill or renewal requirements. There would be no additional direct impacts upon future development as a result of required acquisition, beyond those identified during the construction phase.

Potential changes to flooding, noise and visual amenity because of the project were identified in the EIS and in the updated assessments documented in the Amendment Report. There are several

mitigation measures which have been incorporated into the design of the project to help manage and reduce these impacts on the adjacent residential areas to the project. These measures would also assist in maintaining potential development opportunities private property owners may have for properties near the project. The measures include:

- Use of tunnels to cross Roberts Hill, Shephards Lane ridge and Gatelys Road ridge to avoid and/or minimise impacts on landscape character and visual amenity
- Cut and fill batters have been designed to be 2H:1V where possible to improve the visual amenity and landscaping potential of the project
- Inclusion of around 8.1 kilometres of new noise barriers, low noise pavement for the full length of the project and lower carriageway gradients to minimise operational noise impacts of the project
- Earth mounds incorporated into the project design to help balance earthworks for the project and help with managing visual and noise impacts
- The design of the project would generally allow the natural drainage flow regimes to be maintained. Cross culverts and bridges would be provided beneath the project to convey surface water runoff and would be designed with sufficient capacity to convey the 1 per cent AEP peak flow with no impact on highway function. Flood mitigation measures would be designed to meet the floodplain management objectives for the project, where reasonable and feasible.

Several property-specific measures for managing impacts to agricultural properties are outlined in Table 13-13 of Chapter 13, Agriculture of the EIS. These measures would be implemented in consultation with affected properties. Through this consultation, it is anticipated there would be alternative property specific management measures which could be implemented as a form of compensation to help manage impacts to affected properties during construction. Additionally, affected properties which are seriously or critically impacted by the project will have access to a specialist agricultural consultant to help with assessing opportunities for agricultural diversification and/or revised farm management practices, as identified in environmental management measure AG01. In particular, submission ID 25 refers to provisions for the movement of livestock, farming maintenance and services. At this location, the project has allowed for an underpass for Mackays Road which would allow for these movements.

The impacts of the bypass on businesses in Coffs Harbour is anticipated to be minor as Coffs Harbour will remain a key regional centre for both tourism and commercial purposes. A Directional Signage Plan will be developed in accordance with TfNSW and Destination NSW signage guidelines to ensure effective and appropriate signposting for key locations along the project in accordance with environmental management measure SE02. The plan will identify the range of services that Coffs Harbour provides and will be prepared in consultation with CHCC, Coffs Harbour Chamber of Commerce and the NSW Government's Tourist Attraction Signposting Assessment Committee (TASAC).

Submission ID 16 specifically mentions the impact of Englands Road interchange on their property and development potential. As a result of the proposed design change at Englands Road interchange, the project would result in a decreased impact of 0.07 hectares to the property compared with that assessed in the EIS. Overall, about 12.93 per cent of the property would be acquired by TfNSW for the purposes of the project. A five metre high noise wall is proposed on the eastern side of the project, which would border the western boundary of the property. There is currently no noise wall along this edge of the existing Pacific Highway, as such, the property would benefit from the installation of the noise wall. In addition, being located adjacent an interchange would offer a number of development benefits including ease of access to surrounding areas.

All property acquisition will be carried out in accordance with the Land Acquisition Information Guide (Roads and Maritime Services 2014a), Fact sheet: Property Acquisition of Subsurface Lands (Roads and Maritime Services 2015c) and the *Land Acquisition (Just Terms Compensation) Act 1991*. Refer to **Chapter 6, Revised environmental management measures**. Issues relating to impacts on proposed future property development have been discussed with directly affected property owners as part of property acquisition discussions carried out since the exhibition of the EIS. Impacts to property value are discussed in **Section 4.11.4**.

Through the application of environmental management measures, maintaining access to properties and reservation of the road corridor in 2008, the project would not impact on development potential of individual properties or of Coffs Harbour as a whole.

4.11.6 Compensation

Submission number(s)

28, 97

Issue description

- Compensation is required as the partial acquisition of land will decrease property value and result in loss of income.

Response

TfNSW recognises neighbouring property owners near to the project may be impacted. Several environmental management measures included in **Chapter 6, Revised environmental management measures** have been provided to manage property acquisition impacts including potential financial implications on affected property owners. Future movements in property values are difficult to forecast as they are subject to many variables, including specific attributes of the property, local amenity and accessibility, demand and supply factors and other wider changes in the property market.

Property acquisition and any subsequent compensation will be carried out in accordance with the Land Acquisition Information Guide (Roads and Maritime Services 2014a), Fact sheet: Property Acquisition of Subsurface Lands (Roads and Maritime Services 2015c) and the *Land Acquisition (Just Terms Compensation) Act 1991.*

Submission number(s)

9, 10, 25, 49, 54, 64, 82, 92, 105, 107, 135, 160, 171, 173

Issue description

- TfNSW should consider compulsory acquisition of indirectly affected properties, such as those on Coachmans Close, due to property value impacts. If this is not possible, TfNSW should consider compensation for landowners
- Is there any opportunity for compensation for rental income that may be void during construction due to property impacts such as noise and vibration?
- At-property treatments, such as double-glazed windows and air-conditioning, will reduce the quality of life, increase costs and add to financial stress
- What compensation will be offered for the loss of amenity, dust and noise impacts during construction. Will there be building modifications for noise or monetary compensation such as relocation rent costs?
- Lifestyle changes will be required during construction, which will involve additional electricity costs for cooling, heating and lighting. Will there be compensation for this?

- Should the construction of the bypass be detrimental to health, property owner expects compensation from TfNSW
- Compensation is needed for the negative impact to property and wellbeing due the Coramba Road interchange.

Response

TfNSW recognises neighbouring property owners near to the project may be impacted. Many aspects influence property values, and potential rental income, such as location and use. It is recognised properties affected by the project may be difficult to market before completion of construction because of uncertainty of environmental impacts. Property owners cannot receive financial compensation if they are only adjacent to a new or upgraded road, including if a property decreases in value. The Roads Act 1993 only provides for TfNSW to acquire land required for road purposes (called 'directly affected' land). New or widened roads can have impacts because of their proximity, such as increased noise or visual impacts.

The potential health impacts resulting from the project were assessed as part Appendix Q, Human health risk assessment of the EIS. The assessment was prepared to specifically address risks to human health in relation to changes in air quality and noise, relevant to the construction and operational phases of the project in accordance with the SEARs. The largely qualitative assessment within Appendix Q, Human health risk assessment of the EIS was informed by assessment for air quality and noise and vibration assessment and was used when considering health impacts as they relate to social and community impacts in Chapter 14, Socio-economic of the EIS.

In addition, TfNSW have assessed the potential impacts of the project on adjoining communities and have proposed a number of environmental management measures to reduce these environmental or social effects where possible (see **Chapter 6, Revised environmental management measures**). While TfNSW does not provide financial compensation, it does its best to reduce impacts. TfNSW will continue to consult with neighbouring landholders and the broader community throughout the detailed design and construction phases to manage potential indirect impacts.

4.12 Agriculture

4.12.1 Impacts on blueberry farms

Submission number(s)

25

Issue description

- Concern that pollution and dust from passing vehicles and heavy machinery will settle on unharvested blueberries and contaminate them
- Currently water is extracted from Treefern Creek, and this will cease to exist as a water supply for blueberry farming production due to construction. Acquisition will also impact a bore which provides water to the residence. It will be costly to rectify and brings into question whether current farming activities will be able to continue.

Response

Agricultural properties that have the potential to be impacted by the project were assessed in Appendix K2, Agricultural assessment of the EIS and potential impacts are summarised in Chapter 13, Agriculture of the EIS. Individual property impact reports can be found in Appendix 1 of Appendix K2, Agricultural assessment of the EIS.

The agricultural assessment considered the proximity and extent of earthwork and ancillary facilities, as well as crop sensitivity to dust impacts. Each property was given an impact level that was minor, moderate, serious or critical. No agricultural properties would be critically impacted by dust impacts, with most being assessed as having a moderate or serious impact.

The issues identified above relate to potential impacts to APO 58. The agricultural assessment determined that there would be a serious risk of impact from dust, based on substantial earthworks, proximity to potential ancillary facilities and close proximity of dust sensitive crops to the construction footprint.

The management of dust generation during construction would be addressed through the implementation of an Air Quality Management Plan (AQMP), as identified in environmental management measure AQ01. The plan will identify potential sources of air pollution (including dust), identify sensitive receivers (including blueberry farms), identify air quality management objectives and mitigation and suppression measures to be implemented to manage potential impacts on sensitive receivers, including agricultural properties. The AQMP will also include provisions for real time dust monitoring to assess the effectiveness of the applied management measures for sensitive agricultural receivers. Further mitigation and suppression measures could be applied if controls aren't found to be effective, to help minimise impacts to blueberry farms.

Further mitigation and suppression measures to that already detailed under AQ01 could include designing haul roads to take the most direct route, adding speed humps to manage speed limits, orientation of stockpiles to offer the minimum cross-sectional area to prevailing winds establishment of artificial wind breaks such as bund walls or use of automatic sprinklers that are triggered by wind speed/direction. The final selection of additional mitigation and suppression measures would be subject to a reasonable and feasible evaluation.

As outlined in Chapter 21, Air quality of the EIS, during operation of the project there would be some local increase in air emission concentrations along the project, where previously roads did not exist. However, it is not expected this increase would result in any exceedance of the air quality standards with estimated concentrations of NO_2, PM_{10}, $PM_{2.5}$ and CO found to be well below the relevant EPA air quality criteria. Any emissions are predicted to disperse quickly and are unlikely to settle on adjacent blueberry farms.

Appendix 1 of Appendix K2, Agricultural Assessment of the EIS describes the overall impact to APO 58 as moderate. The agricultural assessment also identified the project would have a serious impact to irrigation water at APO 58 as the water is currently pumped from Treefern Creek. The dam and the pump would be removed by the project. While the impacts are serious there would be feasible options to maintaining irrigation water source requirements. As such, provided there is property owner agreement to the revised irrigation water source, it is anticipated that farming could continue.

In addition, environmental management measure AG02 is proposed for APO 58 and commits to impacted irrigation water sources and/or infrastructure being restored, replaced, relocated or compensated for in consultation with affected property owners. This would include any impacts to farm dams from a drawdown in groundwater levels, updates to the current water license and bore if required. Any replacement or relocation requirements would be at the expense of TfNSW.

Refer to **Chapter 6, Revised environmental management measures** for further detail.

4.12.2 Panama disease

Submission number(s)

13

Issue description

- Panama disease is a real threat, and construction presents a vector to spread infected soil. Protocols for quarantine and ongoing management of Panama disease should be modelled on the Biosecurity Queensland response to Panama Race 4 in Far North Queensland.

Response

The issues associated with Panama disease were also raised by RIARG, DPIE (see **Section 3.3.2**).

As identified in environmental management measure AG08 in the EIS, a Panama Disease Control Management Plan will be prepared and implemented prior to and during construction in consultation with RIARG, DPIE and representatives of the Banana Growers Association of Coffs Harbour & District. TfNSW has committed to preparing this plan in accordance with relevant Queensland Department of Agriculture and Fisheries guidelines including Panama Disease Tropical Race 4: Biosecurity Standards and Guidelines (Department of Agriculture and Fisheries 2015) and Panama Disease Tropical Race 4: Decontamination Guide (Department of Agriculture and Fisheries 2016).

Since exhibition of the EIS, TfNSW has progressed planning and development of the Panama Disease Control Management Plan. This has included consultation with the Queensland Department of Agriculture and Fisheries and the Australian Banana Growers' Council to understand current best biosecurity practice measures being implemented to manage Panama disease risks in North Queensland. TfNSW will continue to engage with all relevant agencies and stakeholders, including RIARG, DPIE and local banana farmers to ensure risks associated with Panama disease are effectively managed.

As described in the EIS, as part of the preparation of the Panama Disease Control Management Plan, several specific management measures and controls will be developed including but not limited to:

- Clearing and grubbing practices
- Stockpile management procedures for topsoil and other materials
- Procedures for the management and/or disposal of contaminated and/or potentially contaminated Panama disease soils including its identification as such to prevent accidental spread of the disease by others
- Erosion and sediment control requirements
- Dust management controls
- The movement of construction plant, vehicles and equipment and personnel both within the project and externally, including where construction plant and equipment may have previously worked in other affected areas such as north east Queensland.
- Revegetation and rehabilitation practices.

The development of the above listed specific management measures and controls will ensure potential impacts to agricultural properties and the movement of contaminated soil are adequately addressed.

Refer to **Chapter 6, Revised environmental management measures** for further detail.

4.13 Socio-economic

4.13.1 Methodology and assessment

Submission number(s)

86, 135

Issue description

- The social impact of residents that reside close to the highway should be assessed, not just an assessment of the Coffs Harbour as a whole.
- The scale of socio-economic impacts has not been quantified but is reasonably anticipated to negatively affect thousands of properties and many more residents.
- There is no justification as to how the socio-economic cost is measured against the project benefits.

Response

The benefits of the project were discussed within the EIS and are updated below for the amended design:

- Complementing the Pacific Highway upgrade program by providing free flowing dual carriageway conditions between Hexham and the Queensland border
- Improved road safety by removing through traffic (light and heavy vehicles) and some local traffic from the existing road network which would reduce conflicts and improve safety for all road users. Total crash rate is estimated to reduce the number of crashes on the existing Pacific Highway by 14 crashes per year in 2044
- Reduced incidents associated with conflict between pedestrian, cyclist, passenger and freight traffic through the CBD with around 60 per cent of heavy vehicles predicted to divert from the existing highway to the project by 2044 (about a total 3000 fewer heavy vehicles daily at the Pacific Highway north of Orlando Street)
- Improved travel time for through and local traffic, reducing travel times by up to 20 minutes for those travelling southbound by 2044
- Improved transport efficiency of the existing Pacific Highway through Coffs Harbour, relieving congestion on the wider Coffs Harbour road network and providing an alternative route for some local trips. This improved transport efficiency and the resulting improvements to accessibility and amenity to the Coffs Harbour CBD would likely result in wider economic benefits for the Coffs Harbour region
- Improved freight efficiency for heavy vehicles by providing a high standard dual carriageway road to complement the National Land Transport Network, Future Transport Strategy 2056 and the recently upgraded Pacific Highway
- Improved safety outcomes through relocation of the existing school bus interchange at Kororo Public School from the Pacific Highway to the service road
- Improved safety for a number of local roads in the northern section of the project as well as the southern end (south of Englands Road interchange) through the provision of a service road and one-way local access road which would reduce the number of conflict points along the existing

Pacific Highway by removing direct access to the Pacific Highway through unsignalised intersections

- The provision of traffic lights at the intersection of the existing Pacific Highway and Charlesworth Bay Road includes signalised pedestrian/cycle crossings of the existing Pacific Highway, improving road safety for pedestrians and cyclists crossing the existing highway.

Adverse impacts of the project, including socio-economic impacts, were considered and justified in Chapter 28, Project justification and conclusion and Chapter 29, Project synthesis of the EIS. It was considered that while the amenity values for people living and working in the area will be impacted (due to noise, air quality including dust, visual impact and inconvenience from altered road and access arrangements during construction) these impacts are short-term. Any long-term impacts would be mitigated through environment management measures outlined in **Chapter 6, Revised environmental management measures**.

The socio-economic impacts are justified when considering the consequences anticipated if the project is deferred, these would include:

- Worsening traffic congestion within Coffs Harbour would lead to greater delays and further deterioration of travel time reliability for both local and longer distance trips, affecting passenger and freight transport tasks
- The motorist, cyclist and pedestrian casualty rate would remain more than three times higher than expected of a road of this class
- Forecast growth in the freight task, particularly on the key Melbourne, Sydney and Brisbane freight network will lead to greater levels of congestion on the Pacific Highway at Coffs Harbour. The proportion of heavy vehicles and through traffic travelling through Coffs Harbour is likely to increase, adversely affecting road safety and amenity within the Coffs Harbour CBD
- Not addressing the current situation would also mean that only a proportion of the program-wide benefits estimated for the Pacific Highway Upgrade Program would be captured and could risk the creation of congestion bottlenecks at Coffs Harbour would continue
- Opportunities for economic growth and development within Coffs Harbour will continue to be constrained by the existing highway.

Chapter 14, Socio-economic of the EIS has addressed the social impact on residents that live in the socio-economic impact assessment (SEIA) study area and within that, the core impact area. The SEIA study area was established in accordance with TfNSW's Environmental Impact Assessment Practice Note: Socio-Economic Assessment 2013 (Roads and Maritime Services 2013a) as well as the SEARs for the project. It considered the potential extent and scale of impacts, both direct and indirect and the combination of urban and rural context of the areas surrounding the project.

To allow for effective demographic profiling, the study area was established to align with the SA1 geographies of Australian Bureau of Statistics (ABS) data. The SEIA study area was established by selecting all 86 SA1s within 500 metres of the project and the existing Pacific Highway alignment and all other SA1s located between them. Communities immediately adjacent to the project would experience more direct impacts than those of the broader SEIA study area. Therefore, a core impact area was also identified. The core impact area was established based on the 27 SA1s located along the construction footprint to enable more refined reporting of demographic data for the communities immediately adjacent to the project.

Additional assessment of the SEIA study area was carried out to address CHCC's concerns regarding the potential social and economic impacts of the project in the Boambee East-Toormina area (see

Figure 3.1-8 in **Section 3.1, Coffs Harbour City Council**). The Northern Beaches (Sapphire Beach and Moonee Beach) are more than 1.5 kilometres and six kilometres north of the project respectively, and these communities are unlikely to be impacted by the project although it is noted that the project would improve access and connectivity between the northern beaches and the SEIA study area, which contain social services and facilities which serve these communities. For further information see the response to CHCC issue within **Section 3.1.14**.

The assessment considered impacts on the community's demographic profile, values, amenity (including noise, air quality and visual changes). Additionally, potential impacts on sensitive receptors, such as schools, places of worship or hospitals within 500 metres of the project were identified and assessed.

In accordance with TfNSW's socio-economic assessment practice note, the following was considered when assessing socio-economic impacts to determine the level of significance of the impact; the sensitivity of those affected, the spatial extent and duration of impacts. As anticipated, the communities immediately adjacent to the project would be more sensitive to and experience more direct impacts than those of the broader SEIA study area. A summary of the impacts described in Chapter 14, Socio-economic of the EIS includes:

- Noise impacts associated with construction, establishment and operation of ancillary sites and movement of construction vehicles
- Blasting required for construction of the project, which would potentially impact nearby residents
- Noise impacts associated with operation of the project has the potential to create annoyance for people who live, work and use the recreational areas near the project. Night-time operational noise near residential areas has the potential to cause sleep disturbance. To reduce the impact of road related noise, several mitigation measures would be used to reduce operational noise including low noise pavement, noise barriers and at-property treatments.
- Annoyance because of dust deposition (soiling of surfaces) and visible dust plumes were identified as one of the main air quality impacts for the project during construction. However, dust soiling impacts because of construction would be local and temporary.
- During construction, a range of activities associated with road works would be visible from viewpoints around Coffs Harbour. There would be an adverse impact on visual amenity for people who have views of the construction footprint and associated machinery and ancillary facilities.
- People who live, work and use the areas where visual and landscape character impacts from the project would be likely to experience some form of associated impact. In particular, views important to the community may no longer be available to them, or the loss of a view may have a potential impact on the value of their property. A range of urban design and landscaping/revegetation strategies would be implemented to mitigate visual and landscape character impacts as much as possible.

The socio-economic assessment was updated for the amended design, and the outcomes are discussed in Section 5.8, Socio-economic of the Amendment Report. Overall, the proposed design and construction changes would likely result in localised changes to socio-economic impacts and are considered to have minimal variation from the impacts described in the EIS.

There are several environmental management measures which have been identified to help manage and reduce these impacts on the communities immediately adjacent to the project (refer to **Chapter 6, Revised environmental management measures**).

4.13.2 Amenity

Submission number(s)

12, 14, 183

Issue description

The project design should be refined to reduce amenity impacts on Coachmans Close, Fernleigh Avenue and Pine Brush Crescent residents. This includes:

- Retaining a treed reserve adjacent to Coachmans Close
- Shifting the southbound carriageway of the project further away from Coachmans Close, Fernleigh Avenue and Pine Brush Crescent properties
- Refining the design to reduce general land use impacts on Coachmans Close, Fernleigh Avenue and Pine Brush Crescent residents.

Response

The section of the project between Korora Hill interchange and Sapphire is tightly constrained and this limits the opportunities to shift the project further away from Coachmans Close. The key constraints driving the design of the project in this location are Kororo Nature Reserve, Kororo Public School and the tie-in to the existing dual carriageway highway at Sapphire.

The effect of these key constraints on the concept design is outlined below:

- The section of the project between Kororo Nature Reserve and Kororo Public School is very tightly constrained. There is just enough space to fit the service road on the eastern side of the project, the main carriageway (including provision for future widening to six lanes), and a property access road to maintain access to an existing property south of Kororo Nature Reserve
- The service road is needed on the eastern side of the project as it provides an important link between Solitary Islands Way and the existing highway near James Small Drive, and to provide access to the Kororo Public School bus interchange
- There is not enough space to fit another service road on the western side of the project to connect Old Coast Road and Korora Basin Road with Bruxner Park Road. Access to the broader road network for residents west of project along Old Coast Road and Korora Basin Road would be via the underpass to the service road near Fernleigh Avenue
- The location of the underpass near Fernleigh Avenue is governed by the crossing of Pine Brush Creek and the tie-in to the existing dual carriageway highway at Sapphire. These two locations influence the vertical and horizontal alignment through this area, which limits the locations where there is enough space to provide the vertical clearance needed for an underpass
- The tie-in to the existing dual carriageway highway at Sapphire sets the northern extent of the project.

The concept design for the project has been developed to minimise the potential impacts on nearby residences along this section of the project, including residences on Coachmans Close. Measures to minimise the potential impacts on nearby residences which have been incorporated into the concept design for the project include:

- Provision of low noise pavement on the main carriageway and a noise wall between the main carriageway and Coachmans Close to reduce noise impacts

- Retaining walls are proposed for the main carriageway to minimise the footprint of the project and reduce the amount of existing vegetation that would need to be cleared to build the project
- Landscape planting is proposed between Coachmans Close and the service road to help reduce the visual impacts of the project and to help reduce headlight glare from vehicles using the underpass and the service road.

In response to the issues raised, TfNSW has carried out a preliminary design investigation to understand the potential impacts of shifting the alignment of the project further west, away from Coachmans Close. Because of the constraints identified above, particularly between Kororo Nature Reserve and Kororo Public School, the investigation focused on flattening the horizontal alignment of the main carriageway to draw the alignment further west and away from Coachmans Close by about 10 metres.

The preliminary design investigations were discussed with a representative of the Coachmans Close, Fernleigh Avenue and Pine Brush Crescent residents on 23 April 2020. The main outcomes of the preliminary design investigation include the following:

- More of the existing vegetation between Coachmans Close and the existing Pacific Highway would be retained, providing greater opportunities to retain vegetation and provide screening vegetation to reduce the visual impacts for residents on Coachmans Close
- Noise impacts on residents in Coachmans Close are expected to be slightly lower because the main source of noise (the main carriageway) would be further away, however noise mitigation would still be needed to reduce noise impacts
- There would be additional property impacts for properties on the western side of the project, which would potentially include additional total property acquisitions and additional direct impacts on the Paradise Palms Resort
- Noise impacts for residents on the western side of the project are expected to be higher because the main source of noise (the main carriageway) would be closer to those properties
- The alignment shift would extend beyond the northern extent of the project past the tie-in to the existing dual carriageway highway at Sapphire. This would require reconstruction of about 150 metres of the existing highway and would extend construction impacts of the project beyond the northern tie-in.

While an alignment shift would likely result in minor amenity improvements for residents in Coachmans Close, it would result in greater amenity impacts to properties west of the project, the acquisition of additional properties and additional project costs associated with additional property acquisitions and extension of the project into the existing dual carriageway highway at Sapphire. Shifting the alignment of the main carriageway further west at this location is not considered a reasonable outcome for these reasons.

In addition to the issue related to shifting the alignment at Coachmans Close, CHCC and community members also raised concerns regarding visual impacts and vegetation screening at this location. TfNSW acknowledges the vegetation within this area is of importance to the community and provides screening value. As illustrated in **Figure 3.1-3**, Coachmans Close north of Fernleigh Avenue, vegetation would be retained where possible to assist with screening views towards the project. During detailed design, an arborist assessment would be carried out to confirm the extent of vegetation that could be retained along Coachmans Close within the construction footprint (refer to environmental management measure UD10 in **Chapter 6, Revised environmental management measures**).

Refer to **Section 3.1.13** and **Section 4.10.4** for a more detail response relating to visual amenity impacts at Coachmans Close.

Submission number(s)

173

Issue description

- Property owner only identified property impacts by the Coramba Road interchange by attending the pop-up information stalls.

Response

A detailed record of the community consultation is available in Chapter 7, Consultation in the EIS. A summary of the consultation activities and where they are detailed includes:

- Table 7-2 provides a summary of engagement activities carried out between 2001 and 2008.
- Table 7-3 provides a summary of engagement activities carried out in 2016 as part of the start of preparation of the EIS.
- Table 7-4 provides a summary of engagement activities carried out for the preliminary concept design.
- Table 7-5 provides a summary of engagement activities for the 2018 concept design.

Community consultation relating to interchange location has been ongoing since display of the 2008 preliminary concept design in mid-late 2016 which re-introduced the project to the community after a period of inactivity and sought feedback on the design to identify issues and opportunities.

Following consideration of feedback on the display of the 2008 preliminary concept design, a strategic review and investigation of the design resulted in a series of options and staging opportunities being developed in late 2017. Further design development was undertaken up to 2018. A major outcome of the design development undertaken during this period was to display a refined concept design to the community before finalising and exhibiting the EIS. The refined concept design was displayed in late 2018.

The Coramba Road interchange design has not been amended since the refined concept design viewing in 2018. Key stages of the concept design development relating to interchange location and design is available in Chapter 4, Project development and alternatives of the EIS.

As discussed in **Section 4.4.5**, TfNSW will investigate alternative designs for the Coramba Road interchange, including a ‘donut’ style interchange, during detailed design. The investigation will consider issues raised in submissions on the EIS and would be guided by the key principles developed during the concept design and EIS phase. Any refinements to the design of the Coramba Road interchange design would need to be consistent with the function of the interchange described in the EIS.

Submission number(s)

74, 107, 116, 136, 147, 158, 161, 168, 169, 174, 183

Issue description

- Community member's children attend Bishop Druitt College. They will be affected by noise, vibration and dust both at home and at school
- Concern for amenity and disruption during construction including noise, blasting noise, vibration, dust, house damage and cracking paths

- Concerned that traffic noise will interfere with use of outdoor space and will confine property owners to staying indoors, impacting their quality of life
- The project will permanently impact the quality of life for residents, environment health, viability of farms, businesses and other enterprises including schools and childcare, the Baringa Hospital, respite care and nursing homes
- There is little information on the mitigation measures for schools affected by noise and dust pollution from the project.

Response

TfNSW acknowledges that amenity impacts and loss of lifestyle is a prominent concern of community members. Consideration of amenity was taken into account when determining the preferred corridor and route for the project. As discussed in Chapter 4, Project development and alternatives of EIS, socio-economic considerations such as amenity was used as a criterion to choose between route options. In some cases, alternative route options were dismissed on the basis they would likely have unacceptable community impacts (including reduced amenity as well as severe land use and business impacts).

Amenity impacts were also assessed in Chapter 14, Socio-economic of the EIS. The assessment found the main amenity impacts during construction relate to noise, traffic and air pollution but that these impacts would be temporary and short-term. The amenity impacts related to construction activities would be managed through the implementation of a Construction Environmental Management Plan (CEMP) and a suite of plans. The plans would provide specific measures to be implemented to manage the amenity related impacts, monitoring programs to assess performance, procedures for consultation with affected receivers, including notification and complaint handling procedures, and contingency measures. Relevant plans are provided below and detailed on **Chapter 6, Revised environmental management measures**.

Relevant management measures and plans include:

- **Noise and vibration management plan (NVMP) (environmental management measure NV01):** Among other measures, the plan will identify measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, respite periods, staging, placement and operation of ancillary facilities, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generating equipment. The plan will also include an Out of Hours Work procedure (NV06)
- **Traffic Management Plan (TMP) (environmental management measure TT06):** Among other measures, the plan will include measures that consider the operation of Kororo Public School and Bishop Druitt College, measures to maintain pedestrian and cyclist access, and requirements to consult and inform the local community of impacts on the local road network
- **Air Quality Management Plan (AQMP) (environmental management measure AQ01):** Among other measures, the plan will include Identification of all dust sensitive receivers, including banana and blueberry farms, residential dwellings, education institutions, health care facilities, places of worship, childcare facilities and open space, and community notification and complaint handling procedures. Any proposed asphalt batch plant(s) will also adhere to measures to minimise odour generation. (see environmental management measure AQ04).

To manage visual impacts related to amenity during construction, environmental management measure UD04 states that project work sites, including construction areas and supporting facilities (such as ancillary sites) will be managed to minimise visual impacts. This includes appropriate

storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.

The assessment in Chapter 14, Socio-economic of the EIS, found that amenity impacts during operation would relate to ongoing noise, pollution and visual impact. Several management measures and strategies have been developed and incorporated into the design to avoid or minimise these impacts. For noise related amenity impacts the measures include low noise pavement along the length of the project, noise barriers (including noise walls or mounds) at specific locations and at-property treatments. Environmental management measure NV11 provides that the operational noise mitigation measures, including noise barriers and/or at-property treatments, will be confirmed during detailed design.

In accordance with NV07, at-property operational noise mitigation measures will be implemented during the pre-construction phase and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts.

For visual related amenity impacts, visual screening has been proposed which includes built elements such as retaining walls, noise barriers (walls and mounds) and vegetation screening. As provided by environmental management measure UD05, where noise walls cause overshadowing, consideration will be given during detailed design to the use of transparent panels within the noise wall design in consultation with potentially affected property owners. The details of the visual mitigation measures will be provided in the UDLP that will be developed in detailed design and in accordance with environmental management measure UD01.

In addition to these specific management measures for noise, visual and air quality related impacts is the Community Liaison Implementation Plan as stated in environmental management measure SE01. The plan will be based on Appendix D, Draft community consultation framework of the EIS, and will be implemented before construction. The plan will provide specific information in relation to community involvement during construction and will include procedures for notifying the community of upcoming work and impacts, and procedures for managing and responding to enquiries and complaints from the community. For further details on SE01 and a list of all the environmental management measures refer to **Chapter 6, Revised environmental management measures**.

Amenity impacts from noise

Submission number(s)

110, 159, 161, 165, 168, 169, 171, 180

Issue description

- Concerned that at-property treatments will not mitigate noise impacts, especially during summer when using outdoor areas and leaving windows open. This will reduce the quality of life for residents and result in a loss of amenity
- Noise pollution and visual pollution will affect the overall quality of life of people who are living in the vicinity of Korora Hill interchange and the proposed route of the Coffs Harbour bypass in general
- Noise mitigation needs to cover external areas as lifestyles will be impacted by the increase in noise.

Response

The operational noise assessment has been carried out in accordance with the SEARs and all relevant guidelines listed under Section 3.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report. Assessment of noise mitigation for the project has been carried out in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and is the application of the NSW Road Noise Policy (DECCW 2011). The primary guiding principle of the Noise Mitigation Guideline is that communities should receive reasonable and equitable outcomes. Assessment criteria in the NSW Road Noise Policy have been set approximately at the point at which 90 per cent of residents are not highly annoyed by the noise.

The Noise Mitigation Guideline prescribes that priority be given to corridor planning and road design where possible prior to consideration of other design measures. In the first instance, the base terrain for the project has incorporated landscape mounds where feasible by incorporating excess spoil from the project. Through the design process and by incorporating tunnels into the project with lower and flatter grades, eliminating tighter curves and integrating the project with the natural terrain, the project has already implemented design measures to help reduce peak noise events/engine brake noise.

The guiding principles from the Noise Mitigation Guideline are considered in the operational noise impact assessment, addressing residual exceedances of noise criteria at qualifying receivers using, in order of preference, quieter road surfaces and noise barriers before considering at-property treatments. The noise barrier assessment gives preference to reducing outdoor noise level and the number of at-property treatments.

The noise assessment develops at-source noise mitigation measures to reduce noise levels from the operation of the project at each noise sensitive receiver based on an external assessment criterion. At-source mitigation measures identified for the project comprise a combination of low noise pavement and noise walls. These have been developed to reduce noise levels for all noise sensitive receivers, including existing sensitive receivers and known future sensitive receivers. Low noise pavement has been included from the southern to the northern extent of the project, excluding the extent of the tunnels. There are eight reasonable and feasible noise barriers identified along the extent of the project ranging in height from 4.5 metres to five metres.

Chapter 14, Socio-economic of the EIS provides a discussion around the socio-economic impacts of noise to the amenity of the community. The assessment acknowledges that construction and night-time operational noise and vibration has the potential to create annoyance for the residents affected, which may lead to stress and/or changes in people's behaviours (such as leaving windows closed or not using outdoor spaces). A number of management measures and strategies have been developed and incorporated into the design to avoid or minimise impacts. These measures include incorporating low noise pavement and noise barriers into the design. Proposed environmental management measures and at-property treatments will help mitigate noise impacts for those receivers close to the project. As for those living close to the Coffs Harbour CBD, there would be a notable reduction in noise, as most heavy vehicles would be removed from the existing Pacific Highway.

In accordance with environmental management measure SE01, consultation will be carried out with potentially affected residences prior to the commencement of and during work in accordance with the Community Liaison Implementation Plan. The plan will be implemented before construction and will include a register of impacted residential properties and businesses and a register for potential construction impacts and timings. The plan will also include procedures for notifying the community of upcoming work and impacts, as well as procedures for managing and responding to enquires and complaints.

4.13.3 Health impacts

Submission number(s)

33, 54, 65, 67, 82, 86, 125, 135, 136, 161, 169

Issue description

- Concerned by impact on health and quality of life during construction particularly at Coramba Road interchange
- The health and wellbeing of residents may be affected by blasting, vibration, heavy machinery, dust, noise, access interruption and general inconvenience during the construction
- Concerns regarding construction impacts such as increased noise and exposure to particulates and effects on health and quality of life, such as the inability to open windows and doors or go outside during the construction phase
- Disruptions to lifestyle could severely impact health
- Community member requires assessment into the health impacts to make an informed decision about the bypass.

Response

The potential health impacts resulting from the project were assessed as part Appendix Q, Human health risk assessment of the EIS. The assessment was prepared to specifically address risks to human health in relation to changes in air quality and noise, relevant to the construction and operational phases of the project in accordance with the SEARs. The largely qualitative assessment within Appendix Q, Human health risk assessment of the EIS was informed by assessment for air quality and noise and vibration assessment and was used when considering health impacts as they relate to social and community impacts in Chapter 14, Socio-economic of the EIS.

Adverse impacts from high dust levels during construction may include possible health effects for the local community (from smaller particles) and soiling and amenity impacts, such as dust settling on cars, or inside windows if left open (due to fallout of the larger particles). However, the risk assessment carried out indicates construction dust is unlikely to present a serious air quality or health issue, with appropriate dust suppression mitigation in place (refer to Chapter 21, Air quality of the EIS). Any effects would be temporary and would mainly arise during dry weather with the wind blowing towards a receiver at a time when dust is being generated. As such, the magnitude of the health impact associated with air quality is considered to be low.

During operation, the project would redistribute traffic from the existing Pacific Highway to the project. This would result in localised air quality changes including a reduction in emissions along the existing highway, and an increase along the project where previously roads did not exist. However, although emissions increase in the immediate vicinity of the project, they are predicted to remain well below the relevant air quality criteria. It is considered the changes to air quality associated with the project would not have a measurable effect on the health of the community around the project.

With regards to noise impacts related to health, construction activities have the potential to create annoyance for the residents affected, which may lead to stress and/or changes in people's behaviours (such as leaving windows closed or not using outdoor spaces). Construction works would take place mostly within standard construction working hours. However, certain activities would need to take place outside of theses hours during the evening and night-time periods. This may be due to technical considerations, for health and safety of the public and construction personnel and to minimise

disruption to the travelling public. Works carried out at night near residential areas have the potential to cause sleep disturbance, which could have health and wellbeing implications.

Once operational the project would result in increased noise in areas where traffic has increased, or roads previously did not exist. Mitigation measures are required to be implemented to ensure the potential risk of unacceptable health impacts are managed. Where at-source noise mitigation measures have not adequately addressed the increased noise levels, the need for at-property treatment is considered. However, it should be noted that at-property treatments also have potential downsides to health of an individual and the community including increased stress levels should the use of outdoor areas be reduced.

There would also be a notable reduction in noise impacts from vehicles using the existing Pacific Highway through the Coffs Harbour CBD, which would benefit those communities located along the existing route. This may reduce existing health impacts for these residents.

Health impacts during construction would be managed through the implementation of a CEMP and a suite of plans, as discussed above in **Section 4.13.2**. The NVMP and AQMP plans would provide specific measures to be implemented to manage the health-related impacts such as dust generation, excessive noise and work outside standard construction hours, monitoring programs to assess performance, procedures for consultation with affected receivers, including notification and complaint handling procedures, and contingency measures.

In addition to the implementation of the NVMP to manage noise impacts during construction, TfNSW will also implement at-property operational noise mitigation measures during the pre-construction phase and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts. This commitment has been included as revised environmental management measure NV07 in **Chapter 6, Revised environmental management measures**.

Operational noise impacts and related health impacts would be managed through the application of low noise pavement, noise barriers and at-property treatments. The final extent of treatment will be confirmed during detailed design in accordance with environmental management measure NV11.

Health impacts due to noise

Submission number(s)

75, 103, 159

Issue description

- There is a need to enforce the current NSW EPA guidelines and address the health impacts of environmental noise
- Concerned by impact on health and quality of life during construction. WHO Guidelines show that serious health conditions will arise from the effects of excess noise pollution
- Without mitigation there are several areas where noise levels will exceed the operational noise criteria which are designed to protect health. There is a need to consider health impacts quantitatively when selecting the bypass route and providing at-property mitigation.

Response

The Noise Mitigation Guideline (Roads and Maritime Services 2015a) specifically considers the recommendations of the WHO guidelines to determine feasible and reasonable assessment of noise mitigation measures and target reasonable and equitable outcomes for the community. Definitions of

feasibility and reasonableness are provided in Section 2 of the Noise Mitigation Guideline and Section 3.3 of the NSW Road Noise Policy (DECCW 2011).

The façade noise level of 45 dB(A) is considered representative of the WHO Night Noise Guidelines for Europe (WHO 2009) and is specifically used in the noise barrier assessment methodology to determine a feasible and reasonable barrier design height as indicated in Appendix H of Appendix B, Updated noise and vibration assessment of the Amendment Report.

As noted in the Noise Mitigation Guideline, this does not equate to all noise sensitive receivers having a target of 45/50 dB(A). Rather, incidental benefits from the noise mitigation designed for qualifying receivers should be recognised at all receivers within a community where noise levels exceed WHO guidelines.

Health impacts from operational noise were considered in Appendix Q, Human health risk assessment of the EIS. In addition, impacts to health from noise were also considered in Chapter 14, Socio-economic of the EIS. The assessment in Chapter 14, Socio-economic of the EIS acknowledges that night-time operational noise near residential areas (or other facilities where people sleep) has the potential to cause sleep disturbance, which could have health and wellbeing impacts. To reduce the impact of road related noise, a number of mitigation measures including low noise pavement, noise barriers and at-property treatments, would reduce operational noise.

The noise and vibration assessment carried out for the project has been prepared in accordance with the requirements of the SEARs for the project, which include NSW EPA guidelines. For further information see the response to NSW EPA noise issues within **Section 3.6.2**.

4.13.4 Business and industry

Submission number(s)

28, 169, 172, 180

Issue description

- If Australia goes into recession the Coffs Harbour retail centre could be pleased to have the passing trade
- Coffs Harbour is a regional hub and attracts people from other areas to spend money and boost the economy. The project will diminish development potential and business opportunities
- Traffic disruption during construction will impact on businesses within Coffs Harbour CBD
- Concerned about a decrease in property value and business viability of Opal Cove Resort during construction due to impacts from property access changes, decreased visible signage and a loss of conference related business.

Response

The impact on businesses was assessed in Chapter 14, Socio-economic of the EIS. The assessment found that although there would be some impacts to passing trade, the overall impact to local business during construction and operation would be low. This is because Coffs Harbour will continue to be a key regional centre and destination for tourists and highway users.

The project presents an opportunity to remove constraints provided by the existing highway through the Coffs Harbour CBD which could assist in further economic growth and development within Coffs Harbour. As discussed in Chapter 3, Strategic justification and project need of the EIS, the project is also important for regional economic growth, as it would provide travel time savings for traffic,

including freight, and would provide safer road conditions to support future business growth and tourism.

Within Chapter 14, Socio-economic of the EIS, it is acknowledged the project may result in a loss of some passing trade. Businesses currently located along the existing Pacific Highway, or reliant on passing trade may suffer economic losses due to the reduction in passing trade associated with the project, including service stations, accommodation providers and major fast food providers.

In addition, key tourist attractions located on the existing Pacific Highway, eg the Big Banana Fun Park, would experience a reduction in through traffic. While these businesses may experience some loss in trade due to no longer being located on a national highway, these impacts would likely be minor and short-term in nature. Coffs Harbour is a major destination regionally and is located halfway between Sydney and Brisbane and forms a logical stopping point. It is likely that many of these businesses would still experience high use as visitors seek out their particular services within the area, particularly with the improved amenity of the Coffs Harbour CBD.

In previous analysis of other towns that have been bypassed, there is evidence to suggest that the accommodation sector may in fact experience higher activity levels in the immediate post-upgrade period as compared to the pre-upgrade period (Parolin and Garner 1996). Furthermore, as outlined in the TfNSW's Economic Evaluation of Town Bypasses report (Parolin 2012), research has shown that while concern about economic impacts is warranted in the short-term (up to one year), in the longer-term, communities do recover to varying degrees from the negative impacts of bypass roads.

To minimise this impact, TfNSW propose to develop a Directional Signage Plan in consultation with CHCC, Coffs Harbour Chamber of Commerce and NSW Government's Tourist Attraction Signposting Assessment Committee (TASAC), in accordance with environmental management measure SE02.

As discussed in Chapter 8, Traffic and transport of the EIS, traffic disruption during construction is unlikely to impact on business within the Coffs Harbour CBD. This is because the proportion of construction vehicles using the existing Pacific Highway would be low and the main construction works would be located at either ends of the existing Pacific Highway where ties-ins to the project would be provided. Notwithstanding, and as identified in environmental management measure TT06 listed in **Chapter 6, Revised environmental management measures**, a TMP will be prepared and implemented during construction. The TMP will be prepared in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c) and would include site specific traffic control measures (including signage) to manage and regulate traffic movement.

Temporary signage including use of variable message signs will also be used to identify any revised access changes to tourism businesses (which would include Opal Cove Resort). The temporary signage will be installed in consultation with affected tourism businesses and in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c). This commitment has been included as a new environmental management measure (SE07) in **Chapter 6, Revised environmental management measures.**

In addition to the above, Appendix D, draft Community consultation framework of the EIS provides an overview of the communication and engagement activities that would be carried out with key stakeholders during construction of the project to assist in minimising a number of impacts such as changes to access. The stakeholders identified for consultation include various tourism businesses and operators.

The draft Community consultation framework will be used to prepare the Community Liaison Implementation Plan for the project (see environmental management measure SE01). This plan will be used to provide specific and timely information in relation to the affected community during

construction, so they are aware of upcoming work and impacts and details of design and construction. Environmental management measure SE01 has been revised to specifically included businesses to ensure procedures and practices take into account their varying needs.

Impacts on tourism

Submission number(s)

75, 123, 161, 168, 169

Issue description

- Concerned that the noise impacts will impact visitor and tourist experience
- The bypass will impact the visitor experience for tourists
- The project needs to consider the unique natural attributes of Coffs Harbour and preserve them for future generations
- Concerned by impact on tourists during construction.

Response

Chapter 14, Socio-economic of the EIS assessed the impacts of the construction and operation of the project on the tourism industry. The assessment found that minor impacts may occur as a result of construction traffic impacting on accessibility for visitors and the visibility of road works from viewpoints around tourist locations. Construction impacts such as noise, vibration and dust may also reduce the amenity of the area. While this may impact on the enjoyment and experience of visiting Coffs Harbour, the overall impact of construction on tourism would be short-term and would not have a significant impact on the region's tourism industry. The unique natural attributes would be preserved, as discussed in Chapter 11, Urban design, landscape and visual amenity of the EIS. The tunnel and tunnel portals have been designed to add value to the community and adjacent landowners by retaining the major vegetated ridges within the Coffs Harbour basin to maximise user experience of the unique natural landscape of the region.

As discussed above, once the bypass is operational, the constraints provided by the existing highway through the Coffs Harbour CBD would be removed which could assist in further economic growth and development within Coffs Harbour, including tourism. The project's anticipated travel time savings and improvements to road safety would support future business growth and tourism. Given its beaches, natural assets and geographic location halfway between Sydney and Brisbane, Coffs Harbour is expected to continue to be a key destination for tourists and highway users.

To assist with tourist access to and within Coffs Harbour and manage impacts to tourism to due to a potential loss of passing trade, TfNSW propose to develop a Directional Signage Plan (SE02). The plan will be developed in accordance with TfNSW and Destination NSW signage guidelines to ensure effective and appropriate signposting for key locations along the project. It will also identify the range of services that Coffs Harbour provides and will be prepared in consultation with CHCC, Coffs Harbour Chamber of Commerce and TASAC.

As described above, temporary signage including use of variable message signs will also be used to identify any revised access changes to tourism businesses affected by the project. The temporary signage will be installed in consultation with affected tourism businesses and in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c). This commitment has been included as a new environmental management measure (SE07) in **Chapter 6, Revised environmental management measures.**

Tourism businesses have also been identified as stakeholders within Appendix D, draft Community consultation framework of the EIS. The draft Community consultation framework will be used to prepare the Community Liaison Implementation Plan for the project (see environmental management measure SE01). This plan will be used to provide specific and timely information in relation to the affected community during construction, so they are aware of upcoming work and impacts and details of design and construction. Environmental management measure SE01 has been revised to specifically included businesses to ensure procedures and practices take into account their varying needs.

4.13.5 Community values

Submission number(s)

25

Issue description

- Concerned that a patch of rainforest near Treefern Creek will be removed, which is part of local family heritage.

Response

Through community consultation activities, TfNSW have gained insight into the long settlement of families at Coffs Harbour, their connection to the area and special features of significance such as trees and memorials. Chapter 14, Socio Economic of the EIS recognised and assessed these as community values, and Chapter 10, Biodiversity, assessed the ecological impacts.

Impact to the patch of rainforest neat Treefern Creek is unavoidable when considering other environmental, land use and engineering constraints in the area. The construction footprint has been refined and selected based on a staged approach of route selection and alignment revision throughout the Coffs Harbour Highway Planning Strategy (CHHPS) (RTA 2001a), through to the refinement of the concept design as part of the current phase of the project. Project design has been iterative with a range of constraints driving the design.

It is acknowledged that the impact to the rainforest would be significant to the family connected to the rainforest. However, to mitigate the impact on the rainforest, environmental management measure SE05 details the TfNSW's commitment to carry out seed collection and salvage of representative species before construction. These will be used in the re-establishment of a portion of the rainforest within adjacent landscaping associated with project. Where possible, the location would allow for access from the realigned Mackays Road/new local access roads.

4.14 Aboriginal cultural heritage

4.14.1 Methodology

Submission number(s)

12, 19, 20, 23, 24

Issue description

- As per best practice, Registered Aboriginal Parties (RAPs) representatives should be engaged to assist with all additional Aboriginal cultural heritage surveys/investigations, including inspections of areas to be affected by project design alterations and areas outside the approved corridor that may also be impacted
- Knowledge holders should be consulted to determine cultural heritage values of these areas
- All reports should be reviewed by the RAPs, and final reports should contain and address RAPs correspondence and concerns.

Response

Section 5, Aboriginal community consultation of Appendix G, Updated Aboriginal cultural heritage assessment report (Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report) details the consultation carried out by TfNSW to date. The formal consultation process has included:

- Advertising for registered stakeholders in the *Koori Mail* (27/07/2016), *National Indigenous Times* (28/07/2016) and *Coffs Advocate* (27/07/2016)
- Government agency notification letters
- Notification of closing date for registration
- An Aboriginal focus group (AFG) (1) meeting held on 28 June 2017 to discuss archaeological assessment methodology and cultural assessment
- Provision of proposed archaeological assessment methodology (28-day review period) outlining the methodology to prepare the Cultural Heritage Assessment Report (CHAR) and undertake the test excavation
- Follow up AFG (2) meeting on 8 February 2018 to further discuss the test excavation methodology and additional matters relating to the incorporation of Aboriginal cultural knowledge in the assessment
- Provision of the draft CHAR (version 1 August 2018) for review (28-day review period provided)
- A third AFG (3) was held on 13 September 2018 to discuss investigation results, draft CHAR (version 1) and detailed mitigation strategies.

After TfNSW amendments related to ancillary areas the following consultation occurred:

- A fourth AFG (4) meeting was held on 11 February 2019 to provide a project update and discuss potential ancillary areas and Aboriginal stakeholder comments from the draft CHAR (version 1) related to the previous 2018 concept design
- Consultation undertaken during fieldwork for the second round of survey and test excavation (2019) to determine any additional Aboriginal archaeological or cultural areas

- A fifth AFG (5) meeting was held on 23 September 2019 during exhibition of the EIS to discuss the findings of the 2019 investigations, the updated draft CHAR, cultural salvage options, and ongoing assessment pathways.

As part of ongoing consultation with the local Aboriginal community, the following was undertaken:

- Provision of updated draft CHAR (current version February 2020) for review (28-day review period)
- A sixth AFG (6) meeting was held on 10 March 2020 to discuss findings of the 2020 investigations, the updated CHAR and detailed mitigation strategies including proposed cultural salvage.
- A meeting with RAPs on 30 April 2020 to discuss the salvage methodologies.

Surveys were undertaken across the project site in 2017, 2018, 2019 and 2020. The 2017 PACHCI Stage 2 assessment was undertaken with representatives from the Coffs Harbour and District Local Aboriginal Land Council (CHDLALC). The 2018 and 2019 test excavation programs were carried out with field representatives of registered Aboriginal stakeholder groups and RAPs were invited to participate in the 2020 archaeological investigation but did not attend.

Section 10, management procedures of the updated CHAR (refer to Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report) has been clarified to state that RAPs representatives will be invited to participate in any required Aboriginal heritage surveys outside of the construction footprint, in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) (Roads and Maritime Services 2011) and TfNSW requirements. Cultural knowledge holders will also be consulted where works outside the construction footprint potentially impact on Aboriginal cultural areas.

Submission number(s)

94

Issue description

- The Aboriginal Cultural Assessment Report based on a survey conducted in 2017 was inadequate. This report does not detail any information from Gumbaynggirr knowledge holders on highly significant cultural pathways, campsites and sensitive areas such as burials. No knowledge holders were contacted by the company conducting the survey for cultural information during this report.

Response

The Aboriginal archaeological survey conducted in 2017 with representatives from CHDLALC was carried out to meet the requirements of Stage 2 of the PACHCI. The aim of Stage 2 is to undertake further assessment and a survey to assess a project's potential to harm Aboriginal cultural heritage, and to determine whether formal Aboriginal community consultation and a cultural heritage assessment report is required.

The assessment comprised an archaeological field survey of the PACHCI Stage 2 assessment area in addition to a comprehensive review of previous archaeological investigations and environmental context. The PACHCI Stage 2 assessment area encompassed an area of about 318 hectares which extended along the eastern edge of the escarpment from the Pacific Highway at Boambee in the south and to Korora to the north. The Aboriginal archaeological survey for the PACHCI Stage 2 assessment was carried out with representatives from the CHDLALC. Further detail on the 2017 PACHCI Stage 2 assessment is located in Section 4.1 of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report.

Following the recommendations of the Stage 2 report, TfNSW commenced the statutory consultation process with Aboriginal parties and the development of a cultural values assessment report.

For the preparation of the CHAR, consultation with Aboriginal people was carried out in accordance with the project SEARs, the PACHCI, the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (OEH 2010) and the requirements of Clause 80C of the National Parks and Wildlife Regulation 2009.

TfNSW advertised and contacted potential Aboriginal stakeholders identified from government agency notification responses. TfNSW invited Aboriginal people who hold knowledge relevant to determining the cultural heritage significance of Aboriginal objects and Aboriginal places in the area in which the proposed activity was to occur to register an interest in a process of community consultation. Investigations for the project have included consultation with nine Aboriginal community groups and individuals. In addition, registered Aboriginal parties were asked to identify knowledge holders who could assist with an Aboriginal cultural values study to identify intangible heritage values of the study area.

An Aboriginal cultural values assessment report (see Appendix C of Appendix L, Aboriginal cultural heritage assessment report of the EIS) was prepared by Waters Consultancy in consultation with knowledge holders, as identified by the RAPs, regarding historical and cultural values within the construction footprint. Archival research was carried out in a range of national, state and local institutions to provide the historical and ethnographic context for the assessment. An analysis of the ethnographic literature and historical record was also carried out to provide a contextual understanding to allow for the interpretation and assessment of the cultural information.

Consultation with Aboriginal knowledge holders is a key component to the assessment of Aboriginal cultural heritage values. All RAPS were spoken with directly other than the Wanggaan Gumbaynggirr Corporation and the Gumbaynggir People applicants. For these two groups only one individual, a member of both groups, could be contacted. No response was received from the other individuals, including the Chairperson and Secretary. Further information on how cultural knowledge holders were identified can be found in Chapter 3, Consultation process of the Aboriginal cultural values assessment (see Appendix C of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report).

Submission number(s)

135

Issue description

- Highly significant Aboriginal heritage landmarks across the ridge will be destroyed in the event of open cuts for the highway which TfNSW appears to have proposed without consultation with local Aboriginal communities.

Response

As described in the Chapter 4, Project development and alternatives of the EIS, tunnels were incorporated into the project in response to community feedback received during the display of the 2018 concept design. One of the key benefits of including tunnels has been a significant reduction in impacts to areas of Aboriginal cultural significance. Table 4-13 of the EIS outlines some of the elements of the comparative assessment completed between the 2018 concept design and alternative option with the focus on the three ridges at Roberts Hill, north of Shephards Lane and west of Gatelys Road. It was determined the alternative option was preferred as it would reduce the impacts on items of Aboriginal cultural heritage significance including archaeological sites, areas of

potential archaeological deposits and cultural pathways at Gatelys Road and Shephards Lane ridges and at Roberts Hill when compared to the 2018 concept design.

The project partially impacts four identified cultural sites within the area: Roberts Hill Pathway, Gumgali Storyline and Pathway, Sealy Point Pathways, and East Boambee Camp. Several mitigation measures are recommended in Chapter 3, Overview of findings and recommendations of the Aboriginal cultural values assessment (see Appendix C of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report). The mitigation measures were prepared in consultation with the RAPs.

Extensive consultation has been undertaken throughout the course of the project in accordance with the SEARs, the PACHCI, the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (OEH 2010), and the requirements of Clause 80C of the *National Parks and Wildlife Regulation 2009.*

TfNSW advertised and contacted potential Aboriginal stakeholders identified from government agency notification responses. There are nine Aboriginal community groups and individuals identified as RAPs for the project.

The formal consultation process has included advertising for registered stakeholders, Government agency notification letters, provision of the proposed archaeological assessment methodology, consultation carried out during fieldwork and six AFG meetings between June 2017 and March 2020. The six AFG meetings held discussed archaeological assessment and cultural assessment methodology, test excavation methodology, investigation results, provision of the draft CHAR and detailed mitigation measures. For further detail on Aboriginal community consultation, refer to Section 5 of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report.

TfNSW will continue to carry out consultation as per the management procedures included in Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report.

4.14.2 Aboriginal artefacts within the construction footprint

Submission number(s)

12, 19, 20, 23, 24, 94

Issue description

- The construction footprint should be inspected by experienced RAPs representatives prior to the start of construction to record any previously unidentified Potential Archaeological Deposits (PADs) and determine the need for test excavation and site salvage if necessary. The test excavation methodology should be agreed by all RAPs and may include grader scrapes, mechanical excavator pits and use of a mechanical sieve to achieve more comprehensive samples than those allowed under the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010)
- As far as possible, all Aboriginal artefacts within the construction footprint should be salvaged prior the start of construction, in consultation with and with the direct involvement of the RAPs. The salvage methodology should be agreed by all RAPs and the rescue of remaining artefacts at the five salvage sites detailed in Appendix L, Aboriginal cultural heritage assessment report of the EIS should follow the completion of Phase 1 and Phase 2 investigations as proposed in Appendix E
- It should be a condition of approval that TfNSW undertake extensive cultural and community salvage across the project boundary in partnership with the RAPs and Aboriginal community

- A large amount of cultural information was excluded from Appendix L, Aboriginal cultural heritage assessment report of the EIS. Additionally, a number of changes to the construction footprint boundary has also meant it has been difficult to assess cultural heritage leading to an inadequate process. To address these inadequacies, monitoring and salvage is recommended to be undertaken during the construction phase.

Response

Aboriginal stakeholder consultation

As described in **Section 4.14.1**, several rounds of consultation have been carried out with RAPs and local knowledge holders. Consultation with Aboriginal people has been carried out in accordance with the project SEARs, the PACHCI, the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2020 (OEH 2010) and the requirements of Clause 80C of the National Parks and Wildlife Regulation 2009.

Survey of construction footprint

As part of preparing the EIS for the project, TfNSW carried out a comprehensive Aboriginal heritage assessment in accordance with the SEARs and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010). This involved an Aboriginal archaeological survey in 2017 which was carried out with representatives from the CHDLALC and identified two Aboriginal archaeological sites and 20 PAD sites. As the project progressed, the construction footprint was refined and three areas of PAD (PADs 11, 13 and 14) were excluded from the impact area.

A test excavation programme was carried out in February/March 2018 by Kelleher Nightingale Consulting and field representatives of registered Aboriginal stakeholder groups at 16 of the 17 areas of PAD within the refined construction footprint. The construction footprint was then refined further by TfNSW following the 2018 test excavation program and following additional consultation with RAPs, three new Aboriginal archaeological sites and 13 areas of PAD were identified.

An archaeological test program was carried out between March and May 2019 by Kelleher Nightingale Consulting and field representatives of registered Aboriginal stakeholder groups. Test excavation was carried out at twelve areas of PAD and an additional site (PAD 1) which had not been previously tested because of access restrictions. These surveys were the basis of the assessment provided in the EIS.

Following exhibition of the EIS, further amendments to the construction footprint were made by TfNSW to reflect the proposed design and construction changes described in the Amendment Report. Additional archaeological investigations were carried out in January 2020. Two previously unidentified Aboriginal archaeological sites were identified. RAPs were invited to participate in the January 2020 field survey but did not attend. Further detail can be found in Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report.

Test excavation, monitoring and site salvage

The CHAR salvage methodology has been revised to include provision for cultural salvage at sites exhibiting moderate or potentially moderate densities of archaeological objects. Surface collection or cultural salvage at other locations may be unproductive given the lack of Aboriginal objects and absence of cultural material on the ground surface.

TfNSW's preferred approach is to give RAPs the opportunity to undertake cultural salvage at all archaeologically salvaged sites which have been assessed as displaying at least moderate archaeological significance as these sites offer the best opportunity for the recovery of cultural

material. It is also noted that RAPs have advised that the primary purpose for RAPs wishing to collect artefacts is for their own community benefit, to assist with cultural learning. As such all material collected as part of the cultural salvage will be in the care and custodianship of the Aboriginal community. TfNSW will not be responsible for ownership care or control of material.

The cultural salvage would be carried out following the archaeological salvage. The cultural salvage methodology includes the use of earthmoving/excavating equipment to expose the ground surface over large portions of land associated with archaeological deposits. Mechanical excavation and the use of mechanical sieves is not in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales: Part 6 *National Parks and Wildlife Act 1974* (DECCW 2010). Further detail can be found in Section 4 of Appendix F, Cultural salvage methodology of Appendix G, Updated Aboriginal cultural heritage assessment of the Amendment Report.

Section 10, management procedures of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report has been clarified to state that RAPs will be invited to participate in any required Aboriginal heritage surveys outside of the construction footprint, in accordance with the PACHCI and TfNSW requirements.

Section 10 of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report also specifies construction constraints including the timing of archaeological salvage excavation or surface collection. Archaeological salvage excavation will be carried out in accordance with the methodology specified in Appendix G, Updated Aboriginal cultural heritage assessment of the Amendment Report. Where archaeological salvage excavation or surface collection has been nominated for impacted sites, no construction activities (including pre-construction activities of minimal environmental impact) can occur on the land to be investigated until the relevant archaeological excavations at the nominated sites have been completed.

As identified in environmental management measure AH01 (refer to **Chapter 6, Revised environmental management measures**), an Aboriginal Heritage Management Plan (AHMP) will be prepared and implemented during construction. It will provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The plan will be prepared in consultation with the RAPs and will give effect to any management measures contained in the Appendix G, Updated Aboriginal cultural heritage assessment of the Amendment Report.

Submission number(s)

12, 19, 20, 23, 24

Issue description

- Monitoring of vegetation clearing and topsoil stripping should be undertaken by experienced local Aboriginal community representatives to ensure that ancestral burials are not destroyed during the project works
- Monitoring areas should be identified by the RAPs and knowledge holders with the monitoring personnel agreed by the RAPs and knowledge holders
- Should human remains be detected, Appendix L, Aboriginal cultural heritage assessment report of the EIS should be implemented
- The project crosses a large number of creeks or tributary systems, with the majority in areas with a high probability to contain burials. Therefore, it is highly likely Aboriginal remains and burials will be encountered and will need to be dealt with in a timely and sensitive manner.

Response

As discussed in Section 15.4 of Chapter 15, Aboriginal cultural heritage of the EIS, avoiding harm to Aboriginal cultural heritage has been a priority of project development. While conservation is the best approach when considering Aboriginal heritage, some level of impact on the identified archaeological sites is unfortunately unavoidable due to the construction requirements of the project. There are no areas of high archaeological significance within the construction footprint, but where impact on Aboriginal archaeological sites of moderate archaeological significance cannot be avoided, mitigation is proposed. It is recommended that recorded surface artefacts are collected, and sites of moderate significance undergo salvage excavation in accordance with the methodology detailed in Appendix F, Updated Aboriginal cultural heritage assessment report of the Amendment Report. The salvage excavation will be undertaken in association with the RAPs.

TfNSW has completed all assessments required by the SEARs. There is no requirement to implement monitoring of vegetation clearing and topsoil stripping by experienced local Aboriginal community representatives. An AHMP will be prepared and implemented as part of the Construction Environment Management Plan (CEMP) which will provide specific guidance on measures and controls to be implemented for managing impacts. This includes procedures to be implemented if previously unidentified Aboriginal objects are discovered during construction and an induction program for construction personnel on the management of Aboriginal heritage values and cultural awareness.

No specific landform with a sensitivity for Aboriginal burials was identified in the construction footprint as part of the preparation of the CHAR and EIS assessment. The potential for burial sites was considered to be moderate overall, strongly dependent on the occurrence of suitable geology and soil types. However, it should be noted the soils within the construction footprint suffer from gradient erosion, flooding, and exhibit limited intactness. In addition, the high level of clay in the soil, relative high acid levels in the upper soil units and fluid soil movement especially on flood prone land combine to limit the survivability of burials within the construction footprint.

Notwithstanding, in the unlikely event that construction activity reveals possible human skeletal remains, management of unexpected finds during project construction is a key consideration of the AHMP which will be implemented as part of the CEMP. As identified in **Chapter 6, Revised environmental management measures**, the management measures to be implemented in the event of unexpected finds during construction include:

- AH06 – TfNSW's Unexpected Heritage Items: Heritage Procedure 02 will be used in the event of uncovering an unexpected archaeological find during construction
- AH07 – In the event that construction activity reveals possible human skeletal material (remains), all work is to halt at that location immediately and the steps outlined TfNSW's Unexpected Heritage Items: Heritage Procedure 02 will be followed. Identified knowledge holders will be notified within 24 hours of any confirmed discovery of Aboriginal skeletal remains.

Submission number(s)

12, 19, 20, 23, 24

Issue description

- TfNSW and/or the construction contractor should employ suitable RAPs representatives for the duration of construction impact activities to ensure preservation of the cultural landscape where possible and provide work opportunities to compensate for Aboriginal site destruction in the development-related context
- The RAPs and knowledge holders wish to be kept fully informed of the program of works for the project

- RAPs and knowledge holders require input to the:
  - Environmental Work Method Statement
  - Cultural Heritage Management Plan (CHMP)
  - Management and mitigation plan for unexpected discoveries
  - WHS and Cultural Safety/Policy Plan.

Response

TfNSW will directly engage Aboriginal site officers (in accordance with the PACHCI) to assist with archaeological site excavation as detailed in **Chapter 6, Revised environmental management measures**.

TfNSW will also require that its contractors meet targets for employment of Aboriginal people under the Aboriginal Participation in Construction policy (NSW Government 2018a). Contractor(s) may offer Aboriginal employment in a variety of roles and services, including cultural heritage inductions, construction work, landscaping, and support services.

RAPs are a key stakeholder for the project (as identified in Appendix D, Draft Community Consultation Framework of the EIS) and will continue to be consulted throughout the project, including through regular Aboriginal focus group meetings where information on planning progress and construction will be provided, as well as consultation on the AHMP and any unexpected discoveries.

4.15 Flooding and hydrology

4.15.1 Methodology

Submission number(s)

12

Issue description

- Design criteria should be revised to ensure no flooding increases east of the indicative road corridor.

Response

The design criteria adopted for this project, relating to flood level increases, are consistent with the NSW Floodplain Development Manual (DIPNR 2005), the SEARs and with many other Pacific Highway upgrades and other TfNSW projects. These criteria are detailed in Chapter 1 of Appendix O, Flooding and hydrology assessment of the EIS, and in Chapter 1 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

The property impacts east of the indicative road corridor, with a few minor exceptions, are predicted to be minimal. These minor exceptions include residential property impacts which were reported in the EIS. The majority of the property impacts have since been resolved in the amended design. The property Lot B DP363629 (located on Coramba Road about 450 metres downstream of the project) remains impacted but impacts have been reduced in the amended design with predicted afflux being below the floor level of the residential building. The project design has been refined in many locations to achieve the current level of impact on properties east and west of the alignment. The minimally impacted areas east of the project are on undeveloped land (with the exception of Lot B DP363629) and, therefore, not likely to experience impacts or associated damage from flood level increases.

As identified in environmental management measures FH09, FH10 and FH11, mitigation measures will be developed in detailed design and will be subject to further flood modelling and consultation with CHCC, EESG, DPIE and adjacent property owners. See **Chapter 6, Revised environmental management measures** for further information.

4.15.2 Operational impacts

Submission number(s)

28, 173, 180

Issue description

- Concern more severe flooding will occur at Opal Cove Resort due to construction of the project. If flooding impacts increase there will be a risk of property access flooding which will affect business
- Concerned that property near the intersection of Coramba Road and Spagnolos Road will now be impacted by flooding when it was not previously impacted
- Concerns relating to increased flood impacts on Coramba Road properties due to the location of the bypass.

Response

A detailed assessment of flooding and hydrology impacts during construction and operation was prepared as part of the EIS and is included in Chapter 17, Flooding and hydrology and Chapter 5 of

Appendix O, Flooding and hydrology assessment. Appendix H, Updated flooding and hydrology assessment of the Amendment Report assesses the changes in impacts because of the proposed design changes, design refinements and model updates implemented following exhibition of the EIS.

Flood impacts for the amended design are generally within the management objectives detailed in Section 1.9 of Appendix H, Flooding and hydrology assessment of the Amendment Report. At locations where impacts are not within the management objectives, additional mitigation measures as well as consultation with landowners will be investigated during detailed design. In many locations downstream of the project, flooding conditions would be improved, and peak water levels are slightly reduced because of the amended design.

Opal Cove Resort

There would be an improvement in predicted flood impacts at Opal Cove Resort and surrounding land from that described for the EIS. Adverse impacts are no longer predicted for access roads in all events. Changes to predicted impacts at this location are primarily attributable to updated data in the form of a detailed digital terrain survey completed following the exhibition of the EIS, which when incorporated into the model shows reduced existing case flood extents. The changes to the Korora Hill interchange design also contributes to improved impacts at Opal Cove Resort. Design changes include flood retention areas within the construction footprint to store flood flows and mitigate downstream flood impacts.

Coramba Road

Residential properties near the intersection of Coramba Road and Spagnolos Road, are outside of the flood extents for all events up to and including the one per cent annual exceedance probability (AEP) event. In the probable maximum flood (PMF) event, modelling predicts reduced flood levels and extents in this area with the amended design. This is consistent with the impacts predicted in the EIS. Impacts downstream of the project in Coffs Creek are contained within the existing waterway.

The property Lot B DP363629 (located on Coramba Road about 450 metres downstream of the project) remains impacted by the project with an updated assessment carried out for the amended design. However, a floor level survey of the residential building carried out since the exhibition of the EIS determined the floor level is about 900 mm above the predicted peak flood level for the one per cent AEP event. The flooding impact at property Lot B DP363629 would be restricted to the rear of the property.

Properties downstream of property Lot B DP363629 would not experience flood impacts as a result of the project. The property identified in submission 180 is a neighbouring property to property Lot B DP363629 and would not experience flood impacts as a result of the project. This is further detailed in Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

Additionally, further flood modelling and model updates has shown the amended design would result in improvements to flood level impacts at property Lot B DP363629.

Submission number(s)

12

Issue description

- As discussed with TfNSW and CHCC, the project has the capacity to ‘floodproof’ the Coffs Harbour residential areas and CBD east of the project corridor.

Response

A detailed assessment of flooding and hydrology impacts during construction and operation was prepared as part of the EIS and is included in Chapter 17, Flooding and hydrology and Chapter 5 of Appendix O, Flooding and hydrology assessment. Appendix H, Updated flooding and hydrology assessment of the Amendment Report assesses the changes in impacts because of the proposed design changes, design refinements and model updates implemented following exhibition of the EIS.

The revised assessment shows the project is generally not predicted to have impacts east of the indicative road corridor. It is outside the scope of the project to improve the existing flooding conditions in the project vicinity. Additionally, there would be considerable cost associated with higher embankments for the project to allow for the flood storage west of the alignment as described by the submitter.

Notwithstanding, the North Coast Regional Plan 2036, released in March 2017, identified a large portion of the land on the western side of the indicative road corridor, within the North Boambee Valley catchment, for future development. This includes North Boambee Valley (West) urban release area (URA) which has been identified for residential development. As identified in environmental management measure FH08, consultation with CHCC will be carried out during detailed design regarding whole of government approach to managing residual flood impacts and considers the relationship between the project and North Boambee Valley (West) URA and reasonable and feasible options which could be implemented to assist in managing potential flood impacts.

Adjacent to this, another area has been identified to support future employment. These development plans, which are detailed in Chapter 12, Land use of the EIS, limit the flooding impacts that would be considered acceptable on the western side of the indicative road corridor. If the project were to further increase impacts on the western side, additional property acquisition would be required west of the alignment that would be adversely affected by this approach.

4.15.3 Environmental management measures

Submission number(s)

12, 64, 105

Issue description

- What management measures have been proposed to prevent homes in Diggers Beach from flooding, when considering the Jordans Creek flooding in 1996?
- Flooding will have a major impact on structures on the property located at point of interest Z. Land will also be impacted by flooding that previously hasn't been. The increased flood level will have a detrimental effect on any sale or development of the property. Proposed measures (such as a levee or house raise) are unsatisfactory due to damage risks to the house. What other mitigation measures are proposed?
- There is a clear and deliberate lack of consultation to address flooding issues. The EIS doesn't acknowledge previous CHCC flood studies and key recommendations. The Boambee Newports Creek Flood Plain Risk Management Study and the North Boambee Valley (West) Flood Study identify a range of mitigation measures necessary to address flooding in the area.

Response

The approach taken by the project has been to achieve no worsening of existing flooding conditions by maintaining existing conveyance and balancing upstream and downstream flood impacts. The amended design does not impact peak flood levels downstream of the existing Pacific Highway at Diggers Beach adjacent to Jordans Creek. The EIS also forecasts no impacts or reduction to peak

flood levels at this location. It is outside the scope of the project to improve the existing flooding conditions at Diggers Beach.

Point of interest Z refers to a residential property on the north side of North Boambee Road, about 180 metres upstream of the project. The property (ie the yard, not the habitable floor of the house) is inundated under existing flooding conditions by about 125 mm of water depth and afflux of up to 25 mm is predicted at the property with the amended design in place, resulting in 150 mm of water depth. A floor level survey of the residential building carried out since the exhibition of the EIS identified the building is about 450 mm above the predicted one per cent AEP flood levels.

Mitigation measures to address the flood impacts, already factored into the concept design, at point of interest Z include:

- Optimisation of bridge over North Boambee Road (BR 04) and bridge over a tributary of Newports Creek (BR 03) to balance upstream and downstream afflux
- Excavation areas beneath the bridge over North Boambee Road (BR 04) and in the floodplain to provide further mitigation of flood conveyance loss and compensatory flood storage.

The following design options will be investigated during detailed design to reduce the predicted afflux at point of interest Z:

- Further optimisation of bridge lengths of the project through North Boambee Valley
- Further deepening of the excavation area in the floodplain (beneath BR 04) to provide additional mitigation of flood conveyance loss and compensatory flood storage
- Channel works involving minor modifications to Newports Creek downstream of the project (between the project and the existing Pacific Highway) as part of a whole of government approach to managing downstream flooding
- Additional storage areas upstream of the project currently being investigated by CHCC as part of a whole of government approach to managing downstream flooding.

Further detail is provided in Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

Since the exhibition of the EIS, TfNSW has carried out consultation with the property owner relevant to point of interest Z, about potential flood impacts because of the project. TfNSW will continue to consult with affected property owners about potential flood impacts during the development of the detailed design.

TfNSW has also been working with CHCC to address the flooding issues described in the EIS and develop a whole of government approach to managing flooding in North Boambee Valley. The outcome of the consultation to date has been documented in the updated flooding assessment provided as Appendix H, Updated flooding and hydrology assessment of the Amendment Report. Key outcomes include extension of the North Boambee Valley flood models and improved representation of the flooding behaviour on the existing Pacific Highway near the Coffs Harbour Health Campus.

The proposed detention basins in the North Boambee Valley (West) Flood Study (Groot and Benson 2014) are further upstream from the project and would require input from both TfNSW and CHCC to implement these options. Currently, CHCC is investigating options for the detention basin upstream of the project and other mitigation options downstream consistent with the flood study. TfNSW will continue to consult with CHCC regarding a whole of government approach to managing flood impacts in the North Boambee Valley with the aim of implementing reasonable and feasible options identified

from those investigations to help manage potential flood impacts (refer to environmental management measure FH08 in **Chapter 6, Revised environmental management measures**).

4.16 Surface water quality and groundwater

4.16.1 Waterway health

Submission number(s)

12, 167

Issue description

- Ensure all sediment and erosion controls prevent degradation of waterways that flow into the Solitary Islands Marine Park. The project should be used as a chance to improve waterway health
- The Solitary Islands Marine Park is easily affected by turbidity and other run-off. It is the responsibility of TfNSW to maintain best practice.

Response

The Solitary Islands Marine Park is the third largest marine protected area in NSW. TfNSW recognises the importance of the Solitary Islands Marine Park to regional biodiversity and that the location of the construction footprint for the project at its closest point is about 150 metres upstream of the marine park. The potential project surface quality impacts and associated management measures are detailed in Chapter 19, Surface water quality of the EIS and have been updated in Section 5.12, Surface water quality of the Amendment Report for the amended design.

One of the key SEARs for the surface water quality assessment is that the project identify sensitive receiving environments (which includes estuarine and marine waters downstream such as the Solitary Islands Marine Park) and develop a strategy to avoid or minimise impacts on these environments. The assessment in Chapter 19, Surface water quality of the EIS was prepared to address this SEAR.

Construction

As discussed in Chapter 19, Surface water quality of the EIS and Section 5.12, Surface water quality of the Amendment Report, while no work is anticipated within or directly adjacent to the NSW Solitary Islands Marine Park, construction work has the potential to result in indirect impacts to the marine park through sediment and pollutant runoff into the waterways. However, a number of management practices and controls have been included **Chapter 6, Revised environmental management measures** to manage potential erosion and sedimentation risks and minimise impacts on water quality during construction.

Construction sediment basins would be designed to contain the five-day 90th percentile rainfall event within all sub-catchments that drain into the Solitary Islands Marine Park. Where a five-day 90th percentile sediment basin cannot be provided due to site constraints, TfNSW has committed to enhanced erosion control measures and best management practice to minimise the potential water quality impacts during construction.

In addition, the Soil and Water Management Plan (SWMP) and associated Erosion and Sediment Control Plan (ESCP) would provide the overarching management documents for identifying sediment and water quality risks and a pollution prevention strategy associated with working in the sub-catchments that drain into the Solitary Island Marine Park. The plans would describe the site-specific management measures and general monitoring requirements to ensure the implemented controls are effective. Management measures and controls adopted will be consistent with best practice and in accordance with relevant principles of the Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004). Refer to **Chapter 6, Revised environmental management measures** and **Appendix B, Updated erosion and sediment management report** for further information.

The SWMP and associated ESCP would be supplemented by site-specific plans where high-risk activities are undertaken within or immediately adjacent Pine Brush Creek (and Williams Creek) to ensure potential risks and impacts to Solitary Island Marine Park are managed. The site-specific plans would be included in the Environmental Work Method Statement required by environmental management measure SW04.

A Water Quality Monitoring Program would also be prepared for the project and implemented to identify whether the project is resulting in adverse impacts on water quality and assess compliance with statutory requirements and project targets. The monitoring program will be prepared in accordance with the TfNSW Guideline for Construction Water Quality Monitoring (RTA n.d.) and is detailed in environmental management measure SW01 in **Chapter 6, Revised environmental management measures**.

Operation

The EIS identified that during operation, the project has the potential to result in water quality impacts from changes in hydrology leading to an increase in erosion and sedimentation, and the mobilisation of pollutants. Pollutants on roads are generated from motor vehicles in the form of heavy metals, motor oils, petrol, trash and atmospheric exposure to an impermeable surface causing increased concentrations during rain events. Updated Model for Urban Stormwater Improvement Conceptualisation (MUSIC) modelling results are provided in Section 5.12, Surface water quality of the Amendment Report.

With the project operational (including the proposed water quality treatment measures), the modelling indicates a negligible to minor increase in total suspended solids (TSS), total phosphorous (TP) and total nitrogen (TN). In addition, the modelling does not consider any existing water quality treatment devices that may exist in downstream developed areas nor existing natural features such as wetlands and ponds. As such, it provides an upper estimate of the potential increases to pollutant concentrations reporting to the wetlands. The catchment-scale modelling shows that the NSW Water Quality Objectives (WQO) are achieved for turbidity (NTU) but are not currently being met across the study area in the existing scenario for TP and TN. The results for the Pine Brush Creek wetlands of the Korora Basin catchment show that the NSW WQO are met for NTU.

The water quality treatment devices included in the operational phase will provide suitable protection to the downstream sensitive receiving environments. Given the proximity of the project to the Solitary Islands Marine Park stormwater pollution controls such as dual-purpose spill containment (with a spill volume capacity of 40,000 litres) and water quality treatment devices have been incorporated. These controls will further reduce the potential impact from road runoff, as well as potentially improving upon the existing condition pollution load. Stormwater treatment measures designed to manage the release of sediment such as grass swales as the primary stormwater treatment measure have also been incorporated into the concept design.

Notwithstanding, the type and design of the specific stormwater treatment measures would continue to be refined as part of the detailed design process with the aim of further reducing the potential impacts described above and to work towards meeting the NSW WQOs. This would include review of the proposed stormwater treatment train (individual devices connected in series to improve overall treatment performance) and consideration of the sensitivity of the receiving environment.

Best management practice guidelines including TfNSW's Water sensitive urban design guideline (Roads and Maritime Services 2017d) will be followed in refining the stormwater treatment train as detailed in environmental management measure SW08. This may result in the selection of devices

and measures that would be more effective in managing the exceedances of the pollutants, eg use of bioretention swales or basins. However, the final selection of the specific stormwater treatment measures within the treatment train would be subject to reasonable and feasible considerations that include ongoing maintenance requirements, land use and property impacts, community and maintenance personnel safety and additional environmental impact (should additional space be needed).

4.16.2 Impacts to groundwater

Submission number(s)

105

Issue description

- Bores provide drinking water to property owner's water tanks. The EIS does not identify any impacts to groundwater near by the property. Please confirm this is the case.

Response

A review of the DPIE Water licenced groundwater bores from the National Groundwater Information System was carried out to identify groundwater bores which might be impacted by groundwater drawdown caused by the project. Impacted groundwater bores and supply wells are presented on figures within Chapter 20, Groundwater of the EIS. Figures show there are several groundwater bores in the vicinity of North Boambee Road. Groundwater borehole GW063855 is located close to the property associated with Submission ID 105. As per Figure 20-7-02 of the EIS, there would be no drawdown of groundwater at this location and therefore no impacts to groundwater.

Notwithstanding, **Chapter 6, Revised environmental management measures** provides mitigation measures for impacted groundwater bores/supply wells. Environmental management measure GW07 states that monitoring and groundwater levels and quality will be included in the Water Quality Monitoring Program. While impacts to groundwater bores/supply wells outside of the zone of drawdown are not anticipated, the monitoring program would confirm whether the project is resulting in adverse impacts on groundwater levels and quality.

4.16.3 Environmental management measures

Submission number(s)

161, 169

Issue description

- As a result of the use of explosives, there is a risk to the water table and bores as well as landslides with no mitigation measures. The location of the proposed route is not suited to large-scale road and tunnelling construction. How can the community and farmers be exposed to these risks and the impacts it can have?

Response

The impacts of blasting and the use of explosives on groundwater was assessed in Section 20.4.2 of Chapter 20, Groundwater of the EIS. Hydrocarbon contamination was identified as a potential risk to groundwater quality from potential fuel and chemical spills during construction activities including drill and blast activity, leading to contamination of groundwater.

As described in Appendix B, Updated noise and vibration assessment and summarised in Section 5.3, Noise and vibration of the Amendment Report, a Blast Management Strategy will be prepared as

part of the Noise and Vibration Management Plan (NVMP). All blasting and associated activities will be carried out in a manner which will not generate unacceptable vibration impacts or pose a significant risk of impact to residences and sensitive receivers. Where a blast location is predicted to have an impact on a sensitive receiver, a series of trials would be carried out at a reduced scale to determine site specific blast response characteristics, to define allowable blasts sizes. This will include identification of any vibration sensitive sites and structures, establishment of appropriate criteria for ground vibration levels, determination of vibration risk impacts from blasting and community consultation procedures.

As discussed in Chapter 19, Surface water quality and Chapter 20, Groundwater of the EIS, a Water Quality Monitoring Program will be implemented before and during construction. This will include monitoring of groundwater levels and quality. By monitoring the levels and quality of groundwater and surface water it is possible to check whether the management measures implemented are effective. If required, contingency and ameliorative measures will be used in the event that adverse impacts are experienced. Refer to environmental management measure SW01 in **Chapter 6, Revised environmental management measures** for further detail. In addition, any risk of groundwater contamination from the use of explosives would be sufficiently addressed in the SWMP. This plan would include appropriate management and handling procedures for explosives to reduce the risk of contamination.

The risk of landslides and subsidence was assessed in Chapter 24, Hazard and risk of the EIS. Subsidence is the excessive movement of the ground caused by soil compressing under a weight, and soil swelling and contracting due to changes in the moisture content. The main subsidence risks for the project are from excavations associated with the tunnels and groundwater drawdown. Given the high stiffness of the bedrock, the extent and magnitude of subsidence occurring within the rock mass surrounding cuttings and tunnels is anticipated to be small.

The risk of settlement was assessed in Chapter 20, Groundwater of the EIS. The lowering of groundwater levels within soils and rocks can lead to ground settlement because of changes in the stresses of the material. Drawdown of groundwater levels along the construction footprint is principally within the fractured bedrock aquifer, with the greatest drawdown occurring adjacent to all Type A cuttings and tunnels. The stiffness of bedrock is very high, although it is reduced in the presence of major geological features. The extent and magnitude of settlement occurring within the rock mass surrounding cuttings and tunnels because of groundwater drawdown is anticipated to be small given the high stiffness of the bedrock.

While settlement and impacts were concluded to be negligible in the EIS, a surface settlement monitoring program would still be prepared and implemented before and during construction to confirm the results of the subsidence modelling as per environmental management measure HZ06. In the unlikely event that subsidence is deemed to cause building and/or property damage as a result of the project, the damage would be repaired at no cost to the owner. Refer to **Chapter 6, Revised environmental management measures**.

4.17 Air quality

4.17.1 Amenity

Submission number(s)

57, 82, 161, 169, 173

Issue description

- General loss of amenity due to dust and pollution during construction and operation. Compensation and pollution mitigation measures are required prior to construction
- Concern regarding the dust during construction over the lengthy construction period.

Response

A detailed assessment of existing air quality conditions and potential impacts during construction and operation was prepared as part of the EIS and is included as Appendix P, Air quality assessment of the EIS and summarised in Chapter 21, Air quality of the EIS.

Construction

The construction assessment involved the application of a semi-quantitative risk-based approach following the guidance developed by the UK Institute of Air Quality Management (IAQM 2014) and adapted to represent the conditions of Coffs Harbour.

Annoyance because of dust deposition (soiling of surfaces) and visible dust plumes were identified as one of the main air quality impacts for the project during construction. Given the proximity and number of sensitive receivers to the construction footprint, there is the risk they would experience some occasional dust soiling impacts. Table 21-6 of Chapter 21, Air quality of the EIS summarises the number of high sensitivity receptors within 20 metres, 20-50 metres, 50–100 metres and 100-350 metres from potential sources of dust associated with the project. Impacts would be greater where there are higher numbers of sensitive receptors such as at the northern and southern tie-ins.

Dust soiling impacts during construction would be local and temporary. For all construction activities, the implementation of effective mitigation measures is expected to prevent significant impacts on sensitive receivers.

A number of environmental management measures were recommended in the EIS to minimise air quality impacts. These are included in **Chapter 6, Revised environmental management measures**. Environmental management measures AQ01 and AQ02 are aimed at managing construction impacts and dust generation. Section 4.17.3 provides further detail on how air quality impacts will be minimised during construction.

TfNSW have identified the potential impacts on amenity of a road project on adjoining communities during preparation of the EIS and have proposed a number of environmental management measures to reduce these environmental or social effects where possible. While TfNSW does not provide financial compensation, it does its best to reduce impacts. TfNSW continue to consult with neighbouring landholders and the broader community through the implementation of the Community Liaison Implementation Plan as detailed in environmental management measure SE01.

Operation

Chapter 21, Air quality of the EIS recognises the operation of the project has the potential to impact local air quality because of changes in vehicle movement across the road network. The project would

provide free-flow conditions along the new Pacific Highway (ie bypass) and remove 'through' motorists from the existing Pacific Highway. Potential local air quality impacts have been assessed using dispersion modelling (GRAL).

The assessment concluded pollutant concentrations are predicted to decrease along the existing Pacific Highway once the project is operational, because of reduced traffic volumes using this road as 'through' traffic is redistributed to the project. As such, the project would improve air quality through Coffs Harbour CBD and contribute to an improved amenity.

There would be some local increase in air emission concentrations along the project, where previously roads did not exist. However, it is not expected that this increase would result in any exceedance of the air quality standards with estimated concentrations of nitrogen dioxide, PM_{10}. $PM_{2.5}$ and carbon monoxide found to be well below the relevant EPA air quality criteria. Concentrations are predicted to reduce by 2034 due to the introduction of new vehicle technologies, in response to cleaner fuel efficiency and emission standards.

The air quality standards for the operational air quality assessment were taken from the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA 2017a). The project meets the air quality standards and would not have an operational impact on air quality. As such, no mitigation measures during operation are proposed.

Amenity impacts associated with air quality impacts during construction and operation was also considered as part of the socio-economic assessment in Chapter 14, Socio-economic of the EIS.

4.17.2 Amphitheatre inversions

Submission number(s)

70, 135, 151, 173, 180

Issue description

- Due to the 'amphitheatre' landscape of Coffs Harbour, air pollutants will remain suspended across the Coffs basin.

Response

The air quality modelling methodology, including the impact of topography and landscape, is discussed in Appendix P, Air quality assessment of the EIS. The modelling, using the Gratz Mesoscale Model (GRAMM) model, included terrain data which has resulted in the surrounding landscape of Coffs Harbour being accurately reflected. The extents of the GRAMM model include the Coffs basin and is shown in Figure 21-2 in Chapter 21, Air quality of the EIS.

The impact of topography is not expected to be a considerable factor in any potential worsening of air pollution which may result from the project, however it was considered in the modelling. Terrain data was incorporated into the GRAMM model at a resolution of 25 metres. Although the terrain is not considered especially complex, a spatially-varying terrain file was used to provide an accurate reflection of the existing situation.

Overall, construction dust is unlikely to represent a serious ongoing problem. Any effects would be temporary and relatively short lived and would only arise during dry weather with wind blowing towards a sensitive receiver at a time when dust is being generated and mitigation measures are not fully effective. For all construction activity, the implementation of effective mitigation measures is expected to prevent significant impacts on sensitive receivers.

The local air quality impacts from the operation of the project have been assessed by considering predicted pollutant concentrations (including existing background and the project contributions) from

the project. Results indicate no predicted exceedances of the relevant air quality standards in any of the scenarios assessed. It is not expected that air pollutants would remain suspended across the Coffs basin.

Environmental management measures are described in **Chapter 6, Revised environmental management measures**. However, as the project meets the air quality standards and would not have an operational impact on air quality, management measures are only required to address construction phase impacts.

4.17.3 Environmental management measures

Submission number(s)

25, 73, 105, 128, 161, 169

Issue description

- There are no mitigation measures in place to protect against impact of air quality during the construction phase
- What mitigation measures will be put in place to minimise dust during construction?

Response

Several mitigation measures were recommended in Chapter 21, Air quality of the EIS and are included in **Chapter 6, Revised environmental management measures** to mitigate potential air quality impacts during construction of the project. As no exceedances of air quality standards are predicted during the operational phase of the project, all the management measures proposed for air quality relate to the construction phase. The key construction environmental management measures from Chapter 21, Air quality of the EIS are described below:

- AQ01 – An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). It will identify potential sources of air pollution during construction, identify all dust sensitive receivers and implement mitigation and suppression measures. It will also include a monitoring program against the objectives and criteria consistent with the Approved Methods for Modelling and Assessment of Air Quality Pollutants in NSW(EPA 2017a). A community notification and complaint handling procedures will be established under the AQMP
- AQ02 – Where buildings and structures are required to be demolished, techniques to minimise dust generation will be developed, including but not limited to dust screens or damping down structures prior to demolition
- AQ03 – Where practicable, construction vehicles will be fitted with pollution reduction devices and switched off when not in use to minimise potential generation of emissions
- AQ04 – Asphalt batch plants established for the project will include a range of measures to minimise odour generation including a new requirement to consider the prevailing winds and the location of sensitive receivers when locating asphalt batch plants.

4.17.4 Monitoring

Submission number(s)

49, 70

Issue description

- Dust monitors should be installed as a mitigation measure
- There is a need for local air quality monitoring of PM_{10}, $PM_{2.5}$, carbon monoxide, sulfur dioxide, nitrogen dioxide and lead.

Response

As identified in Chapter 21, Air quality of the EIS and included as environmental management measure AQ01, an AQMP will be prepared and implemented as part of the CEMP. The AQMP will include provisions for monitoring to assess the effectiveness of the applied management measures and will be undertaken in accordance with the Approved Methods for Sampling and Analysis of Air Pollutants in NSW (Department of Environment and Conservation NSW 2007).

For all construction activity, the aim is to prevent significant impacts on sensitive receivers through the implementation and use of effective mitigation measures. Given the proximity and number of sensitive receivers to the construction footprint, there is the risk they would experience some occasional dust soiling impacts. However, it is anticipated that impacts would be local and temporary. Methods to manage or stop works during strong winds or other adverse weather conditions are also proposed. The AQMP will clarify the community notification and complaint handling procedures during the construction phase. Air quality management objectives and criteria proposed will be consistent with Approved Methods for the Modelling and Assessment of Air Quality Pollutants in NSW (EPA 2017a).

Further mitigation and suppression measures could be applied if controls are not found to be effective, further ensuring impacts are minimised. Further mitigation and suppression measures to that already detailed under AQ01 could include designing haul roads to take the most direct route, adding speed humps to manage speed limits, orientation of stockpiles to offer the minimum cross-sectional area to prevailing winds establishment of artificial wind breaks such as bund walls or use of automatic sprinklers that are triggered by wind speed/direction. The final selection of additional mitigation and suppression measures would be subject to a reasonable and feasible evaluation.

As outlined in **Section 4.17.1** and detailed in Chapter 21, Air quality of the EIS, the project meets the air quality standards and would not have an operational impact on air quality. As such, management measures are only required to address construction phase impacts and it is not proposed to undertake local air quality monitoring of PM_{10}, $PM_{2.5}$, carbon monoxide, sulfur dioxide, nitrogen dioxide and lead during operation.

Submission number(s)

12, 141

Issue description

- The project should be conditioned to ensure operational air quality impacts from the tunnels are monitored and reported. Air quality monitors are routinely provided in tunnels throughout Australia including the St Helena tunnel on the Pacific Highway at Byron Bay.

Response

The project has three proposed tunnels at Roberts Hill ridge (around 190 metres long), Shephards Lane (around 360 metres) and Gatelys Road (around 450 metres long). Based on the relatively short length of these tunnels (ie less than one kilometre), in-tunnel emissions were not assessed as part of the detailed operational air quality assessment in Appendix P, Air quality assessment of the EIS and instead, emissions from portals were considered to be appropriate. Also, given the length of the tunnels, no ventilation facilities are required for the project. Ventilation of the tunnels would primarily occur through natural air flow and the piston effect of moving vehicles pushing air toward the respective exiting portals.

The air quality standards for the operational air quality assessment were taken from the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA 2017a). The project meets the air quality standards and would not have an operational impact on air quality. As such, no mitigation measures or monitoring against the air quality standards during operation are required.

The St Helena tunnel on the Tintenbar to Ewingsdale section of the Pacific Highway upgrade includes air quality monitors within the tunnel for traffic management purposes. It is also proposed that air quality monitors will be included for the project for tunnel traffic management purposes and would be used to identify when jet fans should be operated.

Jet fans would be provided for the Shephards Lane and Gatelys Road tunnels. These would mainly be used in the event of a fire to prevent smoke spreading to where traffic is likely to be stopped behind an incident and to prevent smoke from entering the adjacent tunnel. Jet fans are not required for the Roberts Hill tunnel because of the short length of the tunnel.

The final design of the traffic management and communication system for the tunnels including fire safety systems and air quality monitoring systems will be developed during detailed design. TfNSW will work closely with EPA, SafeWork NSW and FRNSW to inform the design of tunnel systems that are sustainable, safe and value for money.

4.17.5 Water supply contamination from air quality impacts

Submission number(s)

64, 65, 99

Issue description

- Increased traffic volumes and construction activities will cause dust to contaminate rainwater tanks and swimming pools. What mitigation measures will be put in place to reduce pollution during construction and operation?
- Property should be connected to town water supply prior to construction to manage contamination impacts from dust and emissions.

Response

The impacts of dust deposition on rainwater tanks and swimming pools were considered in Chapter 21, Air quality of the EIS. As identified in environmental management measure AQ01, an AQMP will be prepared and implemented during construction. The plan will identify potential sources of air pollution, identify sensitive receivers, identify air quality management objectives and mitigation and suppression measures to be implemented to manage potential impacts on sensitive receiver. The AQMP will include provisions monitoring to assess the effectiveness of the applied management measures. The AQMP will also include community notification and complaint handling procedures.

TfNSW recognises that contamination of rainwater tanks and swimming pools from dust during construction is a concern of the community.

Construction mitigation and management measures were recommended in Chapter 21, Air quality of the EIS and are included in **Chapter 6, Revised environmental management measures**. The construction mitigation and management measures proposed reflect best management practice and are expected to manage the potential water supply contamination risk. Should residual impacts occur it is likely they would be local and temporary only.

Potential local air quality impacts during operation have been assessed in Chapter 21, Air quality of the EIS. The modelling predicts there would be some local increase in air emission concentrations along the project, where previously roads did not exist. However, it is not expected that this increase would result in any exceedance of the air quality standards with estimated concentrations of PM_{10} and $PM_{2.5}$ found to be well below the relevant EPA air quality criteria. Concentrations are predicted to reduce by 2034 due to the introduction of new vehicle technologies, in response to cleaner fuel efficiency and emission standards.

While still below the air quality standards, the largest increases in concentrations are predicted to be at the tunnel portals, as vehicle emissions concentrate as traffic leaves each tunnel. These emissions are predicted to disperse quickly and would significantly reduce in concentration as distance from tunnel portals. As such, no mitigation measures during operation are required.

Connection of properties to the town water supply to manage rainwater tank contamination impacts from dust and emissions is considered outside the scope of the project. As stated above, a number of measures will be implemented for the project to manage potential air quality impacts during construction and no operational mitigation measures are required due to negligible impacts.

4.18 Sustainability

4.18.1 Carbon emissions

Submission number(s)

70, 142

Issue description

- The project is not in the public interest, as the project fails the ecological sustainable development (ESD) principles under the EP&A Act. The project should focus on becoming carbon neutral, transitioning to affordable electric vehicles and introducing safer emission standards
- The carbon footprint of the project is unsustainable and unacceptable
- The project does not seriously consider impacts on the wider environment. Instead of trying to decrease carbon emissions the project encourages reliance on coal and petroleum.

Response

The project's response to the ESD principles is outlined in Chapter 23, Sustainability and Chapter 28, Project justification and conclusion of the EIS. The principles of ESD have been an integral consideration throughout the development of the project.

As discussed in Chapter 3, Strategic justification and project need of the EIS, Coffs Harbour is already experiencing high levels of congestion, and traffic volumes are expected to increase over time in line with population growth. By providing a bypass of Coffs Harbour consistent with the current standards of the Pacific Highway upgrade program, the project would address declining transport efficiency, urban congestion and road safety issues caused by the interaction of through and local traffic. While the project would result in impacts, the development of the concept design and proposed design changes aims to avoid and minimise impacts wherever possible.

Where unmitigated project impacts were unlikely to meet requirements of the ESD principles, appropriate management and mitigation measures have been implemented to reduce impact to acceptable levels or enhance ecological values. These measures are included in **Chapter 6, Revised environmental management** measures reflecting any updates as a result of the Amendment Report and/or the Submissions Report.

A summary of consideration for each of the ESD principles is presented below:

- **Precautionary principle:** The precautionary principle was considered during route options development. Significant environmental impacts on biodiversity and Aboriginal cultural heritage have been avoided or minimised throughout the development of the project. The threat of serious or irreversible environmental damage is one of the essential preconditions to the engagement of the precautionary principle. Environmental risk analysis quantifying impacts to biodiversity to inform the strongest precautionary management measures and worst-case construction and operation assumptions were placed upon noise and vibration impact assessments
- **Inter-generational equity:** Inter-generational equity requires a project to consider the distribution of costs to future generations. Inter-generational equity considerations were assessed against several key environment and social aspects of the project including socio-economic, biodiversity, water quality, air quality and waste and resources. Key findings include significant improvements in driver mortality rates for future generations as a result or the project. While some negative environmental and social impacts were identified, management measures to mitigate any

potential longer-term adverse impacts have been considered and included in **Chapter 6, Revised environmental management measures**

- **Conservation of biological diversity and ecological integrity:** Conservation of biological diversity and ecological integrity has been a fundamental consideration of design development. For the EIS, a biodiversity assessment was carried out in accordance with the FBA (OEH 2014a) to identify potential adverse impacts on biodiversity. This assessment was updated based on the amended design and is discussed in Chapter 5.4, Biodiversity of the Amendment Report. This assessment identifies potential impacts on biodiversity and provides a range of mitigation measures to further avoid and minimise potential impacts. Where impacts would be unavoidable, a range of management and mitigation measures have been identified with the emphasis on conserving biodiversity values locally where practicable
- **Improved valuation, pricing and incentive mechanisms of environmental resources:** Improved valuation, pricing and incentive mechanisms of environmental resources required the project to internalise environmental costs in decision making requiring consideration of all environmental resources. This EIS contains several mitigation and management measures aimed at minimising pollution and waste during project development and offsetting biodiversity impacts. These include biodiversity offsets, as detailed further in Chapter 10, Biodiversity of the EIS and updated in Chapter 5.4, Biodiversity in the Amendment Report. Chapter 23, Sustainability of the EIS considers the whole of life costs associated with the project including transport of material to site, on-going maintenance and eventual decommissioning. The inclusion of mitigation measures would increase the capital and operating costs of the project, which indicates environmental resources have been given appropriate valuation.

In addition to ESD principles highlighted above, TfNSW has committed more broadly to emission reduction through the development and implementation of two key State Government initiatives. In 2019, the NSW Government released the Electric and Hybrid Vehicle Plan (NSW Government 2019). The plan provides a framework to help NSW transition to efficient, low emission, quiet and clean electric and hybrid vehicles. Funding for the plan includes $3 million to support the expansion of fast electric vehicle chargers into regional NSW. The plan set a target of 10 per cent of new general-purpose passenger vehicles purchased or leased by NSW Government agencies to be electric or hybrid vehicles from 2020-21.

TfNSW is also committed to delivering the NSW Government's Climate Change Policy Framework, which outlines long-term objectives to achieve net-zero emissions by 2050 (DPI 2016a). The Net Zero Plan sets an interim emissions target of reducing emissions by 35 per cent by 2030 based on the 2005 level, includes an Electric Vehicle Infrastructure and Model Availability Program which expands on the Electric and Hybrid Vehicle Plan and sets a new target for electric or hybrid passenger vehicles of 30 per cent by 2023, with at least 10 per cent to be fully electric.

A key sustainability objective of the project is to minimise energy use and reduce greenhouse gas emissions. In accordance with environmental management measure S01, an energy efficiency and greenhouse gas emissions strategy will be prepared as part of the project's sustainability management plan. The plan will include the use of energy efficient equipment where fit for purpose for construction activities.

The project aims to minimise where possible, reliance on non-renewable sources of energy and construction materials by aiming to optimise resource efficiency and reduce resource consumption. To achieve this, the project has assessed the feasibility of the following options for implementation during design and construction:

- Consideration of locally sourced materials
- Prioritisation of prefabricated assets where possible
- Avoiding unnecessary resource consumption during construction by making accurate predictions of the required quantities of resources
- Maximising the use of resources with low environmental impact

- Minimising the use of non-renewable resources
- Requiring certified products in project contracts.

Wider environmental impacts of the project have been assessed extensively throughout the project and have informed various design outcomes. Environmental issues for the project were identified through an environmental risk analysis process. Key environmental aspects considered in the environmental risk analysis include but are not limited to noise and vibration, biodiversity, urban design, landscape and visual amenity, flooding and hydrology, soil and contamination and surface water quality. A summary of findings from the assessment can be seen in Chapter 27, Environmental risk analysis of the EIS. Where management of identified risks is required, environmental management measures have been proposed which aim to reduce project impact on the wider environment. These will be supported by specific environmental management plans implemented as part of the overarching Construction Environmental Management Plan.

Environmental management measures including environmental management plans during construction and environmentally sensitive design measures are summarised in **Chapter 6, Revised environmental management measures**.

4.19 Hazard and risk

4.19.1 Consideration of dangerous goods in project development

Submission number(s)

131

Issue description

- The argument surrounding dangerous goods has detracted from progressing the project.

Response

TfNSW understands there are concerns about the safety of the community in relation to dangerous goods.

Chapter 4, Project development and alternatives of the EIS provides details on the design investigations and development decisions regarding the 2018 concept design. In particular, Section 4.5 provides discussion on evaluation of options to cross the major ridgelines and the key criteria to help guide decision making. The major outcome of the design development undertaken during this period was to display a refined concept design to the community before finalising and exhibiting the EIS. This occurred in late 2018.

The clear feedback from the community during the 2018 concept design display was a preference for tunnels over cuttings and land bridges. As such, the EIS and refined concept design included tunnels at Roberts Hill, Shephards Lane and Gatelys Road. A consequence of including tunnels is the need to ensure the safe and efficient carriage of dangerous goods on the road network.

The EIS was exhibited by the DPIE from 11 September to 27 October 2019. Following feedback on the EIS, this Submissions Report and an Amendment Report has been prepared, which will form part of project approval. If the project is approved and funding is available, the tender process would commence with early construction works of the project proposed to start in late 2020.

During this process, discussions with the NSW Dangerous Goods Competent Authorities (ie EPA and SafeWork NSW) and FRNSW will be ongoing and undertaken concurrently to determine whether vehicles carrying certified dangerous goods may be able to use the bypass in future.

Submission number(s)

142

Issue description

- What provisions have been made to limit or prohibit dangerous goods passing through the Coffs Harbour CBD and nearby villages?

Response

The transport of dangerous goods is critical to modern day society. Although several options are available, the most common approach is transport via road.

The project will be built to meet current standards in relation to road and fire safety. All tunnels greater than approximately 100 metres in length are required to meet these standards irrespective of which vehicles and what goods travel through them.

Current policy is that vehicles carrying certified dangerous goods are generally not allowed in tunnels.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.

Submission number(s)

18

Issue description

- Given current dangerous goods transport regulations, the project would not allow for the transport of dangerous goods on the bypass. This will reduce the expected benefits of the project while increasing its capital and operating costs which the EIS does not acknowledge.

Response

As part of the dangerous goods risk assessment for the project and as summarised in Chapter 24, Hazard and risk of the EIS, traffic surveys were undertaken in March 2019 to determine the number of dangerous goods using the Pacific Highway at two locations to the south and north of the Coffs Harbour CBD. A comparison was undertaken with a standard vehicle traffic survey carried out in September 2018 at the same locations. This comparison identified that dangerous goods vehicles make up around 0.19 per cent of all vehicles for Coffs Harbour. While, it is noted the survey may not reflect some weekly or seasonal fluctuations in the cycle of distribution/delivery of dangerous goods, the total volume of dangerous goods vehicles is minor compared to overall traffic volumes.

The project will be built to meet current standards in relation to road and fire safety. All tunnels greater than approximately 100 metres in length are required to meet these standards irrespective of which vehicles and what goods travel through them.

Current policy is that vehicles carrying certified dangerous goods are generally not allowed in tunnels.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.

Submission number(s)

18

Issue description

- The EIS assumes that most dangerous goods transport would continue to enter Coffs Harbour CBD even if the project accommodated dangerous goods transport and that local dangerous goods traffic would not use the bypass. This is an incorrect assumption.

Response

Section 24.2.2 of Chapter 24, Hazard and risk of the EIS noted that Coffs Harbour is a destination for dangerous goods deliveries such as Class 2.1 (flammable gases) and Class 3 (flammable liquids). This observation was based on consultation with industrial businesses within Isles Drive industrial

estate and over 10 petrol stations within and surrounding the Coffs Harbour CBD. It is also anticipated that other sites or industries within and surrounding the Coffs Harbour CBD such as the Coffs Harbour Airport or Boral asphalt plant would require dangerous goods deliveries. As such, during operation of the project, dangerous goods vehicles will continue to use the existing Pacific Highway in order to service customers in the Coffs Harbour CBD.

The EIS did not make any assumptions around whether local dangerous goods traffic would use the bypass other than to note the current policy arrangements for the use of tunnels by vehicles carrying certified dangerous goods.

4.19.2 Dangerous goods through tunnels

Submission number(s)

15, 18, 21, 27, 51, 77, 80, 81, 84, 88, 95, 100, 103, 104, 106, 111, 115, 117, 119, 121, 122, 123, 124, 127, 129, 139, 141, 143, 146, 151, 162, 164, 181, 182

Issue description

- The project should allow all dangerous goods to be transported safely through appropriately designed tunnels.
- The existing design does not allow for transport of dangerous goods.
- The project should adopt the protocols of the St Helena tunnel and allow all dangerous goods should travel through tunnels except Class 1 and 2.1.

Response

The design described in the EIS includes tunnels at Roberts Hill, Shephards Lane and Gatelys Road. Each of the three tunnels will include fire and life safety systems (including deluge systems for fire suppression) and CCTV systems to enable continuous monitoring by tunnel operators. Jet fans will also be provided below the ceiling of the Shephards Lane and Gatelys Road tunnels. Jet fans will be operated in the unlikely event of a fire to prevent smoke spreading to where traffic is likely to be stopped behind an incident and to prevent smoke from entering the adjacent tunnel.

As discussed in Section 5.3 of Chapter 5, Project description of the EIS, the proposed fire and life safety systems for the project's three tunnels will be confirmed during detailed design in accordance with Australian Standard AS4825.

Key objectives of the fire and life safety design would be to protect life and assets, control the incident and facilitate intervention by the emergency services.

These measures are required to manage risks associated with all vehicles travelling through the tunnel as fires in vehicles occur even if they are not carrying certified dangerous goods, particularly when they are involved in accidents.

As part of the above process, TfNSW will develop controls and operating procedures to respond to all tunnel incidents in consultation with relevant authorities and stakeholders. These will include clearly defined responsibilities with respect to access, traffic management and tunnel equipment, to ensure a rapid and coordinated response to emergencies. These procedures, including trial incident response/simulated rescue activities with all key stakeholders responding, will be tested during both desk and field commissioning trials prior to opening the tunnels and at regular intervals post opening to ensure operational readiness in the rare event of an incident.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.

4.19.3 Dangerous goods regulations

Submission number(s)

15, 76, 141

Issue description

- Dangerous goods regulations must be changed to facilitate all categories of dangerous goods to be able to use the project
- There needs to be more clarity around the legislative approach to dangerous goods.

Response

The legislative framework for the transportation of dangerous goods is provided in Section 24.1.2 of Chapter 24, Hazard and risk of the EIS and the project is required to be assessed, and has been assessed, against that legislative framework. The Australian Code for the Transport of Dangerous Goods by Road & Rail (National Transport Commission 2018) sets out detailed technical specifications, requirements and recommendations applicable to the transport of dangerous goods in Australia by road and rail. Each state and territory implement the Code and associated updates to their dangerous goods transport legislation and regulations separately. The relevant legislation in NSW for the transport of dangerous goods are the *Dangerous Goods (Road and Rail Transport) Act 2008* and the Dangerous Goods (Road and Rail Transport) Regulation 2014.

The approval process for the project is not the appropriate mechanism to seek the change of relevant legislation and regulations governing the carriage of dangerous goods on the road network.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

Any changes to relevant legislation and regulations governing the carriage of dangerous goods on the road network will be considered through this wider policy process.

4.19.4 EIS assessment of dangerous goods

Submission number(s)

18, 27, 44, 91, 119

Issue description

- The issue of dangerous goods has not been adequately addressed in the EIS
- There is no evidence the EIS has attempted to rigorously assess the risk to people and property of dangerous goods transport travelling through Coffs Harbour compared to travelling through the tunnels. The EIS suggests there might be a regulatory fix that would allow dangerous goods to use the project, however this is highly problematic and will most likely come after construction.

Response

Chapter 24, Hazard and risk of the EIS outlines the assessment methodology adopted by TfNSW to identify the existing transportation of dangerous goods, the proposed impacts during construction and operation of the project and proposed environmental management measures.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.

4.19.5 Alternative solution for dangerous goods

Submission number(s)

40, 44, 103

Issue description

- A possible alternative solution to dangerous goods in tunnels would be to fit dangerous goods vehicles and tunnel portals with sensors. This sensor would ultimately restrict vehicles entering the traffic area while the dangerous goods vehicles pass through the tunnels
- Is it proposed to move towards the Natroad-advocated risk-based assessment approach, and the potential trial on removing restrictions on dangerous goods through selected tunnels in Sydney and designating key dangerous goods routes with appropriate access and rest areas is a possibility?
- The bypass could be closed to all vehicles except those carrying Class 1 and 2.1 dangerous goods to manage risks.

Response

As previously outlined, TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.

As discussed in Section 5.3 of Chapter 5, Project description of the EIS, the proposed fire and life safety systems for the project's three tunnels will be confirmed during detailed design in accordance with Australian Standard AS4825.

Key objectives of the fire and life safety design would be to protect life and assets, control the incident and facilitate intervention by the emergency services.

As part of the above process, TfNSW will develop controls and operating procedures to respond to all tunnel incidents in consultation with relevant authorities and stakeholders. These will include clearly defined responsibilities with respect to access, traffic management and tunnel equipment, to ensure a rapid and coordinated response to emergencies. These procedures, including trial incident response/simulated rescue activities with all key stakeholders responding, will be tested during both

desk and field commissioning trials prior to opening the tunnels and at regular intervals post opening to ensure operational readiness in the rare event of an incident.

These measures are required to manage risks associated with all vehicles travelling through the tunnel as fires in vehicles occur even if they are not carrying certified dangerous goods, particularly when they are involved in accidents

The alternative solutions raised by the submitters to allow dangerous goods vehicles to use the project are noted and will be considered as part of the aforementioned assessment process.

4.19.6 Dangerous goods risk assessment

Submission number(s)

27, 77, 80, 81, 119, 122, 123, 124, 127, 139, 141, 151, 165, 181, 182

Issue description

- The community should have access to the dangerous goods risk assessment conducted by TfNSW.

Response

As previously discussed, the dangerous goods risk assessment process is ongoing. Further assessment and consultation with relevant authorities and stakeholders will occur as part of this process.

The community would be informed of any decisions that are made in this regard.

Chapter 5

Clarifications, corrections and further information

5. Clarifications, corrections and further information

This chapter describes clarifications and minor corrections that have been identified in the EIS as well as further information, including additional assessments, that have been carried out since the exhibition of the EIS. Where relevant, the text provided can be considered to replace the text from the EIS and appendices. None of these minor errors and discrepancies would result in any significant change to the impacts described in the EIS.

5.1 Clarifications

5.1.1 Noise and vibration

Out of hours work

The NSW Interim Construction Noise Guideline (DECC 2009b) recognises there are some situations where specific construction work may need to be carried out outside of the recommended standard construction hours. As discussed in Section 6.6.2, Out of hours work of the EIS, TfNSW has proposed a number of potential activities including likely locations and justification for the work.

One of the activities proposed was tunnel excavation. This was proposed to be undertaken Monday to Saturday and was described in the EIS as likely being undertaken in 12-hour shifts based on a 24-hour work cycle eg 6am to 6pm and 6pm to 6am. The exception to this would be blasting which would be undertaken in accordance with the recommend hours from Interim Construction Noise Guideline (DECC 2009b). However, to ensure the community and government agencies are fully informed of what is proposed to occur and when, further details are provided in **Table 5-1** and **Figure 5-1** and **Figure 5-2**.

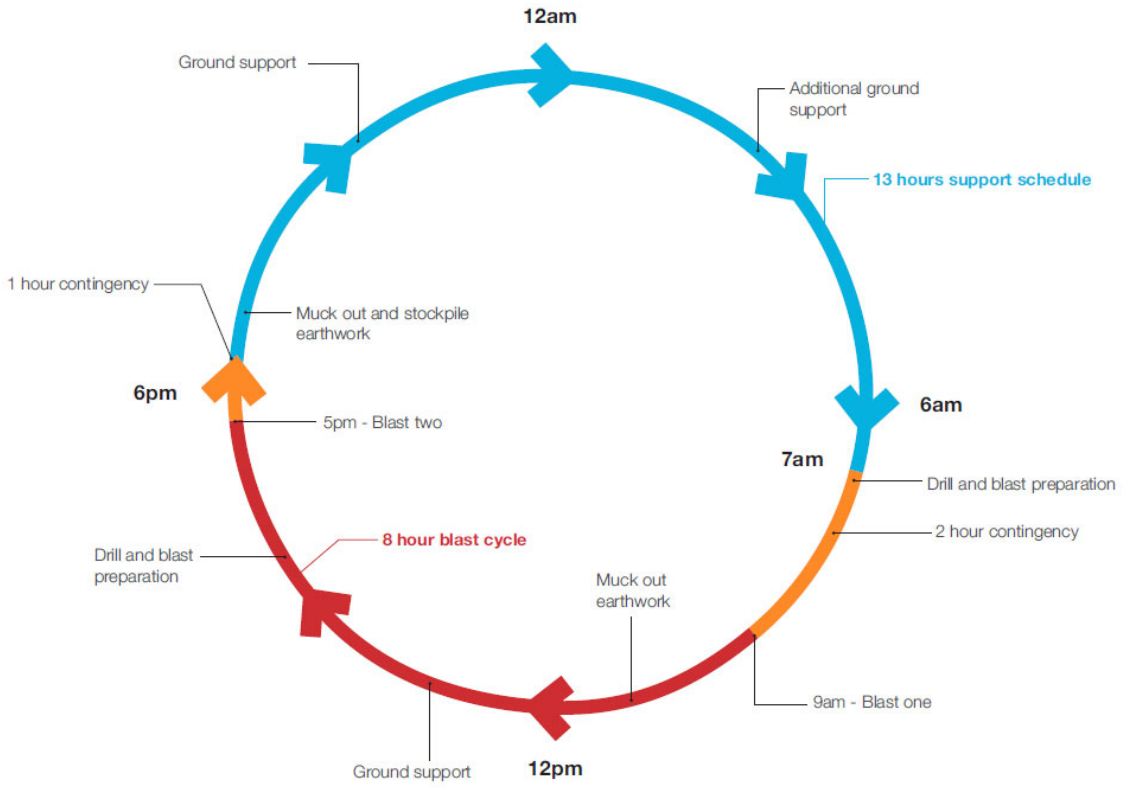


Figure 5-1 Optimised 24-hour schedule

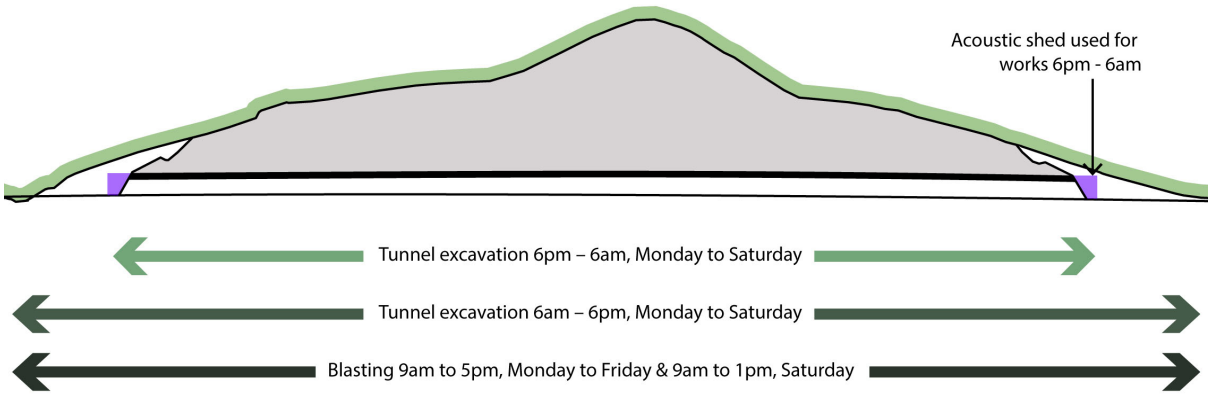


Figure 5-2 Tunnel works schedule

Table 5-1 Tunnel excavation construction hours

Time/Day	Activity	Location	Noise
6am – 6pm, Monday to Saturday	• Portal and tunnel earthworks • Blast preparation • Mucking out of tunnel earthwork • Haulage of spoil and delivery of material • Ground support such as drilling / bolting / s hotcrete.	• Portal area • Within tunnel.	Audible
9am to 5pm, Monday to Friday* 9am to 1pm, Saturday	• Blasting	• Portal area • Within tunnel.	Audible
6pm-6am, Monday to Saturday	• Drill and Blast preparation • Mucking out of tunnel earthwork • Ground support such as drilling / bolting / s hotcrete • Tunnel mechanical and electrical fit out • Testing /commissioning.	• Within tunnel.	Inaudible**

*Section 9.3.1, Construction noise and vibration criteria of the EIS describes situations where the recommended hours could be varied consistent with recent SSI approval conditions, eg Albion Park Rail Bypass (SSI 6878)

**Inaudible is defined as no more than 5 dB(A) above the rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC 2009b)

The above schedule would allow construction contractor(s) to maximise program efficiency and reduce the overall duration of the project. Reducing the overall duration of the project would provide a benefit to the affected community by reducing the overall time exposure to potential construction related impacts such as noise and vibration.

The updated noise and vibration assessment for the project has assessed the above tunnel construction work and is included in Section 5.2.2, Construction noise impact assessment and Table 51 of Appendix B, Updated noise and vibration assessment of the Amendment Report. It should be noted that the results provided in Table 51 are based on an unmitigated scenario.

A number of mitigation measures would be implemented to manage the exceedances identified in Appendix B, Updated noise and vibration assessment of the Amendment Report and are described below. Key to managing the work proposed between 6pm to 6am and its associated audible affects,

Monday to Saturday, would be the installation of sound insulating 'acoustic sheds' at each of the tunnel portals. The acoustic sheds would be designed with the aim of reducing potential noise levels to no more than 5 dB(A) above the rating background level for nearby residences. The use of acoustic sheds to shield noise is common for major tunnelling projects and have been successfully used on a number or road and rail related projects in the Sydney Metropolitan as well as the Tintenbar to Ewingsdale Pacific Highway upgrade project as part of the constriction of the St Helena Tunnel.

Proposed environmental management measures to minimise potential noise impacts associated with tunnel construction work include:

- NV01: A NVMP will be prepared and implemented during construction in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) and the Interim Construction Noise Guidelines (DECC 2009b). The NVMP plan will identify measures to minimise noise and vibration impacts and will include a monitoring program to assess performance against relevant noise and vibration criteria and arrangements for consultation with affected receivers, including notification and complaint handling procedures.
- NV06: An Out of Hours Work Procedure will be included as part of the NVMP to manage any variations to the standard construction hours. The procedure will outline additional measures to minimise noise on nearby sensitive receivers.
- NV07: Implementation of at-property operational noise mitigation measures during the pre-construction phase and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts.

In addition to the above and as discussed in Chapter 6, Construction of the EIS, the proposed strategy to haul earthworks and material along the project corridor would also assist in managing potential noise impacts associated with haulage of spoil and delivery of material to the tunnel sites.

Please refer to **Chapter 6, Revised environmental management measures** for further detail of environmental management measures proposed to manage construction noise and out of hours work.

Noise data exclusion methodology

Inconsistencies were identified with excluding certain periods marked as extraneous in the noise monitoring graphs in Appendix D of Appendix G, Noise and vibration assessment of the EIS, in particular, not excluding noise data where the wind speed was in excess of 5 m/s.
The inconsistencies with data exclusion are because of formatting issues with wind speeds on the noise logger data plots. When weather data was imported to Excel, formatting functions were applied to generate plots. These formatting functions failed to consistently display some wind speeds. Despite the formatting issues, the excluded periods are consistent with the weather data used for processing logger results. This means that although some wind speeds were not consistently displayed on plots, the data was still processed correctly and had no impact on results.

The formatting issue has been rectified and wind speed trace has been updated in logger graphs 5, 11, 12, 13, 16, 17, 19, 20 in Appendix D of Appendix B, Updated noise and vibration assessment of the Amendment Report.

Cross-referencing of receiver ID numbers

The maps in Appendix G, Noise and vibration assessment of the EIS did not show the full receiver ID number, making it difficult to find some receivers. These maps have been amended to include three-digit labels to assist in finding receivers and cross-referencing result tables. These amended maps

have been included in Appendix B, Updated noise and vibration assessment of the Amendment Report.

5.1.2 Socio-economic

Use of ‘low-moderate’ and ‘moderate-low’

Table 14-4 in Chapter 14, Socio-economic of the EIS, was used to determine the levels of significance of socio-economic impacts based on magnitude and sensitivity. Despite the table identifying a 'low-moderate' category of significance, the terms ‘low-moderate’ and ‘moderate-low’ were used interchangeably within Chapter 14, Socio-economic of the EIS. The matrix presented in Table 14-4 was also used for assessments within the Amendment Report. Chapter 5.7, Socio-economic of the Amendment Report uses ‘moderate-low’ to represent the level of significance, consistent with the terminology in the table.

5.1.3 Aboriginal cultural heritage

Duplicate figure

Figure 15.1-03 in Chapter 15, Aboriginal cultural heritage assessment in the EIS, was duplicated and Figure 15.1-04 was omitted, on the printed copy of the EIS and DPIE website versions. However, Figure 6 of Appendix L, Aboriginal cultural heritage assessment report of EIS provided the missing information regarding the AHIMS search. The omitted figure, Figure 15.1-04 is reproduced below as **Figure 5-3**.

Legend

- Construction footprint
- Alignment
- North Coast Railway
- Watercourse
- AHIMS site location
- AHIMS search area

Coffs Harbour Bypass AHIMS search results
Figure 5-3 (Figure 15-1-04 from the EIS)

0 0.2 0.4 0.6 km

Scale @A4: 1:20,000
GDA 1994 MGA Zone 56

N

5.1.4 Flooding and hydrology

Declared Dam location

The design presented in the EIS and the amended design presented in the Amendment Report, show the alignment would pass through upstream portion of the impoundment area of Spagnolos Basin. This basin is a Declared Dam under section 5 of the *Dams Safety Act 2015* (Dams Safety Act). As part of the flood mitigation strategy for the Coffs Creek catchment, the proposed highway embankment would temporarily detain flood waters to the west of the highway in a similar manner to Spagnolos Basin.

Given that this flood storage area would be upstream of Spagnolos Basin and the likely consequences of failure of the highway embankment during a flood event, it is likely that this section of highway embankment would also be classified as a Declared Dam under section 5 of the Dams Safety Act.

To facilitate this process and to ensure the design meets the requirements of the Dams Safety Act and Dams Safety NSW, consultation with Dams Safety NSW would be undertaken during detailed design. If this section of highway embankment is classified as a Declared Dam, TfNSW would need to comply with all of the relevant requirements of the act including failure impact assessments, design, monitoring, auditing and ongoing maintenance of the embankment.

As a result of design changes made as part of the amended design, there are two other locations within the project that could also result in a Declared Dam under section 5 of the Dams Safety Act. These are discussed in Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

Assumptions near James Small Drive

Appendix O, Flooding and hydrology assessment of the EIS made a number of assumptions which were incorrect around the culvert and inflow location near James Small Drive. This resulted in modelling predicting that James Small Drive would be flood affected.

Assumptions have been updated in Appendix H, Updated flooding and hydrology assessment of the Amendment Report including relocating the inflow point that was previously directly on Ballantine Drive, downstream (ie further south-east) within the natural flow path so the inflow is not applied directly to the road.

5.1.5 Environmental management measures

Some environmental management measures have been reviewed for clarity and constructability purposes as part of further design investigations. This review has resulted in minor revisions to text, responsibilities, and timing. The revised environmental management measures are presented in **Chapter 6, Revised environmental management measures**.

5.2 Corrections

5.2.1 Project description

Realignment of Newports Creek

There was an incorrect description of the realignment of the northern tributary of Newports Creek in Chapter 5, Project description of the EIS (page 5-38). Incorrect text is as follows:

'Minor realignment of the northern tributary of Newports Creek (about 400 m north of North Boambee Road and about 150 m north of BR05) as it passes beneath the project. A cross-drainage culvert is proposed in this location to convey flood water beneath the project. The alignment of the culvert would generally follow the alignment of the existing creek and would include a low flow channel to provide for fish passage.'

Realignment was correctly shown in Figure 5-2-03 of the EIS and the description should have read:

'The northern tributary of Newports Creek (about 400 metres north of North Boambee Road and about 150 metres north of BR 05) would be realigned for about 180 metres to run parallel to the project on the western side. It would join the other northern tributary of Newports Creek to the west of bridge BR 05, to pass beneath the project.'

Korora Public School bus interchange parking

Figure 5-10 of the EIS incorrectly noted the number of car park spaces as 55. This should have been noted as 52 car park spaces. This was correctly reported as 52 car park spaces in Chapter 8, Traffic and transport of the EIS.

5.2.2 Traffic and transport

Level of service reporting

Performance of the intersection of Opal Boulevard and the service road was incorrectly reported as level of service A in Table 8-14 of the EIS and in Appendix F, Traffic and transport assessment of the EIS. This should have been reported as level of service B. The correct assessment is displayed in Table 5.2-9 of the Amendment Report.

Traffic volume outputs

The traffic volume outputs previously reported in the EIS for the existing Pacific Highway south of Bruxner Park Road included values of 28,800 vehicles per day, 31,500 vehicles per day and 34,500 vehicles per day for the project scenarios at 2024, 2034 and 2044 respectively. These previous volumes were incorrect as they did not include southbound traffic volumes from Bruxner Park Road and from the project northbound at this location. These values have been updated in Table 5.2-3 of the Amendment Report as 32,500 vehicles per day, 36,000 vehicles per day and 39,200 vehicles per day to ensure all two-way traffic volumes south of the interchange are being reported.

5.2.3 Noise and Vibration

Reclassification of sensitive receivers

The classification of a small percentage of sensitive receivers has changed after a detailed check of property addresses. A number of receivers were incorrectly marked as residential properties and have been changed to sheds and other structures, and a number of sheds and other structures have changed to residential properties. The updated classification has been incorporated into updated noise and vibration modelling provided in in Appendix B, Updated noise and vibration assessment of the Amendment Report.

Residential receivers

The number of residential receivers was incorrectly reported as 2265 in Chapter 9, Noise and vibration of the EIS. This was correctly reported in Appendix G, Noise and vibration assessment of the EIS as 2295 residential receivers. This correction has been incorporated into Section 5.3, Noise and vibration of the Amendment Report.

Pacific Bay Eastern Lands properties

Properties in the approved Pacific Bay Eastern Lands development were assumed to be one-storey in the assessment carried out for the EIS. These buildings were revised to be two-storey buildings consistent with the approved subdivision masterplan. This change has been incorporated into updated noise and vibration modelling provided in in Appendix B, Updated noise and vibration assessment of the Amendment Report.

Noise walls

The height and length of some noise walls was incorrectly recorded in Table 9-27 of the EIS. The incorrect measurements are as follows; NCA06 length recorded as 1560 metres, NCA14 height recorded as four metres and length recorded as 1310 metres, NCA18 length recorded as 1110 metres and NCA25 was not listed. The correct lengths were shown in Appendix G, Noise and vibration assessment of the EIS. This correction has been incorporated into Section 5.3, Noise and vibration of the Amendment Report.

5.2.4 Urban design, landscape and visual amenity

Proposed replacement footbridge structure

The proposed Luke Bowen footbridge was incorrectly referred to as a ‘single span structure’ in the Section 5.5, Bridges of Appendix J, Urban design, landscape character and visual impact assessment of the EIS. This should have read ‘multi-span structure’. The proposed Luke Bowen footbridge was correctly referred to as a multi span structure in Chapter 5, Project description of the EIS.

Magnitude of change, Viewpoint 18

The magnitude of change for the visual impact from Viewpoint 18 at Englands Road was incorrectly reported as high in the EIS and has been corrected to moderate in Table 5.5-3 of the Amendment Report.

5.2.5 Agriculture

Agricultural land take

Sub-appendix K2, Agricultural assessment in the EIS incorrectly reported the direct impact on APO 92 based on the EIS design as 9.96 per cent. This has been corrected in Section 5.7, Agriculture of the Amendment Report to 14.40 per cent. In addition, the assessment in the EIS also incorrectly reported the direct impact on APO 29 based on the EIS design as 39.01 per cent. This percentage was also incorrectly presented in Table 13-11 of the EIS. This has been corrected in Section 5.7, Agriculture of the Amendment Report to 41.90 per cent.

Figures in the EIS incorrectly showed the construction footprint as extending into APO 91, a blueberry farm. However, this area of the property was not intended to be a part of the construction footprint. This was identified before publication of the EIS, so the impacts stated in the EIS are correct.

5.3 Further information

5.3.1 Land use and property

During detailed cadastral survey of the project area following EIS exhibition, it was identified that a small section of the project is located within the surveyed boundary of Kororo Nature Reserve, which is land reserved under the *National Parks and Wildlife Act 1974*. The area within the nature reserve boundary is about 69 square metres and consists of disturbed roadside vegetation and part of the existing Old Coast Road. TfNSW is working with NSW National Parks and Wildlife Service, DPIE to adjust this boundary and transfer ownership of this parcel of land to TfNSW in accordance with the Revocation, Recategorisation and Road Adjustment Policy (OEH 2014d).

5.3.2 Socio-economic

Tree of social significance

During initial property acquisition consultation following EIS exhibition TfNSW has investigated opportunities to avoid an impact on a tree having social significance that was identified near the Coramba Road interchange. This investigation has been undertaken consistent with environmental management measure SE03 as described in the EIS. This consultation has resulted in the potential option to relocate the tree subject to further design investigation and agreement of the property owner. As such, environmental management measure SE03 has been revised to reflect the above.

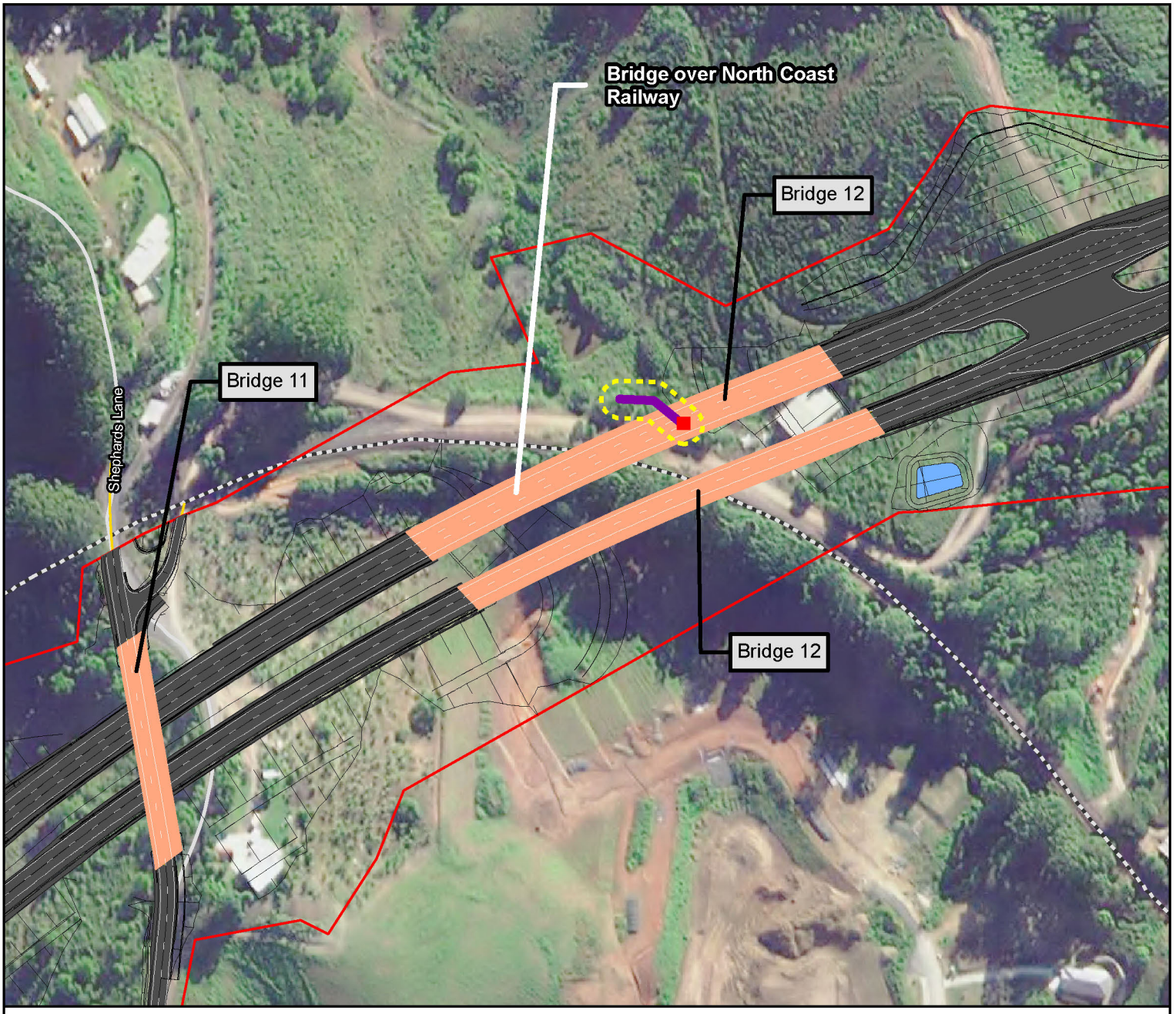
Project amenity impacts

In the EIS, Pacific Bay Resort Golf Course and Elite Training Centre were listed as social infrastructure within the 500-metre core impact area. Since the exhibition of the EIS, the property owner has confirmed the facility is no longer operational and not accessible to the public. As a result, this site is treated as private land for the purposes of the assessment and any socio-economic impacts associated with past provision of social infrastructure on this site are no longer relevant.

5.3.3 Non-Aboriginal cultural heritage

North Coast Railway heritage

Additional field investigations and assessment were carried out for a previously unidentified culvert, headwall and dry argillite retaining wall associated with the North Coast Railway. The culvert was identified during detailed cadastral survey of the project area following EIS exhibition. A field investigation was undertaken on 30 January 2020 and an addendum Heritage Impact Statement prepared to assess the significance of the structures (see **Appendix D, Supplementary non-Aboriginal cultural heritage assessment**). **Figure 5-4** provides the location of the culvert, headwall and dry argillite retaining wall in relation to the project.



Legend

- Construction footprint
- Alignment
- North Coast Railway
- Bridge
- Pavement
- Operational water quality basin
- Watercourse
- Culvert
- Culvert Buffer

Coffs Harbour Bypass
Location of North Coast Railway culvert
Figure 5-4

0 0.025 0.05 0.075 km

Scale @A4: 1:2,500
GDA 1994 MGA Zone 56

N

As discussed in Chapter 16, Non-Aboriginal cultural heritage of the EIS, the North Coast Railway is a heritage item within the study area of the project that has local significance. The project impact described in the EIS was mainly related to construction of the bridge over North Coast Railway near Shephards Lane (BR 12) and associated visual impacts.

The headwall and culvert were built as part of the North Coast Railway. The headwall of the culvert was found to have been constructed largely of small irregular argillite blocks and timber planks holding the argillite in place. The headwall appeared to have been disturbed and repaired, however the argillite wall continues for about 20 metres to the north of the concrete pipe as a retaining wall. There was no bonding material present, indicating this is what is known as a 'dry stone wall'.

Seven other culverts were visited during the field investigation. These comparison culverts consisted of a similar concrete pipe. However, the headwalls were significantly different and consisted of precast concrete with a kilometre marker.

While the headwall and culvert are associated with the North Coast Railway, which holds heritage significance, they have been disturbed. As such, the addendum Heritage Impact Statement concluded that the headwall and culvert are not of local or state heritage significance. The dry argillite retaining wall has not been disturbed and is in relatively good condition. Additionally, further research has not identified other dry stone walls in the vicinity that are associated with the railway. Therefore, the addendum Heritage Impact Statement concluded that the dry argillite retaining wall is of local heritage significance for its rarity, aesthetic significance and association with the North Coast Railway.

The proposed works that would impact the headwall, culvert and dry argillite retaining wall include the construction of bridge piers and superstructure and associated drainage. The culvert and headwall will be directly impacted and the dry argillite retaining wall would be most likely damaged or partially demolished as result of the above works. Sections of the retaining wall that could be avoided would also be subject to potential vibration impacts during construction and visual impacts.

The addendum Heritage Impact Statement has recommended a number of management measures to partially mitigate the potential impacts to the dry argillite retaining wall. These management measures relate to minimising impacts on the structural integrity of the retaining wall and ensuring archival recording is carried out prior to construction. These measures have been included in **Chapter 6, Revised environmental management measures** (see NAH03 and NAH05).

5.3.4 Flooding and hydrology

Digital terrain survey

A detailed digital terrain survey was completed following exhibition of the EIS which required updates to the hydraulic model. This includes detailed survey of Shephards Lane detention basin which was constructed in 2018 after the collection of data used in the EIS (note assumptions were made to represent the basin in the EIS). The updated flooding and hydrology assessment (Appendix H, Updated flooding and hydrology assessment of the Amendment Report) has incorporated the detailed digital terrain survey.

Extension of North Boambee Valley flood model

Following exhibition of the EIS and discussions with CHCC, the North Boambee Valley flood models have been extended by an additional 240 hectares to include additional downstream sub-catchments and floodplain areas and remove the influence of the downstream boundary on flood model behaviour near the project. The downstream boundary is now about 600 metres to 900 metres downstream of the existing Pacific Highway. Figure 7 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report shows the new flood model extents.

5.3.5 Environmental record

Since submission of the EIS the former Roads and Maritime Services has merged with TfNSW. As required by the SEARs and in Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000 (Commonwealth) the person proposing to take the action must include their environmental record in the assessment documentation. Therefore, an updated environmental record for TfNSW is included in **Appendix E, Environmental record**.

Chapter 6

Revised environmental management measures

6. Revised environmental management measures

The Coffs Harbour Bypass EIS (TfNSW 2019) identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the amendments to the project and the issues raised in the public submissions, the environmental management measures for the project (refer to Chapter 26 of the EIS) have been revised where relevant. Should the project be approved, the environmental management measures in **Table 6-1** will guide the subsequent phases of the project.

Additional and/or modified environmental management measures to those presented in the EIS have been italicised and deleted measures, or parts of measures, have been struck out. Management measures that have changed as a result of the proposed design and construction changes as assessed in the Amendment Report are presented in green. Management measures that have changed as a result of responding to community and agency submissions or the review identified in **Chapter 5, Clarifications, corrections and further information** are presented in yellow.

Table 6-1 - Summary of environmental management measures

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Traffic and transport					
Disruption to public transport, including school bus services	TT01		Operational access for public transport services, including school bus services will be maintained as part of the project. The requirements for any temporary changes during construction will be confirmed following further consultation with the school bus operators, CHCC, Kororo Public School and Bishop Druitt College.	TfNSW / Contractor	Detailed design and during construction
Parking and access at Kororo Public School	TT02		Further consultation will be undertaken with Kororo Public School and ~~NSW Department of Education~~ *School Infrastructure NSW* to confirm final parking arrangements and access during construction.	TfNSW / Contractor	Detailed design and during construction
~~**Use of James Small Drive during operation**~~	~~TT03~~		~~Traffic management improvement opportunities for James Small Drive, including but not limited to restrictions to on-street parking and installation of traffic barriers, will be further evaluated and finalised during detailed design and in consultation with CHCC, Kororo Public School, Coffs Harbour Montessori Preschool, NSW Department of Education and the adjacent community.~~	~~TfNSW~~	~~Detailed design~~
Solitary Rural Fire Service access	~~TT04~~	*TT03*	Consultation with the ~~Solitary~~ Rural Fire Service *Mid North Coast Team* will be undertaken during detailed design *and prior to construction to confirm the requirements for relocating their services and* to ensure the appropriate access ~~requirements are~~ *is* achieved.	TfNSW	Detailed design
Pacific Bay Western Lands access	~~TT05~~	*TT04*	Consultation with CHCC and the proponent of the Pacific Bay Western Lands residential development will be undertaken during detailed design to ensure future access arrangements are considered as part of the project.	TfNSW	Detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Pacific Bay Eastern Lands access	~~TT06~~	*TT05*	Consultation with CHCC and the proponent of the Pacific Bay Eastern Lands development will be undertaken during detailed design to ensure future access arrangements are considered as part of the project.	TfNSW	Detailed design
Traffic related risks during construction	~~TT07~~	*TT06*	A Traffic Management Plan will be prepared and implemented as part of the CEMP. The plan will be prepared in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c). The plan will include: • Confirmation of haulage routes • Measures to maintain access to local roads, properties and Kororo Public School • Measures that consider operation of Kororo Public School and Bishop Druitt College • *Consideration of alternative construction access for the section of the project between Shephards Lane tunnel and Gatelys Road tunnel that minimises impacts on adjoining community, sensitive receivers, eg Baringa Private Hospital and RFBI Coffs Harbour Masonic Village, and road users.* • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident and 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	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Access	~~TT08~~	*TT07*	Existing accesses to properties will be maintained during construction. Where this is not feasible or reasonable, temporary alternative access arrangements will be provided following consultation with the affected property owners *and business operators.*	Contractor	During construction
Road condition reports	~~TT09~~	*TT08*	Pre-construction and post-construction road condition reports for local roads will be prepared. Any damage resulting from construction (not normal wear and tear) will be repaired unless alternative arrangements are made *with* CHCC. Copies of road condition reports will be provided to CHCC.	Contractor	Prior to construction and post construction
Permanent removal of parking areas	~~TT10~~	*TT09*	Parking demand and use surveys will be undertaken to confirm the extent of temporary and/or permanent impacts at the following locations: • Areas associated with the informal school bus stop at the intersection of Coramba Road and Spagnolos Road • Englands Road • Oz Group Packhouse at Isles Drive. • The results will be used to determine the need for alternative arrangements, where reasonable and feasible.	TfNSW	Detailed design
Strategy for pedestrians and cyclists	*n/a*	*TT10*	*Consultation with CHCC will be undertaken during detailed design regarding the operational strategy for pedestrians and cyclists particularly where there is potential interaction with CHCC's existing proposed pedestrian and cycle network and where location-specific wayfinding plans are required.*	*TfNSW*	*Detailed design*
Confirmation of assessed impacts	TT11		A review of operational network performance will be undertaken *within* 12 months ~~from~~ after the ~~opening~~ *completion* of the project to confirm the operational traffic and transport impacts of the project on the surrounding road network, in particular at intersection/interchange locations, *Isles Drive*	TfNSW	Operation

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			and Coramba Road. The assessment will be based on updated traffic surveys at the time and the methodology used will be comparable with that used in Appendix F, Traffic and transport assessment of the EIS *and Appendix A, Supplementary traffic and transport assessment of the Amendment Report.* Where required, additional mitigation measures will be identified in consultation with CHCC to manage any additional traffic performance impacts.		
Old Coast Road design investigation	*n/a*	*TT12*	*Design and road safety investigation of the Korora Basin Road and Old Coast Road intersection including Old Coast Road Bridge No. 2, will be carried out during detailed design to determine if any reconfiguration or upgrade is needed. The design and road safety investigation will be carried out in consultation with CHCC.*	*TfNSW*	*Detailed design*
Access arrangements for properties on existing Pacific Highway	*n/a*	*TT13*	*Alternative access arrangements for Boambee Palms and Holiday Park, Lindsay Transport and other properties with access to the existing Pacific Highway between Englands Road and Sawtell Road will be investigated during detailed design. The investigation will be carried out in consultation with CHCC and affected property owners to determine reasonable and feasible design solutions that address the safety concerns described in Section 4.7.7 of the Submissions Report. Any decision to proceed with a design solution will be subject to funding availability and consideration of environmental constraints, project objectives and value for money.*	*TfNSW*	*Detailed design*
Parking and access at Kororo Public School	*n/a*	*TT14*	*The new Luke Bowen footbridge will be constructed prior to the removal of the existing bridge where reasonable and feasible with any disruptions to access occurring outside of school terms and in consultation with Kororo Public School and School Infrastructure NSW.*	*TfNSW/ Contractor*	*During construction*

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Noise and vibration					
Construction noise and vibration management	NV01		A Noise and Vibration Management Plan will be prepared and implemented as part of the CEMP and in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) *and the Interim Construction Noise Guidelines (DECC 2009b).* The plan will identify: • All potential significant noise and vibration generating activities associated with the activity • Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, respite periods, staging, placement and operation of ancillary facilities, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generating equipment • A monitoring program to assess performance against relevant noise and vibration criteria • Process for the implementation of respite periods to provide residents with respite from ongoing impact • Arrangements for consultation with affected receivers, including notification and complaint handling procedures • Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.	Contractor	Prior to construction and during construction
Construction and vibration impacts	NV02		Prior to commencing construction, the structural integrity of Old Coast Road Bridge No. 1 and Old Coast Road Bridge No. 2 will be confirmed by a suitably qualified structural engineer. The results from inspection will be documented and used to verify the applicable vibration criteria, construction vehicle restrictions and any feasible and reasonable mitigation measures to be implemented. A copy of the report will be provided to CHCC.	Contractor	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	~~NV03~~		~~Building condition surveys will be conducted for buildings and other structures within 50 m of vibration generating activities before commencement of construction. A copy of the building condition survey report will be provided to the relevant property owner.~~	~~Contractor~~	~~Prior to construction~~
	NV03		*Building condition surveys will be undertaken for buildings and other structures within the following distances from the main vibration generating activities:* • *Blasting operations – within 500 m* • *Pile driving – within 250 m* • *Excavating by hammering or ripping – within 100 m* • *Vibrating compaction > 7 tonne plant – within 50 m* • *Vibrating compaction < 7 tonne plant – within 25 m* • *Demolition of structures – within 50 m.* *A copy of the building condition survey report will be provided to the property owner.*	*Contractor*	*Prior to construction*
	NV04		Where vibration generating activities will be carried out within minimum working distances for cosmetic damage, vibration monitoring will be carried out. Where monitoring indicates cosmetic damage criteria are exceeded, alternative low-vibration work practices will be investigated and implemented.	Contractor	During construction
	NV05		Consultation with the Boambee Equestrian Centre will be carried out during detailed design following further consideration of construction methodologies and further geotechnical conditions to ensure appropriate work practices are implemented to minimise the risk of vibration impacts.	Contractor	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Impacts from out of hours works	NV06		An Out of Hours Work Procedure will be included as part of the Noise and Vibration Management Plan to manage any variations to the standard construction hours. The procedure will follow the approach in Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) *and the Interim Construction Noise Guideline (DECC 2009b).* The procedure will include, but not be limited to: • Scheduling of noise intensive or high noise impact work to evening periods where feasible • Use of alternative plant and equipment and/or construction techniques to minimise noise • Notification and consultation requirements including preparation of a six-month 'look ahead' program for likely out of hours work • Use of temporary noise barriers • Acoustic sheds will be included around tunnel portals to shield noise from within the tunnel during evening and night periods • Respite periods • Representative noise monitoring • Offers of reasonable and temporary alternative accommodation or an act of good will • Use of negotiated agreements.	Contractor	During construction
	NV07		At-property operational noise mitigation measures will be implemented during the pre-construction ~~phase~~ *and early construction phases of* the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). *At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts.*	TfNSW / Contractor	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Construction noise impacts from ancillary facilities	NV08		Ancillary facilities will be designed to ensure that primary noise sources are at a maximum distance from residences (where reasonable and feasible), with solid structures (sheds, containers, etc.) placed between residences and noise sources (and as close to the noise sources as is practical).	Contractor	During construction
Construction traffic noise impacts	NV09		Management of construction related traffic noise will include the following considerations: • Scheduling of vehicle movements during less sensitive time periods where possible • Training/inductions to address driver behaviour and avoidance of the use of engine compression brakes • Vehicle maintenance.	Contractor	During construction
Blasting	NV10		A Blast Management Strategy will be prepared as part of the Noise and Vibration Management Plan. The strategy will aim to demonstrate that all blasting and associated activities will be carried out in a manner that will not generate unacceptable noise and vibration impacts or pose a significant risk impact to residences and sensitive receivers. The Blast Management Strategy will address: • Details of blasting to be performed, including location, method and justification of the need to blast • Identification of any potentially affected noise and vibration sensitive sites and structures • Establishment of appropriate criteria for blast overpressure and ground vibration levels at each category of noise sensitive site • Details of the storage and handling arrangements for explosive materials and the proposed transport of those materials to the construction site	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			• Identification of hazardous situations that may arise from the storage and handling of explosives, the blasting process and recovery of the blast site after detonation of the explosives • Determination of potential noise and vibration and risk impacts from blasting and appropriate best management practices • Community consultation procedures.		
Operational noise impacts	NV11		The operational noise mitigation measures, including noise barriers and/or at-property treatments, will be confirmed during detailed design. ~~The treatments will be provided as early as practicable in the construction program to reduce potential noise impacts associated with construction.~~ *This will also include consideration of industrial noise exceedances associated with the Kororo Public School bus interchange.*	TfNSW / Contractor	Detailed design
Operational noise impacts	NV12		An operational noise review will be carried out 12 months after the opening of the project to confirm the operational noise impacts. The review will be based on updated traffic surveys at the time (and once traffic flows have stabilised) and will be in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and Practice Note viii of Environmental Noise Management Manual (RTA 2001b). The review will: • Assess actual noise performance compared to predicted noise performance • Assess the performance and effectiveness of noise and vibration mitigation measures • Where deficiencies in performance are identified, provide recommendations for additional feasible and reasonable measures.	TfNSW	Operation

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Biodiversity					
Removal of threatened fauna habitat	FF01		The Threatened Species Management Plan *(Appendix D, Updated threatened species management plan of the Amendment Report)* will be reviewed and updated as required during detailed design and prior to ~~operation~~ *construction*. The purpose of the review will be to address any detailed design and/or construction refinements and to comply with relevant project approval requirements. The Plan will operate in conjunction with the Flora and Fauna Management Plan.	Contractor	Detailed design and prior to ~~operation~~ construction
	FF02		The Flora and Fauna Management Plan will be prepared in accordance with Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a) and implemented a part of the CEMP. The Flora and Fauna Management Plan will build upon the strategies outlined in the Threatened Species Management Plan *prepared in accordance with FF01* and identify detailed site-specific and species-specific mitigation measures and management protocols to be implemented before, during and after all construction activities to further avoid or reduce impacts on threatened biodiversity.	Contractor	Prior to construction
	FF03		Native vegetation and fauna habitat removal will be minimised through detailed design where reasonable and feasible. Particular focus will be given to avoiding and minimising the removal of: • Hollow bearing trees • Native vegetation in riparian zones • Native vegetation from known fauna connectivity corridors and near proposed fauna crossing structures.	Contractor	Detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	FF04		*Where reasonable and feasible,* habitat will be replaced or re-instated in accordance with Guide 5: Re-use of woody debris and bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a). *This approach can be extended to salvaging some habitat logs such as root balls and providing them for re-use to CHCC and other organisations where they have the capacity to accept this material.*	Contractor	During construction
	FF05		Protection and enhancement of vegetated riparian zones will be undertaken to improve opportunities for fauna movement (including spotted-tailed quoll and pale-vented bush hen).	Contractor	During construction
	FF06		Opportunities for providing roosting habitat for microbats in new bridge structures adjacent areas of known microbat habitat will be investigated *where reasonable and feasible and* where future maintenance issues will not be compromised.	Contractor	Detailed design
	FF07		A Nest Box Management Plan will be prepared and implemented as part of the Flora and Fauna Management Plan in accordance with Guide 8: Nest Boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a). The Plan will include requirements for monitoring and maintenance.	Contractor	Prior to construction
Removal / clearing of native vegetation (including riparian vegetation)	FF08		Pre-clearing surveys will be undertaken in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a).	Contractor	Prior to construction
	FF09		The limits of clearing within the construction footprint will be delineated using appropriate signage and barriers, identified on site construction drawings and communicated to construction staff during induction. Vegetation and habitat features to be retained, such as hollow-bearing trees, will be clearly identified and protected by suitable fencing, signage and/or markings.	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	FF10		Vegetation clearing will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a).	Contractor	During construction
	FF11		Native vegetation consisting of suitable species from locally indigenous vegetation communities of the study area will be progressively re-established in accordance with Guide 3: Re-establishment of native vegetation of the Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a).	Contractor	During construction
	FF12		An unexpected species find procedure will be prepared and implemented in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a).	Contractor	During construction
Removal of threatened flora	FF13		A *Rusty Plum* Salvage and Re-establishment Plan ~~for southern swamp orchid individual(s) and rusty plum~~ will be prepared prior to construction, outlining detailed procedures for the preparation of the re-establishment and receiving sites, plant movement, pre- and post- care of target individuals as well as detailing the objectives, monitoring procedures and contingency measures.	TfNSW	Prior to construction
Removal of threatened species habitat	*n/a*	*FF14*	*Threatened species habitat will not be cleared for the purposes of ancillary facilities. These areas will be identified and limits of clearing delineated before construction in accordance with FF09.*	*Contractor*	*Prior to construction*
Fragmentation of identified biodiversity links and habitat corridors	~~FF14~~	*FF15*	Fauna connectivity structures will be designed and constructed to facilitate safe fauna passage across the project in accordance with the locations and design principles detailed in ~~Appendix H, Biodiversity assessment report~~ *Appendix D, Updated threatened species management plan of the Amendment Report.*	Contractor	Detailed design and during construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	~~FF15~~	*FF16*	Permanent fauna fencing, including specific fencing for koala and giant barred frog areas of known habitat, will be progressively installed as fauna connectivity structures become operational in consultation with a suitably qualified and experienced ecologist.	Contractor	Detailed design and during construction
	~~FF16~~	*FF17*	Temporary fauna fencing will be installed if existing fauna fence at the southern end of the project on the Pacific Highway is removed during construction period.	Contractor	During construction
Edge effects on adjacent native vegetation and habitat	~~FF17~~	*FF18*	Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a).	Contractor	During construction
Injury and mortality of fauna	~~FF18~~	*FF19*	Any fauna encountered during construction will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a).	Contractor	During construction
	~~FF19~~	*FF20*	A native stingless bee rescue protocol will be developed and implemented to guide relocation of any native bee hives within the construction footprint.	Contractor	During construction
Invasion and spread of weeds	~~FF20~~	*FF21*	Biosecurity risk and weed species will be managed in accordance with Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a) and Guide 7: Pathogen Management (RTA 2011a). Specific protocols will be prepared and implemented to manage, Chytrid fungus, Phytophthora and Myrtle Rust.	Contractor	During construction
Noise, light and vibration	~~FF21~~	*FF22*	Shading and artificial light impacts on areas of retained native vegetation will be minimised through detailed design where reasonable and feasible.	Contractor	Detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	~~FF22~~	*FF23*	Exclusion measures for microbats will be investigated for culverts identified as having high and medium habitat potential in consultation with a suitable qualified and experienced ecologist. Where required, timing for exclusion measures will be undertaken outside of breeding and winter torpor periods.	Contractor	Prior to and during construction
Impacts to aquatic habitat and changed hydrological regimes	~~FF23~~	*FF24*	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011a) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 (DPI 2013) and with reference to Guidelines for Controlled Activities on Waterfront Land – Riparian corridors (DPI 2012d).	Contractor	During construction
	N/A	FF25	*In the event that water is required to be extracted from local waterways, water levels and construction activities will be managed to ensure key fish habitat/aquatic ecosystems are protected (eg during periods of low and/or no flow, extraction from local waterways will not occur).*	Contractor	During construction
	~~FF24~~	FF26	Any machinery used during instream works should be verified as clean and free of potential weeds and pathogens to avoid biosecurity risk.	Contractor	During construction
	~~FF25~~	*FF27*	Waterway crossings will be designed and constructed in accordance with Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull & Witheridge 2003) and will include maintaining existing nominal flow velocity where possible or at less than 0.3 m/sec to prevent damage to aquatic habitats.	Contractor	Detailed design and during construction
	~~FF26~~	*FF28*	Coffer dams will be used during work undertaken within or immediately adjacent to waterways where reasonable and feasible to prevent or minimise increased turbidity. In the event that coffer dams are not reasonable and feasible, silt curtains would be used.	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	~~FF27~~	*FF29*	Changes to existing hydrological regimes within known and potential coastal petaltail dragonfly habitats will be minimised during detailed design. Bridges and/or culverts will be located and designed to maintain existing hydrological regimes where reasonable and feasible and will consider the potential for scour impacts on downstream habitats.	Contractor	Detailed design
Urban design, landscape and visual amenity					
Landscape and visual impacts	UD01		An Urban Design and Landscape Plan will be prepared *in consultation with CHCC* to support the detailed design of the project. The plan will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The plan will include: • Location and identification of existing vegetation and proposed landscaped areas, including species to be used • Built elements including retaining walls, bridges and noise barriers (using mounds as a priority where feasible, walls to supplement where required) • Pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings • Fixtures such as lighting, fencing and signs • Details of the staging of landscape works taking account of related environmental controls such as erosion and sedimentation controls and drainage • Procedures for monitoring and maintaining landscaped or rehabilitated areas • Water sensitive urban design solutions • *Consideration of a detailed CPTED assessment of the project.*	Contractor	Detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			The plan will be prepared in accordance with TfNSW urban design policy guidelines including: • Beyond the Pavement – urban design policy, procedures and design principles (Roads and Maritime Services 2014b) • Landscape design guidelines: Design guideline to improve the quality safety and cost effectiveness of green infrastructure in road corridors (Roads and Maritime Services 2017b) • Bridge Aesthetics: Design Guidelines to improve appearance of bridges in NSW (Roads and Maritime Services 2019) • Tunnel urban design guideline: Design guideline to improve the customer and community experience of road tunnels (Roads and Maritime Services 2017c) • Noise Wall Design Guideline: Design guidelines to improve the appearance of noise walls in NSW (Roads and Maritime Services 2016b) • Shotcrete Design Guideline: Design guidelines to avoid, minimise and improve the appearance of shotcrete in NSW (Roads and Maritime Services 2016d) • Water sensitive urban design guideline (Roads and Maritime Services 2017d) • *Guidelines for Controlled Activities for Works on Waterfront Land – Vegetation Management Plan (DPI 2012e)* • *Crime prevention and the assessment of development applications – guidelines under section 79C of the Environmental Planning and Assessment Act 1979 (NSW Department of Urban Affairs and Planning 2001).*		

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Water sensitive urban design	UD02		Temporary and permanent drainage infrastructure will be designed to incorporate water sensitive urban design principles where possible in accordance with the Water sensitive urban design guideline (Roads and Maritime 2017d). This could include replacing concrete lined longitudinal catch drains with vegetated swales and the operational water quality control measures.	Contractor	Detailed design
Construction visual impacts	UD03		Temporary site lighting will be installed and operated in accordance with AS 4282:1997 Control of the Obtrusive Effect of Outdoor Lighting (Standards Australia 1997).	Contractor	During construction
	UD04		Project work sites, including construction areas and supporting facilities (such as ancillary sites) will be managed to minimise visual impacts, including appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.	Contractor	During construction
	n/a	*UD05*	*Boundary fencing that incorporates screening will be installed around all ancillary sites that are adjacent to residential areas for the duration of site establishment and construction. The boundary fencing (and screening) will be designed to minimise visual impacts on nearby sensitive receivers.*	*Contractor*	*During construction*
Potential overshadowing	~~UD05~~	*UD06*	Where noise walls cause overshadowing, consideration will be given during detailed design to the use of transparent panels within the noise wall design in consultation with potentially affected property owners.	Contractor	Detailed design
Potential glare impacts	~~UD06~~	*UD07*	A reflectivity study will be undertaken during detailed design to identify adverse reflective glare from the use of transparent panels in noise walls on road users and adjacent residential properties. An appropriate glazing design will be considered where issues are identified. The reflectivity study will also investigate the potential for glare impacts on road users associated with the morning sun for Shephards Lane and Gatelys Road tunnel.	Contractor	Detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Visual impacts at Fern Tree Place	*n/a*	*UD08*	*An arborist will be engaged to determine whether trees within the construction footprint could be trimmed rather than cleared for the construction of the Kororo Public School bus interchange adjacent Fern Tree Close. Any trimming will be carried out by or under direction of the arborist. Retained trees will be protected to ensure construction does not detrimentally affect tree health.*	*Contractor*	*During construction*
	n/a	*UD09*	*Consultation with Fern Tree Place property owners located adjacent to the Kororo Public School bus interchange will be carried out prior to construction to determine whether additional tree planting beyond the indicative road corridor could be undertaken to assist in screening impacts.*	*TfNSW / Contractor*	*Prior to construction*
Visual impacts at Coachmans Close	*n/a*	*UD10*	*An arborist will be engaged to determine whether trees within the construction footprint could be trimmed rather than cleared for the construction of the project along Coachmans Close. Any trimming will be carried out by or under direction of the arborist. Retained trees will be protected to ensure construction does not detrimentally affect tree health.*	*Contractor*	*During construction*
Land use and property					
Future land use	LUP01		Consultation with CHCC will be undertaken during detailed design regarding the West Coffs Investigation Area to ensure appropriate consideration of the project is provided in any future masterplanning.	TfNSW	Detailed design
Property impacts	LUP02		Property acquisition will be carried out in accordance with the Land Acquisition Information Guide (Roads and Maritime Services 2014a), Fact sheet: Property acquisition of subsurface lands (Roads and Maritime Services 2015c) and the *Land Acquisition (Just Terms Compensation) Act 1991.*	TfNSW	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Management of residual land	LUP03		Ancillary sites will be rehabilitated to their pre-construction condition (where reasonable and feasible) and managed in accordance with Appendix B of Appendix J, Urban design, landscape character and visual impact assessment of the EIS.	TfNSW / Contractor	During and post construction
Management of utilities adjustment and/or relocation	LUP04		The following strategy for managing utilities will be implemented prior to construction in consultation with the relevant utility providers: • Further detailed utility investigations (revised 'Dial before you Dig' queries and/or potholing will be carried to confirm location of buried services) • Detailed utility design be undertaken in accordance with the relevant utility providers requirements • Relocation or protection work will be undertaken in a manner that minimises environmental impacts and addresses the relevant utility service providers requirements and construction methods.	TfNSW / Contractor	Prior to construction
Agriculture					
Partial property acquisition	AG01		Where a property is not subject to a total acquisition, a specialist agricultural consultant will be engaged at the request of affected property owners whose properties are seriously or critically impacted by the project to assist in assessing, but not limited to, considering opportunities for agricultural diversification and/or revised farm management practices.	TfNSW	Prior to construction
Impact on irrigation water source	AG02		Impacted irrigation water sources and/or infrastructure will be restored, replaced, relocated or compensated for in consultation with affected property owners.	TfNSW / Contractor	Prior to construction
Impact on agricultural structures	AG03		Impacted structures, eg packing sheds and cropping structures, etc, will be replaced or reconfigured in consultation with affected property owners where feasible.	TfNSW / Contractor	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Impact on property access	AG04		Internal farm access impacted by the project will be reconfigured in consultation with affected property owners where reasonable and feasible.	TfNSW / Contractor	Prior to construction
	AG05		Existing property accesses will be maintained during construction. Where this is not feasible or reasonable, temporary alternative access arrangements will be provided following consultation with the affected property owners with consideration to existing farming practices.	Contractor	Prior to and during construction
Dust impacts	AG06		Real time dust monitoring will be carried out at representative locations of dust sensitive agricultural receivers along the project alignment to allow for the timely management of dust generation on-site and to minimise potential impacts. The representative locations of dust sensitive agricultural receivers will be determined during detailed design and will include the Oz Group Packhouse. Monitoring will be carried out in accordance with the Approved Methods for the sampling and analysis for air pollutants in NSW (EPA 2017a) where applicable.	Contractor	Prior to and during construction
Wind and microclimate impacts	AG07		An Automatic Weather Station will be established at a representative location to confirm the outcomes of the wind flow and microclimate investigations. The Automatic Weather Station will be established in accordance with the Bureau of Meteorology's Observation Specification No. 2013.1: Guidelines for siting and exposure of meteorological instruments and observing facilities.	TfNSW	Prior to, during and post construction
Managing the spread of Panama disease	AG08		A Panama Disease Control Management Plan will be prepared and implemented during construction in consultation with Regions, Industry, Agriculture & Resources, DPIE and representatives of the Banana Growers Association of Coffs Harbour & District. The plan will be prepared in accordance with relevant Queensland's Department of Agriculture and Fisheries guidelines including Panama disease tropical race 4: Biosecurity standards and guidelines (2015) and Panama disease tropical race 4:	TfNSW / Contractor	Prior to and during construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			Decontamination guide (2016). Specific management measures and controls will address the following as a minimum for all existing and former banana plantations within the construction footprint: • Cleaning and washdown procedures for construction plant, vehicles and equipment and personnel • Clearing and grubbing practices • Stockpile management procedures for topsoil and other materials • Procedures for the management and/ or disposal of contaminated and/ or potentially contaminated Panama disease soils including its identification as such to prevent accidental spread of the disease by others • Erosion and sediment control requirements • Dust management controls • The movement of construction plant, vehicles and equipment and personnel both within the project and externally, including where construction plant and equipment may have previously worked in other affected areas such as north east Queensland • Revegetation and rehabilitation practices.		
Socio-economic					
Impacts to ~~residents~~ *the community and businesses* (including those related to property, amenity, and access impacts)	SE01		Consultation will be undertaken with potentially affected residences prior to the commencement of and during work in accordance with Community Liaison Implementation Plan. The Plan will be based on the draft Community consultation framework in Appendix D *of the EIS* and will be implemented prior to construction. The Plan will provide specific information in relation to community involvement during construction and will include, but not be limited to: ~~• A map of impacted properties~~	TfNSW / Contractor	Prior to and during construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			• *A register of impacted residential properties and businesses* • A register of potential construction impacts and timings • A risk assessment and management plan to minimise impacts on stakeholders • A procedure for managing and responding to enquiries and complaints • Procedures for notifying the community of upcoming work and impacts • Procedures for communicating the details of design and construction • *Procedures for consulting with property owners prior to any site establishment activities at ancillary sites* • *Procedures for coordinating with CHCC regarding special events held at the Coffs Coast Sport and Leisure Park precinct to minimise impacts to the community and precinct users.*		
Minimise loss of passing trade	SE02		A Directional Signage Plan will be developed in accordance with TfNSW *and Destination NSW* signage guidelines to ensure effective and appropriate signposting for key locations along the project. The plan will identify the range of services that Coffs Harbour provides and will be prepared in consultation with CHCC, Coffs Harbour Chamber of Commerce and the NSW Government's Tourist Attraction Signposting Assessment Committee (TASAC).	TfNSW	Prior to operation
Minimising impacts and community values	SE03		Design investigation of the property access road south of the Coramba Road interchange *and property owner consultation will be undertaken to develop reasonable and feasible options* ~~with the aim~~ to avoid potential impacts on the tree planted as a memorial to a family member ~~where feasible~~. *This may include but may not be limited to realignment of the property access road or translocation of the tree.*	Contractor	Detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	SE04		Management of the gravestone of Herbert Frazer Simpson at the intersection of the existing Pacific Highway and James Small Drive will be undertaken in accordance with the Roadside Tributes Factsheet (Road and Maritime Services 2016f). Every effort will be made to contact the family, if known, and work with them to develop an appropriate strategy for reinstallation, relocation or removal. If the family is unknown or cannot contacted, TfNSW would store the gravestone off-site for future recovery if necessary.	TfNSW	Prior to construction
	SE05		Seed collection and salvage of representative species within the planted rainforest impacted by the project near Mackays Road will be undertaken prior to construction where reasonable and feasible. The purpose of the seed collection and salvage is to re-establish a portion of the rainforest within adjacent landscaping associated with project. Where possible, the location would allow for access from the realigned Mackays Road/new local access roads.	TfNSW	Prior to construction
~~**Impacts to local businesses**~~	~~SE06~~		~~Consultation with CHCC will be carried out prior to construction regarding impacts to the Coffs Coast Resource Recovery Park and the businesses which operate from the park. Consultation will aim to identify opportunities to reduce the extent of property acquisition, temporary construction impacts and any other associated impacts to facilities which are important to the ongoing operations of the park.~~	~~TfNSW~~	~~Prior to construction~~
Impacts to local businesses	n/a	*SE06*	*Ongoing consultation with CHCC will be undertaken to identify opportunities to reduce temporary construction impacts on the operation of Coffs Coast Resource Recovery Park.*	*TfNSW*	*Prior to construction and during construction*

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	n/a	*SE07*	*Temporary signage including use of variable message signs will be used to identify any revised access changes to tourism businesses. The temporary signage will be installed in consultation with affected tourism businesses and in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c).*	*TfNSW*	*Prior to construction and during construction*
Aboriginal cultural heritage					
Impacts on known Aboriginal sites or places	AH01		An Aboriginal Heritage Management Plan will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The plan will be prepared in consultation with the RAPs. The plan will give effect to any management measures contained in the Aboriginal cultural heritage assessment carried out for the project and include: • Details of investigations completed or planned to be carried out and any associated approvals required • Mapping of areas of Aboriginal heritage value and identification of protection measures to be applied during construction • Procedures to be implemented if previously unidentified Aboriginal objects, including skeletal remains, are discovered during construction • An induction program for construction personnel on the management of Aboriginal heritage values and cultural awareness. • Opportunities for on-going Aboriginal community engagement in the project.	Contractor	Prior to construction
	AH02		Before any construction activity (including pre-construction activities of minimal environmental impact), a heritage site map will be prepared identifying Aboriginal sites to be excavated and avoided (for all sites in proximity to the construction footprint) and included in relevant induction training.	Contractor	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	~~*AH03*~~		~~Archaeological salvage excavation as detailed in Table 15-7 must be carried out in accordance with the methodology specified in Appendix L, Aboriginal cultural heritage assessment report.~~	~~TfNSW/ Contractor~~	~~Prior to construction~~
	n/a	*AH03*	*Collection of surface artefacts and archaeological salvage excavation must be carried out in accordance with the methodology specified in Section 9 and Appendix E of Appendix G, Updated Aboriginal cultural heritage assessment of the Amendment Report.*	*TfNSW/ Contractor*	*Prior to construction*
	AH04		Where archaeological salvage excavation, cultural salvage or surface collection has been nominated for impacted sites, no construction activities (including pre-construction activities of minimal environmental impact) can occur on the land to be investigated until the relevant archaeological excavations at the nominated site have been completed.	TfNSW/ Contractor	Prior to construction
	n/a	*AH05*	*Cultural salvage must be carried out in accordance with the methodology specified in Section 9 and Appendix F of Appendix G, Updated Aboriginal cultural heritage assessment of the Amendment Report.*	*TfNSW/ Contractor*	*Prior to construction*
Unexpected finds of Aboriginal objects	~~AH05~~	*AH06*	The Unexpected Heritage Items: Heritage Procedure 02 (Roads and Maritime Services 2015e) will be used in the event of uncovering an unexpected archaeological find during construction.	Contractor	During construction
Unexpected finds of human remains	~~AH06~~	*AH07*	In the event that construction activity reveals possible human skeletal material (remains), all work is to halt at that location immediately and the steps outlined in the Unexpected Heritage Item: Heritage Procedure 02 (Roads and Maritime Services 2015e) will be followed. Identified knowledge holders will be notified within 24 hours of any confirmed discovery of Aboriginal skeletal remains.	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Impacts to intangible cultural values associated with impacted cultural sites	~~AH07~~	*AH08*	Rehabilitation and revegetation of the construction footprint will occur with local indigenous plant species progressively during construction. The identification of the plant species will be carried out in consultation with the identified knowledge holders and the RAPs. Opportunities will be given to local Aboriginal organisations for involvement and potential engagement in the revegetation process.	TfNSW / Contractor	During construction
	~~AH08~~	*AH09*	A booklet (in a format appropriate for local publication) will be prepared by a cultural heritage specialist on the cultural values and historical records of the cultural sites. As part of the process, the visual documentation of the cultural landscape will occur before construction. The report will be full colour and distributed to local libraries and educational institutions. The final content of the booklet will be developed in consultation with identified Aboriginal knowledge holders *and the RAPs.*	TfNSW	Prior to and during construction
	~~AH09~~	*AH10*	Interpretative signage relevant to the cultural sites will be prepared in consultation with identified knowledge holders. Consultation with the knowledge holders and RAPs will occur in regard to potential locations for the placement of the signage. The final location(s) for interpretative signage will be subject to property owner agreement.	TfNSW	During and post construction
Non-Aboriginal cultural heritage					
Construction impacts to known non-Aboriginal heritage items	NAH01		A Non-Aboriginal Heritage Management Plan will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to Non-Aboriginal heritage. The plan will include: • Details of investigations completed or planned to be carried out and any associated approvals required	Contractor	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			• Mapping of areas of non-Aboriginal heritage value and identification of protection measures to be applied during construction • Procedures to be implemented if previously unidentified non-Aboriginal relics or heritage items are discovered during construction • An induction program for construction personnel on the management of non-Aboriginal heritage values.		
	NAH02		Consideration will be given to minimising impacts to elevated vantage points across the Coffs Harbour Banana Plantation Landscape during the preparation of the Urban Design and Landscape Plan. This will include, but not be limited to, investigating opportunities to maintain views to, from and within the landscape.	Contractor	Detailed design
	NAH03		Archival recording will be prepared for the Coffs Harbour Banana Plantation Landscape, former Coffs Heights Post Office, the North Coast Railway *including the dry argillite retaining wall,* the Old Coast Road Bridge No.1, Old Coast Bridge No.2 and the marked tree stumps. The archival records should record the process of development and alterations to heritage values. A program of archival recording should be completed prior to construction. Archival recording will be completed in accordance with How to Prepare Archival Records for Heritage Items (NSW Heritage Office 1998) and Photographic Recording of Heritage Items Using Film or Digital Capture (NSW Heritage Office 2006).	TfNSW/ Contractor	Prior to construction
	NAH04		The North Coast Railway *including the dry argillite retaining wall,* Old Coast Road Bridge No.1 and Old Coast Road Bridge No.2 will be marked on sensitive area maps to identify their heritage values. These areas will be marked as 'no-go' areas which are established at an appropriate distance (ie on the curtilage boundary of the item) to protect the heritage values. Where construction is to occur within 50 m of the North Coast Railway and the timber	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			beam bridges, the use of physical fencing will be considered to further protect the heritage values but allow construction (including access) to proceed unhindered. The use of sensitive area maps and 'no go' areas will be incorporated into the induction program as part of the Non-Aboriginal Heritage Management Plan.		
	n/a	*NAH05*	*The extent of dry argillite retaining wall impacted will be minimised during detailed design where reasonable and feasible. Where impacts cannot be avoided, the structural integrity of the dry argillite wall will be confirmed by a suitably qualified structural engineer. The results from inspection will be documented and used to confirm any stabilisation works required (eg reinforcing the front of the wall during construction), verify the applicable vibration criteria, and develop any other feasible and reasonable mitigation measures to be implemented to minimise impacts. A copy of report documenting the structural integrity of the dry argillite wall and a description of any stabilisation works if required will be provided to the Australian Rail Track Corporation.*	*Contractor*	*During detailed design and during construction*
Discovery of unexpected non-Aboriginal objects	~~NAH05~~	*NAH06*	Should any heritage items, archaeological remains or potential relics of non-Aboriginal origin be encountered, then construction work that might affect or damage the material will cease and notification provided in accordance with the Unexpected Heritage Items: Heritage Procedure 02 (Roads and Maritime Services 2015e). Work will only re-start once the requirements of that Procedure have been satisfied.	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Flooding and hydrology					
Impacts on flood behaviour during construction	FH01		A Construction Flood Management Plan will be prepared and implemented before construction to manage the impact of a 5% AEP flood event or greater on the operation of ancillary facilities. The plan will form part of the CEMP and will detail: • The impacts on hydrology and flooding from the construction phase • Control measures and procedures for construction activities to avoid, minimise or manage potential adverse impacts to construction works in the event of a flood within or adjacent to the project • *Management responses for ancillary sites provided in Table 17-5 of the EIS and Table 5.10-2 of the Amendment Report* • Flood monitoring to forecast large rainfall and flood events and notification measures • Emergency response and evacuation procedures in the event of a flood during the construction phase • Suitable evacuation routes and procedures for evacuation of site personnel • A register of all materials stored in work areas prone to flooding • Control measures for stockpiling within the floodplain to minimise loss of material in flood events. • Protocols for equipment and materials that can be removed from the subject area during a flood event where reasonable and feasible • Consultation and coordination with local residents, CHCC and other relevant stakeholders • Induction of all construction site staff and visitors to familiarise with the emergency response procedures.	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	FH02		If the detailed construction plan requires staging of additional earthworks within floodplain(s) crossed by the project, revised flood modelling will be carried out as part of the detailed design to determine the potential for changed flooding impacts and any required mitigation and/or management response.	Contractor	During detailed design
Impacts on flood behaviour during construction from temporary waterway crossings	FH03		Temporary waterway crossings will be designed, constructed and maintained in accordance with the following requirements: • Low-flow conditions will be maintained • No additional flooding impacts will occur greater than those assessed for the operational phase • Fish passage will be maintained in accordance with the relevant waterway classification and DPIE guideline, Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull & Witheridge 2003) • Material used in temporary waterway crossings will be selected to minimise risk of fine sediment material entering the waterway • Include erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) • Any material used in the temporary creek crossing will be removed following construction and the site rehabilitated to its existing condition where reasonable and feasible. *The above requirements will be supplemented by learnings from the Woolgoolga to Ballina Pacific Highway upgrade project, specifically the requirements of the Technical Briefing Note: Temporary Waterway Crossings Minimum Standards (Pacific Complete 2017) developed in consultation with EPA and other relevant government agencies.*	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Hydrology impacts from creek realignments	FH04		Creek realignments and/or adjustments will be designed to behave in a similar hydrologic and geomorphic manner as existing conditions and will consider the requirements of the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013). Revegetation and adequate scour protection will be provided so there are no hydraulic impacts on bed and bank stability, erosion, sedimentation or riparian vegetation in accordance with the Controlled Activities for Works on Waterfront Land – In-stream Works (DPI 2012c). Detailed design of waterway realignments and adjustments will be developed in consultation with Regions, Industry, Agriculture and Resources, DPIE and will consider: • Investigation of opportunities to reduce or avoid waterway realignments to maintain existing creek alignments including locating piers outside of the waterway • Retention of existing riparian vegetation where possible, including retention of tree stumps where trees are removed • Maintaining existing waterway lengths, velocities and hydraulic grades • Use of soft engineering approaches to scour protection where landscaping is provided over the rock scour • Maintaining fish passage in accordance with the waterway classification and Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull & Witheridge 2003).	Contractor	Detailed design and during construction
	FH05		During the initial establishment and operation period of realigned or adjusted waterways, regular inspections will be carried out to ensure effective design of the realignment. An inspection program will be documented in the Soil and Water Management Plan. The inspections will assess implementation and success of the controls and identify any maintenance actions required.	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Minimise scour potential	FH06		Scour protection for bridges and culverts will be designed in accordance with Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull & Witheridge 2003) and Guidelines for Controlled Activities for Works on Waterfront Land – Outlet Structures (DPI 2012b).	Minimise scour potential	During detailed design
Construction impacts on flood evacuation routes	FH07		NSW State Emergency Services will be notified of any partial or total road closures during construction because of the project. The Construction Flood Management Plan should detail any impacts on existing flood conditions in relation to flood evacuation routes.	Contractor	During construction
Managing residual flood impacts	~~FH08~~		~~Consultation with CHCC will be carried out during detailed design regarding any residual flood impacts. This will include, but not be limited to:~~ ~~• A whole of government approach will be investigated which considers the relationship between the project and North Boambee Valley (West) URA and what reasonable and feasible options could be implemented to assist in managing potential flood impacts~~ ~~• Modifications to the Bennetts Road detention basin.~~	~~TfNSW~~	~~During detailed design~~
	FH08		*A whole of government approach will be investigated with CHCC which considers the relationship between the project and North Boambee Valley (West) Urban Release Area and what reasonable and feasible options could be implemented to assist in managing potential flood impacts.*	*TfNSW*	*During detailed design*
	~~FH09~~		~~Consultation with the proponent of Pacific Bay Eastern Lands development will be carried out during detailed design to develop a reasonable and feasible design solution to mitigate flood impacts on the approved residential areas. Consultation will also consider future proposals that are being investigated.~~	~~TfNSW~~	~~During detailed design~~

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	~~FH10~~	*FH09*	Proposed mitigation measures for the North Boambee Valley catchment as described in *Table 17 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report.* ~~EIS, Chapter 17, Flooding and hydrology Table 17-10.~~ The final design solution may involve combinations of the described mitigation options and the design response developed as part of the concept design and will be subject to further flood modelling and consultation with CHCC, Environment, Energy and Science Group, DPIE and adjacent property owners.	TfNSW / Contractor	During detailed design
	~~FH11~~	*FH10*	Proposed mitigation measures for the Coffs Creek catchment as described in *Table 20 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report.* ~~Chapter 17, Flooding and hydrology Table 17-13 of the EIS~~ will be investigated during detailed design. The final design solution may involve combinations of the described mitigation options and the design response developed as part of the concept design and will be subject to further flood modelling and consultation with CHCC, Environment, Energy and Science Group, DPIE and adjacent property owners.	TfNSW / Contractor	During detailed design
	~~FH12~~	*FH11*	Proposed mitigation measures for the Northern creeks catchment as described in *Table 23 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report* ~~Chapter 17, Flooding and hydrology Table 17-16 of the EIS~~ will be investigated during detailed design. The final design solution may involve combinations of the described mitigation options and the design response developed as part of the concept design and will be subject to further flood modelling and consultation with CHCC, Environment, Energy and Science Group, DPIE and adjacent property owners.	TfNSW / Contractor	During detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Project impacts on flood evacuation routes	~~FH13~~	*FH12*	Consultation with NSW State Emergency Services and CHCC will be carried out during detailed design if there are any changes to the existing flood evacuation routes or associated roads which may be impacted during operation.	TfNSW	During operation
Consideration of dam safety	*n/a*	*FH13*	*Consultation will be undertaken with Dams Safety NSW during detailed design regarding the potential for parts of the project to be Declared Dams under the Dams Safety Act 2015.*	TfNSW	During detailed design
Soils and contamination					
Contaminated soil	SC01		Phase 2 contamination investigations will be undertaken in areas of potential contamination identified during the preliminary site investigation (RCA 2016). The investigation will be carried out in accordance with the Guideline for the Management of Contamination (Roads and Maritime Services 2013d). This will include soil sampling from targeted areas including: • Banana plantations within proposed cuttings (analysed for arsenic, lead and organochlorin pesticides including DDT, Aldrin and Dieldrin) • Incremental soil sampling along construction footprint at existing Pacific Highway where there is a history of truck accidents to assess potential lead and hydrocarbon contamination • Targeted soil sampling at locations with dumped materials, fill materials and other agricultural uses • Areas of PASS within construction footprint to determine oxidised pH level.	TfNSW	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Contaminated land disturbance	SC02		A Contaminated Land Management Plan will be prepared and implemented as part of the CEMP for any areas of existing contaminated land or to address land contamination likely to be caused by the activity. The plan will be prepared in accordance with relevant requirements of the Guideline for the Management of Contamination (Roads and Maritime Services 2013d). As a minimum the plan will address the following matters: • Control measures to divert surface runoff away from the contaminated land • Capture and manage of any surface runoff contaminated by exposure to the contaminated land • Further investigations required to determine the extent, concentration and type of contamination, as identified in the Phase 2 contamination investigations • Manage the remediation and subsequent validation any certification land, including any certification required • Measures to ensure the safety of site personnel and local communities during construction • Procedures to identify and manage any unexpected contamination finds during construction.	Contractor	During detailed design
Remediation of contamination	SC03		If site contamination investigations indicate that construction works will impact contaminant that are present on site in concentrations above the intended land use criteria, then a Remedial Action Plan will be developed, and remediation works carried out in consultation with the EPA and in accordance with the Guideline for the Management of Contamination (Roads and Maritime Services 2013d).	Remediation of contamination	During detailed design
Soil, surface water and groundwater quality	SC04		A Soil and Water Management Plan will be prepared in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and ~~Erosion and Sediment Management Report: Coffs Harbour Bypass~~	Contractor	During detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			~~(SEEC 2019)~~ *Appendix B, Updated erosion and sediment management report of the Submissions Report* and implemented as part of the CEMP. The plan will identify all reasonably foreseeable risks relating to soil erosion and water pollution associated with carrying out the activity and describe how these risks will be managed and minimised during construction. The plan will include arrangements for managing pollution risks associated with spillage or contamination on the site and adjoining areas.		
Soil erosion and sedimentation	SC05		A primary Erosion and Sediment Control Plan will be prepared and implemented as part of the Soil and Water Management Plan. The plan will identify detailed measures and controls to be applied to minimise erosion and sediment control risks including: • Runoff, diversion and drainage points • Sediment basins and sumps • Scour protection • Stabilising disturbed areas as soon as possible, check dams, fencing and swales • The need for site-specific plans to address staged implementation arrangements. The plan will also include arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Contractor	Prior to and during construction
Erosion and sedimentation management	SC06		A suitably qualified and experienced soil conservationist will be engaged during construction of the project to advise and review the implementation and management of erosion and sediment controls.	Contractor	During detailed design and construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Soil erosion and bank stability risk	SC07		Batters will be designed and constructed to minimise risk or exposure, instability and erosion, and to support long term, ongoing best practice management, in accordance with the Guideline for Batter Stabilisation Using Vegetation (Roads and Maritime Services 2015f). *In considering the application of best practice management, the combination of mulch and topsoil, in establishing vegetation on batters will also be investigated.*	Contractor	During detailed design and construction
Spill management during construction	SC08		A site-specific emergency spill response procedure will be developed as part of the Soil and Water Management Plan and include spill management measures in accordance with the Roads and Maritime Code of Practice for Water Management and relevant EPA guidelines. The procedure will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities.	Contractor	During detailed design
Disturbance of acid sulfate materials	SC09		An Acid Sulfate Soils Management Plan will be prepared and implemented as part of the Soil and Water Management Plan. The plan will be prepared in accordance with the Guidelines for the Management of Acid Sulfate Materials (RTA 2005).	Contractor	During detailed design
Surface water quality					
Water quality monitoring program	SW01		A Water Quality Monitoring Program will be prepared and implemented prior to and during construction and operation to identify whether the project is resulting in adverse impacts on water quality and assess compliance with statutory requirements and project targets. Monitoring will continue for a period of three years following construction, or before if it can be proved that no impact has occurred. The monitoring program will be prepared in accordance with the Guideline for Construction Water Quality Monitoring (RTA n.d.) and details provided in Chapter 19, Surface water quality *of the EIS.*	TfNSW	Prior to and during construction and operation

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			The monitoring program will include requirements for: • Identification of monitoring locations which are representative of the potential impacts • Collection of baseline information prior to construction • Consideration of the identified sensitive environments • Water quality objectives to assess potential impacts against • Contingency and ameliorative measures in the event that adverse impacts are experienced • Reporting of the monitoring results.		
Water quality impacts from dewatering existing storages	SW02		Dewatering of existing storages (eg dams) will occur overland in vegetated areas or will be used for dust suppression activities and not discharged directly into waterways to minimise release of high levels of nutrients and or contaminates directly into the waterways.	Contractor	During construction
Water quality impacts from dewatering during construction	SW03		Any dewatering activities will be undertaken in accordance with the Technical Guideline: Environmental Management of Construction Site Dewatering (RTA 2011b), in a manner that prevents pollution of waters.	Contractor	During construction
Works within or adjacent to waterways	SW04		A detailed Environmental Work Method Statement will be prepared and implemented for all works undertaken within or immediately adjacent to waterways. The Environmental Work Method Statement will detail measures to avoid or minimise risks from erosion and sedimentation to water quality and biodiversity. It will be prepared in accordance with relevant guidelines including, but not limited to consideration of: • Biodiversity Guidelines – Protecting and managing biodiversity on RTA projects	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			• Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings • *Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004).*		
~~**Managing tannin leachates**~~	~~SW05~~		~~Mulch stockpiles will be managed in accordance with the Roads and Maritime Environmental Direction for the Management of Tannins from Vegetation Mulch (Roads and Maritime 2012b). This would include but not be limited to:~~ ~~• Planning and staging vegetation processing activities~~ ~~• Stockpile location and management to minimise the production and release of tannins~~ ~~• Monitoring the stockpiles for the production of tannins~~ ~~• Response to tannin production.~~	~~Contractor~~	~~During construction~~
Managing tannin leachates	SW05		*Mulch stockpiles and the potential generation of tannin leachates will be managed through the implementation of a Management of Tannins from Vegetation Mulch Procedure. The procedure will be prepared in accordance with the Environmental Direction for the Management of Tannins from Vegetation Mulch (Roads and Maritime Services 2012). The procedure will include but not be limited to:* • *Planning and staging vegetation processing activities* • *Management of temporary mulch stockpiles (less than one week)* • *Stockpile location and management to minimise the production and release of tannins including use of impermeable bunds and sumps to capture tannin leachate* • *Monitoring the stockpiles for the production of tannin leachate including post-rainfall inspection requirements* • *Response(s) to tannin leachate production.*	*Contractor*	*During construction*

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Inspection and maintenance program	SW06		An inspection and maintenance program as part of the Soil and Water Management Plan will be implemented during construction to ensure effective implementation of all temporary and permanent soil, erosion and water pollution safeguards. The timing and frequency of inspections will be set out in the Soil and Water Management Plan. The inspections will assess implementation and success of the controls, actions required to ensure on-going effective operation, and compliance with any statutory approvals. A register of inspections will be established.	Contractor	During construction
Operational water quality impacts	SW07		Stormwater and road runoff will be directed towards operational water quality treatment structures that will assist in the removal of pollutants from discharge water to protect ecosystem and human health.	Contractor	During detailed design
	SW08		The type and design of the specific stormwater treatment measures will continue to be refined as part of the detailed design process with the aim of achieving the NSW Water Quality Objectives where reasonable and feasible. This will include review of the proposed stormwater treatment train and consideration of best management practice guidelines including the Water sensitive urban design guideline (Roads and Maritime Services 2017d).	Contractor	During detailed design
Groundwater					
Acid sulfate materials	GW01		Stockpiles containing PASS or ASS treatment areas will be lined and bunded in accordance with the Guidelines for the Management of Acid Sulfate Materials (RTA 2005) to prevent leachate contaminating groundwater.	Contractor	During construction
Management of groundwater interception	GW02		Additional groundwater monitoring standpipes will be included for Type A cuts for alluvial aquifers along the project and in the areas around the major embankments to supplement existing data.	TfNSW	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
	n/a	*GW03*	*Captured groundwater from tunneling will be treated using temporary water treatment plants and transferred to storage dams for reuse during construction as a source of non-potable water.*	*Contractor*	*During construction*
	~~GW03~~	*GW04*	*Unless used as a source of non-potable water for the project,* groundwater captured by cuttings and tunnels will be returned into the aquifer down gradient and within the same catchment from where it was intercepted where reasonable and feasible.	Contractor	During construction
	~~GW04~~	*GW05*	Engineering measures for long-term management of groundwater inflow to cuttings and tunnels will be designed and constructed to ensure groundwater is recharged downgradient of the cutting or tunnel from where it is captured and within the same catchment where reasonable and feasible. This will be facilitated by, but not limited to, absorption trenches, infiltration galleries/pits, sediment basins and grassed swales.	Contractor	During detailed design
	~~GW05~~	*GW06*	Where groundwater recharge downgradient of the cutting or tunnel is not reasonable and feasible, measures will be designed and implemented that transfer seepage water downstream via water quality basins before being discharged into a downstream drainage channel or creek, within the same catchment.	Contractor	During detailed design and during construction
	n/a	*GW07*	*Additional geotechnical and hydrogeological investigations and modelling will be carried out for the Gatelys Road tunnel during detailed design to improve predictions of likely groundwater inflows, inform construction methodologies and develop engineering measures to reduce groundwater ingress where inflow rates are still anticipated to exceed 1 L/s per kilometre. Investigations and modelling will be undertaken in consultation with Water Group, DPIE.*	*Contractor*	*During detailed design*

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Prevention of groundwater impacts from cuttings, tunnels and embankments	~~GW06~~	*GW08*	Monitoring of groundwater levels and quality will be included in the Water Quality Monitoring ~~Program detailed in Chapter 19, Surface water quality~~ *SW01.*	TfNSW	Prior to and during construction and operation
	~~GW07~~	*GW09*	Monitoring of seepage into cuttings will be carried out and evaluated against the predictions of the numerical modelling undertaken during detailed design.	TfNSW / Contractor	During construction
	~~GW08~~	*GW10*	Major embankments will be designed to enable distributed flow of surface water to prevent ponding.	TfNSW / Contractor	During detailed design
	~~GW09~~	*GW11*	Additional ground truthing and site inspections will be undertaken for potentially impacted groundwater bores/supply wells (including supply well GW068986), springs, Jordans Creek *(near Cut 20),* and agricultural dams within and immediately surrounding the zone of drawdown. The purpose of the ground truthing and site inspections is to confirm predicted impacts and develop make good provisions where required in consultation with affected property owners.	TfNSW	During detailed design
Prevention of potential impacts on groundwater quality	~~GW10~~	*GW12*	Sites used for stockpiles, washdown areas, refuelling and chemical storage will be located away from areas of shallow groundwater or appropriately lined and bunded to protect groundwater.	Contractor	Prior to and during construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Air quality					
Management of construction impacts	AQ01		An Air Quality Management Plan will be prepared and implemented as part of the CEMP. The plan will identify: • Potential sources of air pollution (such as dust, vehicles transporting waste, plant and equipment) during construction • Identification of all dust sensitive receivers, including banana and blueberry farms, residential dwellings, education institutions, health care facilities, places of worship, childcare facilities and open space • Air quality management objectives and criteria consistent with Approved Methods for the Modelling and Assessment of Air Quality Pollutants in NSW (EPA 2017a) • Mitigation and suppression measures to be implemented, such as using soil binders or covering exposed surfaces, provision of vehicle clean down areas, covering of loads, use of water carts and street cleaning, use of dust screens, maintenance of plant in accordance with manufacturer's instructions, spray bars on crushers • Methods to manage or stop works during strong winds or other adverse weather conditions • A progressive rehabilitation strategy for exposed surfaces • When the air quality, suppression and management measures need to be applied and who is responsible • A monitoring program to assess the effectiveness of the applied measures *in accordance with Approved Methods for Sampling and Analysis of Air Pollutants in NSW (Department of Environment and Conservation NSW 2007)* • Community notification and complaint handling procedures.	Contractor	Prior to construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Dust generation from building demolition	AQ02		Where buildings and structures are required to be demolished, techniques and practices will be developed to minimise dust generation such as water spraying during demolition as required, and the removal of construction debris along an approved route documented in the Air Quality Management Plan.	Contractor	During construction
Construction vehicle emissions	AQ03		Where practicable, construction vehicles will be fitted with pollution reduction devices and switched off when not in use.	Contractor	During construction
Odour impacts from asphalt batch plants	AQ04		Asphalt batch plants established for the project will include the following measures to minimise odour generation: • Bitumen products will be maintained at the minimum temperature possible to minimise odorous emissions • Particulate extraction equipment will be installed, operated and maintained for efficiency in minimising odour impacts • Filters and burners will be adequately maintained to minimise odour impacts • Commission testing will be carried out prior to full operation to ensure that best practice industry standards are met during the operation of the batch plant • An assessment of prevailing winds and the location and direction of receivers when selecting an appropriate asphalt batch plant site.	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Waste					
Waste management	WM01		A Waste Management Plan will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to support minimising the amount of waste produced and appropriately handle and dispose of unavoidable waste. It will also address the importation of recycled materials to site for use in undertaking the project. The plan will be prepared taking into account the Environmental Procedure – Management of Wastes on Roads and Maritime Services Land (Roads and Maritime Services 2014d). The plan will include, but not necessarily be limited to: • Measures to avoid and minimise waste associated with the project • Classification of wastes generated by the project and management options • Classification of wastes received from off-site for use in the project and management options • Identification of any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions • Procedures for storage, transport and disposal • Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions.	Contractor	Prior to construction
Management of excess spoil	WM02		Spoil will be beneficially reused as part of the project before alternative spoil disposal options are pursued. Any excess spoil will be managed using the following order of priorities: • Review alignment and profile refinements during detailed design • Assess opportunities to reuse excess spoil in works such as landscaping and noise barriers within the construction footprint or in adjacent land	Contractor	During construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			(subject to property owner agreement and/or any project approval or POEO Act requirements) • Beneficial reuse within the construction footprint for rehabilitation of ancillary sites used for the project (where it is within the requirements of the project approval) • Transfer to other nearby TfNSW projects for immediate use, where possible, pending construction of other projects or for use on future projects or routine maintenance • Transfer to a TfNSW approved site for reuse on concurrent private/local government projects (with appropriate approvals as required, eg a section 143 notice under section 143(3A) of the POEO Act) • Disposal at an approved materials recycling or licensed waste disposal facility.		
Waste storage	WM03		Prior to construction, suitable areas within the ancillary sites or in other appropriate areas within the construction footprint will be allocated which provide adequate space and access for: • Separated storage of building materials • Separated storage and sorting of construction waste • Removal of construction waste for recycling, reuse or disposal • Separated storage of known previously contaminated materials and contingency for unknown contaminated materials.	Contractor	Prior to and during construction
Hazardous materials – risk to human health	WM04		A hazardous materials assessment will be carried out of the buildings to be demolished before demolition to identify presence of hazardous materials and ensure appropriate controls are implemented for the demolition, storage and disposal of materials.	TfNSW / Contractor	During detailed design

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Asbestos – risk to human health	WM05		If the hazardous assessment investigations identify asbestos containing materials, an Asbestos Management Plan will be developed and implemented as part of the CEMP. The plan will include: • Identification of potential asbestos on site procedures to manage and handle any asbestos, including potential areas where asbestos may be found within soils • Procedures to manage asbestos if encountered during construction • Measures to minimise the total volume of asbestos contaminated material that is generated. These will include separate stockpiling to ensure that asbestos contaminated material is not mixed with clean stockpile material • Procedures for disposal of asbestos in accordance with NSW EPA guidelines, Australian standards and relevant industry codes of practice.	TfNSW / Contractor	During detailed design
Wastewater	WM06		Where reasonable and feasible, water captured within the construction footprint will be prioritised for reuse as construction water or dust suppression.	Contractor	During construction
Operational waste	WM07		All operational waste will be managed in accordance with the TfNSW waste management procedures and Environmental Management System.	TfNSW	Operation
Sustainability					
Sustainability	S01		A Sustainability Management Plan will be developed to establish governance structures, processes and systems that ensure integration of all sustainability considerations (vision, commitments, principles, objectives and targets), initiatives, monitoring and reporting during the detailed design and construction phases of the project. The plan will include commitments detailed in Chapter 23, Sustainability of the EIS including but not limited to: • Key sustainability management roles and responsibilities	Contractor	During detailed design, construction and operation

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			• Targets for diverse and inclusive workforce participation and local employment opportunities • An energy efficiency and greenhouse gas emissions strategy • A sustainable procurement strategy • Water savings initiatives • Monitoring and reporting requirements for sustainability initiatives and performance.		
Hazard and risk					
Climate change – risk treatments	HZ01		Hydrological and hydraulic assessments undertaken during detailed design will consider the climate change related flood risks to the project and flood impacts from the project. The assessment will confirm the requirements for any additional management measures. The assessment will be undertaken in accordance with the Practical Considerations of Climate Change – Floodplain Risk Management Guideline (DECC 2007).	Contractor	During detailed design
Emergency access	HZ02		Consultation with emergency services, including the NSW Rural Fire Service and Fire and Rescue NSW will be undertaken during construction to ensure emergency access is maintained during and after construction.	Contractor	During detailed design and construction
Bushfire risk	HZ03		A Bushfire Management Plan will be prepared in accordance with the Planning for Bush Fire Protection 2006 (Rural Fire Service 2006) and implemented as part of the CEMP. Measures to be implemented to manage bushfire risk include: • Consultation requirements for community notifications in the event of a bushfire • Maintaining equipment in good working order	Contractor	Prior to and during construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
			• Ensuring plant and equipment are fitted with appropriate spark arrestors, where practicable • Ensuring site workers are informed of the site rules including designated smoking areas and putting rubbish in designated bins • Obtaining hot work permits and implementing total fire bans as required • Implementing adequate storage and handling requirements for potentially flammable substances in accordance with the relevant guidelines.		
Hazardous material storage	HZ04		All fuels, chemicals and other hazardous materials will be stored in a roofed, fire-protected and impervious bunded area at least 50 m from waterways, drainage lines, basins, flood-affected areas or slopes above 10%. Bunding design will comply with relevant Australian Standards and should generally be in accordance with guidelines provided in the EPA Authorised Officers Manual. Appropriate on-site signage will be provided to identify the materials stored.	Contractor	During construction
Spills and accidents	HZ05		Appropriate spill containment equipment will be provided on-site and located at strategic, accessible locations.	Contractor	During construction
Subsidence	HZ06		A Surface Settlement Monitoring Program will be prepared and implemented prior to and during construction to identify whether the project is resulting in adverse subsidence impacts. In the unlikely event that subsidence as a result of the project is deemed to cause building and/or property damage, the damage would be repaired at no cost to the owner.	Contractor	Prior to and during construction

Environmental issue	EIS ID	*New ID*	Environmental management measures	Responsibility	Timing
Transportation of dangerous goods	~~HZ07~~		~~Consultation with EPA, SafeWork NSW and Fire and Rescue NSW will continue to confirm if the project would be able to accept any classes of dangerous goods during operation. To support the consultation, an absolute risk assessment will be carried out with the purpose to demonstrate that risks have been reduced so far as is reasonably practical. The absolute risk assessment will also consider appropriate infrastructure design and operational management measures to reduce risk and the consequence of any event occurring.~~	~~TfNSW~~	~~During detailed design~~
		HZ07	*The dangerous goods risk assessment process is ongoing. Further assessment and consultation with relevant authorities and stakeholders will occur as part of this process.*	*TfNSW*	*During detailed design*
Cumulative impacts					
Cumulative impacts	CI01		Where relevant, consultation would be undertaken with proponents of other nearby developments to increase the overall awareness of project timeframes and impacts.	Contractor	During construction
	CI02		The CEMP will be updated with any revised or new environmental management measure identified from consultation with proponents of other nearby developments, where required.	Contractor	During construction

Chapter 7

Conclusion

7. Conclusion

The EIS was exhibited by DPIE from 11 September to 27 October 2019. As part of the exhibition a number of activities were carried out by TfNSW to engage with the community. These included community drop-in sessions, pop up displays, static displays at various locations, continuation of the project display office, preparation of a project update, social media engagement, advertisements, letters and email updates, various briefings and meetings and updates on the project website. During the exhibition of the EIS, 186 submissions were made. The secretary of DPIE has requested TfNSW to provide a response to submissions that addresses the issues identified in the submissions from members of the public, interest groups and government agencies.

Specific consultation was carried out with the local Aboriginal community since the exhibition of the EIS with additional Aboriginal focus group meetings held and meetings to discuss cultural salvage methodologies.

This Submissions Report has addressed submissions received from the below government agencies:

- Coffs Harbour City Council (CHCC)
- Crown Lands, DPIE
- Regions, Industry, Agriculture and Resources Group, DPIE
- Environment, Energy and Science Group, DPIE
- Heritage NSW, Department of Premier and Cabinet (DPC)
- NSW Environment Protection Authority (EPA)
- Fire and Rescue NSW (FRNSW)
- Water Group, DPIE
- School Infrastructure NSW (SI NSW), NSW Department of Education.

The issues raised by government agencies generally relate to their respective statutory responsibilities. Of particular focus for CHCC was the project design and the interaction with traffic and transport, noise and vibration, flooding and hydrology and biodiversity. Many of these issues were also raised by other agencies with particular focus on the management of impacts during construction of the project.

This Submissions Report has also addressed submissions received from the community. The most commonly raised categories by the community were noise and vibration, construction, traffic and transport, hazard and risk and support for the project. The most frequently raised issue was about project construction delivery.

In addition to the EIS exhibition activities, meetings have been held with stakeholders and residents to discuss submissions received and outline amendments and refinements to the concept design. The changes to the project were made in response to feedback from stakeholders and the community, landowner discussions and further development of the concept design to improve functionality and minimise environmental impacts where possible. In response to the submissions, some proposed environmental management measures were revised and additional environmental management measures were proposed.

DPIE will consider this Submissions Report and the Amendment Report during its assessment of the project. The Secretary of DPIE will prepare an environmental assessment report in accordance with section 5.18 of the EP&A Act. The Minister for Planning and Public Spaces will then decide whether or not to approve the project and identify any conditions of approval which will apply. If approved, TfNSW will continue to consult with community members, government agencies and other stakeholders during the detailed design and construction phases of the project.

Chapter 8

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