Roads & Maritime

Pacific Highway Upgrade
Coffs Harbour Bypass

State significant infrastructure application report

May 2016

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Executive summary

Introduction and need

Roads and Maritime Services (Roads and Maritime) is seeking approval to upgrade around 14 kilometres of the Pacific Highway from south of the Englands Road roundabout to the southern end of the recently opened Sapphire to Woolgoolga upgrade project (the project). The project would achieve four lanes of divided highway to a motorway standard and would include bypassing the Coffs Harbour urban area.

The project is needed to address declining transport efficiency, urban congestion and road safety issues caused by the interaction of through and local traffic on the Pacific Highway at Coffs Harbour. The main benefits of the project would include:

- Travel time savings for through and local traffic and the transport industry
- Improved road safety conditions for traffic, pedestrians and cyclists using the existing highway through Coffs Harbour
- Improved freight efficiency
- Improved accessibility to the Coffs Harbour central business district
- A more reliable route that is free of flooding up to the 1:100 Annual Exceedance Probability.

Planning and assessment process

The project is declared to be State significant infrastructure under section 115U of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The project is also declared to be critical State significant infrastructure under section 115V of the EP&A Act as it is considered to be essential to the State for economic, environmental or social reasons. The declarations are made under clause 16 and Schedule 5 of *State Environmental Planning Policy* (State and Regional Development) 2011.

Accordingly, the project is subject to Part 5.1 of the EP&A Act. The project requires the preparation of an environmental impact statement and the approval of the Minister for Planning.

Proposed scope of the environmental impact statement

This report supports an application under section 115X of the EP&A Act to carry out State significant infrastructure. It aims to assist the formulation of environmental assessment requirements by the Secretary of the Department of Planning and Environment under section 115Y of the EP&A Act, which would inform the preparation of an environmental impact statement.

This application report does the following:

- Describes the project
- Considers the potential environmental issues for the project
- Identifies key environment issues for the project, including:
  - Traffic and transport
  - Visual amenity, built form and urban design
  - Noise and vibration
  - Biodiversity
  - Aboriginal and cultural heritage
  - Geology, soils and water quality
  - Socio-economic, property and land use
- Outlines other non-key environmental issues for the project
- Addresses the requirements of clause 192 of the *Environmental Planning and Assessment Regulation 2000*.

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Abbreviations and Glossary

ABS	Australian Bureau of Statistics
AED	Annual Exceedance Probability
AHD	Annual Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AS	Australian Standard
ASS	Acid Sulfate Soil
BBAM	BioBanking Assessment Methodology
BCAM	Biodiversity Certification Assessment Methodology
BCR	Benefit Cost Ratio
CHCC	Coffs Harbour City Council
CHHPS	Coffs Harbour Highway Planning Strategy
CEMP	Construction Environmental Management Plan
CMA	Catchment Management Authority
DECC	Department of Environment and Climate Change (NSW) (former)
DECCW	Department of Environment, Climate Change and Water (NSW) (former)
DEWHA	Department of the Environment, Water, Heritage and the Arts (Federal) (former)
DMR	Department of Mineral Resources (NSW)
DoE	Department of the Environment (Federal)
DPI	Department of Primary Industries (NSW)
DP&E	Department of Planning and Environment (NSW)
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
ENMM	Environmental Noise Management Manual
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*

EPL	Environment Protection Licence
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased.
FM Act	*Fisheries Management Act 1994* (NSW)
FBA	Framework for Biodiversity Assessment
GDEs	Groundwater Dependent Ecosystems
Heritage Act	*Heritage Act 1977* (NSW)
ha	Hectares
Hz	Hertz
ICNG	Interim Construction Noise Guideline
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
km	kilometre
km/hr	kilometre per hour
LEP	Local Environmental Plan
LGA	Local Government Area
m	metre
Noxious Weeds Act	*Noxious Weeds Act 1993* (NSW)
NOW	NSW Office of Water
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NPWS	National Parks and Wildlife Service
NT Act	*Native Title Act 1993* (NSW)
NSW	New South Wales
OEH	Office of Environment and Heritage (NSW)
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PADs	Potential Archaeological Deposits
PEI	Preliminary Environmental Investigation
PoEO Act	*Protection of the Environment Operations Act 1997* (NSW)

RBL	Relative Background Noise Level
RNP	NSW Road Noise Policy
Roads and Maritime	Roads and Maritime Services
SEPP	State Environmental Planning Policy
SEPP 19	State Environmental Planning Policy No.19 – Bushland in Urban Areas
SEPP 44	State Environmental Planning Policy No.44 – Koala Habitat Protection
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Federal) (former)
SIS	Species Impact Statement
SOHI	Statement of Heritage Impacts
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSI	State Significant Infrastructure
TSC Act	*Threatened Species Conservation Act 1995* (NSW)
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WONS	Weeds of National Significance
WM Act	*Water Management Act 2000* (NSW)
WSP	Water Sharing Plan

1 Introduction

1.1 Overview of the project

Roads and Maritime Services (Roads and Maritime) is seeking approval to upgrade around 14 kilometres of the Pacific Highway from south of the Englands Road roundabout to the southern end of the recently opened Sapphire to Woolgoolga upgrade project (the project). The project would achieve four lanes of divided highway to a motorway standard (two lanes in each direction with median width to accommodate future upgrading to three lanes in each direction) and bypassing the Coffs Harbour urban area.

Coffs Harbour is a major regional city located about 530 kilometres north of Sydney on the NSW Mid North Coast (refer to Figure 1). The project is located within the Coffs Harbour Local Government Area (LGA).

The project is expected to include the following key elements:

- Bypass of Coffs Harbour urban area from south of the Englands Road intersection to Korora Hill
- Upgrade of the existing Pacific Highway between Korora Hill and the southern end of the Sapphire to Woolgoolga upgrade project to achieve motorway standard
- Three grade-separated interchanges at Englands Road, Coramba Road and Korora Hill
- Two tunnels at the northern end of project, and a tunnel south of Coramba Road at Roberts Hill Ridge
- Structures to pass over local roads and creeks as well as a bridge over the North Coast Railway
- A series of cuttings and embankments along the alignment
- Modifications to the local road network, if required, to enable local connections across and around the Pacific Highway
- Ancillary works and facilities, including (but not limited to) utility adjustments, signage and operational requirements for tunnels
- Ancillary temporary construction facilities and temporary works to facilitate the construction of the project.

The alignment of the project would be located generally within the project corridor as shown in Figure 2.

The project would include a median wide enough to accommodate two additional lanes if required in the future. The additional lanes would be subject to separate environmental assessment (if required). The design, within the broad scope as described in further detail in Chapter 3, would evolve through the environmental assessment process to determine the preferred design. The preferred design would be presented in the future environmental impact statement.

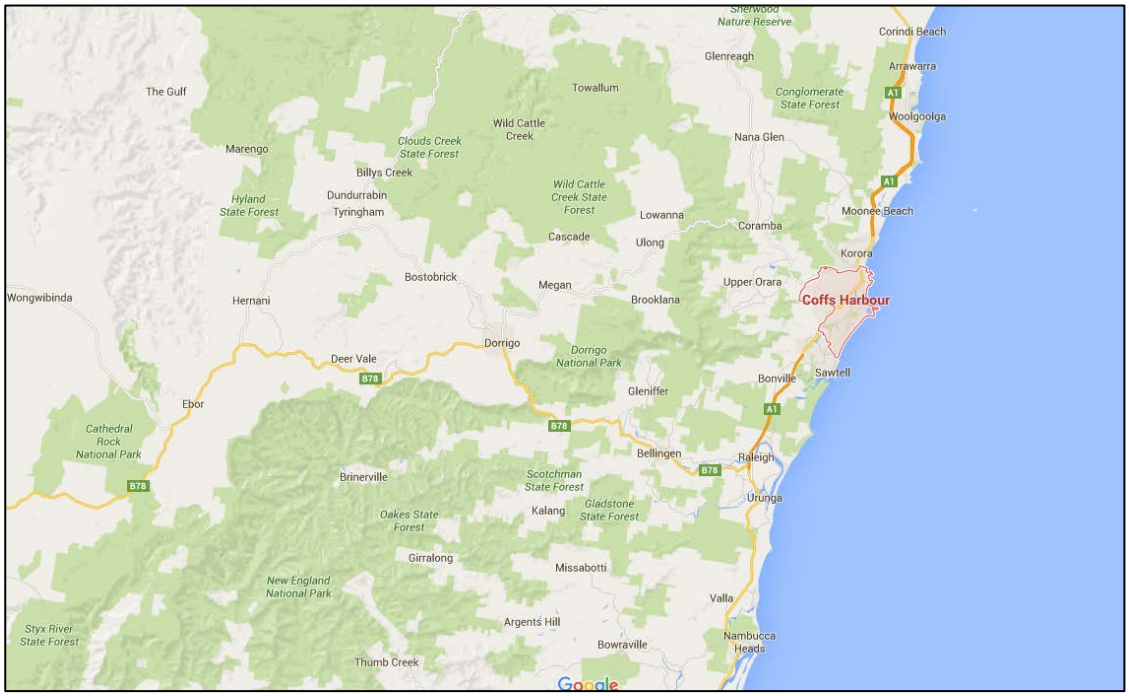

Figure 1: Regional context of the project

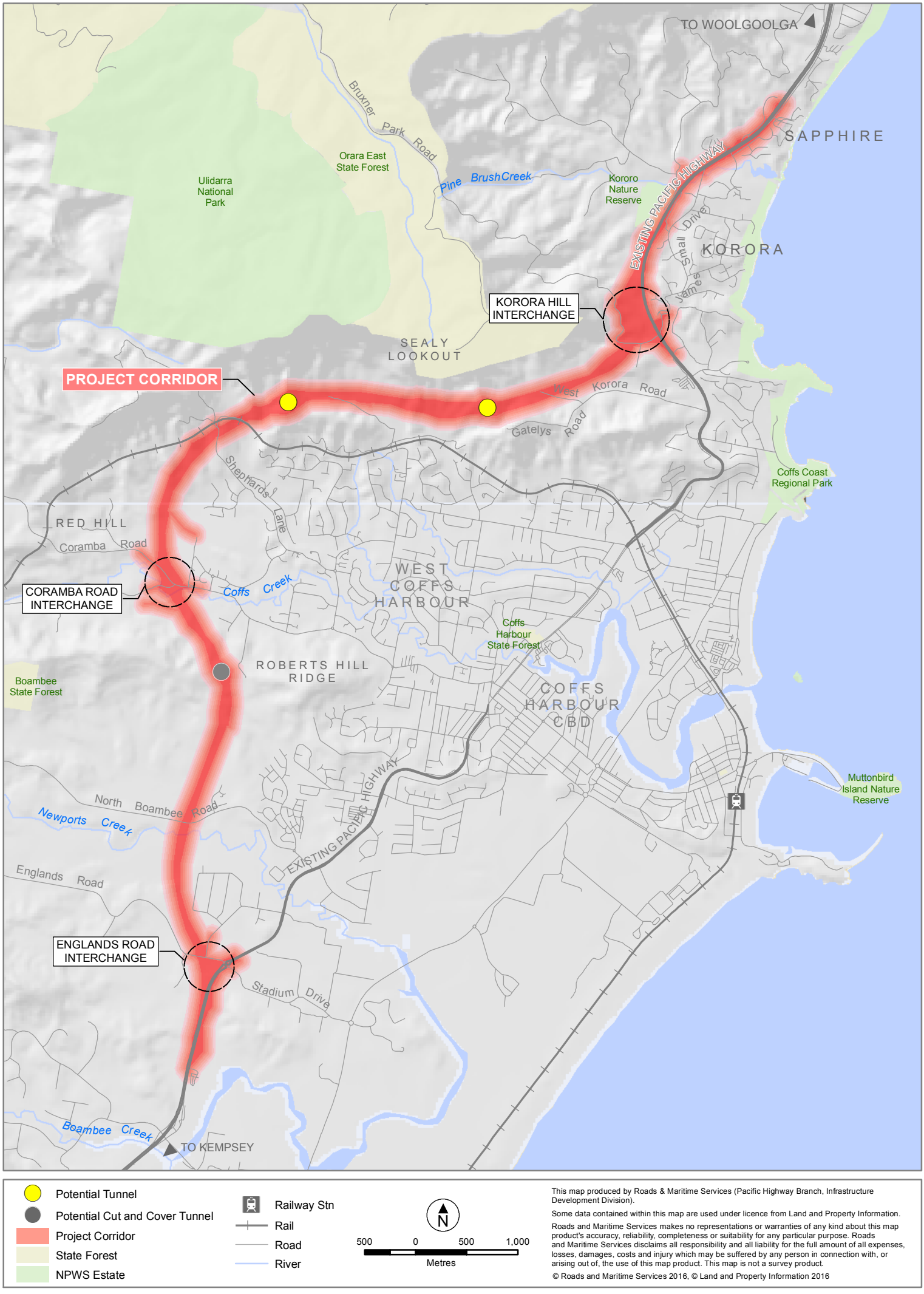

Figure 2: Project overview

1.2 Statutory process

The project is declared to be State significant infrastructure under section 115U of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The project is also declared to be critical State significant infrastructure under section 115V of the EP&A Act as it is considered to be essential to the State for economic, environmental or social reasons. The declarations are made under clause 16 and Schedule 5 of *State Environmental Planning Policy* (State and Regional Development) 2011.

Accordingly, the project is subject to Part 5.1 of the EP&A Act. The project requires the preparation of an environmental impact statement and the approval of the Minister for Planning.

1.3 Purpose of this report

Roads and Maritime has prepared this application report to support a State significant infrastructure application under section 115X of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

The requirements of clause 192 of the *Environmental Planning and Assessment Regulation 2000* for applications seeking approval of the Minister for Planning to carry out State significant infrastructure are addressed in Appendix A.

The purpose of this application report is to assist the formulation of environmental assessment requirements by the Secretary of the Department of Planning and Environment (DP&E) under section 115Y of the EP&A Act. The application report includes the following:

- Describes the project
- Considers the potential environmental issues for the project
- Identifies key environmental issues for the project.

The application report and Secretary environmental assessment requirements would inform the preparation of an environmental impact statement for the project. The form and content of the environmental impact statement would be in accordance with clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

2 Background

2.1 Strategic context and project need

The Australian and NSW governments have been jointly upgrading the Pacific Highway between Hexham and the Queensland border since 1996. The Pacific Highway upgrade, which includes the project, aims to support regional development and provide:

- Safer travel
- Reduced travel times with improved freight transport efficiency
- More consistent and reliable travel
- Better access for towns and villages on the North Coast
- Improved amenity for local communities.

Coffs Harbour is a Regional Centre on the Mid North Coast of NSW. The existing Pacific Highway through Coffs Harbour is two lanes in each direction and is straddled by the central business district and other major commercial and industrial precincts, with 12 sets of traffic signals now in place to manage traffic. About 9.3 per cent of this existing traffic is heavy vehicles, with interstate freight between Sydney and Brisbane expected to triple, increasing from seven million tonnes in 2007 to about 17 million tonnes in 2029 (Department of Transport and Regional Services, 2007). Additionally, heavy vehicle traffic is projected to grow by 1.4 per cent per annum factoring in the increased average truck size and average load carried.

Conflict between pedestrian, passenger and freight traffic through Coffs Harbour town centre is a concern and will continue to be a substantial safety issue as traffic volumes continue to increase. The section of the Pacific Highway to be bypassed through Coffs Harbour central business district, from Englands Road roundabout to the newly upgraded Pacific Highway at Sapphire, has a casualty crash rate more than three times higher than that expected of a road of this class. Casualty crash rates are 2.23 crashes per kilometre per year; the network class average is 0.72. The crash rate is 46.08 per 100 million vehicle kilometres travelled (100mvkt) travelled for all crashes which is substantially higher than the expected crash rate on a bi-directional four lane divided road which is 30.5 per 100mvkt.

By providing a bypass of Coffs Harbour consistent with 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.

The Coffs Harbour Highway Planning Strategy (CHHPS) (Connell Wagner 2004a) started in September 2001 to address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga while planning for future traffic needs within the Coffs Harbour area. The Strategy investigated a range of potential highway corridors and options in two sections as follows:

- Northern (Sapphire to Woolgoolga upgrade) section
- Southern (Coffs Harbour Bypass) section

A wide range of potential highway corridors and route options were investigated during the development of the CHHPS. Options development for the Coffs Harbour Bypass (this project) and the selection of the preferred route are described in further detail in section 2.3.

The project is consistent with other NSW strategic plans as demonstrated in the following:

- *NSW 2021: A plan to make NSW number one* (NSW Government, 2011). The project supports the Plan's transport goals by reducing travel times on the Pacific Highway, improving road safety through separating through and heavy traffic from the Coffs Harbour central business

area, and invests in critical infrastructure, with the Coffs Harbour Bypass declared a critical State significant infrastructure project in 2006.

- *State Infrastructure Strategy 2012 (NSW Government, 2012).* The project supports the strategy's infrastructure priorities by upgrading the Pacific Highway which remains a high priority for the Regional Road Freight Corridor Program.

- *NSW Long Term Transport Master Plan (TfNSW, 2012).* Investment in the Coffs Harbour Bypass has been identified in the Master Plan to "ease congestion in Coffs Harbour, [for] both freight and commuter traffic" (p399), thus the project fits strategically within the ongoing Pacific Highway upgrade program, connecting existing Pacific Highway upgrade projects immediately north and south of the Coffs Harbour urban area.

- *NSW Ports and Freight Strategy (TfNSW, 2013).* The strategy identifies the road network in urban areas is generally less suited to freight movements and notes the importance of providing key freight routes accessible by High Productivity Vehicles (HPV). The project supports this objective by providing a more efficient freight route along the Pacific Highway.

- *Mid North Coast Regional Plan (DP&I, 2009)*. The plan identifies pinch points in major towns, including localised congestion in Coffs Harbour. The Department of Planning and Environment is proposing to 'promote' Coffs Harbour to regional city status in the North Coast Regional Plan as it has a great range of higher order services and employment. The project is consistent in enhancing the ability of Coffs Harbour to meet its functions as a regional city.

- Coffs Harbour Local Environmental Plan 2013 (Coffs Harbour LEP). The Coffs Harbour Bypass corridor is reserved in the LEP with SP2 zoning for infrastructure.

2.2 Project objectives

The objectives of the Pacific Highway upgrade program, of which the project is a component of, are to:

- Significantly reduce accidents and injuries
- Improve transport efficiency by reducing travel times and freight costs
- Have a community satisfied with the physical development of the route
- Have a route that supports economic development
- Manage the development of the route in accordance with *Ecological Sustainable Development* (ESD) principles
- Maximise effectiveness of expenditure.

Specific objectives relating to the project are:

- Improved road safety
- Uninterrupted highway traffic flow
- Easy access on and off the highway for through and local traffic.

2.3 Selection of the preferred project

2.3.1 Overview

September 2001: Coffs Harbour Highway Planning Strategy was announced to address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga, while planning for future traffic need within the Coffs Harbour urban area

February 2004: Route options announced including a review of a proposal for a community generated western bypass corridor, known as the Coastal Ridge Way

December 2004: Preferred route was announced for community comment as part of the Coffs Harbour Highway Planning Strategy

November 2007: Coffs Harbour Highway Planning Strategy Economic Analysis Update report release

September 2008: Concept design announced and displayed for community comment

April 2009: In response to submissions received during the concept design display, Roads and Maritime Services (formerly Roads and Traffic Authority) announced that it will retain the Luke Bowen footbridge

2.3.2 Corridor identification and selection

A wide range of potential highway corridors and route options were investigated during the development of the CHHPS. These have included options developed by the project team and options put forward by Coffs Harbour City Council (CHCC) and the community.

The development of the preferred route on the southern or Coffs Harbour Bypass section of the CHHPS is described in the following reports previously prepared by Connell Wagner:

- *CHHPS - Preferred Option Report (November 2004)*
- *Coffs Harbour City Council Preferred Corridor Feasibility Assessment (*June 2004)
- *CHHPS – Coffs Harbour Section - Review of Coastal Ridge Way Proposal (February 2004)*
- *CHHPS - Coffs Harbour Section - Strategy Report (February 2004)*
- *Preliminary Concept Design Report (March 2002).*

These reports are located on the Roads and Maritime Website:
http://www.rms.nsw.gov.au/projects/northern-nsw/coffs-harbour-bypass/index.html

The preferred route options investigated for the CHHPS fell within four broad strategic corridors as outlined below and illustrated in Figure 3. A series of working papers were prepared to assess and compare the impacts of each corridor option across a range of transportation, socio-economic and environmental planning issues. The corridors were also evaluated against the overall objectives of the Pacific Highway upgrade program and the objectives developed for the CHHPS (as listed in the *CHHPS - Coffs Harbour Section - Strategy Report (February 2004))*.

The corridors and the outcome of the options assessment was as follows:

- *Existing Pacific Highway.* There were likely benefits to road users with upgrading the existing Highway. However, on balance it was concluded that the major adverse social impacts, including community disruption, reduced amenity and severe land use and business impacts in the main urban centre of Coffs Harbour, would be unacceptable. This corridor option was discounted.

- *Coastal Corridor (Inner Bypass).* Options along the coastal plain between Englands Road south of Coffs Harbour and Arrawarra Creek north of Woolgoolga. Following a range of detailed planning and engineering investigations, community input and discussions with a range of government agencies, Options Inner South 1 and Inner North 2 within the Coastal Corridor were adopted as the preferred option for the Coffs Harbour section of the Strategy.

- *Far Western Bypass.* A bypass of Coffs Harbour and Woolgoolga through the Orara Valley from Englands Road south of Coffs Harbour to Halfway Creek or Grafton. The investigation of the feasibility of this corridor concluded that this option would attract less traffic off the existing highway, resulting in longer travel times and higher operating costs than the coastal route

option. This option also had moderate to very high environmental impacts. This option was therefore discounted.

- *Western Bypass* (CHCC Preferred Corridor). Bypass extending for about 38 kilometres from Englands Road in the south to Arrawarra in the north. The feasibility assessment of this corridor found that options within the corridor, including the Coastal Ridge Way route, were not viable due to significant engineering challenges, poor functional performance, high cost and poor value for money. The route options in this corridor also had very significant biophysical impacts on native flora and fauna and a landscape of Aboriginal significance. This corridor option was therefore discounted.

The preferred Coastal Corridor was assessed against the project objectives and was selected as it was considered to:

- Have the best functional performance (provide substantial road safety improvements and travel time savings) while providing opportunities to separate through and local traffic
- Provide the best balance between functional, environmental, social and economic factors
- Have moderate and manageable biophysical impacts
- Have relatively minor and manageable heritage impacts
- Be the lowest cost of all the other corridors
- Provide the best value for money and have fair economic performance
- Have potential to manage social and community impacts with the application of urban design principles and best practice mitigation measures.

Several route options were developed within the Coastal Corridor (Inner Bypass), including:

- *Inner South 1 (IS1).* This option deviated from the existing highway south of Englands Road, crossed North Boambee Road and continued north toward the low saddle in the Roberts Hill ridge, before proceeding to Coramba Road.

- *Inner South 2 (IS2).* This option was initially the same as IS1 but deviated to the west south of North Boambee Road and then continued to Roberts Hill ridge about 800 metres west of the other route. Due to the higher terrain, a 560 metre long tunnel was required under Roberts Hill ridge.

- *Inner North 1 (IN1).* This option deviated north-east from Coramba Road, crossing Shepherds Lane before heading east to Mackays Road, parallel to the railway line for about 1.6 kilometres. From this point the route deviated to pass through the valley between Sealy Lookout and Gatelys Road before traversing the West Korora basin to rejoin the existing highway at Korora Hill.

- *Inner North 2 (IN2).* This option was an alternative option to IN1 with a more westerly alignment crossing Shephards Lane. The route passed through and then to the north of a major ridgeline near the end of Shephards Lane and traversed a relatively isolated valley to rejoin IN1 opposite the western end of Gatelys Road.

A Value Management Workshop was held on 2 and 3 August 2004 to consider the short listed Inner Bypass options IS1 / IS2 and IN1 / IN2 (refer to Figure 4). The workshop participants represented diverse community areas and organisations, Coffs Harbour City Council, government agencies and members of the project team. The workshop analysed the options against the project objectives and their functional, socio-economic and environmental performance.

The assessment recommended a combination of Option IS2 and IN2 as the preferred due to the options:

- Providing the most effective physical separation from existing residential communities
- Least impact on planned urban development areas

- Least traffic noise implications
- Lowest visual and landscape impacts and provide greatest opportunity to mitigate adverse effects.

Following the Value Management Workshop, senior representatives of the RTA (now Roads and Maritime), regional representatives of DIPNR (now DP&E) and the project team further reviewed the work undertaken to date, the technical investigations, the outcome of the value management workshops and the results of the community consultation activities. The review recommended Option IS1 over IS2 for the southern section of the corridor as:

- Transport benefits of both options were similar
- Overall potential impacts of IS1 on likely future land use were similar to IS2 and could be mitigated by replanning the development of the North Boambee Valley
- IS1 had the potential to be refined to further reduce potential noise, visual and other environmental impacts
- IS1 had lower engineering risk and provided better value for money.

Accordingly, the preferred route for the Coffs Harbour section of the CHHPS was the combined Option IS1 and IN2. The preferred route was announced and placed on public display in December 2004.

A total of 22 submissions were received in response to the display. Of the issues raised in the community feedback, the majority were in relation to the selection of the Coastal Corridor as the preferred route, with numerous submissions calling for the adoption of alternative corridors and the removal of heavy vehicle traffic from the Coffs Harbour area. Other issues raised included the potential impact on private property in general and on the banana industry in particular.

A concept design report (Connell Wagner, 2008) for the proposed Coffs Harbour Bypass was displayed for public comment between 22 September and 31 October 2008. The focus of the concept design report was to document progress since the announcement of the preferred option, including information on a range of additional survey and geotechnical investigations, refinements to the concept design and detailed consideration of property access requirements and investigations into potential tunnel options through major ridgelines.

232 submissions were received in response to the display. Issues raised included the need to retain the Luke Bowen footbridge. Other issues raised included the design of the bypass, traffic and access, and impact of the proposal on plants and animals, flooding, water quality, the Solitary Islands Marine Park, noise, air quality, agriculture, business, tourism and the community.

The concept design was refined and then the corridor incorporated into the Coffs Harbour Local Environmental Plan in 2009 with a SP2 zoning for infrastructure to provide planning certainty for Council and the local community.

2.4 Issues raised during consultation

Roads and Maritime, under the previous Roads and Traffic Authority, engaged extensively with the Coffs Harbour community from the start of the Coffs Harbour Highway Planning Strategy in 2001 to the publication of the Concept Design Report in 2008. This included:

- Community updates published at key milestones through the route selection phase, with the first released in September 2001 and the latest in April 2009 following the consultation phase on the Concept Design report
- Community Focus Group meetings to gain input to the CHHPS
- Dedicated project website
- A dedicated Pacific Highway upgrade telephone number and email address
- Public display of studies and investigation reports

- Public forums
- Staffed and unstaffed project displays at various locations
- Community and stakeholder briefing sessions
- Meetings with local Aboriginal Land Council representatives
- Face to face meetings with directly affected landowners and those living alongside the route.

Many of these reports, updates and project documents are available on the project website: http://www.rms.nsw.gov.au/projects/northern-nsw/coffs-harbour-bypass/index.html

Key issues raised by the community during the route selection phase and on the concept design report include:

- Property and access arrangements
- Support for the Coffs Harbour Bypass preferred route
- Support for a far western bypass
- Noise impact
- General information about the concept design of the route
- Landscaping and visual amenity

Roads and Maritime will continue to consult with Coffs Harbour City Council, government agencies, the Aboriginal community, specialist interest groups, utility and service providers, and the public, including community groups and adjoining and affected landowners during the preparation of the environmental impact statement. The environmental impact statement will document the consultation process, consultation carried out and the issues raised.

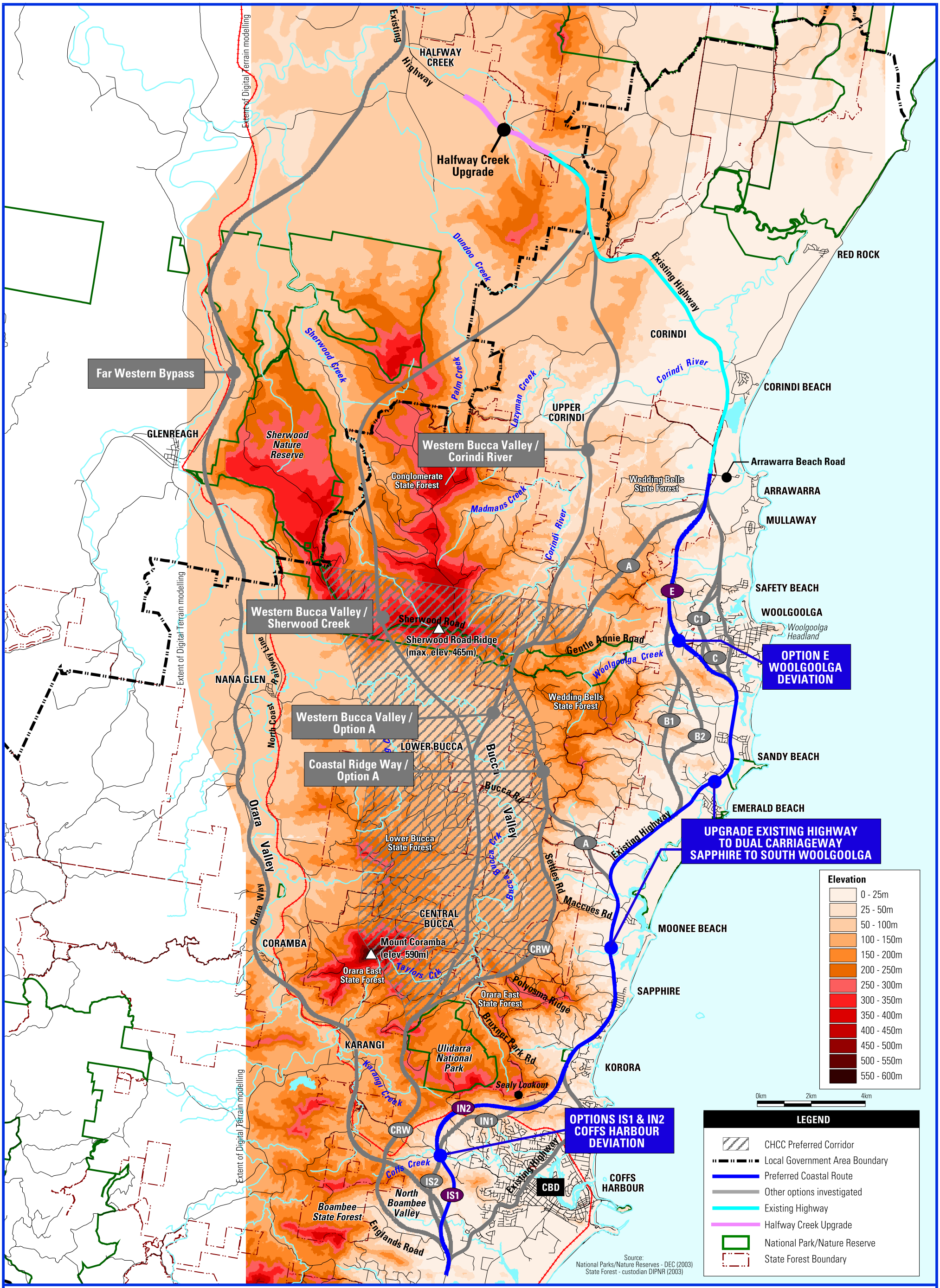

Figure 3 - Route corridor options (Connell Wagner 2004d)

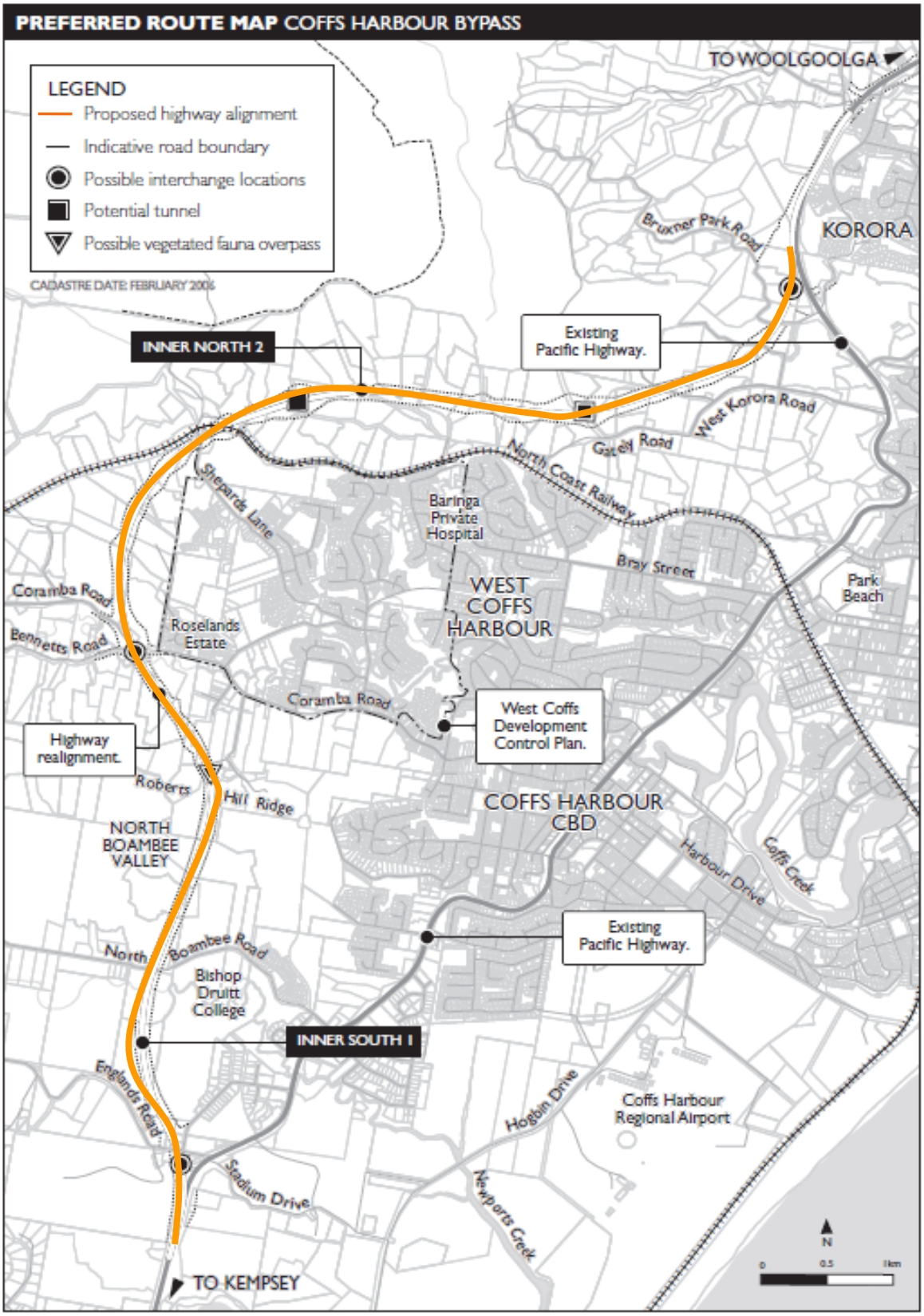

Figure 4: Preferred route as displayed in 2008

3 Project description

Roads and Maritime is proposing to upgrade around 14 kilometres of the Pacific Highway from south of the Englands Road roundabout to the southern end of the recently opened Sapphire to Woolgoolga upgrade project (the project). The project would achieve four lanes of divided highway to a motorway standard (two lanes in each direction with median width to accommodate future upgrading to three lanes in each direction) and bypassing the Coffs Harbour urban area.

Figure 2 shows the general location of the project including the proposed interchanges. The project is expected to include the following key elements:

- Bypass of Coffs Harbour urban area from south of the Englands Road intersection to Korora Hill
- Upgrade of the existing Pacific Highway between Korora Hill and the southern end of the Sapphire to Woolgoolga upgrade project to achieve motorway standard
- Three grade-separated interchanges at Englands Road, Coramba Road and Korora Hill
- Two tunnels at the northern end of project, and a tunnel south of Coramba Road at Roberts Hill Ridge
- Structures to pass over local roads and creeks as well as a bridge over the North Coast Railway
- A series of cuttings and embankments along the alignment
- Modifications to the local road network, if required, to enable local connections across and around the Pacific Highway
- Ancillary works and facilities, including (but not limited to) utility adjustments, signage and operational requirements for tunnels
- Ancillary temporary construction facilities and temporary works to facilitate the construction of the project.

While the preferred project would be refined as part of the environmental assessment and concept design process, the project would include the features as generally described below.

3.1 Key project components

Interchanges

The proposed bypass would be constructed to a motorway standard with entry to / from the bypass limited to grade separated interchanges in key locations along the route. These interchange facilities would provide for access to / from the proposed highway, the existing Pacific Highway and / or the local road network.

The concept design provides for a total of three interchanges over the length of the proposed bypass as follows:

- *Southern interchange at Englands Road*. The southern interchange at Englands Road provides for all movements to / from the existing Pacific Highway in that area. The interchange would provide for travel to / from the northern part of the city to / from industrial areas north of Englands Road and various destinations east of the Pacific Highway, such as sporting complexes, Southern Cross University and the airport via Stadium Drive.

- *Central interchange at Coramba Road*. The central interchange at Coramba Road provides for all movements to / from the proposed bypass in that area.

- *Northern interchange at Korora Hill*. The northern interchange at Korora Hill is to provide for multiple connections to / from the existing Pacific Highway and the proposed local access road

which is included as part of the upgrade of the section between Korora and Sapphire. The primary function of the interchange is to allow travel to / from the proposed bypass to the northern precincts of Coffs Harbour, notably developing residential areas at Korora and Sapphire and nearby tourist resorts and other destinations.

Upgrade of the existing Pacific Highway

The existing Pacific Highway between Korora Hill and Sapphire Beach (about 1.7 kilometres in length) is currently arterial class dual carriageway with a number of intersections for local road connections:

- Old Coast Road
- James Small Drive (north)
- Access to Opal Cove
- Seaview Close
- Campbell Close.

The project would upgrade the existing Pacific Highway to a full Class M (Motorway) standard, which would involve closing at-grade intersections and creating parallel service roads, where needed, to connect to interchanges north and south of the Korora section.

This would provide for continuous travel at Class M standard between Englands Road, south of Coffs Harbour and Arrawarra Beach Road, north of Woolgoolga.

Bridges

As an accessed controlled road, the proposed bypass would have complete grade separation from all local roads and property accesses, either as twin longitudinal bridges or a single transverse crossing. Around 31 bridges would be required over roads, major creek crossings and over the North Coast Railway Line.

Tunnels

A prominent feature of the horizontal alignment of the bypass is that it passes through two major and two other substantial ridgelines as it traverses around the Coffs Harbour basin. The two major ridgelines crossed are north of Shephards Lane and west of Gatelys Road and the other substantial ridges are at the Roberts Hill Ridgeline and immediately south of Bruxner Park Road.

The project is therefore expected to include two tunnels at the northern end of project, and a third tunnel (potentially a cut-and-cover tunnel) south of Coramba Road at Roberts Hill Ridge. The resulting tunnels would be relatively short at less than around 500 metres.

3.2 Ancillary work

Ancillary work would be required to enable the construction of the project. The type and extent of ancillary work required would depend on the construction methodology and techniques adopted during the development of the concept and detailed design.

Ancillary work associated with the project could potentially include:

- Removal of houses and other structures
- Temporary sediment and erosion control measures and other environmental controls
- Temporary signage
- Construction compounds, crushing and screening facilities as well as stockpiles
- Concrete batching plants
- Crane and hard stand area set up
- Casting yard (if contractor decides to case on site)
- Temporary property access arrangements and road diversions

- Public utilities adjustment, relocation, protection
- Corridor boundary fencing and fauna fencing, if required
- Noise mitigation work such as noise mounds and barriers, if required
- Drilling, tunnel boring establishment areas and operational systems
- Bridge pier foundation works and abutments protection
- Landscaping and revegetation work
- Geotechnical investigation work.

The location and size of ancillary construction facilities would be developed as part of the concept design and environmental impact statement. In determination of these facilities, existing land use activities, potential environmental impacts and amenity impacts on the surrounding community would be taken into account.

The project would not include some preliminary works, including surveys, test drilling, test excavations, geotechnical investigations or other tests, surveys, sampling or investigation for the purposes of the design or assessment of the project.

4 Key environmental issues

4.1 Overview

Key issues are those that may have high or moderate impacts (actual or perceived) and assessment is necessary to determine the level of potential impact and to develop appropriate measures to mitigate and manage the impacts.

The outcomes of the preliminary environmental investigations indicate the following key environmental issues will require further detailed assessment and may require project specific impact mitigation measures:

- Traffic and transport
- Visual amenity, built form and urban design
- Noise and vibration
- Biodiversity
- Aboriginal heritage
- Geology, soils and water quality
- Socio-economic, property and land use.

A number of other environmental issues have also been identified. These issues are outlined in Chapter 5 and are considered to be of lesser consequence taking into consideration the project scope, the existing environment and the implementation of standard management and safeguard measures. It is expected that these other environmental issues would not likely be key issues; however the potential impact of these other environmental issues would be assessed further in any future environmental impact statement for the project.

4.2 Traffic and transport

4.2.1 Overview

The Pacific Highway is the major north-south spine connecting Coffs Harbour to Woolgoolga (and ultimately Grafton) in the north and Bonville in the south. Coramba Road acts as a sub-arterial road and links the main Coffs Harbour urban area to western areas of the LGA including the Orara Valley and then to Grafton. Other major roads are Lyons Road and Hogbin Drive, which provide connection between the Pacific Highway south of Coffs Harbour, the airport, the Sawtell / Toormina area, the educational precinct and the Coffs Harbour CBD.

Traffic volumes and freight transport

In 2015, traffic volumes on the Pacific Highway through the Coffs Harbour CBD were recorded to be about 32,000 vehicles per day. About 9.3 per cent of these vehicles are heavy vehicles. The current level of service (LOS) in the Coffs Harbour CBD section is D/E during peak times.

Total traffic along the Pacific Highway is forecast to grow by about 2.1 per cent per annum between 2005 and 2030 (*Bureau of Infrastructure Transport and Regional Economics, 2009b*). As freight and general traffic volumes grow, the performance of the highway through Coffs Harbour will continue to deteriorate with increasing congestion and crashes. The existing highway through Coffs Harbour is signposted at 60 km/h with 80km/h approaches.

The Pacific Highway through Coffs Harbour has over twenty un-signalised at-grade intersections, 12 signalised intersections and a high number of private property access points. These intersections and property accesses disrupt the flow of traffic along the highway with a resulting increase in travel time and decrease in transport efficiency. Congestion is increased during peak times and school holiday periods.

The Coffs Harbour section of the Pacific Highway currently experiences the following traffic issues:

- Through traffic volumes and local traffic conflicts
- Composition of traffic and its mixed purposes
- Traffic growth and congestion
- Heavy traffic noise and diesel pollution
- Travel time and delays – including various speed zones and traffic lights
- Road safety.

Crash history

In the five year period, between April 2010 – March 2015, there have been a total of 290 recorded crashes in the Coffs Harbour section of the Pacific Highway. Of these crashes, 128 were casualty crashes with one person killed and 160 injured. The majority of these crashes involved multiple vehicles; 1 per cent were at an intersection, 36 per cent involved rear end crashes, and 11 per cent involved opposing vehicles turning. There have also been 8 pedestrians (2.8 per cent) and 17 pedal cyclists (5.9 per cent) involved in the crashes. Of all the crashes, 41 (14 per cent) involved heavy vehicles. The crash rate is 46.08 per 100 million vehicle kilometres travelled (100mvkt) travelled for all crashes which is substantially higher than the expected crash rate on a bi-directional two lane divided road which is 30.5 per 100mvkt.

Pedestrian and cyclist use

The existing Pacific Highway currently creates a disconnection for pedestrian access between the residential areas to the west and the commercial and retail centre on the east of the Coffs Harbour central business area. Whilst there is cross connectivity provided via pedestrian crossings at existing traffic signals, timing is restricted to prioritise through traffic on the Pacific Highway travelling north and south.

Planning for the Coffs Harbour City Centre by Coffs Harbour City Council, as shown in Figure 5, shows planned pedestrian and cyclist connections across the existing Pacific Highway. These will present some difficulties in operation with the current Pacific Highway in place given the priority placed on through traffic.

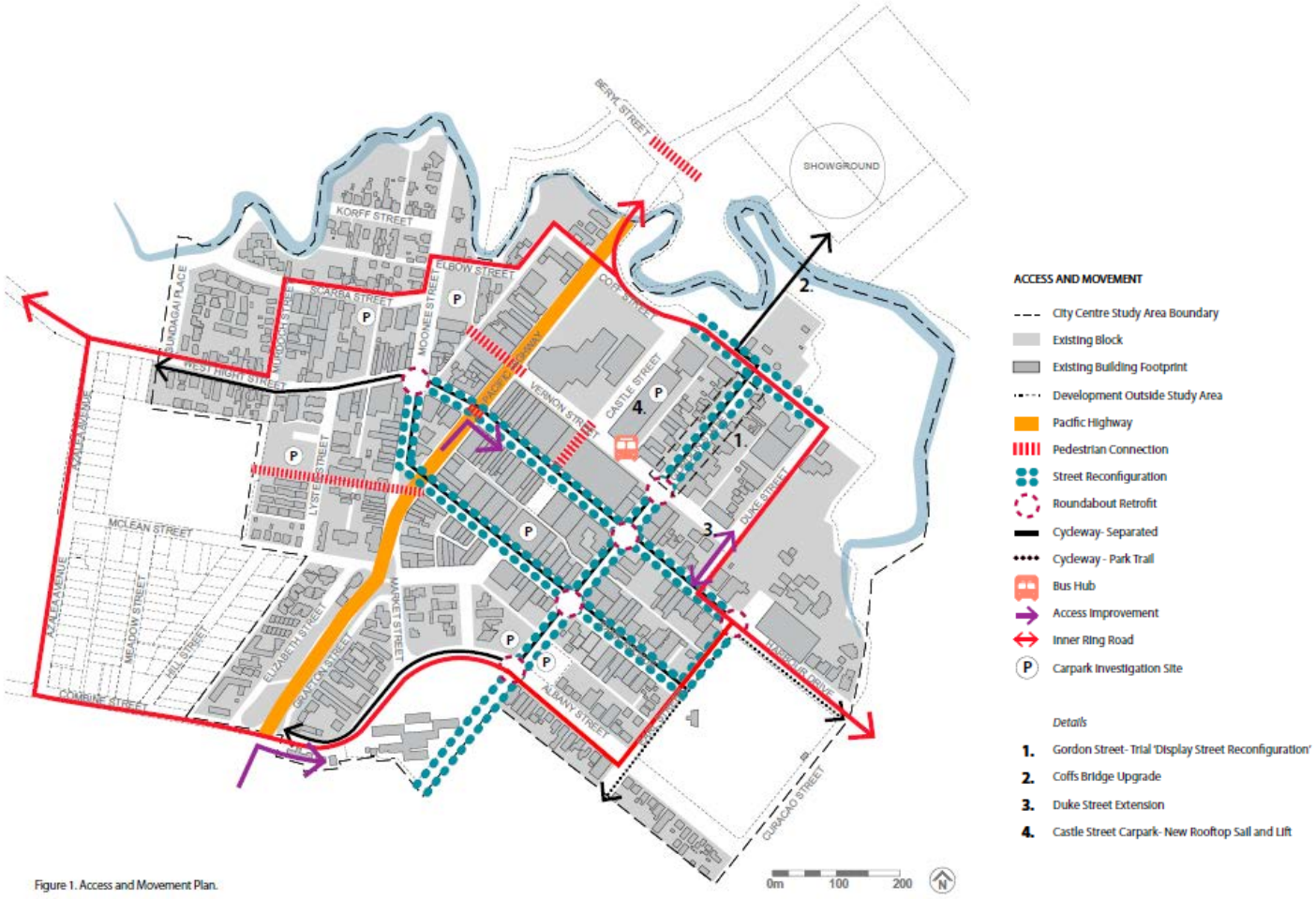

Figure 1. Access and Movement Plan.

Figure 5: Coffs Harbour City Council City Centre Masterplan 2013: Access and Movement Plan

Public transport
The Coffs Harbour urban area is served by a network of public transport buses, with the North Coast rail line providing regional and interstate passenger rail services.

The bus network comprises of a series of bus services which utilise the Pacific Highway from Park Beach Plaza to Park Avenue and then from Halls Road to the Coffs Harbour base hospital, as well as intersecting with the Pacific Highway at various local road connections including Bray Street, Bailey Avenue, Park Avenue and Albany Street.

4.2.2 Summary of issues

Construction

The majority of the project is through green field areas offline of major arterial routes and unlikely to cause substantial disruption to the existing highway and local traffic network. However, there are some points along the route which cross local roads, which may cause temporary disruptions and increased traffic volumes from construction vehicles. These roads include:

- Englands Road at the southern end
- North Boambee Road, which links to new residential estates, a school and a quarry
- Coramba Road, which links the coast to the hinterland area and Orara Way
- Shephards Lane
- Bruxner Park Road

There are anticipated to be both temporary and permanent disruptions to property accesses along the project alignment.

Further to this, the project alignment would cross the North Coast rail line. It is anticipated there may be some disruptions to freight and passenger services during construction of the bridge, with the intention to minimise potential disruptions through restricting work to the rail shut down periods. Any potential disruptions to rail services during construction would need to be carefully planned and undertaken in consultation with the rail operator.

Construction of the project would require ancillary facilities which may include, but not be limited to, stockpiles, compounds and concrete batching facilities. The location of the project in a green field area provides an opportunity for these facilities to be located away from public roads, thereby minimising traffic disruptions.

Operation

Upon completion, a crash rate of 15 per 100mvkt or lower is expected on the bypass. The separation of through traffic from the CBD is also expected to result in a reduction in the crash rate of the bypassed section. With the through traffic (and more than half of the large heavy vehicles removed from the CBD), additional safety measures such as a 40k/hr pedestrian zone could feasibly be implemented.

During operation, the project is likely to result in a reduction of congestion on the surrounding road network by separating highway through traffic from local traffic. This would enhance freight efficiency and provide consistent and higher travel speeds on the Pacific Highway and more reliable conditions on the broader road network.

The project would provide benefits to council's long term vision for the city centre, reducing the total volume of traffic through the city centre, with a reduction in heavy vehicle numbers. This would result in urban amenity enhancements by reducing noise, congestion and visual impact of heavy vehicles in the town centre. It would also improve safety outcomes by creating a safer travel environment without conflicting traffic movements, including addressing pedestrian and cyclist safety in the central business area. Urban amenity enhancements in the CBD could provide opportunity for increased pedestrian and cyclist use of these areas, potentially further reducing congestion.

It is anticipated the project will benefit bus services by reducing the volume of traffic on the existing Pacific Highway through the urban area, thus freeing up congested road space, and enabling better connectivity with the local connecting street network.

Once the project is operating, it would have the following impacts:

- Permanent changes to existing traffic movements and road modifications at Shephards Lane, Gatelys Road, Coramba Road, Englands Road and Bruxner Park Road
- Changes to access arrangements around interchanges and local road upgrades resulting from the project.

4.2.3 Proposed further assessments

A detailed traffic and transport assessment would be prepared to (as a minimum):

- Describe how construction traffic would access the project (including ancillary facilities) and any impacts on the road network in and around the Coffs Harbour urban area
- Provide an assessment of the existing and future traffic and transport environment, including a description of the local and regional road network, speed environment, parking and access arrangements within the study area, provision for public transport and changes to pedestrian and cyclist facilities
- Describe how the project would integrate with Coffs Harbour City Council's relevant transport planning strategies
- Identify and assess impacts of the project on traffic and safety
- Identify feasible and reasonable mitigation measures for the construction and operational stages of the project.

4.3 Urban design, landscape character and visual amenity

4.3.1 Overview

The Coffs Harbour urban area is located mostly on the flat topography adjacent to the coast. The urban area is surrounded by coastal hinterland, with the forested mountains of the Great Dividing Range to the west.

The project alignment begins in the Boambee Valley, sweeping to the western side of the Coffs Basin, finishing at the eastern end of the Korora basin. The project is located on the western side of the Coffs Harbour urban area, traversing mostly cleared farmland associated with grazing, banana and blueberry plantations, with some vegetated corridors.

There are three distinct landscapes:

1. The Great Dividing Range to the west of the Coffs Harbour basin which is primarily vegetated with north coast mixed hardwood. The forested mountains comprise mainly of National Parks and State Forests.
2. The hinterland adjacent to the mountains comprise of undulating hills primarily used for agriculture. The main agricultural uses include pasture, blueberry plantations and banana plantations.
3. The urban and industrial areas of Coffs Harbour are located on relatively flat topography adjacent to the agricultural hinterland and coastline. Some of the urban development is located on coastal floodplains and from time to time subject to flood events.

4.3.2 Summary of issues

Key visual catchments that may be affected by the project include views to the hinterland and mountain forests from the coastal urban areas, and interrupted landscapes associated with the open green fields of the Boambee Valley south of the Roberts Hill ridge spur. The viaduct

structure across the North Coast railway will form a significant structure when viewed from the coastal areas, as well as providing views to the ocean for the road user.

Construction

- Construction activities relating to substantial cuts and fills associated with the undulating spur and valley landforms would impact the views west towards the upper ranges and valleys surrounding Coffs Harbour
- Road network upgrades along sections of Englands Road, North Boambee Road, Coramba Road, Shephards Lane, Gatelys Road and Bruxner Park Road would have impacts on the visual amenity of some sensitive receivers located next to the constructions work and on road users.

Operation

- There would be impacts on views to the hinterland area from the coastal plains
- Work in the foothills between Bruxner Park Road and Coramba Road may have a high visual impact on adjacent properties
- The introduction of grade separated interchanges may have a high visual impact on the adjacent properties
- Increased traffic volumes in some green field areas. Depending on the mitigation measures utilised, may have a high visual impact due to road corridor constraints (eg in areas where noise mitigation measures consist of noise walls).

4.3.3 Proposed further assessments

The urban design and landscaping assessment for the project will be guided by Pacific Highway Urban Design Framework. The *Pacific Highway Urban Design Framework* which has guided all projects since 2004 will also be a reference document. It contains the following vision, relevant to the project:

"*The upgrade should be a sweeping, green highway providing panoramic views to the Great Dividing Range and the forests, farmlands and coastline of the Pacific Ocean; sensitively designed to fit into the landscape and be unobtrusive; and characterised by simple and refine road infrastructure*."

There are six urban design objectives in the Framework that help to achieve this vision:

1. Provide a flowing road alignment that is responsive and integrated with the landscape
2. Provide a well vegetated, natural road reserve
3. Provide an enjoyable, interesting highway
4. Value the communities and towns along the road
5. Provide consistency-with-variety in road elements
6. Provide a simplified and unobtrusive road design.

These objectives will be incorporated into the development of the concept design for this project to produce an integrated engineering and urban design outcome.

A detailed landscape and visual impact assessment would be prepared to provide (as a minimum):

- An analysis of the built and natural environment and community context of the study area and beyond
- A review and update of the preliminary urban design objectives listed above and the development of urban design principles for the project
- A landscape character impact assessment
- A visual impact assessment of the project in the whole and in parts
- The identification of feasible and reasonable measures to mitigate impacts unable to be avoided in the urban design process. Identified mitigation measures will be incorporated into the project design.

Roads and Maritime Services Beyond the Pavement Urban Design Policy Procedures and Design Principles will also be used as a reference. The urban design principals require all projects to fit sensitively into their context; provide good accessibility and connectivity; and achieve a high quality public domain.

4.4 Noise and vibration

4.4.1 Overview

During the development and assessment of the route options for the project, a strategic noise assessment was undertaken. This incorporated a review of road traffic noise issues associated with the route alignment, existing residential precincts and future urban development areas in the vicinity of the route (Wilkinson Murray, 2004).

Locations which contain sensitive receivers impacted by the project include:

- The Bishop Druitt College and adjacent residential development on North Boambee Road
- Roselands Estate
- The rural residential area north of Coramba Road near Spagnolos Road
- The growing residential areas to the east of Shephards Lane
- Mackays Road valley
- Korora.

The assessment was carried out in accordance with the then Department of Environment and Conservation (DEC) Environmental Criteria for Road Traffic Noise (ECRTN) guidelines. The criteria for the proposed bypass were:

- New Freeway / Arterial Road
  - LAeq 15hr (day time) = 55dBA
  - LAeq 9hr (night time) = 50dBA.

The assessment identified that without noise mitigation, the Base Criteria of 50dBA at night time would be achieved at between 500 metres and 800 metres from the edge of the alignment, depending on the topography, gradient and receiver elevation, with distances of up to one kilometre being possible in specific situations.

The 2004 assessment highlighted that some residential receivers already encroached within this distance of the bypass footprint. With further development occurring in the area over the last decade, the number of impacted receivers is anticipated to have increased.

4.4.2 Summary of issues

Construction

- Some construction work would need to occur outside of the standard working hours to minimise impacts on businesses and areas of high traffic flow. This requirement is likely to apply when the upgrade of the existing highway on the northern end of the project is being completed. This may impact on noise sensitive receivers
- A number of noise-sensitive receivers would be impacted by construction noise including the operation of large machinery and equipment. The extent of the impact could vary according to the relationship of the construction work to the receiver location, topography and the nature of construction work at various stages of the construction process
- There is potential for construction vibration impacts on nearby buildings, particularly in the vicinity of the tunnels. The level of impact would depend on the construction techniques used and the offset distances between the vibration source and the sensitive receiver.

Operation

- Once the project is operating new traffic noise would be introduced into areas with existing low noise background levels. It is anticipated this would be amplified to the east of the project

alignment due to the topography of the Coffs Harbour Basin in reference to the location of the bypass.

4.4.3 Proposed further assessments

Roads and Maritime will carry out an assessment of the construction noise and vibration impacts of the project in accordance with *Assessing Vibration: a Technical Guideline* (DEC, 2006), *Interim Construction Noise Guideline* (DECC, 2009) and the *Environmental Noise Management Manual* (RMS, 2001).

Roads and Maritime will carry out an operational noise assessment using the *NSW Road Noise Policy* (DECW, 2011), *Noise Criteria Guideline* and the *Noise Mitigation Guideline* (RMS 2014).

The assessment will:

- Describe the existing noise environment and identify sensitive receivers relevant to the project footprint
- Assess noise and vibration impacts, during construction and operation, on the identified sensitive receivers (the impact assessment will be made against the relevant noise and vibration criteria).

The assessment will identify feasible and reasonable mitigation measures which will include but not be limited to:

- The potential to maximise shielding of the bypass through the use of the existing terrain and the cut / fill configuration of the road alignment
- Noise treatment in keeping with a semi-rural / rural residential environment. For example, the use of mounds or combinations of mounds and low noise walls and quieter pavements in noise sensitive areas such as North Boambee valley, north of Coramba Road near Spagnolos Road and through the Mackays Road valley
- The potential use of elevated interchange ramps to provide noise mitigation in areas where the alignment is in close proximity to the Roselands Estate near the Coramba Road interchange.

4.5 Biodiversity

4.5.1 Overview

An ecological assessment of the proposed bypass was carried out at the preferred option stage and included as part of the CHHPS Strategy Report. Database searches of the NSW BioNet Atlas of Wildlife and the EPBC Protected Matters Search Tool in April 2016 were also carried out to determine the likelihood of threatened species and communities occurring within 10 kilometres of the study area. The following sections discuss the findings of these investigations.

Vegetation communities and fauna habitat

The study area is located in the NSW North Coast bio-region which is characterised by an overlap in distribution of tropical species from the north east and temperate species from the south east areas of the eastern seaboard.

The dominant vegetation types of the study area are generally eucalypt forests. Vegetation communities were identified within the study area through analysis of vegetation mapping supplied by Coffs Harbour City Council (2012) and are described in Table 1.

Table 1: Vegetation communities located within or near the project

Vegetation community	Endangered Ecological Community (EEC) listed under the TSC Act[1]
Coast and Escarpment Blackbutt Dry Forest	
Coast and Hinterland Riparian flooded Gum Bangalow Wet Forest	
Coastal Freshwater Wetland	Possible – Freshwater wetlands on coastal floodplains of the NSW North Coast
Coastal Paperbark Sedgeland Dominated Forest	Swamp Sclerophyll Forest on coastal floodplains of the NSW North Coast
Coastal Wallum Paperbark Wet Shrubland	
Foothills and escarpment Blue Gum Tallowwood-Turpentine Wet Shrubby Forest	
Foothills Grey Gum-Ironbark-Mohogany Dry Forest	
Foothills to Escarpment Brushbox-Tallowwood-Blackbutt Wet Forest	
Hinterland and Escarpment Tallowwood-Blackbutt-Blue Gum Wet Ferny Forest	
Lowland Swamp box-Paperbark-Red Gum Dry Forest	Subtropical Coastal Floodplain Forest NSW North Coast Bioregion EEC
Native remnant vegetation	
Northern Escarpment Blackbutt-Apple Wet Ferny Forest	

1 *Threatened Species Conservation Act 1995* (NSW)

A Nature Reserve and National Park are located in the study area. These areas have been reserved under the *National Parks and Wildlife Act 1974* as they contain elements of conservation significance, such as threatened species or vegetation of local or regional significance. Korora Nature Reserve, located to the north of the study area adjacent to the Pacific Highway, provides a small representation of the range of ecosystems associated with wet sclerophyll forests of the North Coast. The reserve was previously used for Koala regeneration and the establishment of colonies of Red-legged and Red-necked Pademelons. Ulidarra National Park provides habitat for a diverse range of threatened fauna, including Koalas, the Powerful and Masked Owls, Rose-crowned and Superb Fruit Doves, Wompoo Pigien Little Bent-wing Bats and Giant Barred Frog.

In addition to conservation reserves administered by the NSW Department of Environment and Heritage, State Forests of NSW administer Bruxner Park Flora Reserve to the north west of the study area. The nearby State Forests also contain other areas that are managed for the protection of natural and cultural conservation values (informal reserves) and areas managed for conservation of identified values and forest ecosystems and their natural processes.

4.5.2 Summary of issues

Construction

- There will be potential impacts on habitat for threatened species resulting from clearing and grubbing of the site, including Koalas (listed as vulnerable under the Commonwealth *Environmental Protection and Biodiversity Act 1999* and *Threatened Species Conservation Act 1995,* due to the project footprint traversing the areas containing known Koala habitat and Koala corridors
- Native and exotic plantings would need to be cleared

- There would be potential for the introduction and/or spread of weeds, including noxious weeds
- There would be potential impacts on aquatic vegetation and habitat through the installation of instream structures likely to require cleaning and disturbance of the river banks and beds
- There would be potential mobilisation of sediments and pollutants, which may enter several creeks traversed by the proposal, including Newports Creek, Coffs Creek and Pine Brush Creek.

Operation

- There would be an impact on remaining native vegetation communities adjacent to the project through the increase in edge effects
- A potential for increased vehicle strikes to native fauna due to the project traversing across existing fauna corridors. The use of tunnels, including the cut and cover tunnel proposed at Roberts Hill Ridge, will minimise this risk
- The bypass lighting would potentially impact bats and other fauna species given the bypass is pushing into areas which are largely greenfield or agricultural.

4.5.3 Proposed further assessments

There are a number of key ecological issues that may be associated with the proposal due to the topographical context of the study area and the range of native communities that it may support.

During the development of the concept design and the preparation of the EIS, further opportunities to avoid and minimise impacts to areas of ecological value will be explored. Roads and Maritime will carry out an assessment of impact on the ecological values of the project site and adjoining areas including terrestrial, riparian and aquatic areas.

A Biodiversity Assessment Report will be prepared in accordance with the *Framework for Biodiversity Assessment* (FBA) (OEH 2014b) and the *Biodiversity Offsets Policy for Major Projects* (OEH 2014c) by a person accredited in accordance with Section 142B(1)(c) of the TSC Act.

Should offsets be required, a biodiversity offsetting strategy will also be prepared.

If a potential significant impact on nationally listed biodiversity is identified during assessment of the project, Roads and Maritime will first endeavour to avoid that impact. However, if it is unavoidable then Roads and Maritime will initiate a referral to the Australian Government, which may then trigger application of the NSW Bilateral Agreement with respect to environmental assessment.

4.6 Aboriginal cultural heritage

4.6.1 Overview

At the time of first European settlement, the study area was occupied by the Gumgaingirr people. The Aboriginal cultural heritage study area is within the boundary of the Coffs Harbour and District Local Aboriginal Land Council.

In 2004, an Aboriginal archaeological survey and assessment was prepared to assess options and constraints across the study area (Connell Wagner, 2004a). This assessment involved consultation with the relevant land council and representatives of the Coffs Harbour Gumbaingirr people.

The Aboriginal heritage assessment identified that the northern end of the study area is of Aboriginal social value. Although no mapped historic camps occur on or near the project, two banana plantations located in the north of the study area provided employment to Aboriginal people in the Bruxner Park area during the 1940's and 1950's.

Locations of high Aboriginal cultural significance occur to the north and south of the study area. These sites include burials on the high prominent ridgeline trending east from Sealy Lookout and a natural mythological site on a ridgeline knoll above the Big Banana south of West Korora Road.

A search of the Aboriginal Heritage Information System (AHIMS) in October 2015 identified numerous registered Aboriginal sites located near the project. Three known sites lie within the alignment of the project. Other artefacts have also been recorded within 50 metres of the project, the closest about 50 metres at the southern end.

While no archaeological sites are currently recorded within the project alignment, the 2004 Aboriginal heritage assessment concludes that there are areas of high and moderate archaeological potential, particularly along the banks of creeks.

There are no declared Aboriginal places within the vicinity of the project. A search of the National Native Title Register was carried out on 22 October 2015 to identify registered native title claimants or native title holders for the study area. This search identified that there were no native title claimants or native title holders for the project.

4.6.2 Summary of issues

Construction

- Potential direct and indirect impacts on unknown or unidentified archaeological items that may be uncovered, disturbed, damaged or destroyed during construction work. It is considered possible that previously unidentified cultural heritage sites or artefacts may exist within the study area.

Operation

- The cultural value of the study area to Aboriginal people has not been determined to date There could be potential indirect impacts to Aboriginal cultural heritage values due to the placement of the project within the landscape, and the visual impact this may have on areas identified as having cultural significance.

4.6.3 Proposed further assessments

Roads and Maritime will carry out an assessment of impacts on Aboriginal heritage including cultural and archaeological significance in accordance with the Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI). The assessment will also be carried out in accordance with:

- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010)
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010a)
- *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010b).

In carrying out the assessment, Roads and Maritime will:

- Consult with the Coffs Harbour and District Local Aboriginal Land Council and the Aboriginal community
- Identify and investigate the Aboriginal archaeological and cultural heritage values that are known or are predicted to be present by carrying out field survey, test excavations and consultation with the registered Aboriginal stakeholders and Aboriginal knowledge holders as required
- Assess the potential impacts on Aboriginal archaeological and cultural heritage values, including intangible cultural values
- Identify feasible and reasonable mitigation and management measures to avoid and minimise impacts.

4.7 Geology, soils and water quality

4.7.1 Overview

Geology and soils

Geological and terrain mapping carried out in 2004 as part of the route options development identified three main terrain units:

- Steep slopes ridges and upland areas - Residual
- Undulating footslopes - Residual
- Alluvial floodplains and backswamps - Alluvia

The general characteristics of each unit are described below. Elevation levels are shown in Figure 6.

- *Steep slopes ridges and upland areas.* The slopes and ridges of this terrain unit rise steeply from the coastal area with gradients ranging from 30 to 60 per cent. The upland areas rise to over 250m AHD and are often deeply incised by drainage lines that flow down the scarp face of the Great Dividing Range. Major ridge lines also project from the scarp face such as the obvious ridge to the south of Coramba that ends as Roberts Hill.

  The soils are expected to comprise stiff to hard medium to high plasticity, silty clays overlying siliceous argillite and or greywacke. The soil cover is expected to be shallow. The soil landscape mapping indicates that the residual soils (Megan) can be expected to be highly to very highly erodible whereas the colluvial soils (Suicide) are moderately erodible. Localised and widespread occurrence of major slope instability can be expected in the Megan and Suicide soil landscapes respectively.

  Rock in this area contain the siltstones mudstones and shales of the Brooklana and Coramba beds, which are variably weathered and often contain layers of marginally rippable siliceous argillite materials.

- *Undulating footslopes.* This unit comprises the mid to lower slopes between the alluvial areas and the steep slopes associated with the Great Dividing Range scarp face and the steep ridges that protrude from the range towards the coastline. The slope grades are generally between 10 and 30 per cent.

  This terrain unit is expected to comprise more deeply weathered residual soils than the other residual soil unit associated with the steep slopes and upland. The weathering products of the Brooklana and Coramba beds are typically sandy or silty clays and high plasticity clays.

  Moonee and Megan soil landscapes cover most of this terrain unit. The soil landscape mapping indicates that these soils are typically moderately to very highly erodible. Both are also noted as having low wet bearing strength and slopes comprising Megan soils are occasionally prone to slope instability.

  The underlying bedrock is generally expected to be argillite.

- *Alluvial floodplains and backswamps*. The majority of the alluvial landscape lies between RL 5 and RL10m AHD, along and to the east of the existing highway. The alluvial floodplains are associated with the lower reaches of Newports and Coffs Creeks that traverse the study area. The floodplains quickly recede as the topography rises steeply to the west and the alluvium becomes restricted to the creek beds.

  The alluvial soils are expected to comprise silty clays with interbedded sand and gravel layers, overlying weathered argillite bedrock at depth.

The rock level is often in excess of 20 metres deep. The rock can be expected to be more deeply weathered than in the other terrain units.

Acid sulphate soils

Acid sulphate soils (ASS) are typically associated with soils below 5m AHD. As such, areas of low risk potential ASS are concentrated along the existing Pacific Highway corridor, with high risk areas identified adjacent to the rail line in Coffs Harbour and north of Korora. ASS are not expected to be a high risk potential for the bypass proposal.

Contamination

A search of the EPA contaminated land record of notices was undertaken on October 2015. The search returned four sites recorded within the Coffs Harbour LGA. The project is not located near any of these sites.

Limited contamination testing conducted by Holmes and Holmes Pty in 2004 identified no elevated levels of contaminants, indicating that the probability of large scale contamination within the study area is low.

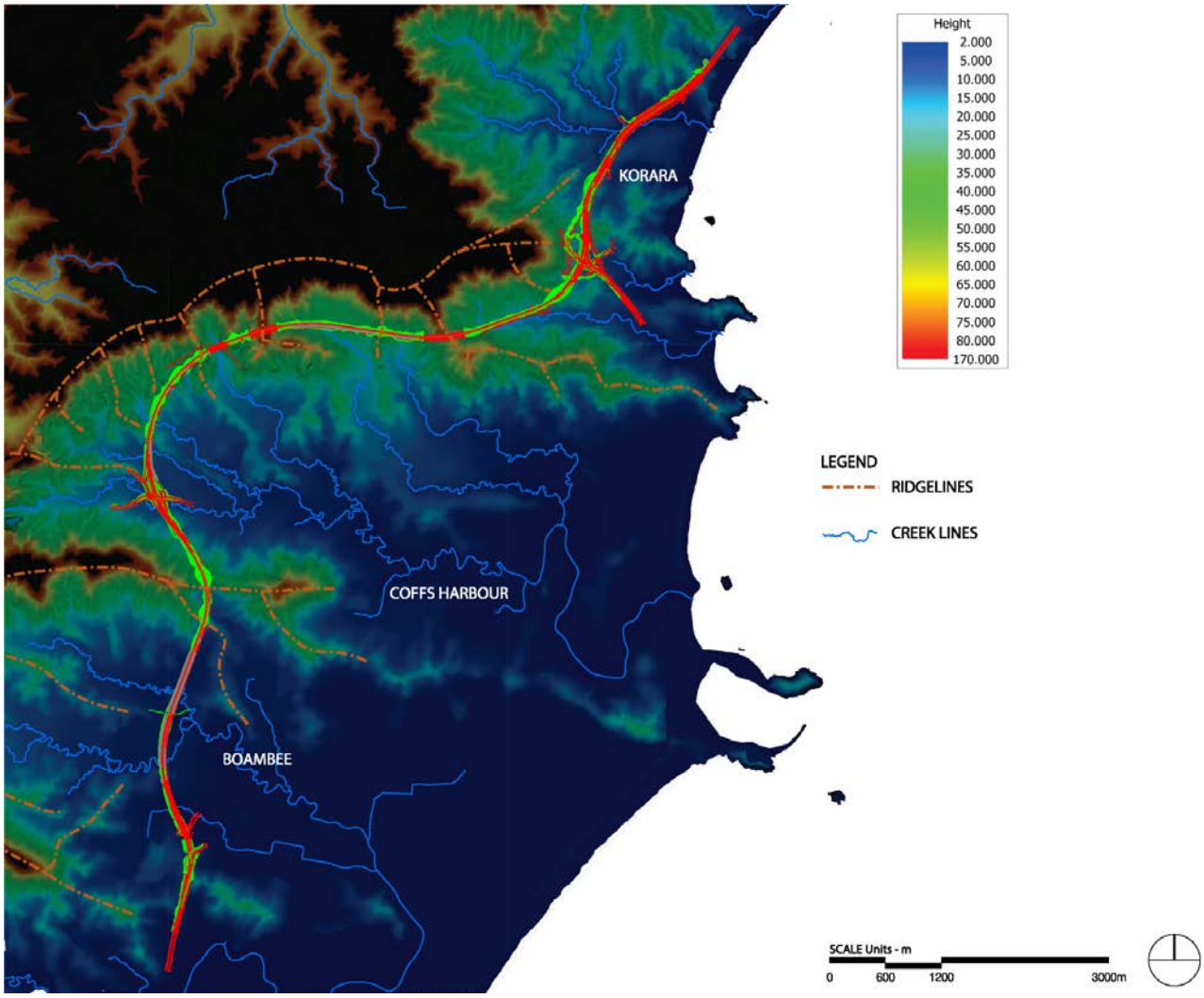

Figure 6: Elevation levels (Tract, 2015)

4.7.2 Summary of issues

Construction

- Direct erosion impacts during construction due to excavation, vegetation removal or heavy vehicle use resulting in soil exposure and mobilisation. An increase in erosion and sedimentation would impact stream water quality
- Direct impact to bank stability waterways traversed by the project
- Direct impact to water quality from accidental chemical spills or materials during construction or improper management of run-off, sediment control and discharge from the construction site
- Potential for contamination of groundwater where groundwater intersection occurs during construction (possibly during tunnelling)
- Potential impact on salinity as a result of changes to the local landscape, which affects the way salt and water move through the environment and where they concentrate
- Groundwater seepage into the tunnel would need to be collected and disposed
- If the tunnel alignment intersects geological structures, including igneous dykes and fault zones, that are connected to water bearing stratum, high inflows of groundwater to the tunnel and water table drawdown, may result.

Operation

- Potential contamination of local waterways resulting from runoff from the road. Road runoff would typically contain oils and greases, petrochemicals and heavy metals as a result of vehicle leaks, operational wear and road wear
- Potential to scour surface soil, banks or bed material due to the changes in drainage off new impervious surfaces
- Altering the movement of groundwater is possible, particularly in the vicinity of the tunnels.

4.7.3 Proposed further assessments

Roads and Maritime will carry out an assessment of impacts on geology, soils and water quality. The assessment will:

- Characterise and assess the hydrogeology and groundwater conditions and assess impacts of construction and operation of proposed tunnels and cuttings on the groundwater regime, groundwater dependant ecosystems, the environment and existing groundwater users
- Obtain water quality data
- Carry out a detailed analysis of the risk of erosion and sedimentation in accordance with the *Roads and Maritime Erosion and Sedimentation Management Procedure* (2008)
- Assess the degree of direct and indirect impacts from the construction site, road runoff and surface disturbance
- Provide detailed information on geotechnical conditions relevant to potential tunnels at:
  - Roberts Hill ridgeline
  - Shephards Lane
  - Gatelys Road Ridgeline.
- Investigate options for treatment and disposal of groundwater seepage into new tunnels
- Identify feasible and reasonable management and mitigation measures to prevent water and pollution, and details of the proposed stormwater management measures to contain pollutants. Measures will take into consideration the *Managing Urban Stormwater: Soils and Construction* (The Blue Book) publications.

4.8 Socio-economic, property and land use

4.8.1 Overview

Coffs Harbour is a Regional Centre located on the Mid North Coast of NSW. It is one of the fastest growing cities on the coast with a population of 52,517 (2009) and 1.6 per cent annual growth. The Coffs Harbour City Council website provides community profile information about the local government area. In this, the three most popular industry employment sectors in 2011 were health care and social assistance (15.3 per cent), followed by retail trade (13.8 per cent) and then accommodation and food services (10 per cent).

In combination, these three industries employed 10,939 people in total or 39.1 per cent of the total employed resident population. In comparison, regional NSW employed 13 per cent in health care and social assistance; 11.4 per cent in retail trade; and 7.7 per cent in accommodation and food services.

Tourism is the most important industry in the city in terms of income and employment generated (CHCC, 1996). This is most noticeable with the high concentration of tourist accommodation in the Park Beach and Korora areas, the restaurant strip in the Jetty area and the city centre.

As a tourist destination, Coffs Harbour experiences a substantial elevation in population during peak holiday periods. Maximum use of facilities and resources is reached during these periods. Wholesale and retail businesses in Coffs Harbour are highly dependent on the seasonal tourist trade

Land use along the existing highway corridor up to Korora is predominantly urban. From the Englands Road roundabout the land use is predominantly lower density industrial / commercial, becoming more dense residential / commercial to the north, from Combine Street onwards (refer to Figure 7).

Agricultural land is the predominant land use traversed by the bypass corridor. These areas however are slowly being developed for residential or rural residential uses, with some remnant banana plantations existing around the Roberts Hill ridge area south of the Coramba Road interchange as well as along Spagnolos Road. An area under blueberry cultivation also exists to the west of the Gatelys Road which potentially could be impacted by the project.

The North Coast region as a whole is generally well supplied with community services and facilities. Coffs Harbour is a base for the provision of local and regional community services, with approximately half of all the community services concentrated in the Coffs Harbour urban area.

Recreation facilities in the area are largely associated with the beach, natural environment and hinterland. The most popular recreation activities are visiting clubs or restaurants, picnics and barbecues at public recreation areas; and visiting parks and gardens.

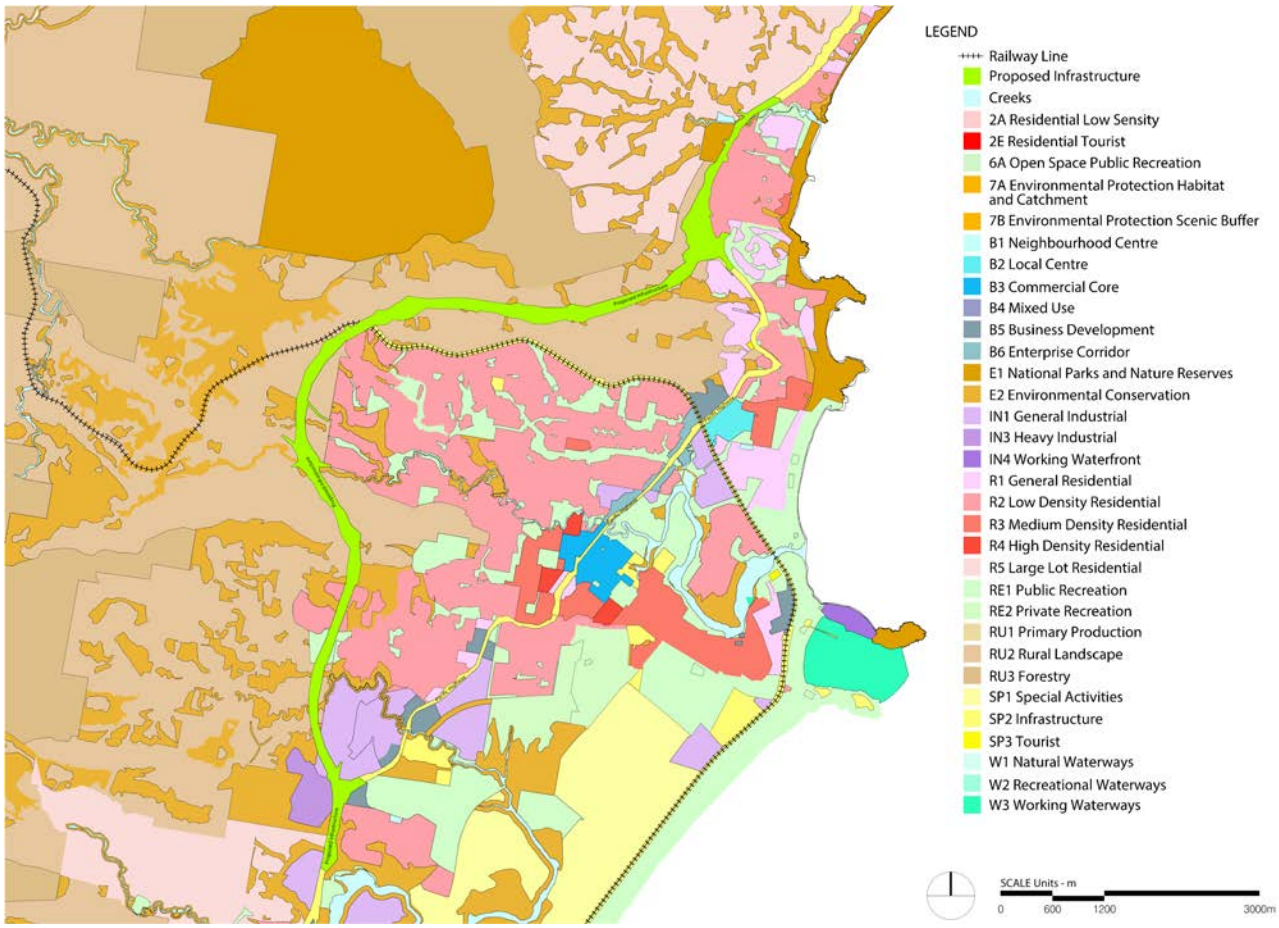

Figure 7: Land use (Tract, 2015)

4.8.2 Summary of issues

Construction

- Direct impact on residents affected by acquisition, noting about half of the corridor has already been acquired for the project
- Direct impact on community facilities due to potential changed access arrangements during construction, such as the Korora school bus interchange
- Impact to agricultural land, including banana or blueberry cultivation
- Temporary impact on the amenity of residents and road users as a result of the construction work
- Temporary changes to access and potential for traffic delays and disruptions near construction work
- Direct and indirect employment opportunities and opportunities for businesses to supply goods, services and materials to the project's construction.

Operation

Once the project is operating it would have the following impacts:

- The amenity of residents in close proximity to the project boundary are likely to be impacted by the presence of increased road traffic noise
- Changes to traffic flows, including movement of traffic onto adjacent local streets close to interchange locations
- Increased severance, either actual or perceived, of communities located to the west of the project
- Community perceptions about changes to air quality and potential health impacts for communities near the tunnel portals
- Potential impact on local businesses and commercial uses in Coffs Harbour urban area would be dependent on the type and nature of individual businesses. Some businesses may be impacted by the diversion of traffic away from the urban area and a reduction in passing traffic. Conversely, the reduction in through traffic including trucks would help to improve local amenity and road safety. This is likely to have a positive impact for some businesses, through improved access for local residents and support for new business functions, such as for tourism.

The project would also have the following benefits:

- Travel time savings between Korora and Englands Road roundabout, as well as the existing Pacific Highway alignment once traffic moves to the bypass
- Improved freight efficiency (diverting freights from existing highway)
- Improved road safety
- Improve urban amenity along the bypassed section of the current highway.
- Improved accessibility to the Coffs Harbour region for regional and local traffic

5 Other environmental issues

5.1 Overview

Other environmental issues listed below are considered to be of lesser consequence taking into account the scope of the project, the existing environment and the implementation of standard and best practice management and mitigation measures. It is considered unlikely that these would be key issues for the project; however, further assessment would be carried out as part of any future environmental impact assessment for the project. Any environmental management and safeguard measures required to minimise and mitigate impacts would be documented as part of the environmental impact statement.

These other issues are:

- Flooding and hydrology
- Non-Aboriginal heritage
- Air quality
- Greenhouse gases and climate change
- Utility infrastructure
- Resource and waste management.

5.2 Flooding and hydrology

5.2.1 Overview

Part of the study area traverses the upper reaches of the Coffs Creek catchment area. Coffs Creek is a relatively small, but highly populated catchment, with the creek being about 12 kilometres long and a catchment area (excluding its northern tributaries) of 24 square kilometres.

Key drainage features of the study area are the two topographic zones as described in the geotechnical desk study and field mapping study undertaken in 2004 as part of route development (Connell Wagner, 2004d). These include the hillside zone (areas above the 50m contour) and the lowland area (areas below 50m contour).

The hillside zone comprises steep slopes and ridges which rise to about 150-250m AHD. Major ridge lines project from the Great Dividing Range such as the prominent ridge to the south of Coramba that ends at Roberts Hill. Numerous drainage channels that typically flow east to the lowland area, incise the hillside area. The majority of the steep slopes and ridges are either forested or used for banana cultivation.

The lowland area is characterised by low undulating residual hills with gentle gradients and alluvial floodplains including backswamps and dunes. Coffs Creek and Newports Creek are the main creeks that cross the area from the upland area in the west to the sea.

The area of potential flooding along the alignment is located on the western side of Spagnolos Road. Coffs City Council has recently constructed a detention basin within land acquired by Roads and Maritime for the project. This detention basin has been designed and constructed in consultation with Roads and Maritime, taking into account the proposed footprint of the bypass project and in particular the Coramba Road interchange.

5.2.2 Potential impacts

Construction

- During construction there may be potential temporary impacts to the recently constructed Spagnolos Road detention basin

- Construction activities would potentially cause hydrological impacts to local creek lines, both directly through construction and indirectly through changes to catchment areas and hydrological flow regimes. Such changes could result in increased or reduced flows within downstream creeks and changes to flood behaviour.

Operation

There would be minimal impacts to flooding and hydrology during the operation of the project given detention basins close to the project alignment have been designed and constructed to take into consideration the proposal.

5.2.3 Proposed further assessment

Further assessment and development of the flooding and hydrology issue would be carried out. This would include, but not be limited to, the following:

- Consultation with the relevant State government departments, council and the community

Consideration of the Coffs Creek Floodplain Risk Management Plan.

5.2.4 Management and safeguard measures

Hydrology and flooding issues are commonly encountered on road projects and can be managed and mitigated through the implementation of standard management measures, which would be informed by the further assessment identified above and detailed in the environmental impact statement for the project. These will include:

- Carrying out hydrology and flood modelling during the concept and detailed design phase, to incorporate these considerations in the project design
- Construction sediment and erosion control plans and construction spill emergency procedures would be implemented as part of the construction environmental management plan (CEMP) for the project.

5.3 Non-Aboriginal heritage

5.3.1 Overview

In 2004, a non-Aboriginal heritage assessment was prepared to assess options and constraints across the study area. A review of this report was carried out in addition to searches of the following registers and databases in October 2015, to identify heritage items in or proximate to the study area:

- Australian Heritage Database
- The State Heritage Register and Inventory
- Roads and Maritime Heritage and Conservation Register
- *Coffs Harbour Local Environmental Plan 2013.*

The assessment and database searches identified that there are numerous heritage places / items listed within the Coffs Harbour Local Environmental Plan and inventory located mainly within the urban area and away from the existing Pacific Highway. It is unlikely these items would be affected by the project.

However, there are two areas of cultural heritage significant listed on the *Register of the National Estate* which lie in close proximity to the bypass corridor. These are the Korora Nature Reserve (registered place) located on the western side of the existing highway at Korora, and the Orara Ornithological Area which is listed as an indicated place.

The Korora Nature Reserve is significant as it provides a small sampling of the ecosystems associated with wet sclerophyll forest of the north coast. The Orara Ornithological Area is located about 5 kilometres north west of Coffs Harbour and is important as an area containing moist hardwood forest supporting high bird diversity.

The *Coffs Harbour Coastal Landscape Heritage Study* (Coffs Harbour City Council 1995), where a community values assessment process was undertaken, identified several places of landscape heritage value in the vicinity of the bypass:

- Sealy Lookout
- Viewing points at Red Hill and Roberts Hill
- The Big Banana.

5.3.2 Summary of issues

Construction

- The bypass alignment will be visible where it passes through the Roberts Hill ridge, however this would be mitigated with a potential vegetation fauna overpass which would be constructed if a cut-and-cover tunnelling methodology was used at this location.
- There could be potential direct impacts on unknown or unidentified archaeological items that may be uncovered, disturbed, damaged or destroyed during construction works.

Operation

- There would be permanent changes to the vistas to and from the bypass alignment as it sits within the Coffs Harbour basin.

5.3.3 Proposed further assessments

Roads and Maritime will carry out an assessment of impact on any State and local historic heritage including archaeology, heritage items and conservation areas. The assessment will:

- Describe the existing non-Aboriginal heritage and archaeological heritage values relevant to the project
- Prepare Statement of Heritage Impact for identified impacted items
- Identify feasible and reasonable mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the measures).

5.4 Air quality

5.4.1 Overview

The project is surrounded by a number of sensitive receivers that are discussed in more detail in Section 4.4

The project is surrounded by a highly urbanised environment and located in the City of Coffs Harbour. A search of the National Pollutant Inventory (NPI) indicates that the existing air quality in the vicinity of the project is primarily influenced by emissions from construction material, waste treatment and disposal and remediation services.

Other sources of emissions in the locality include service stations, domestic/commercial solvents and aerosols and other particulates. The main industry emissions include:

- Total Volatile Organic Compounds
- Particulate Matter 10.0 um
- Carbon monoxide
- Zinc and compounds
- Oxides of Nitrogen.

5.4.2 Potential impacts

Construction

- Temporary increases in dust (particulate matter) during clearing, earthworks, tunnelling and other construction activities. The nature of any increase in dust (and impacts) would depend on the scale of activities, quantities or material handled and proximity to sensitive receivers
- Temporary increases in air quality impacts from emissions, such as exhaust fumes generated through the operation of construction machinery and vehicles.

Operation

- Potential increases in near roadside air pollutant concentrations due to changes in the alignment of the Pacific Highway
- Potential increases in air pollutant concentrations around tunnel portals
- During operations, the project could improve air quality along the existing Pacific Highway as it would remove a substantial number of vehicles from this route.

5.4.3 Proposed further assessment

Further assessment of potential air quality impacts would be carried out. This would investigate, but not be limited to, the following:

- Identification of relevant air quality goals and standards, sensitive receivers, activities and weather conditions potential impacting air quality (particularly given the Coffs Harbour urban area is located in a basin)
- An assessment of air quality impact from proposed construction activities
- An assessment of air quality impact during the operational phase, covering existing and future operational scenarios (noting there may be some improvements along the existing Pacific Highway corridor)
- Identify feasible and reasonable management measures (including dust suppression measures) to be implemented during construction and operation.

5.4.4 Management and safeguard measures

The potential for air quality impact on road projects is common and can be managed through the development of construction management plans and appropriate consideration of air quality issues during detailed design. Roads and Maritime will detail the management measures and safeguards to be implemented during construction in the environmental impact statement. Safeguards would include the implementation of appropriate dust control measures during construction.

5.5 Greenhouse gas and climate change

5.5.1 Overview

The *NSW Climate Impact Profile* (DECCW, 2010) identifies the following projected climate change impacts for the NSW North Coast region:

- By 2050, the climate is virtually certain to be hotter, with rainfall increasing in summer and decreasing in winter. However, changes in weather patterns that cannot be resolved by the climate models mean that rainfall in coastal regions and difficult to simulate
- Run-off and stream flow are likely to increase in summer and autumn and decrease in spring and winter
- Sea level is virtually certain to keep rising
- Soil erosion is likely to increase on steeper slopes in the upper catchments, potentially causing sedimentation on the floodplains. Gully erosion is likely to ease
- Sea level rise is virtually certain to pose a major risk to property and infrastructure developments closest to the shore and on sand spits are most at risk. Increases in brief, heavy rainfalls are expected to increase the likelihood of flooding along urban streams. Towns on coastal plains and near estuaries are likely to suffer additional risk of flooding

- Sea level rise is virtually certain to have a substantial impact on estuarine and foreshore ecosystems. Sea level rise, increased temperatures and changes in hydrology and fire regimes are likely to have a substantial impact on terrestrial and freshwater ecosystems. Vulnerable ecosystems include saline wetlands, low-lying coastal ecosystems and fragmented forests and woodlands in the hinterland.

5.5.2 Potential impacts

Construction

- Construction of the project would generate direct and indirect greenhouse gas emissions.

Operation

- During operation, greenhouse gas emissions would be generated from electricity used for road lighting and the use of equipment, machinery and materials to maintain the carriageway and tunnels
- In addition, the project could be impacted by climate change due to changes in rainfall and intensity and extreme temperatures, which potentially could impact on the safe and efficient use of the bypass and tunnels.

5.5.3 Proposed further assessment

Further assessment and development of greenhouse gas and climate change would be carried out. This would investigate, but not be limited to, the following:

- A greenhouse gas assessment as defined by the *Greenhouse Gas Protocol*
- A climate change risk assessment based on *Draft Australian Standard* (DR AS 5334) *Climate change adaptation for settlements and infrastructure, AS/NZS ISO 31000:2009 Risk management – Principles and guidelines and ISO/IEC 31010:2009 Risk management – Risk assessment techniques*
- Identify feasible and reasonable management measures that may be implemented to reduce greenhouse gas emissions during construction and operation.

5.5.4 Management and safeguard measures

Greenhouse gas and climate change issues are commonly encountered on road projects and can be managed and mitigated through the implementation of standard management and safeguard measures, which Roads and Maritime would detail in the environmental impact statement. These will include:

- Incorporating climate change considerations into the project design
- Minimising vegetation clearance wherever possible
- Minimising waste and re-using materials wherever possible
- Reducing construction transport requirements through use of local staff, resources, suppliers, and landfills wherever possible.

5.6 Utility infrastructure

5.6.1 Overview

The major utilities and services in the vicinity of the project are anticipated to be:

- Water and sewerage infrastructure
- Stormwater infrastructure
- Telecommunications infrastructure
- Electricity infrastructure.

5.6.2 Potential impacts

Construction

- During construction of the proposal existing public utilities and services within or close to the proposal may have the potential to be disrupted or may need to be relocated.

Operation

- It is anticipated any relocations / disruptions to public utilities will be carried out as part of the construction process. All public utilities are anticipated to be appropriately incorporated into the project design, thus there would be expected to be little or no impacts during operation.

5.6.3 Proposed further assessment

Further assessment and development of potential impacts to utilities would be carried out. This would investigate, but not be limited to, the following:

- Utility requirements for the project
- Utilities and services that would be temporarily disrupted or require relocation as a result of the proposal.

5.6.4 Management and safeguard measures

Roads and Maritime regularly work with utility providers in the identification and relocation of services as a result of infrastructure projects. In carrying out this proposal, Roads and Maritime will:

- Consult with utility providers to gain input into the location of and any specific requirements relating to the operation of public utilities
- Notify the community should any service disruptions be required
- Specify standard construction safety protocols.

5.7 Resource and waste management

5.7.1 Overview

The construction of the project has the potential to generate substantial waste materials. Significant quantities of waste materials such as green waste, litter and road infrastructure materials would be generated as part of construction activities. These materials would be collected for off-site disposal at a suitable location by the responsible maintenance contractor.

The project is also likely to require large cut and fill activities and may require importation and/or disposal of large quantities of fill materials.

5.7.2 Potential impacts

Construction

The project would require construction resources and manufactured items during the construction stage, which may include:

- Fill material (eg rock, sand, gravel, sandstone, brick)
- Bitumen and asphalt
- Timber and steel
- Concrete and cement
- Water and fuel
- Soil and plant species for landscaping
- Composite materials
- Manufactured items (eg poles, pipes, cables, signs).

The main waste streams that are likely to be produced during construction of the project are:

- Excavation materials (eg rock, gravel, clay, sand)
- Demolition wastes
- Vegetation wastes
- Packaging materials
- Liquid wastes
- Construction materials.

5.7.3 Proposed further assessment

Further assessment and development of the waste management impacts would be carried out. This would investigate, but not be limited to, the following:

- Identification of the indicative resource requirements for the project and assessment of the resource use impacts of the project
- Identification of specific waste impacts of the project, as well as opportunities to reduce waste (such as the use of recycled materials, bulk delivery of good to minimise packaging and arrangements with suppliers to return any unused construction materials)
- Identification of opportunities to use recycled materials (provided they are fit for purpose and meet engineering requirements)
- Implementation of strategies to minimise the volume of excavated material disposal to landfill.

5.7.4 Management and safeguard measures

Resource and waste management for project construction can be managed and mitigated through the implementation of standard management and safeguard measures, which will be detailed in the environmental impact statement. These would include the following measures:

- Developing a waste management strategy to follow the hierarchy principles of avoid, reduce, reuse, recycle, recover, treat and dispose
- All generated wastes would be managed and disposed of in accordance with relevant State legislation and government policies
- Waste materials would be transport to and from the site by covered trucks where possible
- A waste register would be maintained for the site detailing types of waste collected, amounts, date/time and details of disposal
- The construction contractor would be required to re-use materials where feasible, including materials collected on site
- Solid waste materials awaiting disposal would be appropriately contained and stored in a manner that would ensure they do not escape into the environment
- Training in waste minimisation principles and measures would be provided as part of site inductions.

6 Conclusion

Roads and Maritime Services (Roads and Maritime) is seeking approval to upgrade around 14 kilometres of the Pacific Highway from south of the Englands Road roundabout to the southern end of the recently opened Sapphire to Woolgoolga upgrade project (the project). The project would achieve four lanes of divided highway to a motorway standard and would include bypassing the Coffs Harbour urban area.

The project is needed to address declining transport efficiency, urban congestion and road safety issues caused by the interaction of through and local traffic on the Pacific Highway at Coffs Harbour. The main benefits of the project would include:

- Travel time savings for through and local traffic and the transport industry
- Improved road safety conditions for traffic, pedestrians and cyclists using the existing highway through Coffs Harbour
- Improved freight efficiency
- Improved accessibility to the Coffs Harbour central business district
- A more reliable route that is free of flooding up to 1:100 Annual Exceedance Probability.

The project is declared to be State significant infrastructure under section 115U of the Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act). The project is also declared to be critical State significant infrastructure under section 115V of the EP&A Act as it is considered to be essential to the State for economic, environmental or social reasons. The declarations are made under clause 16 and Schedule 5 of State Environmental Planning Policy (State and Regional Development) 2011.

Accordingly, the project is subject to Part 5.1 of the EP&A Act. The project requires the preparation of an environmental impact statement.

The key environmental issues identified for the project include:

- Traffic and transport
- Visual amenity, built form and urban design
- Noise and vibration
- Biodiversity
- Aboriginal heritage
- Geology, soils and water quality
- Socio-economic, property and land use.

The environmental impact statement will include the following:

- A detailed description of the project including its components, construction activities and potential staging
- A comprehensive assessment of the potential impacts on the key issues including a description of the existing environment, assessment of potential direct and indirect and construction, operation and staging impacts
- Description of measures to be implemented to avoid, minimise, manage, mitigate, offset and/or monitor the potential impacts
- Identify and address issues raised by stakeholders.

7 References

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Appendix A

Requirements of the Environmental Planning and Assessment Regulation 2000

Requirements of the Environmental Planning and Assessment Regulation 2000

Clause 192 of the *Environmental Planning and Assessment Regulation 2000* requires that an application for approval of the Minister to carry out State significant infrastructure must include:

a. details of any approval that would, but for section 115ZG of the Act, be required for the carrying out of the State significant infrastructure, and
b. details of any authorisations that must be given under section 115ZH of the Act if the application is approved, and
c. a statement as to the basis on which the proposed infrastructure is State significant infrastructure, including, if relevant, the capital investment value of the proposed infrastructure.

Approvals that would otherwise apply

Approvals that may be required to carry out the SSI, if not for section 115ZG of the EP&A Act, include:

- Permit under section 201 of the *Fisheries Management Act 1994* for dredging or reclamation work
- Permit under section 90 of the *National Parks and Wildlife Act 1974* for impact on Potential Archaeological Deposits
- Permit for excavation under section 139 of the *Heritage Act 1977*
- A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*

Authorisations if the application is approved

Authorisations that may be required for the project under section 115ZH of the EP&A Act include:

- An environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997* (for any of the purposes referred to in section 43 of that Act)
- A consent under section 138 of the *Roads Act 1993*

State significant infrastructure statement

Clause 14(1) of State Environmental Planning Policy (State and Regional Development) 2011 provides that development is declared to be State significant infrastructure pursuant to section 115U(2) of the Act if it is permissible without development consent under Part 4 of the Act under a State environmental planning policy; and is specified in the categories of development in Schedule 3.

State Environmental Planning Policy (Infrastructure) (ISEPP) permits development for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. As the Coffs Harbour Bypass is for a road and road infrastructure facilities, and is to be carried out by Roads and Maritime, the project is permissible without development consent under Part 4 of the EP&A Act.

The project is declared to be State significant infrastructure under section 115U of the Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act). The project is also declared to be critical State significant infrastructure under section 115V of the EP&A Act as it is considered to be essential to the State for economic, environmental or social reasons. The declarations are made under clause 16 and Schedule 5 of State Environmental Planning Policy (State and Regional Development) 2011.

Accordingly, the project is subject to Part 5.1 of the EP&A Act. The project requires the preparation of an environmental impact statement. Approval from the Minister for Planning is required under section 115W of the EP&A Act.

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