



Transport
for NSW

Moruya bypass

Strategic Corridor Options Report



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Executive summary

Transport for NSW acknowledges the Yuin Nation as the Traditional Owners of the land for which the proposed Moruya bypass travels over and pays respect to Elders past, present and future. Yuin people have lived in the area for thousands of years and have an enduring custodianship and connection over the land and waterways of Eurobodalla.

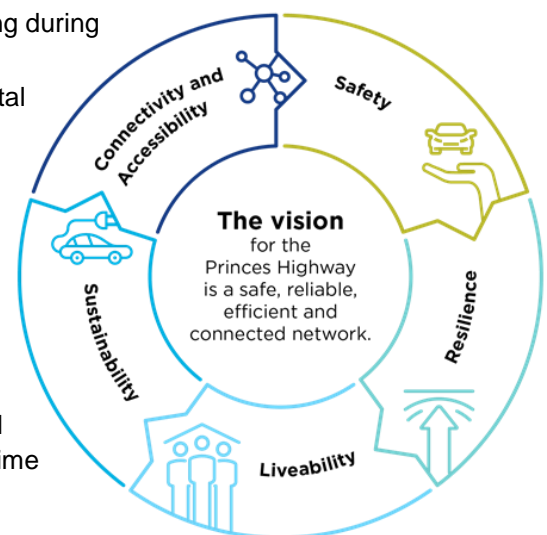
Transport for NSW (Transport) is progressing with plans for a proposed bypass of Moruya and has identified a preferred strategic bypass corridor.

Since 2011, the Australian and NSW Governments have invested \$2.5 billion to upgrading the Princes Highway. This has transformed and better connected communities, employed thousands of local residents, improved safety, eased traffic congestion and grown regional economies. The Australian and NSW Governments have now committed a further \$1.5 billion to upgrade the Princes Highway between Jervis Bay Road at Falls Creek and the Victorian border.

The Moruya bypass is a priority project as part of the Princes Highway upgrade program roadmap to deliver a safe, reliable, efficient and connected transport network.

The Princes Highway upgrade program roadmap is built on five goals:

- **Safety** - Safer for all customers and communities; including during construction and once completed
- **Resilience** – Adaptable to a changing social, environmental and economic context including the ability to quickly recover from major disruption events
- **Liveability** – Gives the town back to the community by contributing to the provision of attractive, healthy places to live, work and play
- **Sustainability** – Socially, environmentally and economically sustainable and unlocks a wide variety of benefits for communities and other customers
- **Connectivity and accessibility** – Provides good physical and digital connectivity and accessibility, including travel time savings and more reliable journeys.



A bypass of Moruya would unlock opportunities to improve Moruya town centre for the benefit of locals, visitors and businesses and complement the appealing, tourist-friendly experience of the town.

Key benefits of the proposed bypass include:

- Reduced travel time and congestion, particularly in peak periods, by removing the need for vehicles to pass through numerous intersections and conflicting traffic movements
- Safer journeys for everyone, including those using the bypass and motorists, cyclists and pedestrians on the local road network
- More efficient freight movement by taking trucks off local roads
- Enhanced amenity and liveability of the town centre, providing the opportunity for improvements to streetscapes, town entrances and community facilities
- Caters for future growth of the town and provides ease of access to employment and essential services such as hospitals and education.

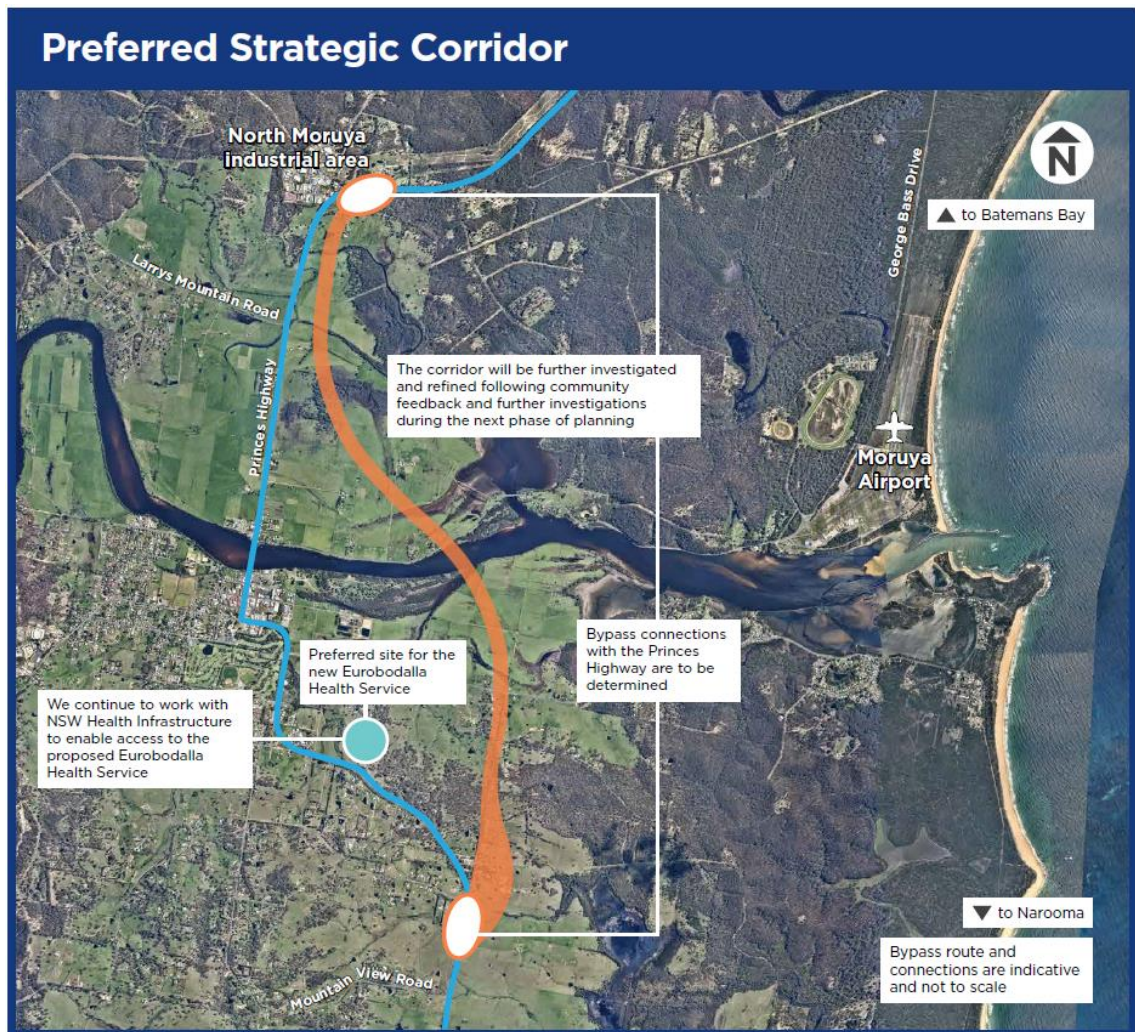
Preferred strategic corridor

The preferred strategic bypass corridor (Orange) is around 8 kilometres in length, starting near Shelley Road, running parallel and to the east of the existing highway to the Larrys Mountain Road intersection.

From Larrys Mountain Road, the corridor veers further east with a new bridge crossing of the floodplain and Moruya River about 2 kilometres east of the existing bridge. South of the Moruya River, the preferred strategic corridor crosses over South Head Road and continues south to re-join the existing highway.

The preferred strategic corridor would provide connections to the local traffic network at the northern end of the corridor near the North Moruya Industrial Estate and southern end near Mountain View Road.

It would also improve travel time and accessibility to the proposed Eurobodalla Health Service, maintaining connectivity during flood events. The southern extent of the corridor is shown as a wider corridor as the connection to the Princes Highway and Eurobodalla Health Service are still to be determined. Transport is continuing to partner with NSW Health Infrastructure as plans for the new Eurobodalla Health Service progress.



Preferred strategic corridor selection process

An extensive strategic corridor options investigation and assessment process was carried out between March 2020 and April 2021. As part of this process, community consultation activities were undertaken during March and April 2020 to give community and stakeholders a chance to learn more about the project, meet with the project team and to have their say.

A Value Management Workshop was held in September 2020 which brought together project team members, technical specialists, and key stakeholders including presentation from local business, Eurobodalla Shire Council, NSW Health Infrastructure, NSW Police and other state government agencies to assess five short listed strategic corridor options. Participants in the workshop considered the project objectives, broad community issues, technical information and a range of corridor options before assessing options against agreed criteria.

Following the Value Management Workshop, additional work was undertaken to assess the issues of crossing a major floodplain.

Additional field work was also undertaken in late 2020 and early 2021. Temporary cameras were installed at various locations in and around Moruya to collect traffic data over the peak 2020/2021 holiday period. Geotechnical investigations and vegetation, local habitat and Aboriginal heritage studies were carried out in early 2021 to get a better understanding of the environmental, Aboriginal heritage and geotechnical conditions of the area.



The Orange corridor is recommended as the preferred strategic bypass corridor following consideration of technical, cost, environmental and risk studies, community and stakeholder input and the outcome of the Value Management Workshop.

Orange was recommended because the corridor on balance best met the project and Princes Highway objectives and the wider Princes Highway upgrade roadmap goals.

- **Safety:** the proposed option would improve safety along the Princes Highway through provision of an upgraded corridor, which includes safety barrier and separates opposing traffic and within the Moruya township by reducing vehicle and freight movements within high pedestrian zones
- **Resilience:** the preferred bypass corridor would improve the flood immunity of the highway and has a low bushfire risk
- **Liveability:** The removal of trucks and through traffic from the Moruya township would improve amenity and liveability, opening up future planning and further possibilities for Moruya as a place and destination. The preferred strategic corridor minimises potential noise impacts and enables future growth of the town, while still providing connections to key destinations. It does not impact Moruya's riverfront parks and supports existing and planned active transport networks
- **Sustainability:** The preferred strategic corridor minimises impacts to bushland areas in the east
- **Connectivity and accessibility:** The preferred strategic corridor on balance improves congestion and journey reliability in town, and reduces travel time on the Princes Highway while maintaining good connections to Moruya and the planned Eurobodalla Health Service.

Next steps

The preferred strategic corridor will be placed on public display until Monday 14 June 2021 to provide the community and stakeholders an opportunity to review the preferred strategic bypass corridor and provide feedback.

Following community consultation, Transport will develop a preferred design option generally within the preferred bypass corridor. Developing the preferred option includes:

- considering community and key stakeholder feedback received on the preferred bypass corridor
- traffic modelling and design to refine the corridor alignment and determine the intersection and connection points along the proposed bypass corridor, including consideration of the proposed Eurobodalla Health Service in consultation with the NSW Health Infrastructure
- site investigations to better understand the geotechnical, flooding and environmental constraints and conditions
- investigations to improve the Moruya town centre and consider impacts to parking, footpaths, cycleways and public transport facilities
- consultation and investigations to better understand potential heritage impacts.

These tasks will allow Transport for NSW to develop a preferred concept design option.

Transport would like to thank the community, customers and stakeholders for their time, thoughts and input to date. Submissions to this preferred strategic corridor are highly encouraged. There will also be further opportunities for the community and key stakeholders to provide feedback as the project progresses.

1 Introduction

1.1 Background

The Princes Highway is critical to a thriving South Coast NSW. It helps drive the state's third largest regional economy, is relied upon by over 500,000 locals, and welcomes almost four million tourists each year. The Princes Highway connects regional centres and essential services and is the main transport corridor for freight to the region.

Since 2011, the Australian and NSW Governments have invested \$2.5 billion upgrading the Princes Highway. This has transformed and better connected communities, employed thousands of locals, improved safety, eased traffic congestion and grown regional economies.

The focus is now on the future, with the Australian and NSW Governments committing \$1.5 billion to upgrade the Princes Highway between Jervis Bay Road at Falls Creek and the Victorian border.

Five priority projects have progressed to the design phase including Jervis Bay Road and Princes Highway intersection, Jervis Bay to Sussex Inlet Road upgrade, Milton Ulladulla bypass, Burrill Lake to Batemans Bay upgrade and Moruya bypass.

1.2 Princes Highway upgrade roadmap

Transport for NSW (Transport) has developed a strategic roadmap for the Princes Highway upgrade. It is Transport's plan for the highway over the next 20 years and identifies what needs to be done in the short, medium and long term to deliver a vision for the Princes Highway as a safe, reliable, efficient and connected network.

Transport worked with the community and key stakeholders including Local Government, NSW Government agencies, growing, emerging and established industry and carried out socio-economic analysis and transport studies to understand how customers will move in the future and how a highway can better contribute to the places and economies it serves.

Visit princeshighway.nsw.gov.au/roadmap2040 for more information on how the priorities were identified.

The vision is for a highway that enables the movement of people and goods and supports sustainable growth of the local economy, employment opportunities and population.

It would contribute to the character of the places it serves and be resilient to adapt to natural hazards and climate change, respond to changing land use and support new technologies, new industries and economic trends.

The roadmap is built on five goals:

Safety: A safer corridor for all customers and communities including local traffic, freight, tourists, and public and active transport users.

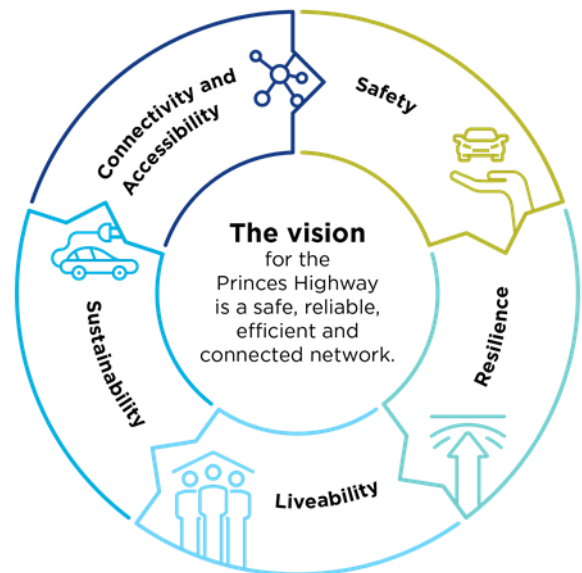
Resilience: A corridor that can be efficiently managed and maintained while adapting to changing social, environmental and economic factors including the ability to quickly recover from natural disasters and respond to changing land use and technologies.

Liveability: A corridor that supports communities by connecting and contributing to providing attractive and healthy places to live, work and play.

Sustainability: A corridor that is socially, environmentally and economically sustainable and unlocks a wide range benefits for communities and other customers.

Connectivity and Accessibility: A corridor that has good physical and digital connectivity and accessibility, for access to opportunity and services.

The roadmap aligns with the Future Transport 2056 strategy and the Regional NSW Services and Infrastructure Plan. This will ensure the future of the Princes Highway delivers the key outcomes and priorities for regional transport throughout the state.



1.3 Project overview

Moruya is located about 25 kilometres south of Batemans Bay and about six kilometres inland. It is the local government and services centre for the Eurobodalla Shire Council (ESC) and has a regional airport, hospital, three schools and a TAFE. The location for the new Eurobodalla Health Service has been announced in south east Moruya.

The proposed upgrade to the Princes Highway would deliver a better connected and more mobile regional centre, deliver a more resilient transport network, improve safety, ease congestion and help grow the regional economy. A bypass of Moruya would also unlock opportunities for other modes of transport and contribute to making Moruya a more attractive and healthy place to live, work and play.

Prior to identifying a preferred strategic bypass corridor, Transport carried out initial community consultation in early 2020 to understand concerns with the existing transport network and how the community want to move in the future. Feedback received from the community focussed on suggestions on the location of the proposed bypass, potential environment and socio-economic impacts, traffic and transport and the need to integrate with the proposed Eurobodalla Health Service. For further information, refer to the [Moruya Bypass Community Consultation Report \(August 2020\)](#).

1.4 Project Investigation Area

The location of the project is shown in Figure 1-1 and the investigation area is shown in Figure 1-2.

The project investigation area includes about 13 kilometres of the Princes Highway north and south of Moruya within the Eurobodalla Shire Council local government area (LGA), about 300 kilometres south of Sydney and about 175 kilometres south-west of Canberra.

Moruya township is largely located south of the Moruya River with a smaller residential and commercial area located immediately north of the river and North Moruya Industrial Estate located off the Princes Highway about 3 kilometres north of the town centre. The land north of Moruya River consists of primarily agricultural land on the floodplain to the west of Malabar Creek Lagoon and large areas of native vegetation to the east. The land south of Moruya River consists of the main commercial and residential areas of Moruya and a smaller area of agricultural land to the south-east of Racecourse Creek.

The Moruya River and its tributaries Dooga Creek, Malabar Creek and Racecourse Creek are the main waterways within the investigation area. The Moruya River at Moruya is a wide, tidal river that is popular for recreational and commercial activities as well as the tourism and aquaculture industries. The Moruya River and Malabar Creek are key community resources and host a range of recreational activities such as boating and swimming. The proximity of Moruya Airport allows float planes to use the river for scenic flights, training operations and aerial firefighting.

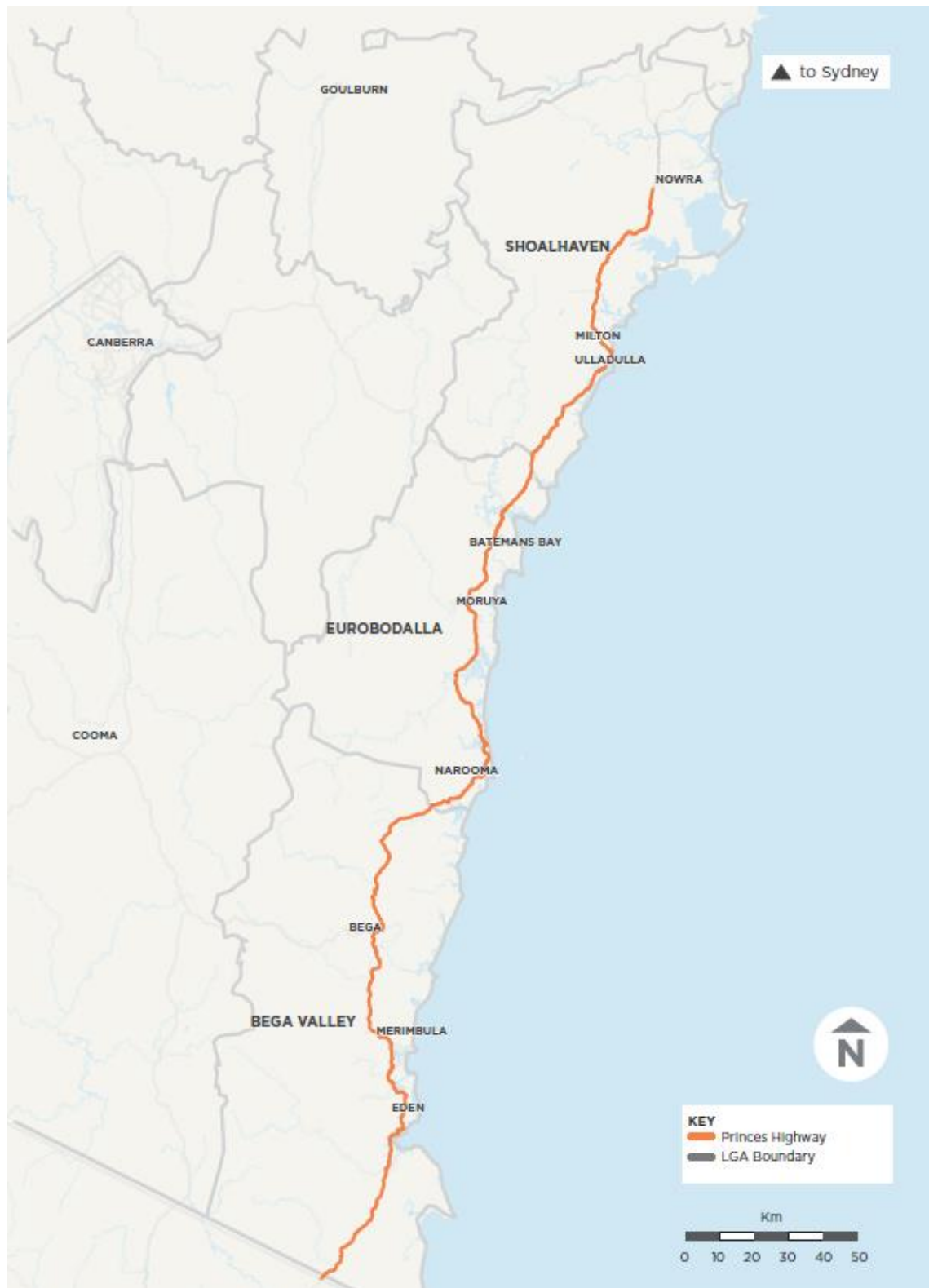


Figure 1-1: Moruya bypass regional context

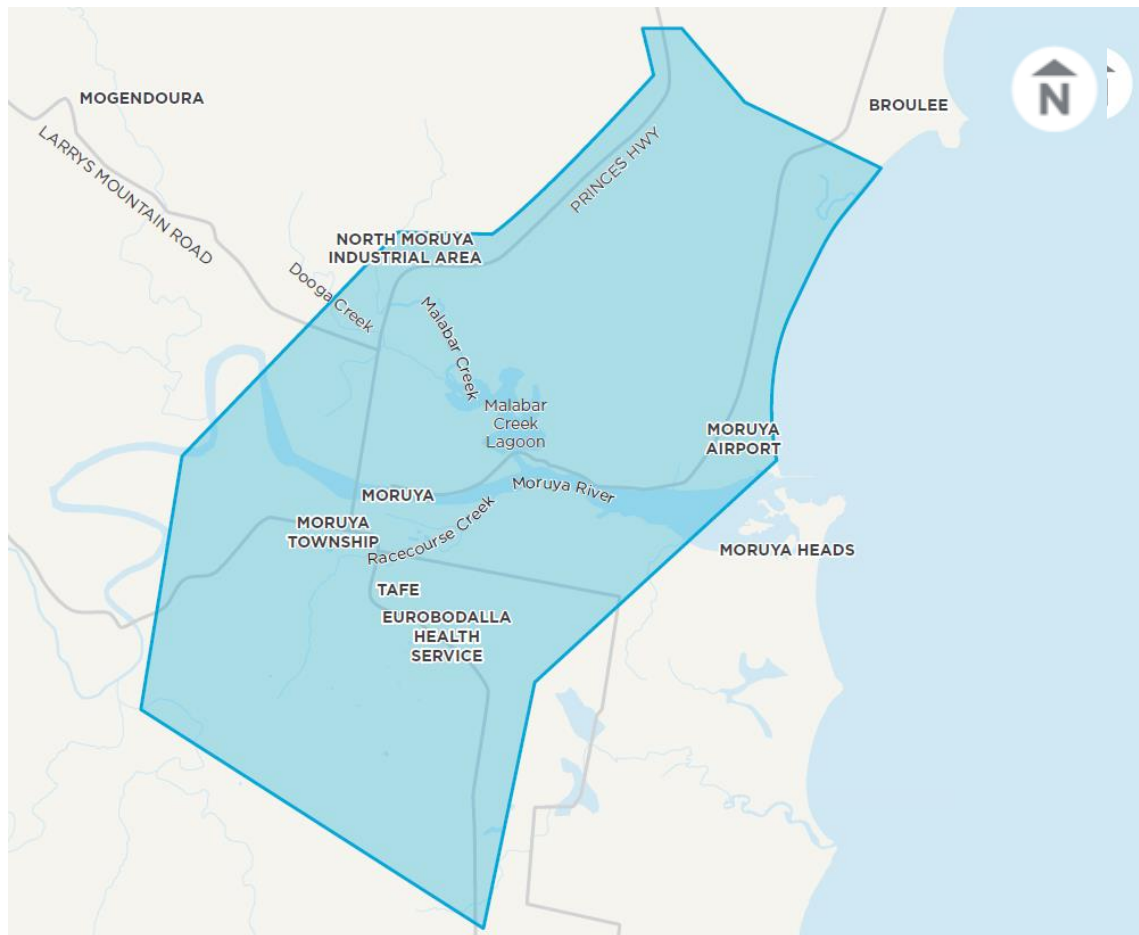


Figure 1-2: Moruya bypass investigation area

1.5 Purpose of this report

The purpose of this report is to document the process followed for the development and assessment of corridor options and recommendation of a preferred strategic corridor.

Need for the proposal – An overview of the service need, problem statement, customer definition and strategic alignment for the project (refer to Section 2).

Identification of key considerations and constraints – An assessment of key constraints and design requirements that were considered in the development of preliminary corridor options (refer to Section 3).

Community involvement and feedback – A summary of community and stakeholder engagement to date (refer to Section 4).

Assessment of strategic alternatives – The overarching strategic alternatives for the project that were considered (refer to Section 5.2).

Identification and evaluation of a long list of strategic corridor options – Development and assessment of 11 preliminary corridor options to identify a shortlist of 5 strategic corridor options (refer to Section 5.3 and 5.4).

Development and evaluation of shortlisted strategic corridor options – Development, assessment and further work undertaken of 5 shortlisted corridors to reach a preferred strategic corridor (refer to Section 5.5, 5.6 and 6).

2 Need for the proposal

2.1 Service need and problem statement

2.1.1 Context

The Princes Highway and the Princes Motorway together form the primary road transport corridor connecting Sydney and the Illawarra region with the NSW South Coast and beyond into Victoria. This corridor provides a key local connection between villages, towns, and regional centres like Nowra, Batemans Bay, and Bega; and facilitates the movement of freight both along the NSW South Coast, as well as to the west via connections to the Kings Highway and Snowy Mountains Highway.

Moruya is surrounded by areas of high environmental and heritage value, including protected wetlands, conservation areas, threatened vegetation, the Moruya quarry (from which the granite for Sydney Harbour Bridge was sourced), Batemans Marine Park and Aboriginal conservation areas.

Moruya is the hub of the Eurobodalla LGA. It is the centre for administration, agricultural activities, medical services, sporting facilities, education and learning. The weekly Sustainable Agriculture and Gardening Eurobodalla (SAGE) farmers' market, held at Riverside Gardens, attracts visitors from within the region and provides a unique attraction for tourists.

The 13 kilometre section of the Princes Highway between Broulee Road and Donnelly's Road predominantly consists of an undivided road with one lane in each direction that passes through the Moruya town centre.

2.1.2 Planned Development in Moruya

The future growth of Moruya and its surrounds is supported through a series of current and planned developments that will enhance the amenity and liveability of the town and improve access to essential services.

One such development is the new Eurobodalla Health Service. The NSW Government has committed \$200 million towards the development of the new Eurobodalla Health Service, to build a sustainable, modern and purpose-built facility to support the healthcare needs of the Eurobodalla Shire from Narooma to Batemans Bay. The new Eurobodalla Health Service will use the latest health care solutions and models of care to deliver patient-centred health services closer to home. In May 2020 the Clinical Services Plan (CSP) was endorsed by the Ministry of Health and site selection process commenced. The site selection process involved consultation with the community, local Aboriginal groups and key stakeholders such as health service staff, visiting medical officers, Eurobodalla Shire Council and Transport for NSW and was evaluated against a range of assessment criteria including location of population growth areas, flood and bushfire zones, capacity for future expansion, transport, and access to and from key infrastructure. The recommended site from the site selection process was identified in south-east Moruya.

Another is the redevelopment of Moruya Airport to increase capacity, improve passenger experience and expand commercial and tourism opportunities. Completed works include expansion of the terminal, apron and taxiway extension and runway strengthening. In 2015,

Eurobodalla Council adopted a masterplan which will guide redevelopment of the airport over a 30-year period. Council has secured funding of \$9.73 million towards the progressive upgrade of Moruya Airport, including improvements to the terminal and road access, utility infrastructure upgrades, runway and lighting upgrades, and improved passenger and airport parking facilities.

The Moruya Library, Arts and Cultural Centre has recently been extended to incorporate an Exhibition Centre with new public meeting spaces and the intention to host additional learning and business activities to support the local community.

Expected growth in housing and jobs, including residential and industrial development is likely to drive population growth and the need for additional infrastructure to serve the growing community. This is also expected to increase traffic volumes, adding demand to the local and regional road network.

2.1.3 The problem

There are a number of problems with the current location and function of the Princes Highway that affect the safety, resilience, liveability, sustainability and accessibility and connectivity for Moruya and its surrounds.

Safety

Between 2014 and 2018 there were 19 crashes on the Princes Highway within the investigation area. These crashes included one fatal and nine serious crashes that resulted in two fatalities and 14 seriously injured people. 10 of the 19 crashes occurred within the lower speed environment (posted 50km/h limit) through town with pedestrians involved in three crashes across the analysis period. This has resulted in a crash rate and severity index that is generally higher than the state average for the same class of road.

Resilience

There are significant floodplains to the north and south of the river, and the community experiences frequent flooding events and evacuations. Moruya is situated within a bushfire prone area and the lack of alternative routes can critically hinder the emergency response.

Liveability

The Princes Highway is an important movement corridor that passes through Moruya's main street (Vulcan Street). Within the town, there are several intersections, slow moving traffic, parking along the sides of the road and pedestrian movements accessing local services, including schools, retail and a health centre. Heavy vehicles travelling through must negotiate three roundabouts. Although the speed limit reduces to 50 km/h through the town, Moruya's urban amenity and safety is diminished, with pedestrians and cyclists mixing with local and long-distance traffic.

Sustainability

Moruya is characterised by farming land along the river plain and a strong historic town centre, surrounded by natural landscapes with areas of high environmental and heritage value. The Moruya River is the key natural feature running west-east across the investigation area. The wide river corridor and flood plain dominates the landscape around Moruya, characterised by agricultural fields and small forestry plots. Long distance views to the surrounding mountains are also evident beyond the fields and trees.

A proposed Moruya bypass must also be able to support economic prosperity for the region including jobs, particularly during the economic recovery from the 2019/20 bushfires and the subsequent COVID-19 pandemic.

Connectivity and Accessibility

Moruya experiences congestion, queuing and delays during peak times and holidays, due to the highway travelling through the town centre. Some intersections have poor performance, and there are parts of the network that are not efficient.

A bypass is needed to separate through traffic from local trips, in order to improve these trips and to allow efficient access to and from key trip generators such as the new Eurobodalla Health Service, the North Moruya industrial area, and jobs in other towns such as Batemans Bay. Separating local and through trips will also support active transport in the town by reducing traffic volumes. Better infrastructure and digital infrastructure connectivity is also needed to enable the implementation of other transport options and future transport such as on-demand services.

2.2 Customer types and needs

Transport for NSW is committed to putting the customer at the centre of everything we do. This is guided by our key strategy and policy documents, Future Transport 2056 and Connecting NSW 2016-2021. To achieve this commitment, it is important to understand our customers and their transport needs. This involves considering how their travel behaviours and needs change over time. For example, how they travel at various times of day and night for different purposes or how emerging technologies may influence their travel behaviour. Understanding our customers is critical for enabling us to connect their whole lives by balancing movement within, to, from and through places, and creating safer environments within which to travel by any transport mode.

2.2.1 Transport network function

The travel behaviour of existing customers provides insight into their current travel needs. This information can also be used to identify opportunities to influence the travel behaviour of customers. In planning for the Moruya bypass, there are two primary functions of the transport network:

- Travel within and to Moruya town centre and surrounds (town centre trips)
- Travel through Moruya to other regional centres (bypass trips).

2.2.2 Customer types

Data from the Australian Bureau of Statistics (2016) indicates that Moruya has a population of 3,606 people. There is a total Indigenous population of 263 people or 7.3%. The average age of the population is between 45-54 years and there is a higher proportion of people aged 55 and over than NSW averages suggesting an aging population.

Moruya falls within the Eurobodalla Shire Council LGA, this LGA is home to a total of 11,983 jobs. The top three industries of employment in the Eurobodalla LGA are Health Care and Social Assistance (15.7%), Retail Trade (14.9%) and Accommodation and Food Services (11.6%).

Based on the identified land use, landscape and socio-economic context, Moruya is considered to contain the following key customers:

- Local families and communities using the Princes Highway for access to education, recreation and local services in Moruya (or travelling through to other larger centres such as Batemans Bay). These trips are by private vehicle, public transport and active transport
- Commuters, travelling to Moruya or other towns such as Batemans Bay for employment from nearby residential areas. These trips are by private vehicle, public transport and active transport
- Businesses, making frequent trips to service households, industry and business more generally. These trips are generally by private vehicle or light and heavy trucks
- Tourists (retirees, domestic and international travellers) travelling through to/from Batemans Bay, and/or travelling further north/south to access tourism opportunities. These trips are generally by private vehicle, and can be by public transport
- Freight travelling to, from and through Moruya from agricultural/forestry areas to processing plants to the north around Nowra, and further south to Eden. These trips are generally by heavy trucks.

In addition to customers using the transport network, the following indirect customers have been identified:

- Users of Moruya River, for example boaters, seaplane operator, emergency services, other tourism operators, oyster leases, fishing, recreation, moorings; that need access to the river
- Users of Moruya Airport, for example airlines and aviation businesses that need airport clearances, access and requirements to be met, while allowing for the current and future redevelopment of the airport.

2.2.3 Key customer needs

Customer needs have been identified for each travel function (town centre and bypass) within the five Princes Highway corridor goals in Table 2-1.

Table 2-1: Customer needs by goal

Goal	Customer needs
Safety	All customers need: <ul style="list-style-type: none"> • A safe journey for all trips and transport modes • Safe access, intersection and road design.
	Town centre customers need: <ul style="list-style-type: none"> • Safe and efficient points of access to the bypass • Safe pedestrian and cycling connectivity • Safe spaces for public transport connections • A safe town traffic environment.
	Bypass customers need: <ul style="list-style-type: none"> • A safe road environment that reduces the likelihood and severity of crashes • Regular, accessible and safe rest areas for heavy and light vehicles • A safe travel environment for freight vehicles.

Goal	Customer needs
Resilience	<p>All customers need:</p> <ul style="list-style-type: none"> • A reliable transport network during emergency situations, including traffic emergencies, flooding and bush fires • A transport network that can respond to climate change impacts including rising sea levels and more frequent extreme weather events • Real-time travel and route information, including during emergency events • A transport network that integrates with the Princes Highway Emergency Route Management Plan.
	<p>Town centre customers need:</p> <ul style="list-style-type: none"> • Access to emergency evacuation routes.
	<p>Bypass customers need:</p> <ul style="list-style-type: none"> • Emergency stopping bays and crossing and turnaround points for use during emergencies • Improved flood immunity • A corridor that can respond to future evolving technologies.
Liveability	<p>All customers need:</p> <ul style="list-style-type: none"> • The opportunity to benefit economically from construction activity, including job creation.
	<p>Town centre customers need:</p> <ul style="list-style-type: none"> • A vibrant and prosperous town centre with a unique sense of place • Minimal disruption from construction activity and noise impacts • Access to affordable transport service options, such as public and active transport that are safe, connected and convenient • Improved amenity through a reduction in heavy vehicles and congestion in town.
	<p>Bypass customers need:</p> <ul style="list-style-type: none"> • An enhanced journey from and to Moruya and the surrounding region • Places to have breaks • Good connectivity to Moruya for breaks, tourism activities, meals and overnight stays, connecting them to an enhanced experience of the place.
Sustainability	<p>All customers need:</p> <ul style="list-style-type: none"> • Integration of the corridor with environmental and heritage values within the region and local area • Access to alternative and sustainable modes of transport • A transport network that reduces its carbon footprint and reduces waste throughout the infrastructure lifecycle • A transport network that supports the diversification of tourism and business offerings, and economic prosperity.
	<p>Town centre customers need:</p> <ul style="list-style-type: none"> • A bypass corridor that supports existing and proposed land uses, including residential, industrial and the proposed Eurobodalla Health Service • Access to shops along the main street • Support of environmental values.

Goal	Customer needs
	Bypass customers need: <ul style="list-style-type: none"> Way-finding signage and ease of connections to town to encourage people to stop and support the economy of Moruya.
Connectivity and Accessibility	All customers need: <ul style="list-style-type: none"> Improved travel time and journey time reliability Wayfinding and signage to key destinations with real time information Seamless digital connectivity Electric vehicle charging stations Connectivity to health, community, emergency services and public transport facilities, including the Eurobodalla Health Service.
	Town centre customers need: <ul style="list-style-type: none"> Convenient and reliable public transport Drop off zones and parking for commuters and community services Pedestrian and cyclist paths Efficient access to the highway.
	Bypass customers need: <ul style="list-style-type: none"> Connectivity between major centres, state roads and distribution centres Areas for freight vehicles to couple and decouple.

Planning for the Moruya bypass would also consider:

- A potential increase in dispersed work-from-home workforce following COVID-19, which has enabled relocation to areas outside the major centres of Sydney and Canberra.
- Provision for additional tourist facilities to support the general trend of greater accessibility to and likely increase in domestic travel in response to COVID-19 and international travel restrictions.

2.3 Proposal objectives

Project goals and objectives have been developed for the Moruya bypass project that complement the five Princes Highway upgrade roadmap goals (refer to Section 1.2). The project objectives were developed by considering the program goals, as well as community feedback received to date. They were then further refined and tailored to the specific requirements of Moruya bypass by the project team. The objectives were endorsed by Transport and key stakeholders before being used to assess corridor options.

This project goals and objectives are summarised in Table 2-2.

Table 2-2: Moruya bypass goals and objectives

Goal	Objectives
Goal 1 – Safety A safer transport network for all customers and communities; and for all phases of the project lifecycle.	<ul style="list-style-type: none"> Objective 1.1 – Work towards zero fatal and serious injury crashes across the transport network and for all modes; both for the highway and within the township.
	<ul style="list-style-type: none"> Objective 1.2 – Deliver safety in design, keeping our people, industry partners and customers safe during construction, operation and maintenance of the transport network.

Goal	Objectives
Goal 2 – Resilience A transport network that is adaptable to a changing social, environmental and economic context including the ability to quickly recover from major disruption events.	<ul style="list-style-type: none"> Objective 2.1 – Improve the transport network's ability to respond to emergencies including bushfires and flood. Objective 2.2 – Future-proof the transport network against climate change impacts including flooding and sea level rise. Objective 2.3 – The transport network is able to respond to future evolving technologies and requirements.
Goal 3 – Liveability A transport network that gives the town back to the community by contributing to the provision of attractive, healthy places to live, work and play.	<ul style="list-style-type: none"> Objective 3.1 – Provision of a transport network that contributes to and reinforces Moruya town centre as a place. Objective 3.2 – Protect and maintain natural and open spaces. Objective 3.3 – Support mode shift and health and wellbeing outcomes for Moruya. Objective 3.4 – Support access to affordable transport services and a range of housing options.
Goal 4 – Sustainability A transport network that is socially, environmentally and economically sustainable and unlocks a wide range of benefits for communities and other customers.	<ul style="list-style-type: none"> Objective 4.1 – Support existing environmental values and the continued ecological function of the surrounding environment. Objective 4.2 – Support a circular economy approach to resource and waste management. Objective 4.3 – Support economic prosperity in the region. Objective 4.4 – Support growth in employment opportunities. Objective 4.5 – Support the expansion and diversification of tourism into the region in a sustainable way.
Goal 5 – Connectivity and Accessibility A transport network that provides good physical and digital connectivity and accessibility.	<ul style="list-style-type: none"> Objective 5.1 – Improve access to a range of transport modes and connectivity to employment, services, retail and recreation for all customers. Objective 5.2 – A solution that facilitates accessibility to the Eurobodalla Health Service (new hospital). Objective 5.3 – Provide digital and communications infrastructure to support access and connectivity.

2.4 Strategic alignment

The proposal is consistent with relevant strategic planning documents, as described in Table 2-3.

Table 2-3: Strategic alignment of the proposal

Strategic plans	Strategic alignment of the proposal
Future Transport 2056 (TfNSW 2018b)	<p>The proposal contributes to achieving several of the key objectives including:</p> <ul style="list-style-type: none"> Supporting the 'hub and spoke' regional transport network, as well as the strategic centres of Nowra, Ulladulla, Batemans Bay, Moruya and Bega Adopting a safe systems approach to the design and delivery of the bypass to contribute to achieving the 'Towards Zero' target of zero deaths and serious injuries Applying the 'Movement and Place' Framework to inform decision-making on the corridor in a way that supports safe, efficient and reliable journeys while enhancing the liveability and amenity.
Future Transport 2056 – Regional NSW Services and Infrastructure Plan (TfNSW 2018c)	<p>For regional NSW, Future Transport 2056 is supplemented by the Regional NSW Services and Infrastructure Plan which describes the necessary initiatives required in the short, medium and long term to meet customer needs now and into the future.</p> <p>The proposal contributes to the commitment of investigating upgrades of the Princes Highway between Jervis Bay Road and Moruya. The proposal also supports the target to increase in public and active transport use across regional NSW by reducing traffic volumes within the Moruya town centre and providing the opportunity for improving footpaths, cycleways and public transport infrastructure.</p>
Connecting to the future – Our 10 Year Blueprint	<p>The Proposal contributes to the following key outcomes of the blueprint including:</p> <ul style="list-style-type: none"> It provides safe, seamless journeys for people and goods It forms a transport investment that services the people of NSW It delivers a quality asset and efficient network, by improving the highway to current standards and guidelines that mean it can be effectively managed at the right price in the future.
NSW Road Safety Strategy – 2021 (TfNSW 2018d)	<p>The proposal contributes to the commitment of reducing fatal and serious injury crashes on rural roads by addressing known safety risks within the corridor bypassing the town. It applies a Safe Systems approach to transport planning and design. This means the proposal is designed using a holistic view to assess, guide, and review travel safety to reduce risks for all road users.</p>
NSW Freight and Ports Plan 2018 – 2023 (TfNSW 2018a).	<p>The proposal supports the plan by:</p> <ul style="list-style-type: none"> Enhancing productivity by improving freight movement efficiency and travel times along the Highway Increasing use of safer and more productive vehicles Enabling regional growth by helping improve regional connectivity and access aligned with the 'hub and spoke' model Reducing fatalities and serious injuries from crashes involving heavy vehicles or light trucks aligned with 'towards zero' outcome.

Strategic plans	Strategic alignment of the proposal
Princes Highway Upgrade – Roadmap 2040	<ul style="list-style-type: none"> Transport for NSW has developed a roadmap for the Princes Highway upgrade. The roadmap sets out a plan for the Highway to 2040. This includes identifying the Moruya bypass as a priority to create a safer and more efficient journey along the Highway. The Moruya bypass has been developed to support to the five roadmap goals of safety, resilience, liveability, sustainability and connectivity and accessibility.
South East and Tablelands Regional Plan – 2036	<p>The proposal supports the four goals set in the Regional Plan.:</p> <ul style="list-style-type: none"> It helps deliver a connected and prosperous economy by prioritising freight movement while also improving the amenity, safety, liveability, and attractiveness of Moruya It offers the opportunity to maintain connectivity between important communities and habitats in the area, termed biodiversity corridors It helps support healthy and connected communities by improve the amenity of the regional towns while promoting walking and cycling It indirectly supports delivering environmentally sustainable housing choices through its broader sustainability goals.
Tourism and Transport Plan (NSW Government 2018a)	<p>The proposal supports the plan by:</p> <ul style="list-style-type: none"> Providing greater access to more of NSW by offering more travel time certainty and removing the congestion and delays through Moruya Providing the means to identify Moruya as a destination along the highway so that people can stop and enjoy its improved amenity Offering a seamless experience when travelling along the Highway by avoiding the need for people to adjust from travelling along a highway to an urban town environment.
NSW South Coast Marine Tourism Strategy (NSW Government 2019)	<p>The Proposal aligns with Strategic Direction 4: Tourism Activation of the Marine Environment by improving accessibility to the South Coast from Sydney.</p>

3 Proposal considerations and constraints

3.1 Statutory and planning framework

This section outlines the statutory and planning framework for the proposal and considers the provisions of relevant Commonwealth, State and local legislation, plans, and policies.

3.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal piece of legislation governing land use planning and development in NSW. It includes provisions to ensure that environmental impacts of a development are assessed and considered in the decision-making process. The approval of infrastructure proposals is covered under Division 5.1 and Division 5.2 of Part 5 of the EP&A Act.

If the proposal is determined and approved under Division 5.1 of the EP&A Act, a Review of Environmental Factors (REF) would be prepared with Transport for NSW being the proponent and determining authority.

If the proposal is classified as State Significant Infrastructure, it would be assessed and approved under Division 5.2 of the EP&A Act and an EIS would be prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning, Industry and Environment (DPIE). The Minister for Planning and Public Spaces is the approval authority for State Significant Infrastructure.

3.1.2 State Environmental Planning Policies

Various environmental planning instruments are made under the EP&A Act. This includes State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs). Both address planning issues respectively at the State and local level. The key SEPPs relevant to the proposal are described below.

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State. Clause 94 of the ISEPP permits development for the purpose of a road or road infrastructure facilities to be carried out on any land by or on behalf of a public authority without consent.

As the proposal is for a road or road infrastructure facilities and is to be carried out by or on behalf of Transport for NSW, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

Part 2 of ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development.

State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP) promotes an integrated and coordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the NSW *Coastal Management Act 2016*.

Land identified by the CM SEPP as 'coastal wetlands' and 'proximity area for coastal wetlands' exist in the investigation area adjacent to the Moruya River and Malabar Lagoon. As defined under Clause 10 of the CM SEPP, various activities including clearing, earthworks, draining of land require development consent under Part 4 of the EP&A Act when proposed to be carried out within coastal wetlands.

Works within coastal wetland areas would be classified as designated development under Part 4 of the EP&A Act which requires preparation of an EIS and development consent by Eurobodalla Shire Council. The environmental assessment would also consider the significance of impacts on land in proximity areas to coastal wetlands to ensure that the development would not significantly impact on the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or the quantity and quality of surface and groundwater flows to and from the adjacent coastal wetland.

Environmental protection works also require development consent, however as they are intended to limit environmental impacts, they are not classified as designated development.

Clauses 13 and 14 of the CM SEPP set out matters to be considered by a consent authority before approving development in a defined 'coastal environment area' and 'coastal use area'. While these clauses are not directly applicable to infrastructure approved under Part 5 of the EP&A Act, the matters referred to in these provisions would still be considered as part of the environmental assessment.

State Environmental Planning Policy (Koala Habitat Protection) 2020 and 2021

State Environmental Planning Policy (Koala Habitat Protection) 2020 and 2021 aim to help reverse the decline of koala populations and encourage the conservation and management of areas of natural koala habitat. The SEPPs set specific controls limiting development in potential koala habitat areas. This applies to a range of local government areas (LGAs) including Eurobodalla Shire Council.

The requirements of these SEPPs do not apply to infrastructure approved under Part 5 of the EP&A Act. They only apply to development consented under Part 4 of the EP&A Act. This means the SEPPs apply to those sections of the investigation area that fall within the coastal zone defined under the CM SEPP.

While the SEPPs' provisions would be considered in the development application made to Eurobodalla Shire Council they would still be critical to the wider proposal in assessing and aiming to avoid or offset potential koala habitat impacts while aiming to respond to the council's Plan of Management and supporting controls surrounding development near or within koala habitat.

3.1.3 Other relevant legislation and environmental planning instruments

The following legislations and policies are also relevant to the proposal and/or investigation area.

Eurobodalla Local Environmental Plan 2012

The investigation area is located within the Eurobodalla Shire Local Government Area (LGA). Local land use and development within the LGA is mainly controlled by the corresponding Local Environmental Plan 2012 (Eurobodalla LEP). The LEP identifies local land use zones in the investigation area. Local planning and development control objectives are associated each zone. This describes what land uses and development activities are permissible or prohibited in each zone.

The LEP's policies and development controls do not apply to infrastructure approved under Part 5 of the EP&A Act. However, local land use policy is important in assessing potential land use conflict and is something that would be considered in the environmental assessment.

National Parks and Wildlife Act 1974

The NSW *National Parks and Wildlife Act 1974* (NPW Act) provides the basis for the protection and management of National Parks Estate and Aboriginal sites, objects, and heritage values in NSW.

There are no National Parks within the investigation area, however there are National Parks within close proximity. The Eurobodalla National Park is the closest, located about 300 metres to the east. The Deua National Park is the next closest. It is located about one kilometre west of the investigation area.

Section 86 of the NPW Act lists offences relating to harming or desecrating Aboriginal objects. Under Section 90 of the Act an Aboriginal Heritage Impact Permit (AHIP) is typically needed where harm to an Aboriginal object or Aboriginal place cannot be avoided.

There are known Aboriginal heritage sites within the investigation area. The potential for the proposal to impact on Aboriginal heritage would be considered during the environmental assessment.

Forestry Act 2012

The NSW *Forestry Act 2012* (Forestry Act) provides for the dedication and revocation of State Forests in NSW and the regulation of forestry and non-forestry activities within dedicated State Forests, Timber Reserves and Flora Reserves. The Forestry Act also establishes the Forestry Corporation of NSW. The Corporation is responsible for managing forestry activities within State Forests.

The investigation area includes part of Mogo State Forest. This is categorised as Forest Management Zone 4 – General Management Zone. The Forest is mainly used for timber production. The revocation of the State Forest status may be needed if any land designed under the Forestry Act is affected. This may involve a resolution or Act of Parliament.

Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2016* (BC Act), together with the Biodiversity Conservation Regulation 2017, provides the strategic approach to biological conservation in NSW and is a mechanism to address impacts on biodiversity from land clearing associated with development. Under this legislation, there are provisions for the risk-based assessment of native plant and animal impacts.

Based on preliminary investigations, several threatened ecological communities and threatened flora and fauna species listed under the BC Act have been identified or are likely to occur within

the investigation area. The potential for the proposal to impact on threatened species, populations and ecological communities listed under the BC Act would be considered during the environmental assessment.

Coastal Management Act 2016

The NSW *Coastal Management Act 2016* promotes the strategic and integrated management, use and development of the coastal environment in an ecologically sustainable way for the social, cultural, and economic well-being of the people of NSW. The investigation area encompasses areas of coastal wetland defined under the *Coastal Management Act* and would trigger the provisions relating to the CM SEPP.

Marine Estate Management Act 2014

The NSW *Marine Estate Management Act 2014* provides for strategic and integrated management of the whole marine estate of NSW and the declaration and management of Marine Parks and Aquatic Reserves.

The Act requires that a determining authority must not carry out or approve an activity within or in the locality of a Marine Park without considering the relevant matters identified in Sections 55 and 56 of the Act.

The investigation area is within the Batemans Marine Park. Under the Batemans Marine Park Operational Plan (DPI, 2010), Malabar Creek is mapped as a Sanctuary Zone. This provides the highest level of protection for habitats, animals, plants, and areas of cultural significance. The Moruya River is listed as a General Use Zone. This provides for effective management through a wide range of ecologically sustainable uses.

Consultation with the Batemans Marine Park Authority would be needed under Section 55 and Section 56 of the Act to ensure the appropriate management rules are implemented. A Marine Parks Permit would also be needed if the proposal involves carrying out work within the limits of the Park. This would require the environmental assessment to comply with the criteria identified in Section 5 of the NSW Marine Estate Management Regulation 2017.

Fisheries Management Act 1994

The NSW *Fisheries Management Act 1994* (FM Act) aims to conserve, develop, and share the fishery resources for the benefit of present and future generations. Any proposals to carry out work in watercourses requires assessment against the requirements of the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013) and *Why Do Fish Need to Cross the Road?* (Fairfull and Witheridge 2003).

Schedules 4, 4A and 5 of the FM Act list species, populations and ecological communities that have been identified as being endangered, critically endangered and vulnerable to extinction. If any of these protected values maybe impacted by an activity, an assessment that addresses the requirements of Section 5A of the EP&A Act must be completed to determine the significance of the impact.

There are several areas mapped as key fish habitat within and near the investigation area, including Moruya River, Malabar Creek, and their tributaries. These habitats are also protected under the FM Act. Generally, a permit is needed to carry out any dredging or reclamation work within key fish habitat in accordance with section 199 of the FM Act.

The investigation area includes sections of the Moruya River and Malabar Creek that contain mapped marine vegetation (refer to Section 3.3.1). Generally, a permit is needed to harm any

marine vegetation (including saltmarsh, mangroves, and seagrasses) in accordance with section 205 of the FM Act.

Generally, a permit is needed to temporarily or permanently block a fish passage within a waterway in accordance with section 219 of the FM Act.

As the proposal requires a crossing of Moruya River and other creeks that contain marine vegetation, the environmental assessment would need to consider the aquatic impacts and obtain any necessary permits in accordance with the FM Act.

Biosecurity Act 2015

The NSW *Biosecurity Act 2015* (Biosecurity Act) provides a flexible and responsive statutory framework to safeguard the economy, environment, and community from a variety of biosecurity risks including animals and plant pests and diseases, weeds, and contaminants. Under Part 3 of the Biosecurity Act, any person who deals with biosecurity matters and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by biosecurity matters has the duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated and minimised.

Various controlled weeds, including Weeds of National Significance (WONS), have been recorded within the investigation area. The presence of invasive flora and fauna species within the investigation area would be considered during the environmental assessment and managed during construction as needed.

The use of vessels from other waterways has the potential to introduce aquatic pests and diseases to oyster leases located in the Moruya River and the planned Moruya Shellfish Hatchery at Moruya Airport. Biosecurity matters identified during the development of the proposal would be considered as part of the environmental assessment.

Protection of Environment Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) focuses on protecting, restoring, and enhancing the environment within NSW, and reducing potential risks to human health and the environment. The Act aims to provide opportunity for increased public involvement and access to information regarding environmental protection.

The POEO Act identifies scheduled activities where an Environment Protection Licence (EPL) is needed. The main scheduled activity under the POEO Act that may apply to the proposal is road construction as there is the potential need to extract and process of more than 50,000 tonnes of materials during construction (Refer to Schedule 1, Clause 35 (3a) of the POEO Act).

The POEO Act also requires that pollution and waste be managed in accordance with the relevant regulations. As such, the environmental assessment will consider potential pathways for pollution and seek to minimise waste generation.

Roads Act 1993

The NSW *Roads Act 1993* (Roads Act) provides for the classification of roads and the declaration of Transport for NSW and other public authorities as roads authorities. It also regulates the carrying out of various activities in, on and over public roads. The Roads Act provides for the entry into land for inspection and investigation purposes.

A Road Occupancy Licence (ROL) under Section 138 of the Roads Act is expected to be needed during construction.

Heritage Act 1977

The NSW *Heritage Act 1977* concerns all aspects of non-Aboriginal heritage conservation including protection against indiscriminate damage and demolition of buildings and sites, through to restoration and enhancement. It provides for the conservation of buildings, works and relics that are of historic, scientific, social, archaeological, architectural, natural, or aesthetic significance to the State.

Approval under Section 57(1) is needed for works to a place, building, work, relic, moveable object, precinct, or land listed on the State Heritage Register. Generally, an excavation permit under Section 139 to disturb or excavate any land containing or likely to contain a relic.

There are known non-Aboriginal heritage sites within and near the investigation area. The potential for the proposal to impact recorded and previously unrecorded non-Aboriginal heritage items or archaeological relics would be considered during the environmental assessment.

Aboriginal Land Rights Act 1993

Through the NSW *Aboriginal Land Rights Act 1993*, vacant Crown Land not lawfully used, occupied, or required for an essential purpose or for residential land is returned to Aboriginal Peoples and vested in Aboriginal Land Councils. In accordance with Section 42B of the Act, land vested in an Aboriginal Land Council can only be acquired by Transport for NSW through an Act of Parliament.

A search of the Aboriginal Land Claims register indicates all parcels of Crown Land within the investigation area are subject to Aboriginal Land Claims. Consultation with Aboriginal Land Claim holders and claimants would be undertaken as part of the environmental assessment.

Crown Lands Management Act 2016

The NSW *Crown Lands Management Act 2016* sets out the requirements for ownership, use and management of land that is vested in the Crown in NSW. Ministerial approval is needed to grant a 'lease, licence, permit, easement or right of way over a Crown Reserve'.

Based on preliminary investigations, there are multiple parcels of Crown Land located throughout the investigation area. If Crown Land is affected by the proposal, the acquisition requirements of the above Act and Commonwealth *Native Title Act 1993* would need to be considered.

Commonwealth Native Title Act 1993

The Commonwealth *Native Title Act 1993* provides the legislative framework that:

- Recognises and protects native title
- Establishes ways in which future dealings affecting native title may proceed, and to set standards for those dealings, including providing certain procedural rights for registered native title claimants and native title holders in relation to acts which affect native title
- Establishes the National Native Title Tribunal.

The above Act provides for the protection of land affected by a Native Title Claim. The entire investigation area is within the South Coast People claim area (NC2017/003 Native Title Claim registered in January 2018). This claim extends along the NSW South Coast from southern Sydney to Eden. Native Title holders and claimants would therefore be consulted with as part of the environmental assessment.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the main environmental legislation at the Commonwealth level. It protects matters of national environmental significance (MNES), as defined under the Act, and the environment of Commonwealth Land.

Under the EPBC Act a referral is needed to the Australian Government for proposed actions that have the potential to significantly impact on MNES or the environment of Commonwealth Land. The results of the preliminary protected matters search are provided in Section 3.3.

Several nationally listed threatened ecological communities, threatened species and migratory species, all MNES, are likely to occur within the investigation area. The potential impacts to these would be considered during the environmental assessment.

Transport for NSW would confirm if whether a referral to the Australian Government would be needed after completing more detailed site investigations.

3.2 Transport considerations

The following sections describe the key transport considerations for developing the strategic bypass corridor options.

3.2.1 Urban centres and townships

Moruya is located within the Eurobodalla Shire Council area and accommodates a range of land uses. This includes grazing land and light industrial uses to the north, while the southern part of Moruya focuses on low-medium density residential land uses. The town provides a range of services, including education, health care and retail offerings.

Moruya Airport is located about seven kilometres from Moruya town centre and can be accessed via Princes Highway and George Bass Drive. Moruya is also the proposed location for the planned Eurobodalla Health Service, a new regional hospital serving the Eurobodalla community.

Moruya is connected to the main urban centres of Batemans Bay to the north and Narooma to the south. These towns have direct connection to Moruya via Princes Highway. Smaller coastal towns such as Broulee and Tomakin are located to the north and can be accessed via North Head Drive and George Bass Drive. Moruya Heads and Congo are located to the south east and can be access via South Head Road and Congo Road.

3.2.2 Eurobodalla Health Service

The new Eurobodalla Health Service would be a purpose built facility to support the healthcare needs of Eurobodalla Shire from Narooma to Batemans Bay. The regionally significant development is currently in the planning phase. Once complete the new facility would provide a range of services, some of which may include:

- An emergency department
- Surgical and operating theatres
- A day-stay unit
- An ambulatory care unit for the community to access outpatient health services

- Increased capacity for chemotherapy and renal dialysis, and
- Research and education facilities.

Site selection for the Eurobodalla Health Service has recently been completed by NSW Health Infrastructure, involving consultation activities with the community, local Aboriginal groups and key stakeholders and an assessment against a range of factors including accessibility, proximity to population centres and surrounding infrastructure, capacity for expansion and environmental impacts. The preferred site has been confirmed towards the south-east of Moruya town-ship and an acquisition plan is underway.

The preliminary traffic modelling undertaken by Transport (outlined in Section 3.2.6), has considered the preferred location for the Eurobodalla Health Service. This has been undertaken to ensure the potential impact of additional traffic travelling to the proposed hospital on the wider network have been considered as part of the option selection process. For further information, refer to [Southern NSW Local Health District](#) and [Health Infrastructure](#) websites.

3.2.3 Emergency Services

Emergency services based in Moruya include:

- Fire and Rescue NSW, Church Street
- NSW Rural Fire Service, Campbell Street
- NSW SES Moruya unit, Araluen Road
- Moruya District Hospital and emergency department, River Street
- NSW Ambulance station, Mirrabooka Avenue
- NSW Police station, Queen Street.

Moruya Airport, located about six kilometres east of the Moruya town centre, is also home to a firebombing aviation command unit and a Westpac Life Saver rescue helicopter. During emergencies, it also supports medical, fire and military operations.

In addition, during emergencies where a coordinated, multi-agency response is required, the relevant lead agency or Local Operations Controller (NSW Police) will enact the Eurobodalla Local Emergency Operation Centre (EOC). The Moruya RSL Hall has been used as the base for the EOC during past emergencies, but there is currently no permanent, purpose-built EOC for the region.

3.2.4 Roads and intersections

Transport for NSW and local councils define the functional road hierarchy to establish a consistent basis for road network management. The key road categories within the study area and their functions are outlined in Table 3-1:

Table 3-1: Road hierarchy classification guidelines

Category	Road types	Function	Roads within study area
State Roads	Freeways, motorways and primary arterials	Forming connections between urban centres such as Sydney, Newcastle, Wollongong and the Central Coast etc. Often running through major regional towns	Princes Highway

Category	Road types	Function	Roads within study area
Regional Roads	Secondary or sub arterials	Provide the main connections between smaller regional towns and districts with the main State Road network	Unclassified regional road 7630 Batemans Bay - Moruya Road (including George Bass Drive and North Head Drive)
Local Roads	Collector and local access roads	Roads providing local access to residential properties, as well as connections to arterial roads	South Head Road, Broulee Road, Larrys Mountain Road, Shelley Road and Araluen Road

An overview of the key roads within the study area is provided as follows and illustrated in Figure 3-1

- Princes Highway is a major road link which connects Eurobodalla Shire to Sydney, the Illawarra, the far South Coast and Victoria - this state road provides access for residents, tourists and freight to the NSW South Coast
- George Bass Drive / North Head Drive is a regional road that runs parallel to Princes Highway and traverses along the coastline between Moruya and Batemans Bay: it provides a road connection to a range of coastal towns, including Broulee and Tomakin, and Moruya Airport, with the southern sections of George Bass Drive popular route for cyclists
- South Head Road is a local access road that provides access between Moruya and Moruya Heads. Cycle infrastructure is present along segments of this route
- Shelley Road is a local access road that provides connection between the North Moruya Industrial Area and Princes Highway: this road is part of the freight network and allows access for vehicles up to a 19 m B-Double
- Larrys Mountain Drive is a local access road that provides access to residential and primary production land uses from Princes Highway: household projections indicate that an increase in residential lots in this area is forecasted, likely increasing the traffic along Larrys Mountain Drive
- Araluen Road is a road connecting the town of Araluen in the north west of Moruya: this local access road connects into Princes Highway via Luck Street and Campbell Street (though at the time of preparation the Araluen Road is currently closed to through traffic due to landslip)
- Broulee Road is a local access road that provides a direct connection between Princes Highway and Broulee.

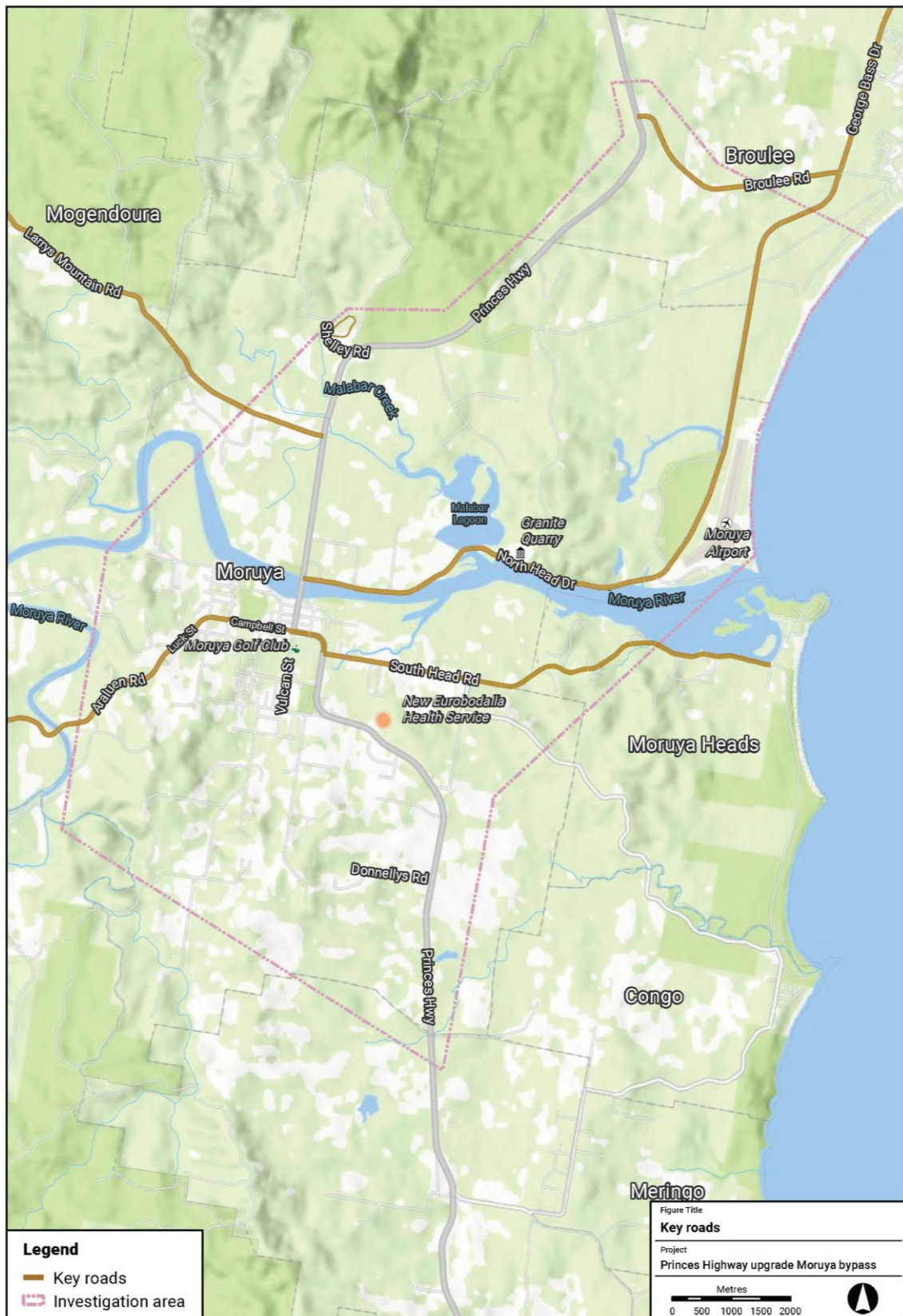


Figure 3-1: Study area road network

3.2.5 Road safety

The speed zone on the Princes Highway, outside of the urban area of Moruya, is 100 kilometres per hour (km/h). The speed limit reduces to 80 km/h on the approaches to town, then reduces to 50 km through the urban area of Moruya, from just south of Toose Street to just south of Carrie Crescent.

The Princes Highway in this location has a poor crash history. Verified crash data for the five-year reporting period between 2014 and 2018 shows there were 19 crashes recorded. These are summarised by type and severity in Table 3-2.

Table 3-2: 2014-2018 crash data classified by type and severity

Crash Type	Crash Severity						
	Non-casualty (tow away)	Minor/Other Injury	Moderate Injury	Serious Injury	Fatal	Total	Proportion
Vehicle - Object	1	0	1	0	0	2	11%
Vehicle - Animal	0	0	0	1	0	1	5%
Vehicle - Pedestrian	0	0	0	2	0	2	11%
Rear end	0	1	1	1	0	3	16%
Right angle	0	0	1	1	0	2	11%
Head-on	0	0	0	1	1	2	11%
Other angle	0	0	2	3	0	5	26%
Rollover	0	0	2	0	0	2	11%
Total	1	1	7	9	1	19	
% by severity	5%	5%	37%	47%	5%		

Recorded incidents for the five-year period are spread relatively evenly across a range of types, with 'other angle' being the most common ahead of 'rear end' collisions. The data also suggests that when a crash does occur, the outcome is relatively severe, with moderate to serious injury recorded for 84% of crashes. One fatal incident was also recorded on the Princes Highway north of Percy Davis Drive. The 2014-2018 crash history data for the Princes Highway within the study area is presented graphically in Figure 3-2. This maps the recorded incidents, however, it should be noted that there are likely to be additional minor incidents that are not captured.

The proposed bypass offers an opportunity to improve road safety issues highlighted through the crash data and community consultation through the potential reduction of total traffic throughput and the mix of heavy vehicles with passenger vehicles and pedestrians in Moruya town. Eurobodalla Shire Council has also developed a speed management and pedestrian activation plan for Moruya CBD East that identifies key sites for infrastructure improvements. TfNSW is working with Council to investigate a reduced speed zone to support a high pedestrian activity area to assist in delivering Councils vision for the precinct.

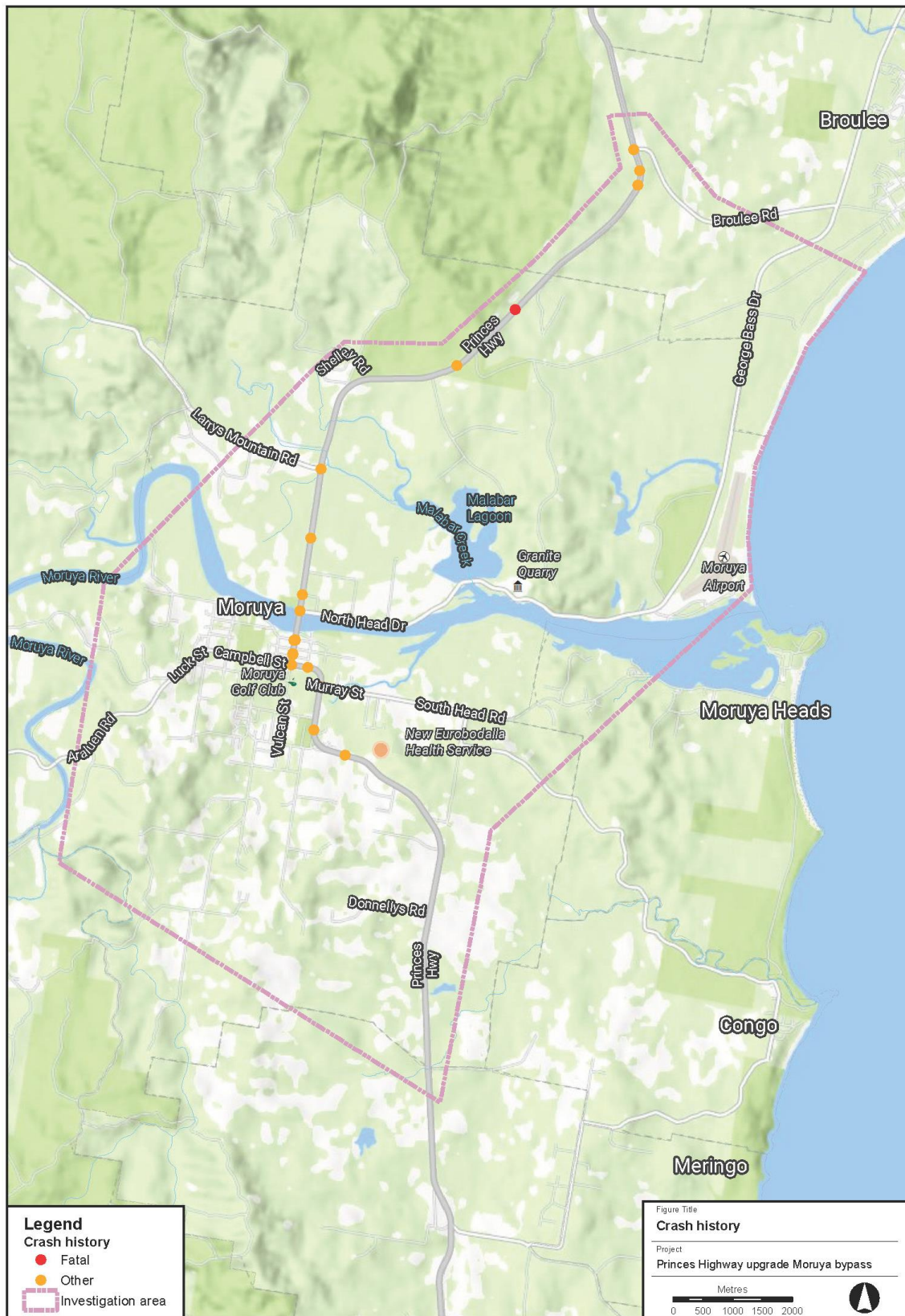


Figure 3-2: Crash history, 2014-2018

Safety concerns associated with the intersection of Princes Highway and Shelley Road were raised during community consultation process. Shelley Road is the primary access into the North Moruya Industrial Area and facilitates the usage of up to 19 m B-doubles. Sightlines at this intersection are reduced due to horizontal curves and a vertical crest on Princes Highway. No acceleration lanes are noted in the area for heavy vehicles. Given the high-speed environment (posted 100 km/h speed limit), slow moving heavy vehicles may pose an ongoing safety risk at this location. This would be reviewed during the next stage of the design process.

3.2.6 Network performance

Transport has undertaken extensive traffic data collection and modelling for Moruya and the surrounding road network.

Existing network performance

A review of traffic surveys collected in 2019 and 2021 has provided insights into the performance of the current road network. This section highlights the current traffic volumes and the travel behaviours of drivers traversing to or through Moruya.

The collected data shows the majority of traffic traversing to and through Moruya is via Princes Highway, making up about 8,400 vehicle per day (vpd). North Head Drive, which provides connections to Moruya Airport and towns north of Moruya such as Broulee and Tomakin, carries about 4,200 vpd. South Head Road, which provides a lower order connection to catchments to the east of Moruya, carries about 2,400 vpd. Existing daily traffic volumes are summarised in Figure 3-3.



Figure 3-3: Existing daily traffic volumes

A review of the origin / destination information collected in 2019 and 2021 highlights the travel behaviours of drivers that currently access Moruya. This data shows where people are driving from; whether they're stopping in Moruya or driving through; and the proportion of light and heavy vehicles exhibiting these behaviours. Figure 3-4 depicts the major light and heavy vehicle movements that drive through Moruya. The origin / destination survey data suggests that approximately 25% of Princes Highway traffic passes through Moruya without stopping on a typical weekday. This proportion is 24% for light vehicles and increases to 38% for heavy vehicles.

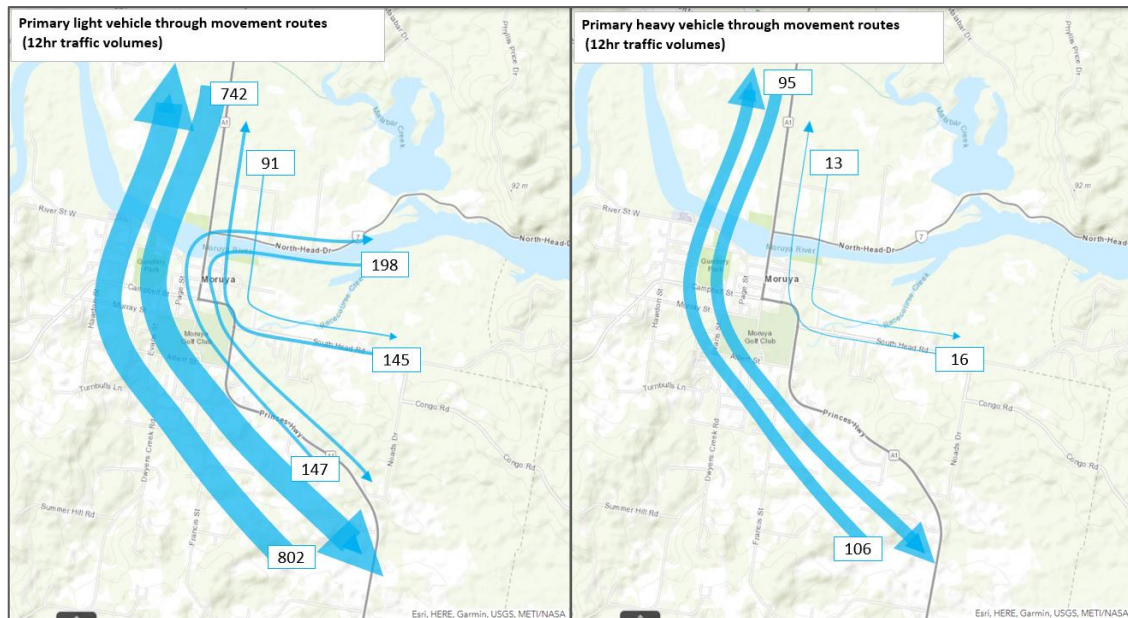


Figure 3-4: Major traffic movements

Intersection queue surveys undertaken outlined localised congestion and queuing within the town centre of Moruya during average weekday peak hours. This was most prominently noted at the Church Street and Campbell Street intersections with Princes Highway.

Maximum queue lengths at the Church Street/ Princes Highway signalised intersection were observed to extend onto the Moruya River Bridge to the north and past Queen Street to the south. This also impacts the performance of adjoining side streets such as Shore Street. Similarly, the Campbell Street/ Princes Highway intersection was observed to exhibit notable queues along the minor legs of this roundabout. Murray Street and Campbell Street were observed to have notable queuing to cater for the priority movement along Princes Highway. Queue length observation for each of these intersections are shown in Table 3-3.

Table 3-3: Intersection queue lengths

Intersection	Approach	AM Peak Maximum Queue (no. of vehicles)	PM Peak Maximum Queue (no. of vehicles)
Church Street/Princes Highway	North	17	29
	South	17	24
	East	8	10
	West	5	9

Intersection	Approach	AM Peak Maximum Queue (no. of vehicles)	PM Peak Maximum Queue (no. of vehicles)
Campbell Street/ Murray Street/ Princes Highway	North	6	6
	South	3	18
	East	11	6
	West	11	20

Though maximum queues were noted to impact adjacent intersections, the average delay experienced at key intersections along Princes Highway within Moruya town centre are currently within reasonable operating capacity. This is represented by a level of service (LoS) of D or better. Level of service is a measure of intersection delay and provides a measure for the performance of the intersection. LoS A represents the best performance, with F the worst. Typically, LoS D is the lowest acceptable level as described in Table 3-4.

Table 3-4: Level of Service criteria

Level of Service (LoS)	Average delay per vehicle (s)	Traffic signal and roundabout operation	Give way and stop sign operation
A	<14	Good operation	
B	15 to 28	Good operation with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity, incidents will cause excessive delays	At capacity, requires other control mode
F	>70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires additional capacity

Future network performance (without the proposed bypass)

Using the traffic data collected, Transport has undertaken preliminary traffic modelling to understand the future performance of the road network without the proposed bypass. Future scenarios for 2019 (existing), 2026 and 2036 were developed with demand growth assumptions adapted from the Eurobodalla Shire Transport Model (ESTM) which utilises the latest land use projections provided by Eurobodalla Shire Council (ESC). This data forecasts an average per annum growth rate for Moruya (from 2019 to 2036) of 2.7 per cent and 2.0 per cent in households and jobs, respectively.

The key model outputs that has been utilised to interpret the future performance of the road network are as follows:

- **Intersection Level of Service (LoS)** – a measure of intersection performance based on average delay experienced by drivers using the intersection during modelled peak hours
- **Travel Time** – comparison of northbound and southbound travel times on Princes Highway between Noggarula Drive and Broulee Road
- **Vehicle Hours Travelled (VHT)** – a network wide measure that captures the total number of hours spent travelling by all drivers in the modelled network - this is a good measure for the operating efficiency of the road network.

Delays at intersections are experience in Moruya town centre with the highest delays generally experienced at the following intersections:

- North Head Drive / Princes Highway
- Shore Street / Princes Highway
- Church Street / Princes Highway
- Queen Street / Princes Highway.

The afternoon (PM) peak period is the critical period for a typical weekday. While observations and collected data shows that these intersections are currently operating at a reasonable level of delay (LoS D or better), this is not the case for future scenarios. As shown in Figure 3-5, the forecast delays at these intersections grows beyond a LoS D by 2026 and is further compounded for 2036. A LoS F represents heavily congested conditions with high delays and demand exceeding capacity.

The modelling also outlined that with increase delays along Princes Highway, traffic will be attracted to the neighbouring Ford Street; impacting its function as a lower order access road that provides connection to retail land uses and the Riverside Park Marine Facility.



Figure 3-5: Forecast intersection delays

A review of forecast network efficiency outputs also shows increases in travel times and vehicle hours travelled (VHT). Without the bypass, travel time along Princes Highway (between Noggarula Drive and Broulee Road) is expected to increase relative to current conditions by up to 18% in 2036. Furthermore, VHT measures are anticipated to increase by up to 66% relative

to current conditions in 2036. This indicates the efficiency of the overall road network surrounding Moruya would likely worsen in the future.

Holiday traffic

The South Coast is a key tourism destination and attracts increased traffic to Moruya during holiday periods. Key pinch points exist within Moruya town centre which experience increased delays and queuing during peak holiday periods. Preliminary modelling has shown that the holiday period may attract up to 15% more traffic than normal peak weekday periods. Where typical travel patterns are more tidal during the average weekday, the holiday periods see more balanced traffic flows. This leads to less gaps in traffic, impacting the performance of right turning movements at unsignalised intersections along the Princes Highway.

Initial modelling and observations show significant queuing, with southbound traffic queues along Princes Highway extending beyond the Moruya River Bridge and may extend as far as 1 kilometre north of North Head Drive. Northbound traffic queues impact most of the side streets in the town centre, with queues extending down to the Princes Highway/Campbell Street/ Murray Street intersection. The level of service of key intersections in Moruya is also shown to worsen to a LoS F during the holiday period. This is shown in Figure 3-6.



Figure 3-6: Holiday peak intersection delays

In order to understand seasonal traffic patterns, Transport undertook additional traffic surveys over the 2020/2021 summer holiday period. Given that the traffic counts were collected during COVID 19 restrictions, this data was reviewed using historical traffic signal detector data from the intersection of Princes Highway and Church Street to ensure that traffic volumes reflected

typical holiday peak. The data collected as part of the recent 2020-2021 surveys was observed to be relatively consistent with the trend in traffic volumes from previous years.

An updated origin-destination (OD) survey was undertaken to provide an understanding of traffic patterns through Moruya during holiday periods. For the December 2020 and January 2021 survey days respectively, approximately 46% and 32% of Princes Highway traffic was found to pass through Moruya without stopping. This is notably higher than the rate of 25% calculated from the June 2019 weekday survey.

Analysis of the 12-hr volumes captured at the OD survey sites, shown in Table 3-5, indicates Princes Highway traffic volumes collected during the holiday-period survey days were 15% - 31% higher than traffic volumes recorded during the weekday survey.

Table 3-5: OD survey bi-directional 12-hr traffic volumes

Survey	Bi-directional 12-hr volume			Difference vs June 2019	
	June 2019	Dec 2020	Jan 2021	Dec 2020	Jan 2021
OD site 1 (north of Moruya)	7236	8325	9455	+ 15%	+ 31%
OD site 4 (south of Moruya)	6732	8605	8805	+ 28%	+ 31%

The proportion of heavy vehicles on the road was also found to reduce during holiday periods, accounting for about 8% of total traffic compared to 16% of total traffic during weekday periods. This is largely due to the increase in light vehicles on the corridor during holiday periods.

The ongoing effects of COVID-19 on travel patterns and future demand will be further considered during the next stages of the project.

3.2.7 Freight routes

The volume of road freight movements along the Princes Highway corridor is relatively small compared to other regional freight corridors within NSW. However, with the absence of rail freight capability, the Princes Highway is an essential part of the supply chain for merchandise, foodstuffs, fuel, agriculture and construction materials in the region.

Moruya's current transport activity shows a large volume of light traffic, and Moruya Airport has been identified as a major focus for tourism. Freight demand may increase with the Moruya Airport upgrade which aims to expand commercial and tourism spaces.

The Princes Highway at Moruya is currently an approved route for General Mass Limit (GML) 23 m long B-doubles Shelley Road, the main access into the North Moruya Industrial Area, is restricted to 19 m long B-doubles only. Higher Mass Limit (HML) and higher productivity vehicles (HPV) are currently approved within the road network to Nowra and just north of the Snowy Mountains Highway. HML vehicles are not currently approved on the Princes Highway at Moruya.

The main localised constraints to freight movements along Princes Highway in and around Moruya relates to the following:

- Princes Highway passes through a range of undulating terrain around Moruya - steep sections of road reduce the efficiency of freight vehicles and impacts the operational safety of road users, especially as they navigate around slow moving heavy vehicles

- The roundabouts located within Moruya town centre also impacts the movement of heavy vehicles along Princes Highway, with the movement of freight vehicles through urban areas increases the risks of conflict with pedestrian and passenger vehicles
- Current rest stop areas do not always provide adequate space and facilities to meet heavy vehicle demands.

Existing rest areas are located to the north of Moruya, near Waldrons Swamp and Broulee Road.

3.2.8 Public Transport

Public transport in the study is generally provided by private bus and coach operators. There are several of these publicly available transport operators currently servicing Moruya, primarily consisting of long-range routes between other South Coast and regional centres. These services, which predominantly travel along the Princes Highway with limited stop locations within Moruya, include:

Table 3-6: Existing bus services

Route	Description	Type	Frequency (per direction)
700-1	Sydney to Eden, <i>Premier Motor Service</i>	Coach	1 per day
860	Batemans Bay to Moruya (via Broulee, Surf Beach) <i>Priors Scenic Express</i>	Public	6 per day weekdays* 3 per day on Saturdays
MCS	Canberra to Narooma (via Moruya) <i>Murrays</i>	Public	1 per day
Rixons	Trial on demand service between Canberra and South Coast (Milton to Narooma, incl Moruya)	Public	1 per day, advance booking required

*incl limited services stopping at Moruya District Hospital and Moruya TAFE

** Saturdays only

The primary bus stop location in Moruya is at Apex Park, which serves as an interchange for the services listed above. Bus stops for the timetabled services also exist in a number of other locations, including at Moruya TAFE, Moruya District Hospital and on the Princes Highway near Carrie Crescent.

School bus services

School bus services in the region are primarily offered by two providers:

- Marshall's Bus and Coach
- Priors Bus Service.

Marshall's Bus and Coach operate twenty-two school services daily in the region for pickup and drop-off to schools in Bodalla, Moruya and Broulee, with a focus on the southern residential catchment between Moruya and Narooma. A majority of these routes utilise sections of the Princes Highway within the study area for parts of their journey.

Similarly, Priors Bus Service operates a range of services for schools in Moruya (including Moruya Primary School, Moruya High School and St Mary's Primary School), Batemans Bay,

Broulee and other locations in the region, focusing predominately on the northern residential catchment between Moruya and Batemans Bay.

Point to point and on-demand transport

Point to point transport is available in the region through Moruya Radio Taxis, a traditional taxi service provider. Global ridesharing service Uber is also understood to have expanded into the region following an announcement in March 2020 that drivers between Ulladulla and the Victorian Border, a region encompassing Moruya, would be able to sign up to drive with the rideshare provider.

3.2.9 Pedestrian and cycling facilities

Existing facilities for pedestrians and cyclists within the project include footpaths, shared paths and road shoulders centred around the commercial centre of Moruya, which attracts significant pedestrian activity.

The existing bicycle network is limited to a shared path along a small portion of the Princes Highway between Moruya TAFE and Vulcan Street, along with some shared path, mixed traffic and road shoulder routes within the town.

A range of other shared paths and footpaths exist throughout the town as shown in Figure 3-7. This map, which was produced as part of the Eurobodalla Pathways Strategy (June 2017) includes proposed additional shared paths and footpaths to address various connectivity issues that exist in the current network.

The Pathways Strategy made fifteen recommendations for additional shared path and footpath infrastructure. A number of these have since been completed.

The Pathways Strategy also states that on-road cycling outside of the town is anticipated given the flat nature of the land. Impacts and opportunities for cycle infrastructure would be investigated in the next stage of the project.

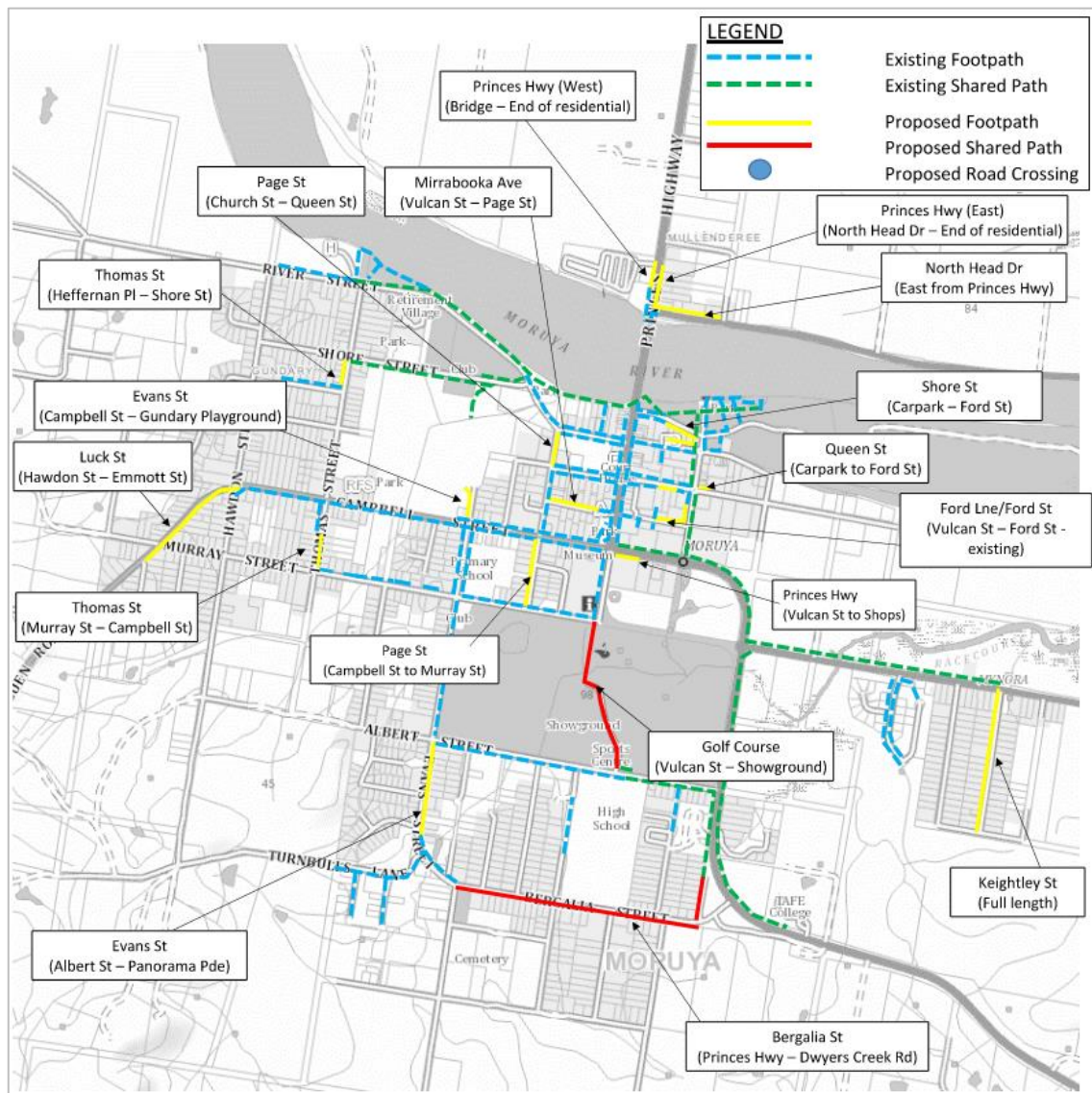


Figure 3-7: Eurobodalla Pathway Strategy (2017) - Location of Proposed Works

3.2.10 Moruya Airport

The Moruya Airport is a key focus for tourism in Eurobodalla Shire. The airport is serviced by Regional Express Airlines (REX) with regular flights to Sydney and Merimbula, with the Bureau of Infrastructure and Transport Research Economics (BITRE) indicating a total volume of 21,600 passengers per year (inbound and outbound) in 2019.

The airport also supports several small businesses and key supporting services for the town, which include:

- Skydive Oz, which operates tandem skydives offering sport skydiving for qualified skydivers and skydiving courses and training
- Merit Aviation, which offers charter flights including a range of scenic tours and provides pilot training
- South Coast Seaplanes, which offers a range of pleasure flights

- Moruya Aero Club
- Westpac Surf Lifesaver
- The Rural Fire Service (RFS), which operates regularly from Moruya during the bushfire season and has temporary facilities established to the north of the terminal and aviation fuel storage.

Moruya Airport is owned and operated by Eurobodalla Shire Council and has received funding commitments to commence a major redevelopment to increase capacity, improve passenger experience and expand commercial and tourism opportunities. The proposed developments are outlined in the Moruya Airport Master Plan 2015, which formed a key consideration for the Moruya bypass options development.

The Moruya Airport Master Plan 2015 Appendix A includes figures of the take-off/landings requirements and Obstacle Limitation Surfaces (OLS) boundaries. The OLS boundaries provide a height limit for development and activities in close proximity to the airport.

3.2.11 Moruya River transport and users

Moruya River marine facilities

Both Transport and ESC maintains a range of marine facilities to support recreational boating, fishing and other water-related activities, including kayaking, canoeing and swimming. At Moruya, these publicly maintained and operated facilities include:

- Russ Martin Park fishing platform, about 50 m downstream of the Moruya Bridge
- Riverside Park Marine Facility, including a boat ramp and jetty and fishing facilities, Ford Street
- Quarry Wharf fishing facilities, at Granite Quarry, North Head Drive
- Preddys boat ramp facility, including a boat ramp and jetty and fishing facilities, Preddys Wharf Road
- Brierleys boat ramp facility, including a boat ramp and fishing facilities, Bruce Cameron Drive.

With regards to private vessels and marine facilities, one private formed launching ramp, about 200 m upstream of the Moruya Bridge, is marked on the boating map produced by Transport and a hire boatshed is located just downstream of the Moruya Bridge. Mooring information held by Transport shows that private vessels regularly using the Moruya River include:

- 12 yachts, ranging in length from 6 m to 12.1 m
- 2 tri-sail vessels, averaging 11.8 m in length
- 4 catamaran vessels, averaging 11.1 m in length
- 5 motor cruisers, ranging in length from 5.3 m to 18.1 m
- A number of runabouts, averaging 5.4 m in length.

Many of these private vessels are moored at locations downstream of Malabar Creek. No information was available on the types and numbers of commercial vessels or other recreational vessels that may use the river.

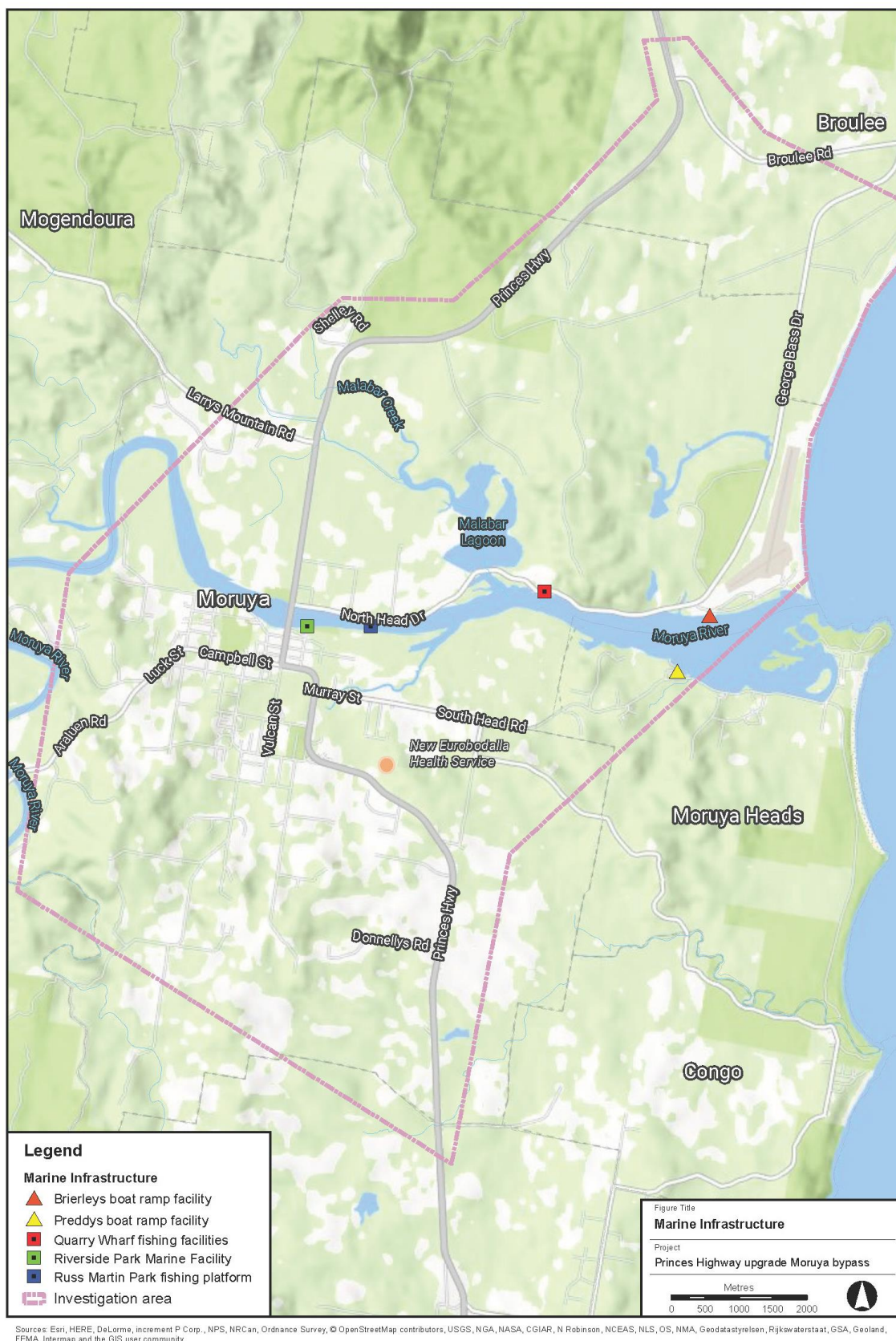


Figure 3-8: Marine infrastructure

Moruya River aviation use

Moruya River is also used for aviation purposes. South Coast Seaplanes is one tourism operator utilising the river for scenic flights, with two areas designated for take-off and landing:

- East of the existing Moruya River bridge
- Near the Moruya River mouth (close to Moruya Airport).

The construction of a new river crossing as part of the proposed Moruya bypass would likely conflict with the existing take-off and landing areas of operation. Consultation with South Coast Seaplanes and other operators would be required to determine if constraints on the height, clearance or other features of the new bridge are needed so that these services can continue to use the river safely.

The Moruya River is also a valuable resource during firefighting operations as it provides the opportunity for water bombers to refill by landing and taking off from the river. Moruya Airport, next to the river, is home to a firebombing aviation command unit that regularly operates during the summer months. Consultation with the Rural Fire Service would be ongoing during the environmental assessment for the proposal regarding potential impacts to firefighting operations.

3.3 Biodiversity

The following sections describe the key biodiversity considerations for developing the strategic bypass corridor options. These would be further considered during later design phases and the environmental assessment for the proposal.

3.3.1 Aquatic ecology

Aquatic fauna

The Australian Grayling (*Prototroctes maraena*) (listed as Endangered under the NSW *Fisheries Management Act 1994* and Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*) is mapped as occurring within the western most portion of the project investigation area (DPI, 2016). It is considered highly likely that Australian Grayling utilise the Moruya and Deua Rivers, given historical records from upstream and the high-quality habitat throughout the watercourse.

The Moruya River Estuary provides suitable habitat for Black Rock Cod (*Epinephelus daemeli*) (listed as Vulnerable under both the FM Act and EPBC Act) along its armoured banks and rocky outcrops. The species is likely to be found in areas of naturally occurring rocky estuaries (Harasti et. al 2014), and so artificial bank protection measures provide similar habitat, and these along with rocky outcrops along the banks provide good habitat for prey and protection of juveniles.

A number of oyster leases are present near the mouth of the Moruya River within the far eastern extent of the project investigation area. The oyster leases part of the Oyster Industry Sustainable Aquaculture Strategy priority area.

Aquatic flora

Estuarine Macrophytes mapped as occurring within the project investigation area include:

- Halophila
- Mangrove
- Saltmarsh
- Zostera.

Key Fish Habitat

The project investigation area contains a number of first, second and third order streams. The following watercourses (and associated unnamed tributaries) within the project investigation area are mapped as Key Fish Habitat:

- Moruya River
- Malabar Creek
- Bengello Creek
- Dooga Creek
- Racecourse Creek.

Wetlands

The following wetlands are located within or near the project investigation area:

- Nationally Important Wetlands
 - Moruya River Estuary Saltmarshes
 - Waldrons Swamp
- NSW Wetlands
 - Moruya River
 - Malabar Lagoon
- Coastal Wetlands (Coastal Management SEPP 2018).

Marine Protected Areas

NSW Marine protected areas within the project investigation area include:

- Batemans Marine Park General Use Zone (IUCN VI)
- Batemans Marine Park Malabar Creek Sanctuary Zone (IUCN II).



Figure 3-9: Aquatic ecology constraints

3.3.2 Terrestrial ecology

National Parks and State Forests

There are no National Parks within the project investigation area, however there are National Parks within close proximity. The Eurobodalla National Park is the closest, located about 300 metres to the east. The Deua National Park is the next closest. It is located about one kilometre west of the investigation area. The northern portion of the project investigation area contains a section of the Mogo State Forest.

Biodiversity corridors

Areas classified as biodiversity corridors in the South East and Tablelands Regional Plan 2036 are present within the project investigation area. Biodiversity corridors are generally present where large stands of native vegetation exist and along watercourses. The areas of native vegetation associated with Mogo State Forest are likely to support threatened species habitat and wildlife corridors.

Vegetation

The project investigation area consists of a mixture of urban residential and commercial areas, cleared agricultural land, crown land, state forest and areas comprising a mixture of native and exotic vegetation.

Threatened ecological communities

A number of Threatened Ecological Communities (TEC) occur within the project investigation area. TECs mapped as occurring within the project investigation area are shown on Figure 3-10. Ground-truthing of vegetation types including TECs commenced in late 2020 and is ongoing. TECs that have been confirmed as occurring within the investigation area and their status under the BC and EPBC Acts are shown in Table 3-7.

Table 3-7: TECs confirmed within the investigation area

TEC Name	BC Act Status	EPBC Act Status
Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	Not listed
Bangalay Sand Forest in the Sydney Basin and South East Corner Bioregions	Endangered	Not listed
Brogo wet vine forest in the South East Corner Bioregion	Endangered	Not listed*
Lowland Grassy Woodland in the South East Corner Bioregion	Endangered	Not listed
Illawarra and south coast lowland forest and woodland ecological community	Not listed	Critically Endangered
Lowland Grassy Woodland in the South East Corner Bioregion (Critically Endangered)	Not listed	Critically Endangered
Dry Rainforest of the South East Forests in the South East Bioregion	Endangered	Not listed
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Not listed

TEC Name	BC Act Status	EPBC Act Status
Subtropical and Temperate Coastal Saltmarsh	Not listed	Vulnerable
River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Not listed
River-flat eucalypt forest on coastal floodplains of southern NSW and eastern Victoria	Endangered	Critically Endangered
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	Not listed
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of NSW and South East Queensland ecological community	Not listed	Endangered
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner	Endangered	Not listed*

* Currently on the proposed priority assessment list of nominations to be listed as endangered under the EPBC Act.

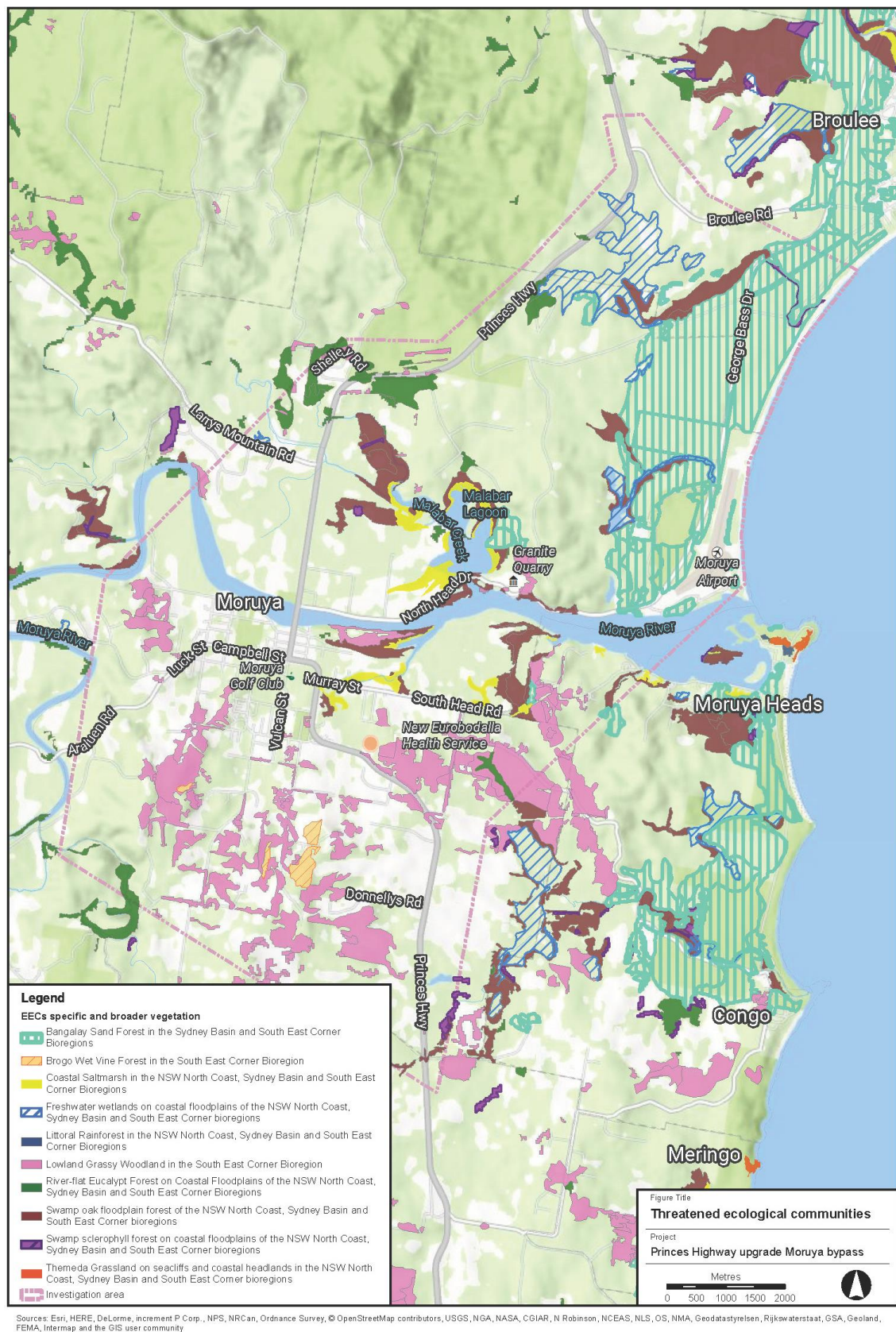


Figure 3-10: Threatened ecological communities mapping (NSW Bionet Atlas)

Threatened flora

A likelihood of occurrence assessment was undertaken to assess the likelihood of threatened flora species identified from desktop searches as occurring within the project investigation area. The assessment has been based on the habitat profile for the species and any other habitat information where available, location of nearby records and observation dates and information about species populations in the area. Table 3-8 lists 12 threatened flora species with a moderate or greater likelihood to occur within the investigation area and their listing status under the BC and EPBC Acts respectively.

Table 3-8: Threatened flora species

Scientific Name	Common Name	BC Act Status	EPBC Act Status
<i>Aldrovanda vesiculosa</i>	Waterwheel Plant	Endangered	Not listed
<i>Correa baeuerlenii</i>	Chef's cap correa	Vulnerable	Vulnerable
<i>Cryptostylis hunteriana</i>	Leafless tongue Orchid	Vulnerable	Vulnerable
<i>Distichlis distichophylla</i>	Australian saltgrass	Endangered	-
<i>Galium australe</i>	Tangled bedshaw	Endangered	-
<i>Genoplesium vernale</i>	East Lynne Midge Orchid	Vulnerable	Vulnerable
<i>Haloragis exalata subsp. exalata</i>	Square raspwort	Vulnerable	Vulnerable
<i>Persicaria elatior</i>	Tall Knotweed	Vulnerable	Vulnerable
<i>Pomaderris bodalla</i>	Bodalla pomaderris	Vulnerable	-
<i>Thesium australe</i>	Austral Toadflax	Vulnerable	Vulnerable
<i>Wilsonia rotundifolia</i>	Round-lead wilsonia	Endangered	-
<i>Wilsonia backhousei</i>	Narrow-leaved wilsoni	Vulnerable	-

Threatened fauna

A likelihood of occurrence assessment was undertaken to assess the likelihood of threatened fauna species identified from desktop searches as occurring within the project investigation area. The assessment has been based on the habitat profile for the species and any other habitat information where available, location of nearby records and observation dates and information about species populations in the area. Table 3-8 lists 45 threatened fauna species with a moderate or greater likelihood to occur within the investigation area and their listing status under the BC and EPBC Acts respectively.

Table 3-8 Threatened fauna species

Scientific name	Common name	BC Act Status	EPBC Act Status
<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered
<i>Artamus cyanopterus</i>	Dusky Woodswallow	Vulnerable	-
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	Endangered
<i>Calidris alba</i>	Sanderling	Vulnerable	-
<i>Calidris canutus</i>	Red Knot	-	Endangered
<i>Calidris ferruginea</i>	Curlew Sandpiper	Endangered	Critically Endangered
<i>Calidris tenuirostris</i>	Great Knot	Vulnerable	Critically Endangered
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Vulnerable	-
<i>Calyptorhynchus lathami</i>	Glossy-black Cockatoo	Vulnerable	-
<i>Charadrius mongolus</i>	Lesser Sand-plover	Vulnerable	Endangered
<i>Daphoenositta chrysoptera</i>	Varied Sitella	Vulnerable	-
<i>Glossopsitta pusilla</i>	Little Lorikeet	Vulnerable	-
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	Vulnerable	-
<i>Haematopus longirostris</i>	Pied Oystercatcher	Endangered	-
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	Vulnerable	-
<i>Hirundapus caudacutus</i>	White-throated Needle-tail	-	Vulnerable
<i>Ixobrychus flavicollis</i>	Black Bittern	Vulnerable	-
<i>Lathamus discolor</i>	Swift Parrot	Endangered	Critically Endangered
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit	-	Vulnerable
<i>Lophoictinia isura</i>	Square-tailed Kite	Vulnerable	-
<i>Ninox strenua</i>	Powerful Owl	Vulnerable	-
<i>Numenius madagascariensis</i>	Far Eastern Curlew	-	Vulnerable
<i>Pachycephala olivacea</i>	Olive Whistler	Vulnerable	-
<i>Pandion cristatus</i>	Eastern Osprey	Vulnerable	-
<i>Tyto novaehollandiae</i>	Masked Owl	Vulnerable	-
<i>Tyto tenebricosa</i>	Sooty Owl	Vulnerable	-
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Vulnerable	Vulnerable
<i>Litoria aurea</i>	Green and Golden Bell Frog	Endangered	Vulnerable
<i>Mixophyes balbus</i>	Stuttering Frog	Endangered	Vulnerable
<i>Dasyurus maculatus</i>	Spotted-tail Quoll	Vulnerable	Endangered
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	Vulnerable	-

Scientific name	Common name	BC Act Status	EPBC Act Status
<i>Isoodon obesulus</i>	Southern Brown Bandicoot	Endangered	Endangered
<i>Phascolarctos cinereus</i>	Koala	Vulnerable	Vulnerable
<i>Petaurus australis</i>	Yellow-bellied Glider	Vulnerable	-
<i>Petaurus norfolcensis</i>	Squirrel Glider	Vulnerable	-
<i>Petauroides volans</i>	Greater Glider	-	Vulnerable
<i>Petauroides volans</i>	Greater Glider population in the Eurobodalla local government area	Endangered population	Vulnerable
<i>Potorous tridactylus</i>	Long-nosed Potoroo	Vulnerable	-
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Vulnerable
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	Vulnerable	-
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	Vulnerable	-
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Vulnerable	Vulnerable
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Vulnerable	-
<i>Myotis macropus</i>	Southern Myotis	Vulnerable	-
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	Vulnerable	-
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Vulnerable	-

3.4 Heritage

The following sections describe the key heritage considerations for developing the strategic bypass corridor options. These would be further considered during later design phases and the environmental assessment for the proposal.

3.4.1 Aboriginal Heritage

There is a long history of Aboriginal occupation in the study area. The Moruya River has provided economic and spiritual sustenance to Aboriginal people for thousands of years and travelling routes are identified in the surrounding area from historical documents and archaeological evidence.

A search of the Aboriginal Heritage Information Management System (AHIMS) conducted on the 11th November 2020 identified 117 Aboriginal sites and no declared Aboriginal Places within the study area. The Eurobodalla LEP identifies three Aboriginal heritage listings within the investigation area:

- Malabar Lagoon Aboriginal Heritage Conservation Area (AH8)
- Bengello Creek Aboriginal Heritage Conservation Area (AH4)
- Aboriginal Canoe Tree (I47) (listed as Item however this is an area of conservation).

These listings are illustrated in Figure 3-11.

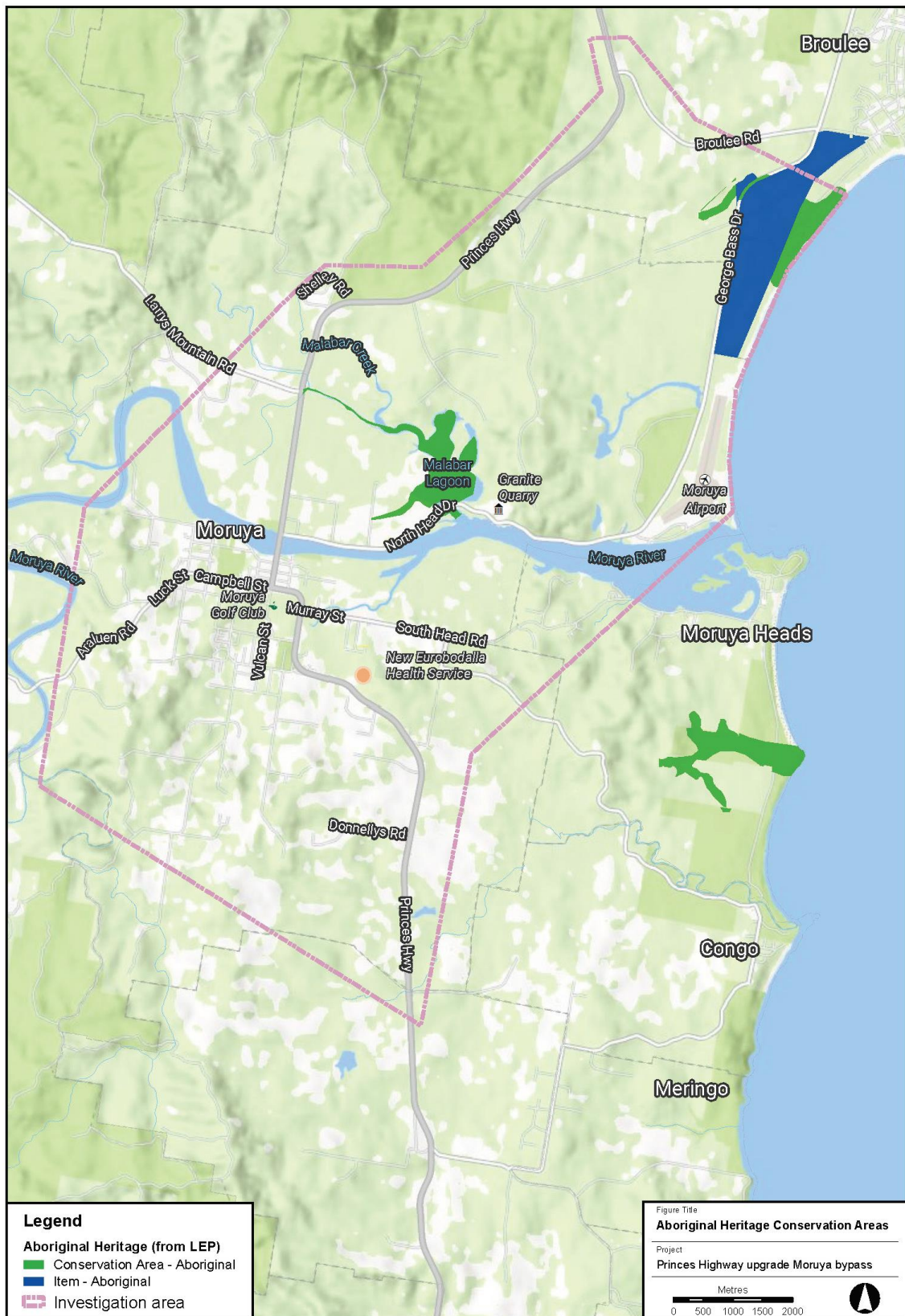


Figure 3-11: Eurobodalla LEP Aboriginal Heritage listings

Review of the project investigation area identified that there are landforms that have high potential for the identification of Aboriginal objects, most likely in the form of stone artefacts on spur crests, ridge lines, elevated flats, and gentle inclined basal/simple slopes. Native mature trees are also present within the project investigation area, which have the potential to be culturally modified.

Detailed investigations in accordance with the Transport for NSW Procedure for Aboriginal Cultural Heritage Consultation and Investigation process are underway, with survey field work having commenced in February 2021. Transport will undertake further investigations and consultation with local Aboriginal communities as part of the next phase of the project to confirm the presence of Aboriginal cultural and archaeological sites within the preferred alignment option and to assess, minimise, avoid and manage potential impacts to Aboriginal objects and/or places.

3.4.2 Non-Aboriginal heritage

Database searches have identified 75 non-Aboriginal heritage items within the project investigation area, including two State Heritage Register (SHR) listed items and three conservation areas.

The two State Heritage Register listed items within the investigation area include:

- Former Mechanics Institute (I141)
- Abernethy & Co Stonemason's Lathe (I293).

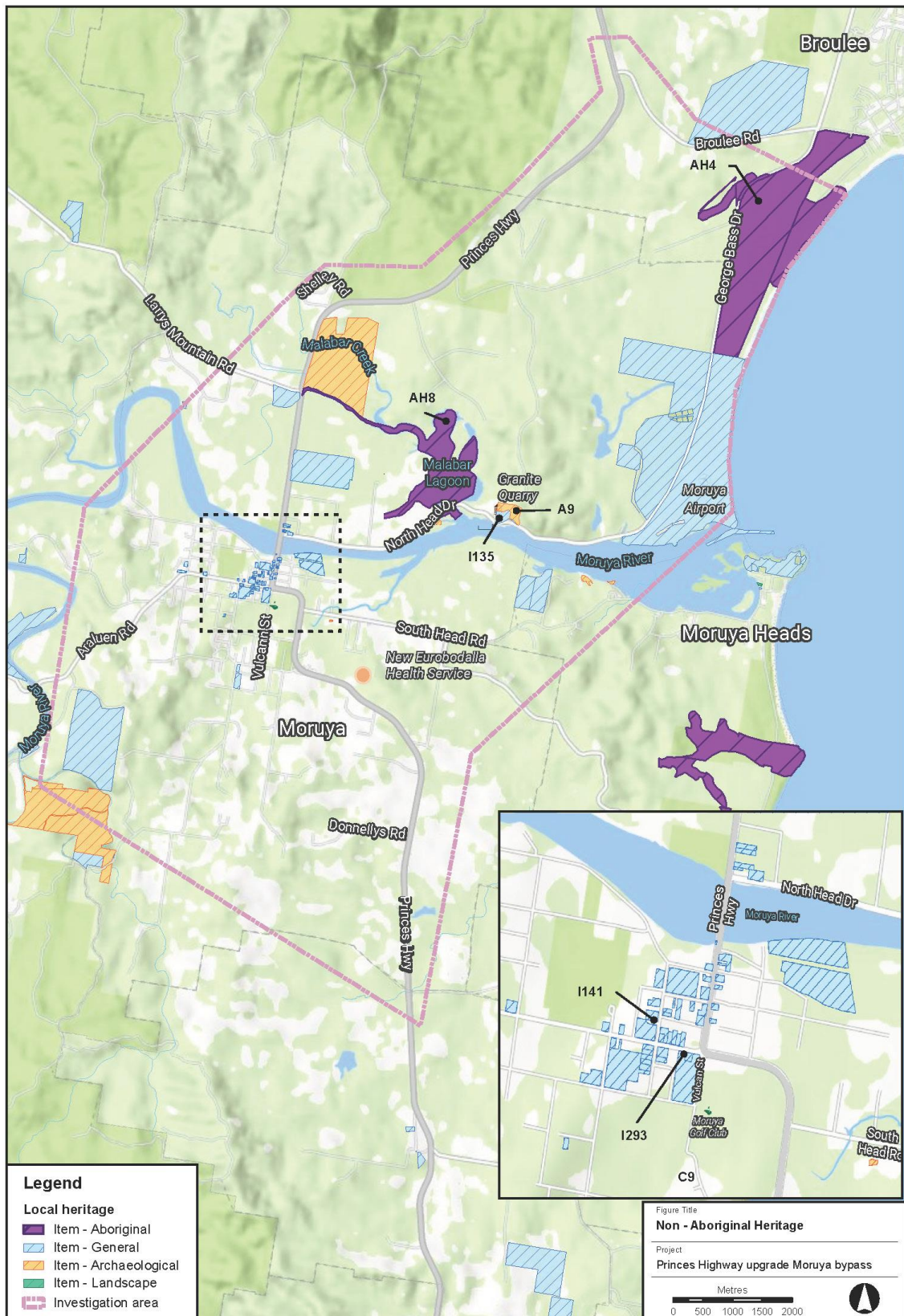
The three heritage conservation areas within the project investigation area include:

- Moruya Showground, comprising Grandstand and Exhibits Pavilion conservation area (C9)
- Malabar Lagoon Place of Aboriginal Heritage Significance conservation area (AH8)
- Bengello Creek Place of Aboriginal Heritage Significance (AH4).

The 70 locally significant heritage items within the project investigation area includes archaeological sites, churches and a range of other buildings including hotels, commercial buildings, industrial buildings and residences that are predominantly located within the urban areas of Moruya as illustrated in Figure 3-12.

Of note are the Moruya quarry, site and structures (also incorporating Zieglers Quarry) (ID I135) and the remains of Granite Town (A9) which are located within an area which has been used for production of granite for various purposes (monumental stone, dimension stone, granite rubble for building, and large stone for building breakwaters) from at least 1864. The Moruya quarry is best known as the source of the granite facing for the Sydney Harbour Bridge pylons between 1925 and 1932.

A search of the Maritime Heritage Register in March 2021 identified one shipwreck within the project investigation area on the northern bank of Moruya River adjacent to the confluence between Moruya River and Malabar Creek associated with the local heritage item A22 (Wreck of sand barge). The potential impacts to existing heritage items would be considered during the next phase of design development, through additional heritage investigations and as part of the environmental assessment.



Sources: Esri, HERE, DeLorme, increment P Corp., NPS, NRCAN, Ordnance Survey, © OpenStreetMap contributors, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatasirelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Figure 3-12: Non-Aboriginal heritage items

3.5 Landform, geology and soils

3.5.1 Landform

The Moruya River is a key natural feature of the landform, running west-east across the investigation area and the town of Moruya. The river has a number of tributaries which include Malabar Creek and Dooga Creek to the north, Racecourse Creek to the south and Mogendoura Creek to the west of the river.

Figure 3-13 below displays the topographic contours within the investigation area.

The land immediately adjacent to the river and tributaries are characterised by flat low-lying alluvial flood plains, with elevations ranging from 0 m to 6 m AHD. While the majority of the study area is made up of floodplains, agricultural land and small forestry plots, it is important to note that a large portion of the Moruya town centre is situated on low lying land and is prone to flooding in large storm events.

The area surrounding the flood plain is characterised by steep, hilly bushland which borders the town. These areas include:

- South head east of the town with high point of about 50 m AHD
- North head north east of the town with a high point of about 95 m AHD
- The area around Luck Street/Araluen Road west of the town, which has a high point of about 75 m AHD.

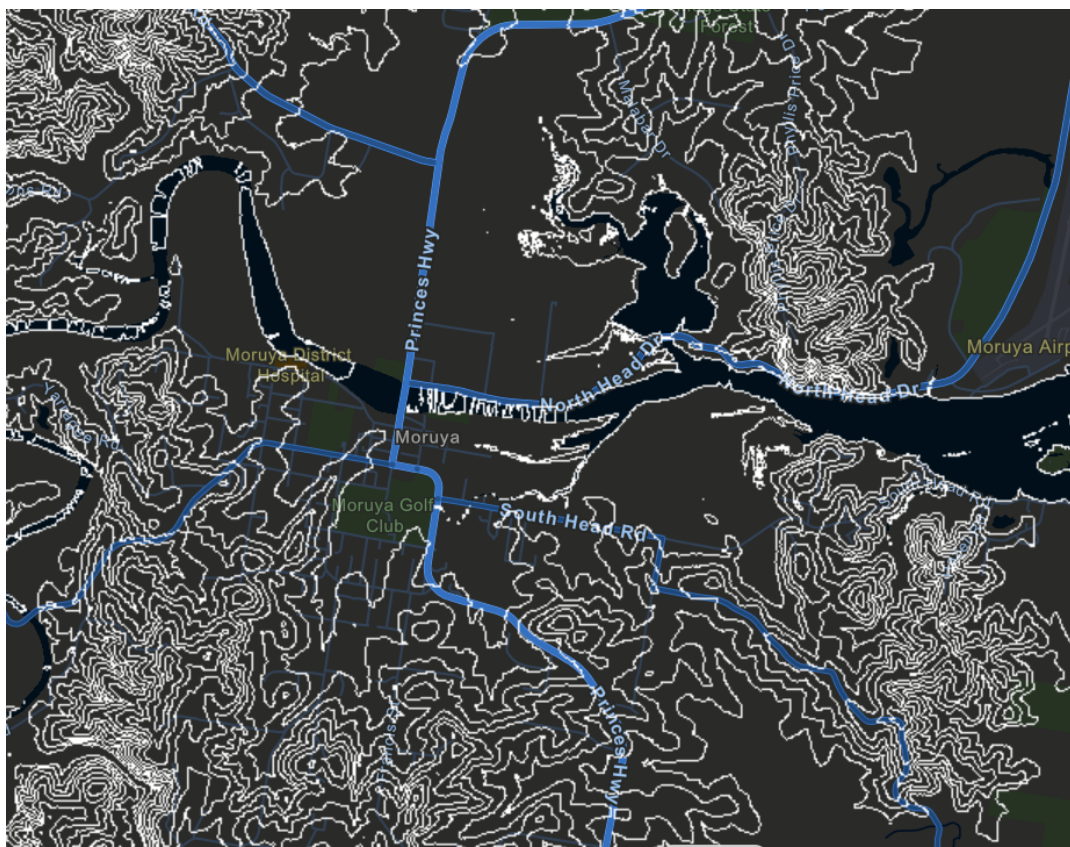


Figure 3-13: Contours within the investigation area (10m contours)

3.5.2 Geology and Soils

The 1:250,000 Ulladulla Geological Series Sheet S1 56-13, show that the investigation area to the west is underlain by the Silurian 'Moruya Granite' Formation. The Moruya Granite consists of biotite granite, granodiorite and tonalite. To the east the investigation area is indicated to be underlain by Ordovician siltstones, claystones, sandstones, quartzites and chert.

Quaternary Alluvium is shown overlying the Moruya Granite across the Moruya River Floodplain. The Alluvium is described as "alluvium gravel, swamp deposits and sand dunes". Soft compressible soils are likely to be present within the areas mapped as Quaternary Alluvium across the Moruya River floodplain. Quaternary alluvium is also shown along the coastline with the geological map also indicating the presence of sand dunes along the coastline.

Granitic rock masses weather somewhat differently to many other rock types and require careful consideration during geotechnical investigation and design as the silty nature of some extremely weathered granites often causes them to be highly erodible. Understanding of this weathered profile and some of the potential issues this can create with construction of piles, retaining walls and slopes is essential in geotechnical investigation and design.

A geotechnical investigation would be needed as part of the proposal's development to determine the geological profile for design of cuttings, fills, bridge foundations and road foundation and pavement.

3.5.3 Acid sulphate soils

Acid sulphate soils (ASS) are naturally occurring soils and sediments containing iron sulphides. They are typically found at low elevations along the NSW coast and around inland waterways, wetlands and drainage channels. This can have a bearing on construction and the durability during the life of the asset.

The investigation area is mapped as having both high and low risk of occurrence of ASS. Moruya River, the floodplain to the north of Moruya River (and west of the Princes Highway) and the area along George Bass Drive are within low probability areas, while the floodplain areas to the north and south of Moruya River (and east of the Princes Highway, including Malabar Creek) are within high probability areas.

3.6 Hydrology, water quality and groundwater

3.6.1 Surface water

The main surface water feature within the investigation area is the Moruya River (6th order stream), which forms at the junction of the Deua River (4th order stream) and Wamban Creek (4th order stream) some 11.5 kilometres upstream of the Princes Highway crossing. Though the river is initially bound by relatively steep terrain, downstream of the Mogendoura Creek (5th order stream) junction the Moruya River opens to an extensive floodplain that meets up with minor watercourses, including Malabar Creek (5th order stream), Malabar Lagoon, Dooga Creek (4th order stream) and Racecourse Creek (5th order stream).

Stream orders that are classified as six and higher, have a riparian zone defined as 50m either side of the high bank of the features. When assessing impacts under the Biodiversity Assessment Method, riparian corridors need to be mapped and measures to avoid and mitigate impacts to the riparian zones need to be identified.

3.6.2 Hydrology and flooding

The project investigation area has significant floodplain areas extending north and south from the main channel of the Moruya River (refer to Figure 3-15). Due to its location on the southern floodplain, Moruya has a long historical flood record. Prior to 1940, several peak flood levels in excess of 4 m AHD were observed at Moruya Bridge. However, in the past three decades, there have been no flood peaks above the estimated 20% AEP level (about 2.5 m AHD).

Flood extents for the Moruya River Catchment have been developed as part of the 2010 Moruya Flooding Climate Change Assessment commissioned by Eurobodalla Shire Council.

Further flood modelling was commissioned by Transport for a range of flood events, from the 5% AEP through to the PMF event. The modelling shows that there is extensive and widespread flooding in the vicinity of the Moruya Bridge and township, particularly on the northern side of the river. This represents a number of constraints to any potential bypass options that are considered.

The existing Princes Highway is relatively low-lying through the floodplain, with historical observations of overtopping of the highway during flood events. These observations are supported by flood modelling results, which found overtopping depths in excess of 1 m for large sections of the highway north of the river in the 5% AEP event. On the southern side of the Moruya Bridge, the highway is cut off near Racecourse Creek, with depths in the order of 0.3 to 0.4 metres in the 5% AEP event. Results of the flood modelling showing overtopping for sites along the existing Princes Highway are provided in Figure 3-14 and Table 3-9.

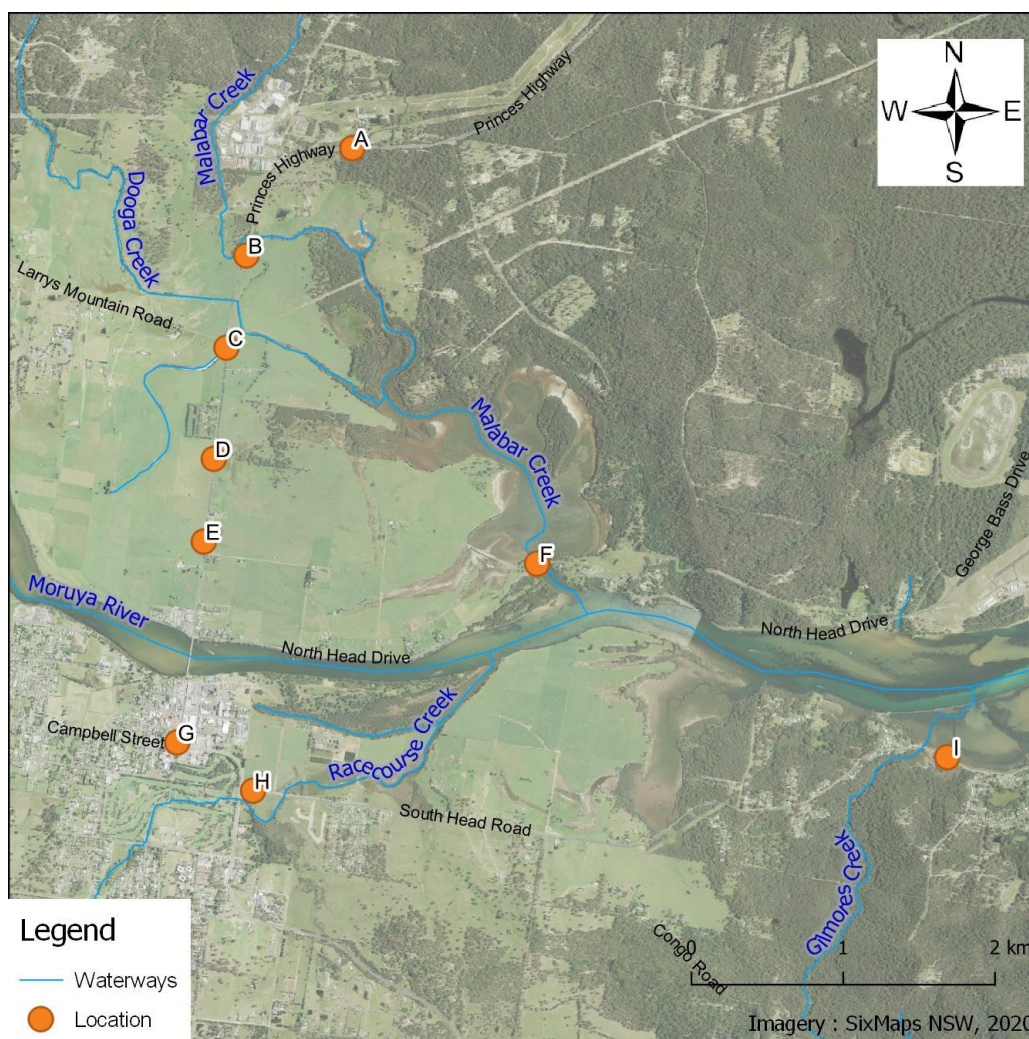


Figure 3-14: Location of flood depths along roadways (Rhelm, 2020)

Table 3-9: Indicative road overtopping peak depths (m) (Rhelm, 2020)

Location	5% AEP	2% AEP	1% AEP
A	0.4	1.8	2.6
B	0.5	2.0	2.8
C	0.1	1.6	2.4
D	0.8	2.1	2.9
E	1.1	2.5	3.4
F	0.8	2.2	3.0
G	0.1	1.4	2.2
H	0.6	2.0	2.8
I	0.2	0.2	0.2

The combination of peak flood depths and velocities pose a hazard to road users. At location E, for example, the peak overtopping depth of 1.1 m in the 5% AEP event is concurrent with the a peak flood velocity in the range of 0.5 – 1.0 m/s (Figure 3-15). This places it in the H4 Flood

Hazard Rating category, 'unsafe for people and vehicles', as defined by the Australian Institute for Disaster Resilience Guideline (2017).

As the only major north-south route in the area, the vulnerability of the existing Princes Highway and surrounding roads to flood events affects the certainty of access to and from Moruya and surrounds and the emergency response during a flood incident. The impacts of flooding have been considered in developing potential bypass corridors to achieve the project of the Princes Highway upgrade program roadmap and provide a solution that improves network connectivity, accessibility and resilience.

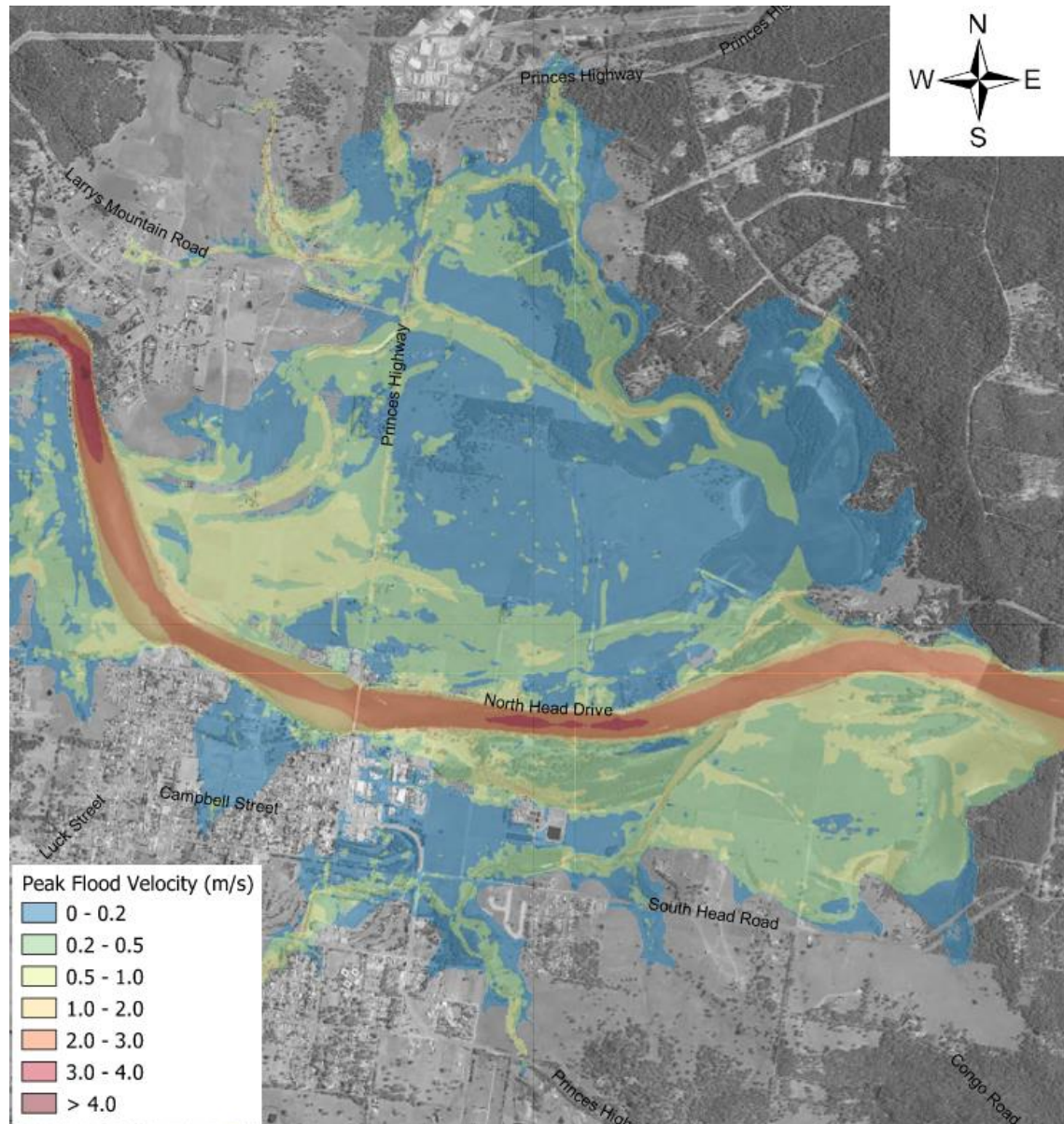


Figure 3-15: 5% AEP existing flood velocity (Rhelm, 2020)

3.6.3 Water quality

The investigation area includes receiving environments such as watercourses, key fish habitat, estuarine and floodplain wetlands, reservoirs, oyster leases, aquaculture and commercial fishing, recreational fishing areas and aquaculture, and the Batemans Marine Park. These areas are all sensitive to pollution or degradation of water quality.

Runoff from the Princes Highway would likely include contaminants, gross pollutants and litter, sediment and suspended solids, toxic organics, nutrients, heavy metals and hydrocarbons. Drainage requirements and water sensitive urban design would be considered in later design phases and the environmental assessment for the proposal.

3.6.4 Groundwater

The Groundwater Dependant Ecosystems Atlas shows several groundwater dependent ecosystems located throughout the investigation area. These ecosystems are sensitive to changes in surface and groundwater hydrology. The potential direct and indirect impacts of the proposal to Groundwater Dependant Ecosystems (GDEs) would be considered as part of the environmental assessment.

3.7 Climate Change

The NSW Government has committed to action on climate change through the NSW Climate Change Policy Framework while also acknowledging the need to address climate change risks in various planning documents state-wide.

With the International Panel on Climate Change (IPCC) estimating the planet will warm by 1.5 C between 2030 and 2052 (IPCC, 2019), understanding and mitigating climate-related risks on large projects is important. Climate change, including extreme weather conditions and severe climate extremes, can lead to costly impacts in terms of maintenance, repairs and reduction of service for infrastructure. This is required consideration in the development and delivery of new infrastructure.

The NSW and ACT Regional Climate Modelling (NARClIM) Project has developed the following summary of climate change variables for the South East and Tablelands Region of NSW. Note that NARClIM only provides data relevant to the Region and not specifically for Moruya.





	Projected temperature changes	
	Maximum temperatures are projected to increase in the near future by 0.5–1.0°C	Maximum temperatures are projected to increase in the far future by 1.8–2.5°C
	Minimum temperatures are projected to increase in the near future by 0.4–0.7°C	Minimum temperatures are projected to increase in the far future by 1.4–2.3°C
	The number of hot days will increase	The number of cold nights will decrease
	Projected rainfall changes	
	Rainfall is projected to decrease in spring and winter	Rainfall is projected to increase in summer and autumn
	Projected Forest Fire Danger Index (FFDI) changes	
	Average fire weather is projected to increase in summer and spring	Number of days with severe fire weather is projected to increase in summer and spring

Figure 3-16: South East and Tablelands Region Climate Change variables (NARClIM)

Rainfall in the region is projected to decrease in spring and winter and to increase in autumn. On average across the entire region the annual rainfall is expected to decrease by 1.8% in the near future and increase by 1.4% in the far future.

3.8 Emergency response

The proposal is situated in an environment that can experience emergencies in relation to natural hazards such as floods and bushfires, as well as incidents relating to operation of the highway (e.g. crashes). The existing Princes Highway fulfils an important function during emergencies for continuity of service and in facilitating an emergency response, particularly due to the isolated nature of the towns and villages in the investigation area and their reliance on the highway for access to emergency services and for evacuation.

3.8.1 Bushfire

Bushfire is a significant risk for the investigation area and surrounding area, with NSW, including the South Coast region, experiencing major bushfires in 2019/20 that resulted in the loss of around 2,000 homes across the state. The investigation area contains large areas of bushfire prone land on the eastern side, and smaller patches of bushfire prone land on the western side on the periphery of town. During the 2019/20 bushfires, the Moruya Basketball Stadium and surrounding showground were used to manage thousands of evacuees on multiple occasions.

3.8.2 Flooding

Flood events due to river flooding or coastal inundation are also significant risks for Moruya and surrounds. In August 2020, a major flood event resulted in an evacuation order for the Moruya CBD to the east of the Princes Highway. This flood, which reached around 2.09 m AHD at the Moruya Bridge, was found to be of a relatively frequent probability (less than a 20% AEP).

During larger flood events, the Moruya showground, RSL Hall, high school and primary school have been used as evacuation centres, depending on the scale of the flooding. ESC advises, however, that the current RFS, Ambulance and Fire and Rescue sites are located on flood-prone land and do not have sufficient capacity.

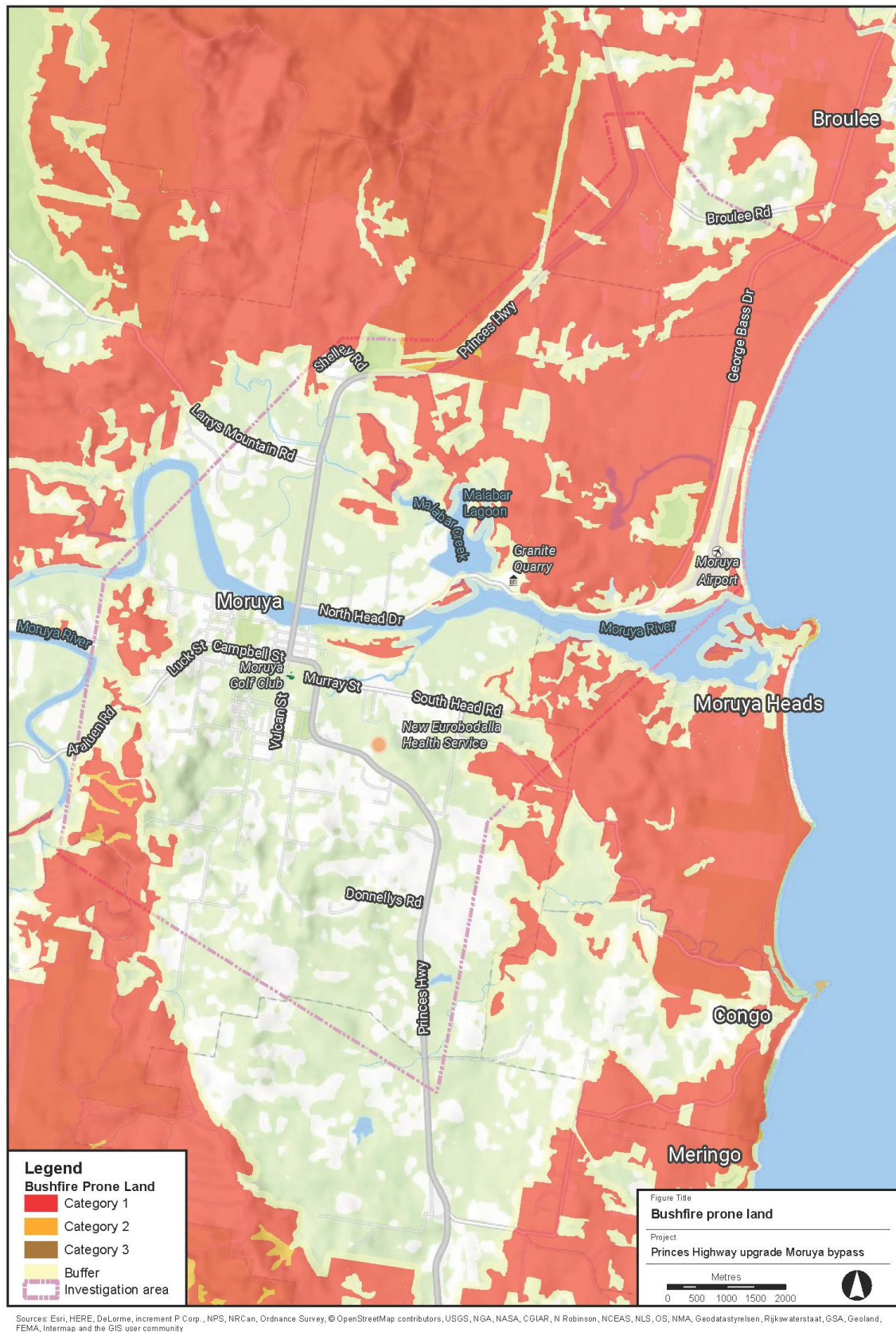


Figure 3-17: Bushfire prone land

3.9 Noise and vibration

The dominant noise source in the investigation area is road traffic noise, with intermittent aircraft noise from Moruya Airport.

The main existing sensitive receivers in terms of noise are residential dwellings along the Princes Highway and the adjacent local road network within the township of Moruya. A higher density of receivers occurs on RU3 – Medium Density Residential zoned land to the south of the Moruya River. Other sensitive receivers include a number of schools and education facilities, churches, the existing Moruya District Hospital and proposed Eurobodalla Health Service. Key recreational areas include Riverside Park and Moruya Golf Club, and Moruya Park and racecourse.

Potential noise and vibration impacts to adjacent receivers would be further considered as part of the environmental assessment.

3.10 Utilities

A utilities constraints assessment was undertaken for the project to identify the location of utilities within the investigation area. Utilities in the investigation area were identified from Dial Before You Dig (DBYD) plans, aerial imagery and consultation with utility authorities

There are several utilities present within the investigation area and are generally located within and adjacent to existing road corridors and utility easements. The existing utilities include but are not limited to, electricity lines, water, sewer and optic fibre/telecommunications.

Potential options to avoid, protect or relocate utilities would be further investigated in consultation with the relevant utility providers and asset owners during concept and detailed design.

3.11 Land use

Moruya is residential settlement of about 4,000 people and is home to a number of local services, which include schools, a health centre, local retail centre and industrial warehousing. Housing is predominantly detached, low-density and low-rise, with rural or suburban character.

Moruya River is the key natural feature running west-east across the investigation area. The wide river corridor and flood plain dominates the landscape around Moruya and is characterised by agricultural fields and small forestry plots. Long distance views to the surrounding mountains are also evident beyond the fields and trees.

The northern parts of the investigation area are characterised by grazing land uses, with some light industrial uses on the northern edge of Moruya. Southern parts of the section are predominantly low-medium density residential land uses. Some strategic agricultural land is also identified around Moruya town. This would be further considered during later design phases and environmental assessment for the proposal.

3.11.1 Key social infrastructure

The integrity of Moruya township and social infrastructure is a key consideration for the project. Key areas identified within the town that were seen to be of value to the community are listed as follows:

- Moruya town centre and main street - supporting a number of commercial and residential developments and a strong historic character and value
- Moruya Airport – with regular flights to Sydney
- Moruya TAFE Campus south of the Moruya township
- Pre-schools and early learning centres (Moruya Preschool, Moruya Early Learning Centre, Premier Early Learning Centre), Primary (Moruya Public School, St Mary's Primary School) and Secondary Schools (Moruya High School) within the township of Moruya
- Moruya Racecourse – leased by the Moruya Jockey Club (MJC), holds race meetings and facilitates racehorse training
- Riverside Park and River Park – includes Moruya War Memorial Swimming Pool, boat ramp and SAGE community gardens and farmers market
- Mogo State Forest reserve - supporting a number of walking tracks and biking trails
- South Coast Sea Planes - a key tourist generator offering pleasure flights. The main take-off and landing area for the planes is east of the Moruya River Bridge, with an access point from the Riverside Park boat ramp
- Moruya Golf Course is an 18-hole course close to Moruya town centre
- Moruya granite quarry is a heritage listed site with a memorial located on North Head Drive and is known for its use on the Sydney Harbour Bridge and a number of significant buildings
- Malabar Creek Lagoon has been identified as an environmentally protected marine park and reserve but is also known for kayaking.

Minimising/ avoiding impacts to social infrastructure as far as practically possible was a key consideration during options identification.

3.11.2 Socio-economic / Known growth plans

The economic structure of Moruya is quite diverse with a mixture of core agriculture, retail and education services being provided to the surrounding communities. Key industry sectors also include health and aged care, construction and retail. In addition, the weekly Sustainable Agriculture and Gardening Eurobodalla (SAGE) farmers markets held at Riverside Park are a unique attraction for tourists.

The draft Eurobodalla Local Strategic Planning Statement (LSPS) identifies Eurobodalla's heavy reliance on the tourism industry and need reduce its economic reliance on peak season. Eurobodalla's Economic Development Strategy (Advancing Eurobodalla) sets out key actions to support the growth of the shire.

The following strategies, plans and actions have been identified within the investigation area:

- Visitor, resident and investment attraction through enhancing amenity, including streetscapes, town entrances and community facilities and infrastructure to support sustainable population growth

- The draft Eurobodalla Local Strategic Planning Statement (LSPS) identifies an area for potential industrial development east of the Princes Highway around Malabar Creek
- Moruya is also identified as an area for both increased infill and higher densities, and future residential growth with an annual growth rate 0.9%
- The LSPS also references a future bypass for Moruya
- Eurobodalla is expected to see an increase in population of about 14.5% to 45,515 people by 2036
- Economic growth focus includes a diversifying agricultural base around seafood, dairy, and vegetables; and a strong tourism industry
- The new Moruya Library, Arts and Cultural Centre Project was opened in September 2020
- The NSW Government has committed \$200 million towards the development of the new Eurobodalla Health Service, to be located to the south-east of Moruya township (refer Section 3.2.2)
- There is also known to be a new Moruya Shellfish Hatchery Project being constructed at Moruya airport to contribute to ongoing, reliable supply of oyster and mussel spat (Eurobodalla Shire, 2020)
- Moruya Airport has recently been upgraded to enlarge the terminal, increase the size of the apron, extend the runway and build a parallel taxiway.

Figure 3-18 illustrates key social infrastructure within the study area and Figure 3-19 provides the Eurobodalla LEP local land use zones, illustrating the permitted urban extent beyond Moruya CBD outskirts and industrial area to the west of the existing North Moruya Industrial area. The surrounding planned land use and growth plans would be further considered during later design phases and the environmental assessment for the proposal.

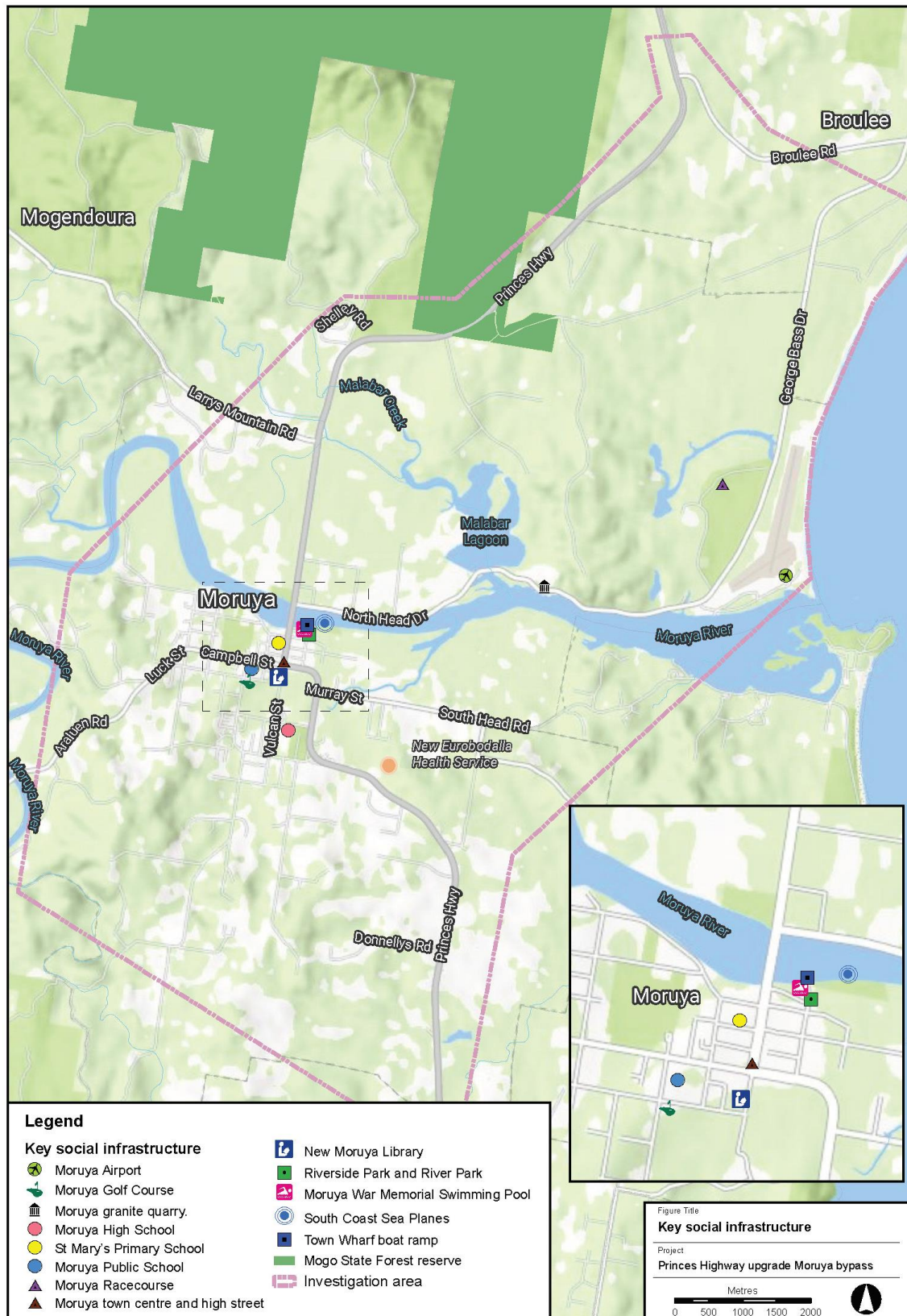


Figure 3-18: Key social infrastructure



Figure 3-19: Eurobodalla LEP zoning

4 Community involvement and feedback

4.1 Consultation activities to date

4.1.1 Initial community consultation

Between 16 March and 13 April 2020, Transport sought community and stakeholder feedback about current experiences travelling to and along the Princes Highway in the Moruya area. The purpose of this consultation was to enable the questions and concerns of the public to be considered during project development prior to the identification of a preferred strategic option.

During the consultation period submissions were received from individuals, community groups and government representatives, who provided feedback through:

- 63 emails
- seven phone calls
- 232 comments on the online consultation map.

During the consultation period, 375 unique issues were identified that focused on seven key topics:

1. Location of the proposed bypass and design suggestions
2. Environment and biodiversity
3. Socioeconomic
4. Traffic and transport
5. Project need and justification
6. Timing of consultation period
7. Other, including Eurobodalla Health Service comments.

For further information, refer to the [Moruya Bypass Community Consultation Report \(August 2020\)](#).

4.1.2 Key stakeholder meetings and workshops

Stakeholder engagement, including participation and input at the Value Management Workshop on 21 September 2020 (refer Section 5.6.1) included the following:

- Eurobodalla Shire Council
- Moruya Business Chamber – Moruya bypass subcommittee
- NSW Government agencies including:
 - Health Infrastructure and South East NSW Local Area Health District
 - Department of Planning, Industry and Environment
 - NSW Department of Primary Industries
 - NSW Police.

Other stakeholder and agency engagement included:

- Heritage NSW

- Emergency service agencies
- NSW Environment Protection Agency.

4.2 Community Engagement methods

A summary of community engagement methods utilised for the project is included in Table 4-1.

Table 4-1: Community engagement methods

Engagement Method	Details
Princes Highway Upgrade portal (princeshighway.nsw.gov.au)	Digital portal including interactive map of all work activities as part of Princes Highway upgrade program. Purpose of webpage is to explain scope of the program, program benefits, objectives and provide up-to-date information
Website (nswroads.work/moruyabypass)	Details of project are provided on the Transport for NSW website. Website also includes a subscription form for members of the public to sign up for project updates and nominate how they would like to receive project information
Project email (princeshighway@transport.nsw.gov.au)	Dedicated Princes Highway Upgrade program email address that enable contact with the project team.
Project information line (1800 719 759)	Dedicated project information line advertised to the public
FAQ	Frequently Asked Questions document accessible via the project website to answer common project questions
Postcard distribution	Postcards dropped to 2500 households in the Moruya area
Social Media	Facebook was used to raise awareness of the project and project consultation periods. Facebook posts were geo-targeted to reach Facebook users in the region
Advertising	Print and digital advertising in the Bay Post was used during project consultation periods to inform members of the public encourage
Media release	Media releases were issued to announce project milestones
Facebook Live Q&A session	30 minute live online Q&A session was held via Facebook, with 90 users attending
Emails to stakeholder list and subscribers	A subscription database was established utilising known contacts and expanded via an email subscription form via the project website.

4.3 Ongoing future consultation

Communication with the community and other stakeholders will continue as the project progresses and approaches key milestones. Communication methods will include updates to the website and interactive portal, media releases, feedback opportunities, advertising, live (online) Q & A sessions and information sessions as required.

The preferred strategic option outlines in this report will be on public display for community feedback from 7 May 2021 to 7 Jun 2021.

5 Strategic corridor development and assessment

5.1 Methodology for strategic corridor recommendation

The approach to the selection of a recommended strategic corridor involved the following process:

- **Definition of objectives and need for the proposal** – An overview of the project objectives, service need, problem statement, customer definition and strategic alignment for the project (refer to Section 2)
- **Identification of key considerations and constraints** – An assessment of key constraints and design requirements that were considered in the development of preliminary corridor options (refer to Section 3)
- **Community involvement and feedback** – An understanding of community and stakeholder feedback and input (refer to Section 4)
- **Assessment of strategic alternatives** – Development and assessment of overarching strategic alternatives, (refer to Section 5.2)
- **Identification and evaluation of a long list of strategic corridor options** – Development and assessment of 11 preliminary corridor options to identify a shortlist of 5 strategic corridor options, taking all of the above into consideration (refer to Section 5.3 and 5.4)
- **Development and evaluation of shortlisted strategic corridor options** – Development, assessment and further work undertaken of 5 shortlisted corridors to reach a preferred strategic corridor that, on balance, achieves the goals of the Princes Highway upgrade program roadmap and responds to community inputs (refer to Sections 5.5 and 5.6 and 6).

Consultation activities included engagement with the community, local Aboriginal groups and key stakeholders including other Government agencies, Eurobodalla Shire Council and industry and community associations (refer to Section 4).

5.2 Consideration of strategic bypass options and alternatives

As part of the development of any infrastructure proposal, a range of high level strategic alternatives are required to be considered in order to explore strategic solutions that best meet the project objectives and service needs.

For this proposal, a range of strategic alternatives were considered by Transport that reflected a spectrum from low and medium cost solutions through to the provision of major highway infrastructure for a bypass of Moruya. These included:

- **Business as usual** – the ‘do nothing’ option
- **Minor infrastructure improvements** – ‘do minimum’ options, in this case involving upgrades to existing infrastructure and town network improvements
- **Major upgrades** – development of full bypass options, including short and long bypasses of Moruya.

Each of these strategic alternatives are discussed in the following sections.

5.2.1 Business as usual or do nothing alternative

The business as usual option involves retaining the Princes Highway as it currently exists. This alternative was not considered for further assessment as it fails to address any of the project objectives or service needs.

5.2.2 Minor infrastructure improvements

The minor or 'do minimum' infrastructure improvement alternatives considered by the project team included upgrades of existing intersections to provide traffic flow and safety improvements, particularly in the town centre of Moruya where traffic congestion and delays impact on both highway efficiency and the amenity of the town. These minor infrastructure improvements were considered to have limited benefit in improving broader network connectivity, resilience of the road, sustainability of the region, or in achieving desirable amenity and 'place' outcomes for Moruya as a standalone solution.

However, they were considered viable and important in terms of providing safety and travel time improvements. As such the development of minor infrastructure improvements within the town centre of Moruya did go forward for consideration in parallel with the major infrastructure improvements.

5.2.3 Major infrastructure improvements

The major infrastructure improvements included long and short bypass options. The considerations for these strategic alternatives included major upgrades of the Princes Highway, both along its current alignment and on new bypass alignments.

A bypass would provide a substantial improvement to safety and efficiency, while also allowing for increased resilience, sustainability and improved place outcomes due to the ability to bypass Moruya and provide an alternative route to the existing alignment.

Major infrastructure improvements were recognised as potentially delivering substantial benefits across all of the project goals – safety, resilience, sustainability, liveability and connectivity and accessibility. However, it was also acknowledged that this type of strategic alternative was significantly more expensive and had a number of risks to be managed.

For this reason, as the project progressed, a range of corridor options were developed in parallel with minor infrastructure improvements.

5.3 Identification of long list of corridor options

Between July 2020 and September 2020, Transport prepared a technical assessment of the constraints and conditions associated with the investigation area (refer Section 3) and developed a long list of corridor options for the Moruya bypass.

The long list took into consideration goals set out in the Princes Highway upgrade program Roadmap (refer Section 2) and the community and stakeholder feedback and engagement undertaken in April-May 2020 (refer Section 4).

A total of 11 preliminary corridor options were identified across four broad categories including:

- Three western corridors to the west of Moruya (Options A, B and C)
- One lower cost internal corridor option utilising the existing Moruya River bridge (Option D)

- Three 'central' corridors to the east of Moruya and to the west of Malabar Creek (Options E, F and G)
- Four eastern corridors to the east of Malabar Creek (Options H, H-I, I and J).

The 11 preliminary corridor options are shown in Figure 5-1 and a description provided in Table 5-1.

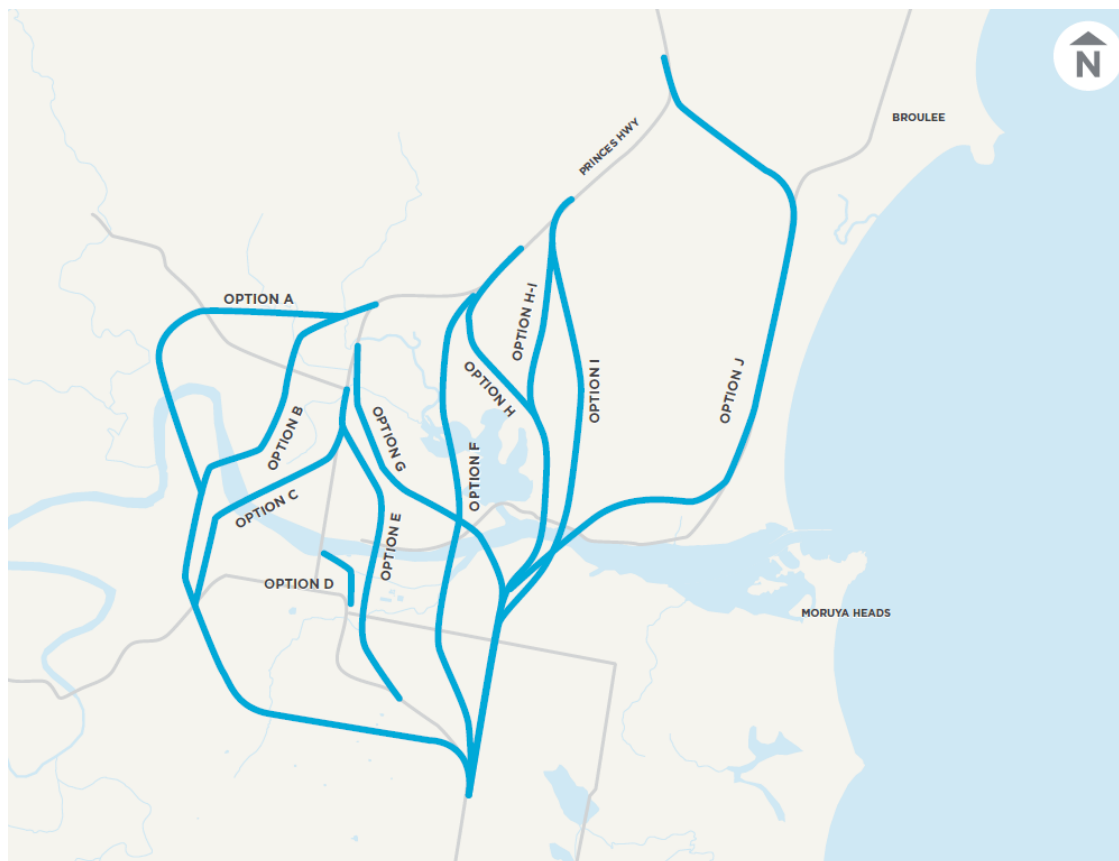


Figure 5-1: Long list of corridor options

Table 5-1: Description of long list of corridor options

Location	Corridor option	Description (north to south)
West	Option A 12 km	This is the western-most corridor option. The corridor starts near Shelley Road and travels to the west of the residential development at Glenduart Grove, off Larrys Mountain Road. The corridor crosses the Moruya River at Behringers Point, then travels south and east to connect to the existing Princes Highway just north of Mountain View Road.
	Option B 10 km	This corridor also starts near Shelley Road but travels to the east of the residential development at Glenduart Grove, off Larrys Mountain Road. The corridor crosses the Moruya River at Behringers Point (further east than the Option A corridor), then travels south and east to connect to the existing Princes Highway just north of Mountain View Road.
	Option C 8 km	This corridor starts south of Larrys Mountain Road, crosses the Moruya River at a point near the existing Moruya District Hospital, and travels south and east to connect to the existing Princes Highway just north of Mountain View Road.

Location	Corridor option	Description (north to south)
Through-town	Option D 1km	This corridor would constitute an inner, or town centre bypass, which utilises the existing bridge over Moruya River. The corridor starts just south of the existing bridge, travels east along Shore Street and Church Street, then south along John Street to connect to the existing Princes Highway just north of Murray Street.
Central	Option E 4 km	This corridor starts just south of Larrys Mountain Road and heads to the east, before travelling south along Main Street. It crosses the Moruya River at Riverside Park and crosses South Head Road before passing to the east of Moruya TAFE to connect to the existing Princes Highway south of Bergalia Street.
	Option F 7km	This corridor starts north of Percy Davis Drive, travels south and crosses Malabar Lagoon, Moruya River and Racecourse Creek, then continues broadly south to cross South Head Road and connect to the existing Princes Highway at Mountain View Road.
	Option G 8km	This corridor starts just north of Larrys Mountain Road and travels south-east, crossing Moruya River to the west of the mouth of Malabar Creek. The alignment then heads in a south direction to cross South Head Road and connect to the existing Princes Highway at Mountain View Road.
East	Option H 7km	This corridor starts north of Percy Davis Drive, travels south east utilising some of Malabar Drive, crosses Moruya River to the east of the mouth of Malabar Creek and the west of the granite quarry, then travels south to cross South Head Road and connect to the existing Princes Highway at Mountain View Road.
	Option H-I 8km	H-I is a hybrid of options H and I. The corridor starts near the Waldron Swamp rest area, travels south to cross the Moruya River to the east of the mouth of Malabar Creek and the west of the granite quarry. The corridor then travels south to cross South Head Road and connect to the existing Princes Highway at Mountain View Road.
	Option I 8km	This corridor starts near the Waldron Swamp rest area, travels south in the vicinity of Phyllis Davis Drive, and crosses the Moruya River to the east of the granite quarry. The corridor then travels south to cross South Head Road and connect to the existing Princes Highway at Mountain View Road.
	Option J 12km	This corridor starts near Broulee Road, travels south east using the existing George Bass Drive past Moruya Airport, then veers west and to cross the Moruya River. It then heads south to cross South Head Road and connect to the existing Princes Highway at Mountain View Road.

5.4 Evaluation of long list of corridor options

5.4.1 Corridor shortlisting workshop

A preliminary corridor shortlisting workshop involving Transport project team representatives was held on Monday 17 August 2020 to review and assess the long list of 11 preliminary corridor options and to establish a shortlist of corridor options for further development and investigation.

An options assessment register was used to identify the key functional, social and environmental features and constraints, and highlight any considerations that may rule out corridor options.

The workshop commenced with a background presentation to the participants which outlined the project goals and objectives, and the project givens and constraints.

The workshop participants reviewed the long list of 11 corridor options and focussed on constraints, impacts or performance measures that would eliminate a corridor option. As agreed by the group, the key considerations included the following:

- Community and stakeholder acceptance based on feedback received during the consultation phase (refer Section 4)
- Traffic modelling metrics, including vehicle hours travelled (VHT), vehicle kilometres travelled (VKT) and bypass utilisation (refer Section 3)
- Potential flooding impacts and length of floodplain crossing (refer Section 3)
- Corridor length
- Potential to minimise environmental and heritage impacts, including impact to Aboriginal cultural heritage and conservation areas.

The outcomes of the corridor shortlisting workshop are presented in Table 5-2. This provides an overview summary of the workshop commentary for each option, the nomination of hybrid options and a rationale for shortlisting or elimination as agreed at the workshop.

Table 5-2: Corridor shortlisting workshop outcomes

Corridor option	Workshop commentary and rationale for shortlisting	Shortlisted – Yes / No
Option A	<ul style="list-style-type: none"> • High impact to community and existing roads north of Moruya River • Significant longer travel length and travel time compared to the existing Princes Highway. 	No
Option B	<ul style="list-style-type: none"> • A hybrid of Option B and Option C was shortlisted for further development. (See Option B-C below). 	No
Option C	<ul style="list-style-type: none"> • A hybrid of Option B and Option C was shortlisted for further development. (See Option B-C below). 	No
Option B-C	<ul style="list-style-type: none"> • The workshop participants suggested a further option be developed that is a hybrid of Option B and Option C, which selects the most efficient path considering the technical constraints and considerations including flooding and bridge lengths • It was agreed that a corridor option to the west of Moruya township would be shortlisted for comparison at the value management workshop. 	Yes renamed as Blue

Corridor option	Workshop commentary and rationale for shortlisting	Shortlisted – Yes / No
Option D	<ul style="list-style-type: none"> • Makes use of the existing bridge over Moruya River which was constructed in the 1960s • Difficult for large vehicles to make the turn onto the existing Princes Highway, just south of the existing bridge • Traffic performance likely to be poor • No significant improvements to connectivity • Amenity considerations 	Not shortlisted for a bypass, but was further considered as short term 'Do Minimum' option
Option E	<ul style="list-style-type: none"> • This corridor option was considered to perform well in terms of travel time, however it would have a long bridge across the floodplain. 	Yes renamed as Purple
Option F	<ul style="list-style-type: none"> • Crosses Malabar lagoon • Impacts to Aboriginal cultural heritage and conservation area • Potentially long bridges across the floodplain. 	No
Option G	<ul style="list-style-type: none"> • Passes to the east of town and provides connection to the Shelley Road industrial estate • It was agreed that an option with a long length of bridge across the floodplain would be shortlisted for comparison at the value management workshop. 	Yes renamed as Orange
Option H	<ul style="list-style-type: none"> • A hybrid of Option H and Option I was shortlisted for further development. (See Option H-I below) • Similar corridor to Option H-I, however with a perceived lesser benefit due to the length of corridor and northern tie-in point. 	No
Option I	<ul style="list-style-type: none"> • A hybrid of Option H and Option I was shortlisted for further development. (See Option H-I below) • Impact to Crown Land. • Passes through more challenging terrain. • Longer route than the consolidated Option H-I. • Moruya River crossing (to the east of Moruya quarry) to be consolidated with Option H-I. 	No
Option H-I	<ul style="list-style-type: none"> • Perceived greater benefit than Option H as it provides the most direct route • Shortlisted with the intent of shifting the Moruya River crossing to the east, to avoid impacting the Moruya granite quarry heritage site and provide a more appropriate launching platform for the bridge (in a similar location to Option I). 	Yes renamed as Yellow

Corridor option	Workshop commentary and rationale for shortlisting	Shortlisted – Yes / No
Option J	<ul style="list-style-type: none"> Perceived as a better performing corridor in terms of capturing traffic in the area and improving the performance of the wider traffic network within Moruya and Broulee. 	Yes renamed as Green

5.5 Development and investigation of shortlisted corridors

5.5.1 Development of shortlisted corridors

Following the preliminary corridor shortlisting workshop, the five shortlisted corridors were further developed, taking into account the constraints identified and ongoing technical investigations (refer Section 3).

This further development included minor adjustments to the start and finishing points of the short-listed corridors to allow for future intersections and other potential connections to the existing road network.

Following shortlisting, the naming convention for the five shortlisted corridors was changed from letters to colours. The shortlisted corridor options are shown in Figure 5-2 and described in Table 5-3.

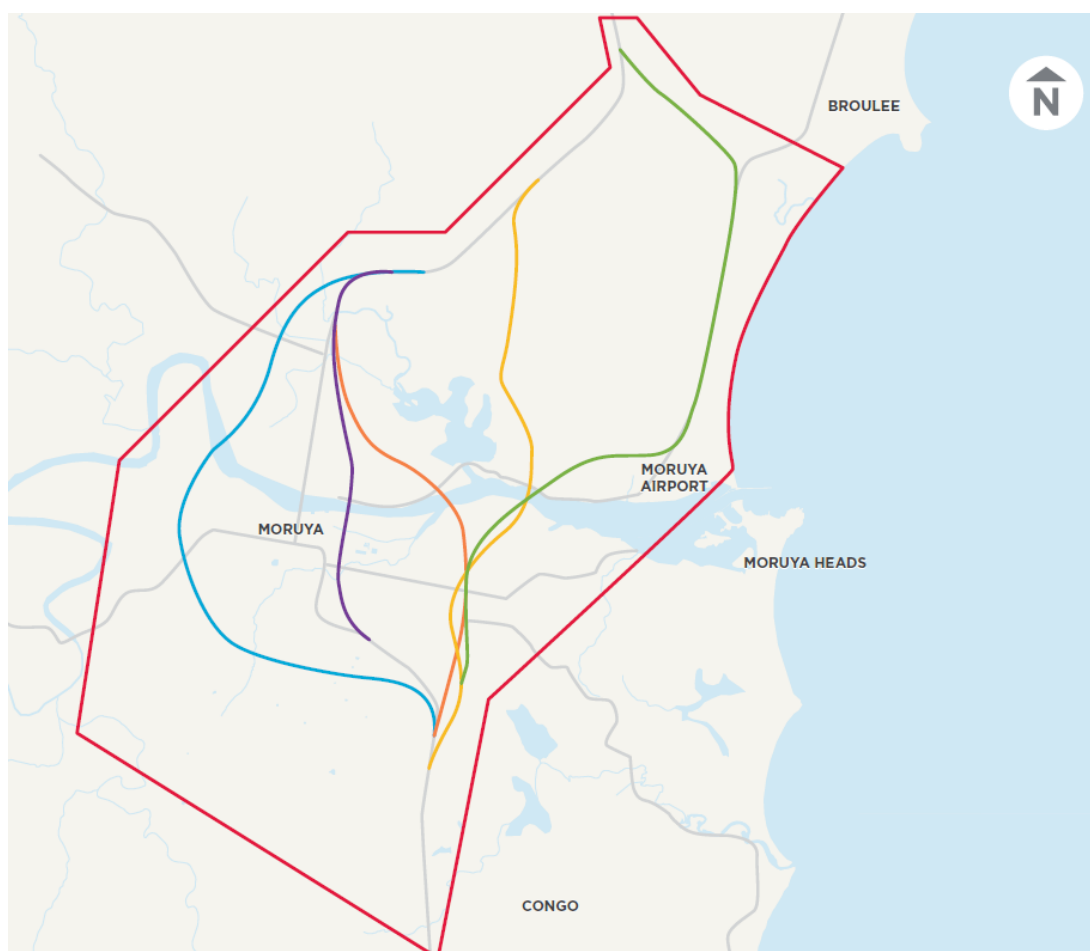


Figure 5-2: Shortlisted bypass corridors

Table 5-3: Description of shortlisted corridor options

Location	Long list corridor name	Shortlist corridor name	Description (north to south)
West	Option B-C	Option Blue	The Blue corridor starts south of Malabar Drive and heads west, passing to the east of the residential area off Larrys Mountain Road. It crosses Moruya River west of the Moruya District Hospital, travels in a large arc around the western and southern sides of Moruya town, before connecting to the existing Princes Highway near Mountain View Road.
Central	Option E	Option Purple	The Purple corridor starts near Shelley Road and runs to the east of the existing highway before heading south-east near Larrys Mountain Road. The corridor crosses Moruya River at Riverside Park, and runs between the town centre and Braemar Estate to connect to the existing Princes Highway east of Moruya TAFE.
Central	Option G	Option Orange	The Orange corridor starts just north of Larrys Mountain Road and travels south-east, crossing Moruya River to the west of the mouth of Malabar Creek. The alignment then heads in a south direction to cross South Head Road and connect to the existing Princes Highway south of Noads Drive.
East	Option H-I	Option Yellow	The Yellow corridor starts immediately south of Waldron Swamp rest area, travels south to cross the Moruya River to the east of the mouth of Malabar Creek and the west of the granite quarry. The corridor then travels south to cross South Head Road and connect to the existing Princes Highway north of Donnelly's Road.
East	Option J	Option Green	The Green corridor starts at Broulee Road, travels south east using the existing Broulee Road and then George Bass Drive past Moruya Airport. It veers west to cross the Moruya River. It then heads south to cross South Head Road and connect to the existing Princes Highway north of Donnelly's Road.

5.6 Evaluation of shortlisted corridors

The evaluation of the shortlist of five options in order to select a preferred strategic corridor took place alongside technical investigations and specialist engagements in late 2020 and early 2021. This was made up of three main elements:

Value Management Workshop: a one day workshop held to assess the performance of the shortlisted options against the Princes Highway upgrade program roadmap goals.

Risk assessment: a workshop to consider the risks associated with the project, including flooding, constructability, design risks, future maintenance and environmental risks.

Further technical investigations: including flood modelling, traffic modelling, cost estimating as well as biodiversity and Aboriginal heritage field studies

5.6.1 Value management workshop (VMW)

A multi-criteria analysis of the shortlisted options was undertaken at a value management workshop (VMW) on Monday 21 September 2020.

The VMW considered the performance of all five shortlisted corridors (Blue, Purple, Orange, Yellow and Green) against the five goals – or ‘values’ - of the project, as well as community feedback. It was a facilitated forum where participants reviewed, assessed and evaluated the corridor options against agreed weighted assessment criteria derived from the proposal’s goals and objectives (refer Section 2). The estimated comparative costs of the corridor options were not considered at this workshop.

The VMW brought together a range of project stakeholders, community business representatives and technical specialists to gain a common understanding of the project and work undertaken to date and assessed the shortlisted corridor options against agreed criteria.

Participants included representatives from the community and stakeholders such as Eurobodalla Shire Council, Moruya Business Chamber, NSW Health Infrastructure, Department of Planning, Industry and Environment (DPIE), Department of Primary Industries, Southern NSW Local Health District. It also included Transport team members representing a range of disciplines such as road safety, design, bridge engineering, environment, community engagement, Aboriginal engagement, planning, geotechnical engineering, construction, maintenance, work health and safety (WHS), property and management and governance. Additional support and technical advice was provided by Arup (design and environment), Ranbury (constructability), Rhelm (flooding), North Projects (cost estimates) and Tract Consultants (landscape character).

At the workshop, participants:

- Learned about the project, the community and service needs, and the roadmap vision and objectives through presentations
- Nominated ‘What’s important’ from their perspectives
- Identified and agreed the assessment criteria to meet the five goals of safety, resilience, liveability, sustainability and accessibility and connectivity
- Agreed on weightings of the assessment criteria within each goal
- Agreed on scoring for each corridor option against the assessment criteria
- Discussed the rankings of each corridor option for each goal
- Discussed the overall ranking of the options from a values perspective.

Cost, to determine value-for-money, did not form a part of these discussions, but was considered later in the project following additional technical investigations. (Refer Section 5.7.2).

5.6.2 Assessment of five shortlisted options

Overall rankings

The overall conclusion following the assessment of the five shortlisted outcomes against project goals, objects values was as follows in Table 5-4.

Table 5-4: Values assessment ranking summary – end of VM

Goals	Option Blue	Option Purple	Option Orange	Option Yellow	Option Green
Safety	5	2	1	2	4
Resilience	5	1	1	1	1
Liveability	5	2	1	4	3
Sustainability	2	2	1	2	5
Accessibility and connectedness	5	1	4	1	1

- Option Blue provided the least improvement in travel time and was the poorest performing corridor in the goals of safety, connectivity and accessibility, resilience and liveability. It was equal second in terms of sustainability due to its comparatively lower impact to ecological habitats and species, as well as Aboriginal and non-Aboriginal heritage values, however, there was a large gap between the performance of Orange and second place in terms of sustainability. Overall, and on balance of all considerations, it was ranked **fifth** in terms of meeting the project goals and objectives.
- Option Purple performed more highly in terms of accessibility and connectivity because of its connection points close to the town. It also performed well in the goal of resilience as it was outside of the bushland areas and had a low bushfire risk associated with it. It was among the best performing corridors in safety. While it was second in terms of liveability, it lagged significantly behind Orange, due to the closer proximity to the town, and potential impacts in terms of noise and amenity. Overall, it was ranked **second** by the VMW group in terms of meeting the goals.
- Option Orange was the best-performing corridor in the goals of safety, however it is acknowledged that all roads would provide significantly improved safety compared to the existing highway. It performed well in terms of resilience because it had a lower bushfire risk associated with it. It was also seen as the most sustainable solution of the five. However, the main performance area was seen to be in terms of liveability – the distance of the preferred strategic corridor from the Moruya town-ship means that potential noise impacts are minimised and the corridor would allow for future growth of the town, while still providing connections to key destinations. It would not affect important social infrastructure such as the riverfront parks and supports existing and planned active transport networks. While the Orange corridor performed less well in terms of accessibility and connectivity, this was because it was a longer route compared to some other corridors. However, it would still improve congestion and journey reliability in Moruya, and reduce travel time on the Princes Highway. On balance, it was considered that the Orange corridor best met the project's goals and objectives. Overall, it was ranked **first** in terms of meeting the values and goals.

- Option Yellow performed well in connectivity and accessibility because it is a shorter route, providing significant travel time savings. It performed well in terms of resilience because of its resilience against floods. While it performed second in sustainability, as per the above its score was far behind Orange and there were residual concerns about impacts to environmental and cultural values. It performed less well in terms of liveability because it was further from the Moruya township. Overall, it was ranked **third** in terms of meeting the goals.
- Option Green performed well in terms accessibility and connectivity as it provided significant savings in travel time. It also performed well in terms of resilience due to being away from the floodplain. It performed less well in terms of safety mainly because of additional safety risk associated with construction close to the airport and numerous existing roads. It also performed less well in terms of liveability as it was the farthest away from the town; and in sustainability because of potential impacts to ecological and Aboriginal heritage values. Overall, it was ranked **fourth** in terms of meeting the goals.

Detailed assessment of the five shortlisted options

The detailed assessment of the five shortlisted options is provided below.

Safety

Two criteria were used to assess the performance of the options against the safety goal.

Criterion 1: Improve Road Network Operational Safety for all Transport customers, as measured by Safe Systems Assessment (SSA). A Safe System Assessment is a safety examination of road related project.

Criterion 2: Safety in design and construction - enable safe construction, operation and maintenance of the transport network, as measured by the results of a constructability and risk workshop held in September 2020 (with a follow up in March 2021).

The results were as follows:

- The two criteria were weighted equally.
- All corridor options would improve the existing network safety of the Princes Highway.
- Option Blue performed less well against network safety due to the number of intersections that would be retained. It was the overall worst performer against safety in design and construction due to proximity to Moruya town and industrial areas, greatest utility impact, potential blasting and undercutting an existing road; and potential noise wall maintenance.
- Option Purple also performed less well against network safety as it was recognised that it retained a significant length in a semi-urban environment. It was overall the best performer against safety in design and construction due to good access, no significant cuttings, blasting and least utility impact.
- Option Orange performed well in terms of network safety because it bypassed the town. It had a neutral score against safety in design and construction. While it had a long floodplain crossing in mixed terrain, it was considered that risks could be managed.
- Option Yellow performed well in terms of network safety because it bypassed the town. It performed less well against safety in design and construction as it had difficult construction access through steep terrain, likely to require blasting through granite for large cuttings.

- Option Green performed well in terms of network safety because it bypassed the town. It performed worse than Yellow in safety in design and construction as it had the greatest reliance on existing roads, was close to airport, had large cuts and potential for contamination from airport and roadside dumping.

Resilience

Two criteria were used to assess the performance of the options against the resilience goal.

Criterion 1: Improve the Princes Highway's resilience in emergencies, as measured by a qualitative assessment of the option's resilience to bushfires, flooding, traffic incidents and impacts to the existing emergency route management plan.

Criterion 2: Improve Moruya's resilience and response to emergencies, as measured by a qualitative assessment of the option's ability to improve Moruya's resilience during bushfire and flood events and access to emergency services.

The results were as follows:

- The resilience of the Princes Highway was weighted slightly higher than the resilience of Moruya, although it was acknowledged that one influenced the other.
- All options would provide increased resilience for the Princes Highway and Moruya with little separation in scores between the options.
- Option Blue performed less well in terms of resilience for the Princes Highway as the bridge provided less resilience to floods than the other options; and the route is close to bushfire prone areas. It provided less resilience for Moruya because of the risk of flooding from the option.
- Option Purple performed well in terms of resilience for the Princes Highway as the bridge provided resilience against floods and traversed the least amount of bushfire prone area. It scored less well for resilience for Moruya because of the risk of flooding from the option.
- Option Orange also performed well in terms of resilience for the Princes Highway as the bridge provided resilience against floods and traversed the least amount of bushfire prone area. It performed less well for resilience for Moruya because of the risk of flooding from the option.
- Option Yellow performed well in terms of resilience for the Princes Highway as the alignment provides improved flood immunity. However, it traversed bushfire prone areas. It performed better than Blue and Purple for resilience for Moruya because the route is further away from the town and there is less risk of flooding from the option.
- Option Green performed well in terms of resilience for the Princes Highway as the bridge provided resilience against floods. However, it traversed bushfire prone areas. It performed better than Blue and Purple in terms of resilience for Moruya because the route is further away from the town and there is less risk of flooding from the option.

Liveability

Four criteria were used to assess the performance of the options against the liveability goal.

Criterion 1: Improve Moruya's amenity, as measured by a qualitative assessment of change in amenity for residents including consideration of:

- Estimated reduction in traffic volumes and heavy vehicles through Moruya
- Appraisal of business impacts and opportunities

- Appraisal of opportunities for place making, including LOS (Level of Service, refer Glossary Section 8 and Section 3.2.6 for further information) for town centre intersections
- Social infrastructure, markets and spaces.

Criterion 2: Support multi modal shift from private vehicles to active and public transport, as measured by a qualitative assessment of improvements for active and public transport including consideration of:

- Ability to integrate with existing and planned active transport links
- Ability to integrate access to active and public transport
- Impacts to existing desire lines.

Criterion 3: Minimise impacts to landscape character and visual amenity, as measured by a qualitative assessment of impact on landscape character value.

Criterion 4: Minimise noise and air quality impact, as measured by a quantitative measure of estimated nuisance noise levels.

The results were as follows:

- The results reflected the weighting process that valued Moruya's amenity more highly than the other criteria. It also reflected the range of criteria that were considered – all options had positives and negatives.
- There was a large gap in the scores between first - Orange, which overall had a strong benefit in terms of liveability - with all other options scoring less strongly.
- It was agreed that ways to improve the performance of liveability outcomes would need to be considered as part of ongoing considerations during the development of the project.
- Option Blue was considered to have the greatest disbenefit in terms of the liveability of Moruya. It had the least impact in terms of reducing the traffic through Moruya. It also skirted close to the western edge of the town. It was scored poorly against the amenity of Moruya, modal shift and noise nuisance. However overall it was considered neutral in terms of landscape impacts because while there were impacts, there was also the opportunity to open up new views to the west.
- Option Purple was ranked second overall in terms of the liveability of Moruya, but again the scores were mixed. While it performed best in terms of reducing traffic through the township, the alignment was considered too close to the township to provide good amenity and the alignment impacted Riverside Park. Its performance was considered good in terms of the potential for modal shift, but it scored poorly against landscape and visual impacts as well as noise nuisance, bringing its overall score well below that of Orange.
- Option Orange was by far the highest performing in terms of the liveability of Moruya, It ranked well against amenity and the potential for modal shift. While it had a moderate effect in terms of reducing traffic in the town, it did not divide the town physically. It had a moderate impact in terms of landscape and visual effect; and due to its distance from residences was able to minimise noise nuisance.
- Option Yellow was overall ranked fourth in terms of the liveability of Moruya. While it performed reasonably well in terms of reducing traffic through the township, it scored poorly against amenity due to its distance from the town and poor connectivity to the industrial areas in North Moruya. Its performance against landscape and visual was poor due to the cuts and fills required.

- Option Green overall ranked third in terms of the liveability of Moruya. While it performed well in terms of reducing traffic through the township of Moruya, it was considered to have adverse impacts to Broulee. It performed well in terms of modal shift due to the opportunity to create new cycle links. It performed poorly against the landscape and visual due to the cut and fills, but was able to minimise noise nuisance due to its distance from the town.

Sustainability

Six criteria were used to assess the performance of the options against the liveability goal.

Criterion 1: Minimise impacts on terrestrial ecology, as measured by consideration of impacts to:

- Commonwealth listed TEC (area)
- State listed TEC (area)
- Native vegetation
- Fauna connectivity and impacts to fauna corridors.

Criterion 2: Minimise impact on aquatic ecology, as measured by consideration of impacts to:

- Coastal Management SEPP wetlands
- Marine vegetation.

Criterion 3: Minimise impact to Aboriginal heritage, as measured by consideration of impacts to:

- Known cultural heritage AHIMS sites
- Identified areas of Aboriginal cultural heritage
- Crown Land subject to Aboriginal Land Claims.

Criterion 4: Minimise impact to non-Aboriginal heritage, as measured by:

- Consideration of impacts to known non-Aboriginal heritage items identified in LEP.

Criterion 5: Minimise social impact from direct property and business impacts, as measured by consideration of impacts to:

- Adjacent properties and their current land use (e.g. residential, rural, environmental)
- Businesses including South Coast Seaplanes and agricultural land
- Proximity of bypass to Moruya.

Criterion 6: Maximise integration with existing and future land use planning, as measured by consideration of integration with existing and future land use including:

- State Forest
- Residential and industrial areas
- Eurobodalla Health Service.

The results were as follows:

- The criteria were equally weighted.
- It is noted that there was a large gap between the highest score (which still indicated an overall, though comparative minor disbenefit in terms of sustainability) and the second score.

- Option Blue had less impact than other options on terrestrial ecology, aquatic ecology, Aboriginal heritage and non-Aboriginal heritage. However, it was seen to perform poorly against economic sustainability and land use integration due to its property, business and residential impacts.
- Option Purple as compared to other options was seen to have a moderate comparative level of impact in terms of terrestrial ecology, aquatic ecology, Aboriginal heritage and non-Aboriginal heritage. It performed poorly against economic sustainability and land use integration as it was seen to bisect the town and was close to Riverside Park and properties. It does however provide access to the North Moruya industrial area.
- Option Orange as compared to other options had the highest performance in terms of sustainability. While it has adverse impacts in terms of terrestrial ecology, aquatic ecology, Aboriginal heritage and non-Aboriginal heritage, it performs in terms of economic sustainability and land use integration because this option does not segregate the town, it allows for future development and growth of the township and provides amenity because of its distance from the town. It would also allow connectivity to the North Moruya industrial area.
- Option Yellow as compared to other options was considered to have a higher level of impact in terms of terrestrial ecology, aquatic ecology, Aboriginal heritage, non-Aboriginal heritage due to the bushland terrain on the north side of the river. However, in terms of scores this was largely offset by its positive performance in terms of land use integration due to its location in relation to the town.
- Option Green performed the poorest in terms of sustainability because of its low scores in terms of terrestrial ecology, aquatic ecology, Aboriginal heritage and non-Aboriginal heritage. While there were seen to be economic benefits in its connectivity to the airport, the land use integration was considered neutral and overall it ranked last.

Accessibility and connectivity

Two criteria were used to assess the performance of the options against the accessibility and connectivity goal.

Criterion 1: Improve travel time on the Princes Highway, as measured by estimated normal AM and PM peak period travel time savings on Princes Highway in 2036.

Criterion 2: Improve efficiency across the transport network, as measured by estimated normal peak period AM and PM network operation in 2036 (VHT, VKT, delay per vehicle).

The results were as follows:

- The efficiency across the wider transport network was weighted slightly higher than improved travel time on the Princes Highway.
- All options would provide good travel time savings on the Princes Highway and improve efficiency across the transport network.
- Option Blue provided some travel time savings of 14% but had the lowest score as it had the longest route length. It provided moderate improvements to the overall network efficiency
- Option Purple provided travel time savings of 21%. It provided a high level of improvement to overall network efficiency due to its proximity to the town because there was a higher level of traffic on the corridor, and the connection points are closer to the town.

- Option Orange provided travel time savings of 20%. It provided good improvements to the overall network efficiency.
- Option Yellow provided travel time savings of 28% due to it being the shortest route length between common points. It provided a high level of improvements to the overall network efficiency because it is a shorter corridor.
- Option Green provided time savings of 25%. It provided a high level of improvements to the overall network efficiency because there was a higher level of traffic on the corridor.

5.7 Post VMW workshops and technical studies

The VMW recognised that on balance, the Orange option best meets the goals and objectives of the project – safety, resilience, liveability, sustainability and connectivity and accessibility.

However, it also recognised that there were risks that required additional investigation before the Orange option could be ratified and recommended as the preferred strategic corridor.

Further discussions were also required with Health Infrastructure to ensure that the location of the preferred strategic corridor would support the selected site for the new Eurobodalla Health Service.

The following activities were undertaken between October 2020 and April 2021 to address these issues:

- A post-value management workshop was held to determine whether it was possible to improve any of the options and reduce costs through design optimisation.
- Additional flood modelling, traffic modelling, economic analysis and cost estimating were undertaken as well as biodiversity and Aboriginal heritage field studies in better inform the feasibility, risks and constraints of the design.
- Additional field work was also undertaken to get a better understanding of the environmental and geotechnical conditions of the area:
 - Temporary cameras were installed at various locations in and around Moruya to collect traffic data over the peak 2020/2021 holiday period
 - Geotechnical investigations were undertaken in early 2021 at various locations in and around Moruya
 - Targeted biodiversity surveys and ground-truthing of vegetation commenced in late 2020 and is ongoing
 - Aboriginal heritage consultation commenced in late 2020 with field surveys occurring in early 2021. Aboriginal investigations are ongoing.
- Discussions with NSW Health Infrastructure were held.
- A Corridor Review Workshop was held in October 2020 to review the additional design and technical work undertaken and further consider risks and mitigation measures.
- A preliminary economic analysis was prepared for the preferred strategic corridor.

5.7.1 Risk identification and mitigation

A Corridor Review Workshop was held on 20 October 2020 in order to review the design and technical work undertaken following the Post Value Management workshop, and further consider the risks associated with the project, including flooding, constructability, design, future maintenance and environmental risks.

A risk management approach was undertaken as part of the corridor evaluation in order to determine the significant risks that were required to inform the planning for the preferred strategic corridor.

The risks considered were those within four broad categories which were identified as having high potential consequence for the project. These were:

- Construction risk and flooding during construction
- Design and construction risk associated with long and complex bridge structures across the floodplain
- Planning pathways and environmental approvals timeframes
- Future maintenance complexity and maintenance access requirements.

Further detail regarding these risks, and the mitigation measures identified as part of this process are provided in Table 5-5.

Table 5-5: Strategic corridor risk identification and mitigation

Risk category / identified risk	Mitigation measure	To be actioned at
Potential for increased costs associated with floodplain management, risk mitigation strategies, redesign and environmental offsets and management plans	<ul style="list-style-type: none"> • Key risks to be included in cost estimates at the strategic design stage, including environmental constraints and mitigation measures. 	Strategic design
Integration with the proposed Eurobodalla Health Service requires additional infrastructure to integrate with bypass	<ul style="list-style-type: none"> • Ensure Health Infrastructure are involved throughout early stages of design to provide input into corridor selection • Collaboration with NSW Health Infrastructure to ensure functional tie in arrangements with the preferred strategic corridor. 	Strategic design and concept design
Complexity and difficulty of constructing of a new highway – including embankments and a long bridge in a floodplain environment	<ul style="list-style-type: none"> • Develop constructability assessments and plans during design development to identify key construction tasks – including staging requirements for the preferred strategic corridor. 	Concept design and detailed design
Temporary works results in adverse flood/afflux impacts on Moruya and surrounds	<ul style="list-style-type: none"> • Undertake a detailed flood assessment to assess flood risk during construction • Develop specific flood management plan for construction phase • Assess and model key temporary works stages, including proposed levels of access tracks and construction pads 	Concept design and detailed design

Risk category / identified risk	Mitigation measure	To be actioned at
	<ul style="list-style-type: none"> Identify site compound and material with regards to flood immunity. 	
Road geometry and associated bridge detailing requires design and construction precision due to complexity of the long bridge structure and topography of the surrounding environment	<ul style="list-style-type: none"> The preferred strategic corridor width to be sufficient to allow to further refinement during the detailed design phase – horizontal curves should be large enough to allow two-way crossfall with no superelevation transitions Key drivers in construction and design risk (such as earthworks, bridge length and environmental constraints) are to be developed with enough contingency to allow for opportunities for ongoing risk mitigation during detailed design phases Confirmation of acceptable methodology for stormwater discharge and treatment requirements from long bridges Pier design and orientation should minimise floodway obstruction - look at ways to improve flow, streamline pier shape and function; eg pile cap for floodplain bridge is to be below ground level. 	Concept design
Abutments in the floodplain are at high risk of encountering unsuitable soils (such as acid sulphate soils or soft / compressible soils) or intense flood velocities	<ul style="list-style-type: none"> Conduct sufficient detailed geotechnical surveys and testing during the design phase to accurately determine the ground conditions and presence of contaminants or soft / compressible soils Acid sulphates to be considered during foundation design and how to treat during constructions Consideration of abutment location, ensuring not within the high flow areas Multiple openings of waterway in the floodplain to reduce concentration of flow. 	Concept design and detailed design
Environmental impacts lead to long environmental approvals process - delays project	<ul style="list-style-type: none"> Design to be refined to ensure minimal impacts to environmentally sensitive areas, particularly in relation to biodiversity, non-Aboriginal heritage and Aboriginal heritage A detailed environmental assessment is to be developed for the project Establish acceptable runoff requirements from bridge decks in terms of discharge and water quality requirements for receiving waters. 	Concept design
Maintenance effort is increased due to location and length of bridges, access is limited, specialist equipment required	<ul style="list-style-type: none"> Concept and detailed bridge design to minimise the number of deck joints and bearings in order to reduce routine maintenance requirements Constraints / key issues for maintenance are to be identified early in the design phase – planning for maintenance access to be included in design 	Concept design and detailed design

Risk category / identified risk	Mitigation measure	To be actioned at
	<ul style="list-style-type: none"> Constructability and HSiD workshops to be undertaken throughout all stages of design and construction to ensure that maintenance is considered Consideration of design solutions with fewer maintenance requirements Development of innovative solutions to avoid requirement for access to bridge structures from floodplain. 	
Flooding during construction may damage work already completed or create additional delays due to access restrictions	<ul style="list-style-type: none"> Develop construction program to minimise or avoid works on the flood prone areas during wet season Identify flood prone land and critical construction phases. 	Construction planning
Construction in the floodplain has a high probability of encountering unsuitable material (such as acid sulphate and soft / compressible soils)	<ul style="list-style-type: none"> Conduct sufficient detailed geotechnical surveys and testing during the concept design phase to accurately determine the ground conditions and presence of contaminants Provide adequate allowance in construction program for possible increased timeframes around soft / compressible soils Develop construction plan to mitigate the impact unsuitable material on construction Early identification of waterway opening location and carry out detail geotechnical investigations for substructure design Consider bridge designs that minimise access to and impact on floodplain, eg. launched structures rather than those requiring cranes. 	Concept design and detailed design

Overall, it was considered that while there were residual risks associated with the floodplain and the project more generally, these risks could be managed within the ongoing design process.

5.7.2 Preliminary Economic Analysis

A preliminary economic analysis of the preferred option was undertaken as part of the post VMW technical studies and investigations. The review focussed on identifying the values of the major benefit streams to be realised as a results of the upgrade. The major benefit streams identified were associated with lowered transportation costs for local and through traffic road users as well as health and accessibility benefits associated with improved flood resilience of the Moruya River crossing. Table 5-6 summarises the major benefit streams assessed.

Table 5-6: Economic benefits of the Orange corridor

Benefit stream	Benefit percentage
Travel Time Savings	34%
Flood Resilience	31%
Residual Values	13%
VOC to bypass Users	11%
Whole of Corridor Benefits*	6%
Reliability Improvement	2%
Safety Improvement	2%

Source: Rhelm, April 2021

*The project would contribute to a range of whole of corridor benefits associated with provision of planned upgrades along the entire Princes Highway including resilience to bushfires, freight accessibility and induced traffic generation.

The preferred strategic corridor would generate benefits in relation to travel time savings to road users as well as Vehicle Operating Cost reductions. The preliminary economic assessment undertaken is considered conservative as the modelling undertaken focussed primarily on bypass users and did not capture all impacts to local road users and community members. This is particularly the case with regards to the seasonality of traffic demand within Moruya. Further traffic modelling will be undertaken to demonstrate the impacts of holiday peak demands on local road users and the associated benefits of diverting through-traffic to the bypass. It is also noted that additional benefits could be realised by addressing local intersection issues in conjunction with the bypass option as part of a holistic solution.

The provision of an additional Moruya River crossing would significantly improve the resilience of the corridor at Moruya, maintaining connectivity across the floodplain during wet weather events and reducing the potential for long delays and detours. Importantly, provision of a resilient crossing would provide improved access to the proposed Eurobodalla Health Service during floods, reducing the risk to life associated with people being unable to access health care services.

A detailed cost benefit analysis has not been undertaken at this stage. A range of further benefits would be considered as part of detailed economic analysis, including evaluation of 'place' value benefits to Moruya through the removal of heavy vehicles and reduced traffic volumes through the town centre, travel cost reductions for local road users, and further consideration of how seasonality of traffic demand impacts local network performance.

5.7.3 Recommended preferred strategic corridor

The Orange corridor was selected as the preferred strategic bypass corridor following consideration of community and stakeholder input, the outcome of the Value Management Workshop (VMW) and the technical, economic, constructability, flooding, environmental and risk studies held both before and after the VMW.

The Orange corridor was selected because the corridor overall outperformed all other options in terms of in meeting the project objectives and the wider Princes Highway upgrade roadmap

goals, and because the risks raised during the VMW and Corridor Review workshops have been shown to be able to be planned for, managed and mitigated through ongoing design processes.

The benefits of the preferred strategic corridor are as follows:

- **Safety:** while all the options would improve safety, the technical studies found that the preferred strategic bypass corridor provided significant safety improvements to the existing network and within the township.
- **Resilience:** the preferred bypass corridor would improve the flood immunity of the highway and has a lower bushfire risk associated with it. It has a positive impact on emergency route management and resilience by providing an additional crossing of the Moruya River. It would improve accessibility during emergency events.
- **Liveability:** the main performance area of the Orange option was seen to be in terms of liveability - the removal of trucks and through traffic from the Moruya township would improve amenity and mode shift, opening up future planning and possibilities for Moruya for transport choice and as a place and destination. The distance of the preferred strategic corridor from the Moruya township means that potential noise impacts would be minimised and the corridor would allow for future growth of the town, while still providing connections to key destinations. It would not divide the town or affect important social infrastructure such as the riverfront parks and supports existing and planned active transport networks.
- **Sustainability:** the preferred strategic corridor avoids the bushland areas in the eastern parts of the study area. While there are potential impacts to other biodiversity values and Aboriginal heritage sites, these impacts would be minimised through ongoing design and investigations. In terms of economic sustainability, lower traffic volumes in the town centre provides the opportunity for enhanced amenity, including improvements streetscapes, town entrances and community facilities as a means to improve economic sustainability, visitor and investment attraction.. The proximity of the corridor to Moruya and the northern industrial area was also valued highly.
- **Connectivity and accessibility:** The preferred strategic corridor on balance improves congestion and journey reliability in town, and reduces travel time on the Princes Highway while maintaining good connections to Moruya and the planned Eurobodalla Health Service.

6 Recommended preferred strategic corridor

The Orange corridor has been identified as the recommended preferred strategic corridor for a bypass of Moruya. The preferred bypass corridor is shown in Figure 6-1.

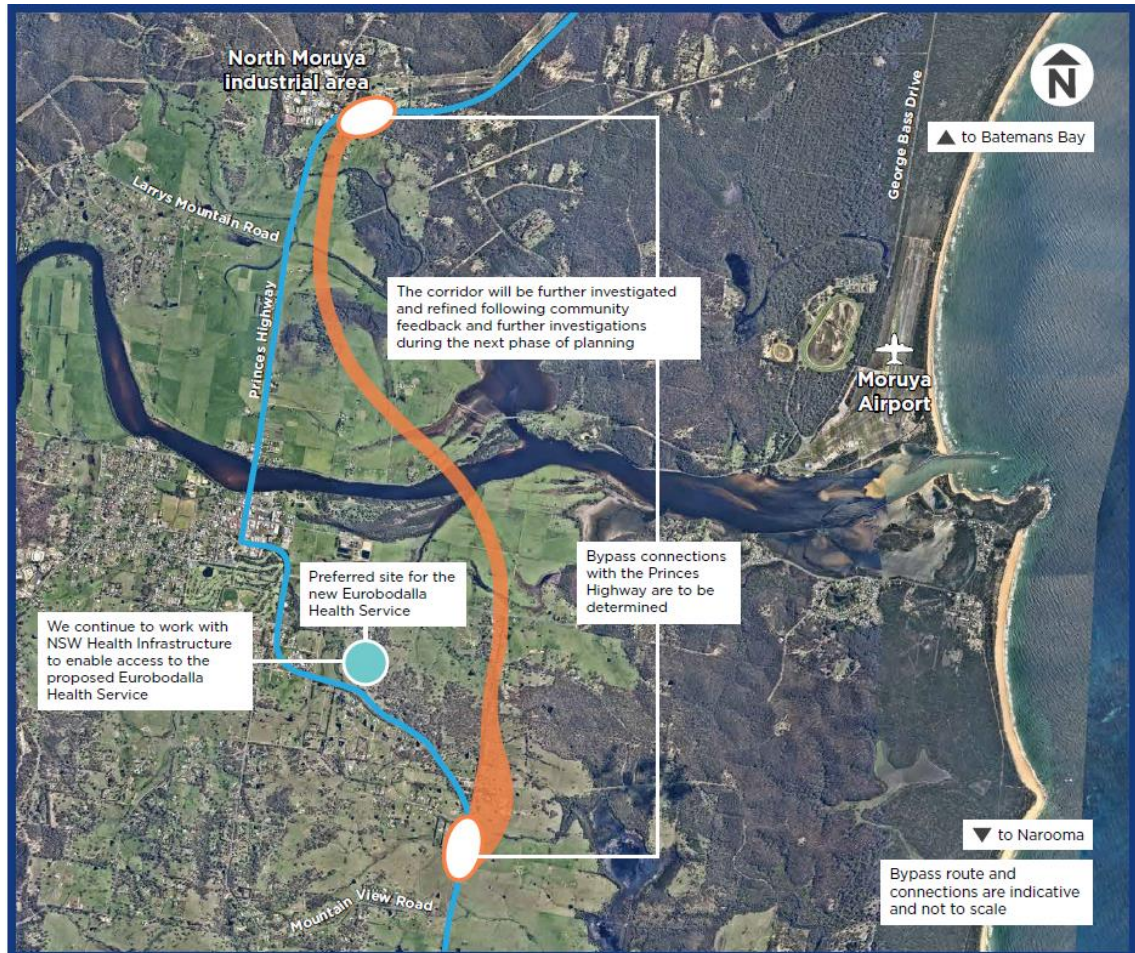


Figure 6-1: Preferred strategic corridor (Orange)

Preferred strategic corridor description

The preferred strategic corridor (Orange) is around 8 kilometres in length, starting near Shelley Road and running parallel to the east of the existing highway to the Larrys Mountain Road intersection.

From Larrys Mountain Road, the corridor veers further east with a new bridge crossing of the floodplain and Moruya River about 2 kilometres east of the existing bridge. South of the Moruya River, the preferred strategic corridor continues and crosses over South Head Road to re-join the existing highway.

The preferred strategic corridor would provide connections to the local traffic network at the northern end of the corridor near the North Moruya Industrial Estate and southern end near Mountain View Road.

It would also improve travel time and access to the proposed Eurobodalla Health Service, improving connectivity during flood and emergency events. Transport is continuing to partner with NSW Health Infrastructure as plans for the new Eurobodalla Health Service progress.

A bypass of Moruya would unlock opportunities to improve the feel of Moruya town centre for the benefit of locals, pedestrians and businesses and complement the appealing, tourist-friendly experience of the town.

Key benefits of the proposed bypass include:

- Reduced travel time and congestion, particularly in peak periods, by removing the need for vehicles to pass through numerous intersections and conflicting traffic movements
- Safer journeys for everyone, including those using the bypass and motorists, cyclists and pedestrians on the local road network
- More efficient freight movement by taking trucks off local roads
- Enhanced amenity and liveability of the town centre, providing the opportunity for improvements to streetscapes, town entrances and community facilities
- Caters for future growth of the town and provides ease of access to employment and essential services such as hospitals and education.

7 Next steps

The preferred strategic bypass corridor will be placed on public display until Monday 14 June 2021 to provide the community and stakeholders an opportunity to review the preferred strategic bypass corridor and provide feedback.

Following community consultation, Transport will develop a preferred option generally within the preferred bypass corridor. Developing the preferred option includes:

- considering community and key stakeholder feedback received on the preferred strategic corridor
- traffic modelling and design to refine the corridor alignment and determine the intersection and connection points along the proposed bypass corridor, including consideration of the proposed Eurobodalla Health Service in consultation with the NSW Health Infrastructure
- site investigations to better understand the geotechnical, flooding and environmental constraints
- investigations to improve the Moruya town centre and consider impacts to parking, footpaths, cycleways and public transport facilities
- consultation and investigations to better understand potential heritage impacts.

There will be further opportunities for the community and key stakeholders to provide feedback as the project progresses.

8 Glossary of terms and abbreviations

Term / acronym	Definition
Aboriginal Land Rights Act	<i>Aboriginal Land Rights Act 1993</i>
AADT	Annual Average Daily Traffic
ACT	Australian Capital Territory
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ARR	Australian Rainfall and Runoff
ASS	Acid sulphate soils
BC Act	<i>Biodiversity Conservation Act 2016</i>
Biosecurity Act	<i>Biosecurity Act 2015</i>
CLM Act	<i>Contaminated Land Management Act 1997</i>
CM SEPP	State Environmental Planning Policy (Coastal Management) 2018
Coastal Management Act	<i>Coastal Management Act 2016</i>
Crown Lands Management Act	<i>Crown Lands Management Act 2016</i>
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
EPL	Environmental Protection Licence
ESC	Eurobodalla Shire Council
ESTM	Eurobodalla Shire Transport Model
FM Act	<i>Fisheries Management Act 1994</i>
FMZ	Forest Management Zone
Forestry Act	<i>Forestry Act 2012</i>
GDEs	Groundwater dependent ecosystems
GIS	Geospatial Information System
Heritage Act	<i>Heritage Act 1977</i>
HW1	Highway number 1 (Princes Highway), as per Schedule of Classified Roads, pursuant to the <i>Roads Act 1993</i>

Term / acronym	Definition
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
km/h	Kilometres per hour
LEP	Eurobodalla Local Environmental Plan 2012
LGA	Local Government Area
LoS	Level of Service: <ul style="list-style-type: none"> • LoS A: Average delay less than 15 seconds (good operation). • LoS B: Average delay 15-29 seconds (good with acceptable delays and spare capacity). • LoS C: Average delay 29-43 seconds (satisfactory). • LoS D: Average delay 43-57 seconds (operating near capacity). • LoS E: Average delay 57-70 seconds (at capacity). • LoS F: Average delay greater than 70 seconds (unsatisfactory).
Marine Estate Management Act	<i>Marine Estate Management Act 2014</i>
MNES	Matters of national environmental significance
Native Title Act	<i>Native Title Act 1993</i>
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
OLS	Obstacle limitation surface
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2011
PCT	Plant community type
PEI	Preliminary Environmental Investigation
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
REF	Review of Environmental Factors
Roads and Maritime	Roads and Maritime Services (now Transport for NSW)
RFS	Rural Fire Service
Roads Act	<i>Roads Act 1993</i>
SEPP	State Environmental Planning Policy
SEPP 44	State Environmental Planning Policy No 44 - Koala Habitat Protection
SES	State Emergency Services
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSI	State Significant Infrastructure
TAFE	Technical and Further Education (NSW)

Term / acronym	Definition
TEC	Threatened Ecological Community
Transport	Transport for NSW
TSC Act	<i>Threatened Species Conservation Act 1995</i> (now repealed)
VHT	Vehicle hours travelled
VKT	Vehicle kilometres travelled
WM Act	<i>Water Management Act 2000</i>
WONS	Weeds of National Significance

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