

Executive Summary

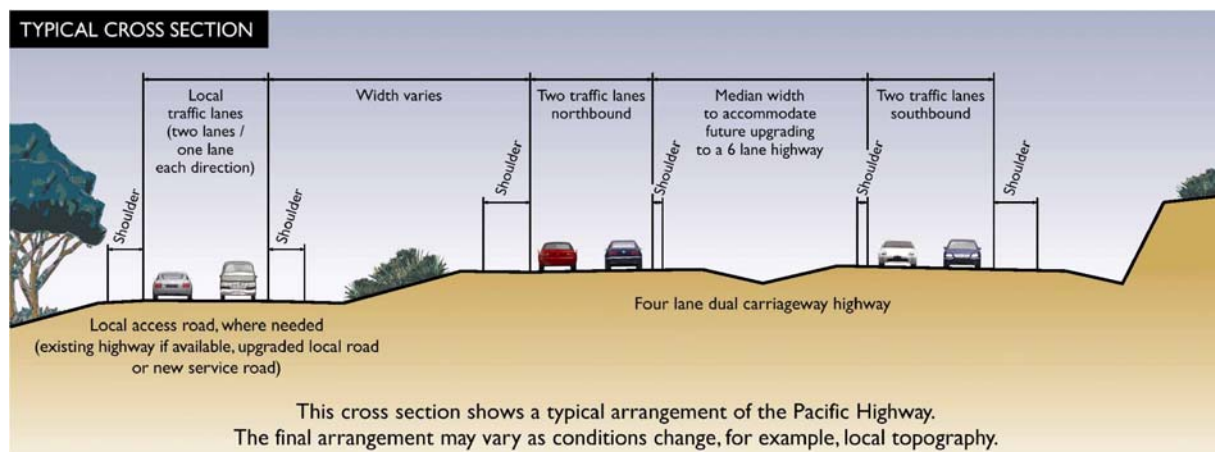
1. Completing the Upgrade of the Pacific Highway

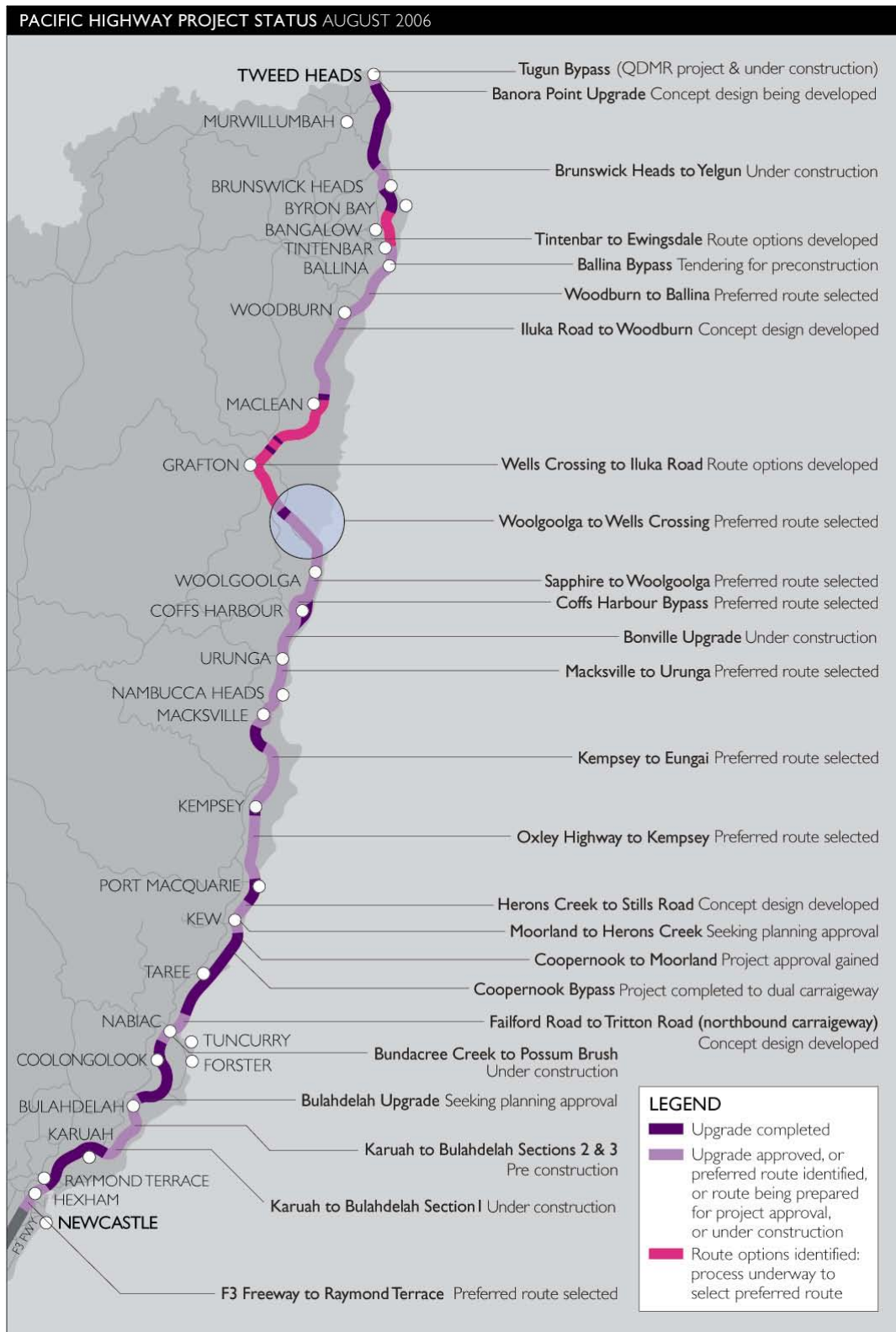
In January 1996 the NSW and Australian governments announced their joint commitment to a 10 year program to upgrade the Pacific Highway between Hexham and the Queensland border. As of the end of July 2006, a total of 233 kilometres are now double-lane divided road. A further 380 kilometres of highway are under construction, have been approved for construction or have had a preferred route identified. This leaves only 103 kilometres of existing highway with a preferred route still to be identified.

The Pacific Highway is an AusLink National Network road. For the 10 years to June 2006, some \$2.3 billion has been invested by the NSW and Australian governments. Over the past 10 years, the NSW Government has committed \$1.66 billion and the Australian Government \$660 million.

In December 2005, the NSW and Australian governments announced a jointly funded program of \$960 million for three years to 2009. In May 2006, the Federal Budget announced an additional \$160 Million, matched by NSW, for the period to the end of 2009, thereby increasing the total value of the new joint investment program from \$960 million to \$1.3 billion.

Both governments are jointly examining how the entire length of the highway can be upgraded to dual carriageway in the next 10 years.





Woolgoolga to Wells Crossing Project

This project involves the proposed upgrade of approximately 27.8 km of the Pacific Highway on the north coast of NSW.

The project commences approximately five kilometres north of Woolgoolga at Arrawarra Creek. It extends for approximately 27.8 km over Dirty Creek Range to the intersection of the highway with Bald Knob Tick Gate Road.

The study area consists of a corridor up to three kilometres wide, which generally surrounds the existing highway, including the completed Halfway Creek duplication.

This report summarises the outcomes of the route options development and preferred route selection phases of the project.

It describes the four highway upgrade options that were placed on public display as well as an additional option that was developed as a result of community and stakeholder feedback. This report also provides information on the process used and the factors considered in the assessment of the options.

2. Road Design and Upgrade Strategies

Design standards for the Pacific Highway Upgrade Program require two lanes in each direction, with consideration for the future addition of a third lane each way, separated by a median of a desirable width of 12 metres. Traffic volume projections have been prepared for 20 years from 2016.

Two highway upgrade scenarios are being considered as part of the project:

- Class A (Arterial road standard) – two lanes in each direction, 100 km/h posted speed, limited access condition roadway with at grade intersections; and
- Class M (Motorway standard) – two lanes in each direction (median width to accommodate future upgrading to three lanes in each direction), 110 km/h posted speed, controlled access condition roadway with grade separated interchange access.

The upgrade of the highway is expected to be completed in stages to meet traffic growth. Upgrade to Class A (Arterial) standard may be followed by a subsequent upgrade to Class M (Motorway) standard. Upgrading may also be completed on a staged basis.

Preliminary traffic investigations indicate that only one grade separated interchange would be required within Section A of the project. The final location of this grade separated interchange and service roads for the entire length of the preferred route will be determined during the concept design phase.

One possible location being investigated for a grade separated interchange is in the vicinity of Arrawarra Beach Road where there is sufficient width between the existing Highway and the old Pacific Highway (Eggins Drive) to accommodate an interchange.

New service roads would be required in a Class M scenario to provide access to the proposed grade separated interchange or to provide a continuous alternate route. In a Class A scenario, new service roads maybe provided to assist with the rationalisation of at-grade intersections and private accesses.

The service road strategy would aim to improve safety by separating through and local traffic. This may involve use of existing local roads, sections of old highway or the existing highway. Where possible, the new service roads would be located within or immediately adjacent to the upgraded highway, but may also be located outside the preferred route corridor.

The ultimate arrangement of the grade separated interchange and service roads may result in further impacts and benefits beyond those considered in this report and will be considered further during the Environmental Assessment of the preferred route.

3. Route Option Development and Preferred Route Selection Process

The route option development process involved the following steps:

- ▶ Review of existing data;
- ▶ Site visits – field and aerial inspections of the study area;
- ▶ Preliminary ecological, heritage, traffic, geotechnical and other investigations;
- ▶ A variety of community involvement activities to identify community interests, issues and concerns;
- ▶ Opportunities and constraints workshops;
- ▶ Options workshop to consider possible options;
- ▶ Identification and refinement of the feasible route options; and
- ▶ Preparation of the route options development report.

The route options development process concluded with the public display of the route options and the release of the Route Options Development Report. The public display of the route options provided the community with an opportunity to make review and comment on the route options.

The public display also marked the beginning of the Preferred Route Selection Process.

The selection of the preferred route involved the following steps:

- ▶ Public display of the route options and receipt of submissions from the community;
- ▶ Review and consideration of submissions from the community;
- ▶ A Value Management Workshop;
- ▶ Additional investigations as a result of community submissions and the outcomes of the Value Management Workshop;
- ▶ A Project Team Route Selection Workshop which considered the findings of the Value Management Workshop, community submissions and the results of additional investigations; and
- ▶ Preparation of the Preferred Route Report.

4. The Study Area Characteristics

A summary of the key characteristics of the study area and the existing highway are provided below. Further information is provided within Chapter 3 of this report.

Overview of the Local Area

The study area is located approximately midway between Coffs Harbour (to the south) and Grafton (to the north). Woolgoolga is outside the study area but is the closest major town. The study area is dominated by rural land and forest reserves, with scattered rural residential development and the villages of Corindi Beach and Corindi in the south of the study area. In 2001, the population of the study area and surrounds was 3,835 people with higher population densities towards the coast.

The study area is located within the Coffs Harbour Local Government Area (LGA) and the recently formed Clarence Valley LGA.

Traffic and Transport Issues

If the upgrading of the Woolgoolga to Wells Crossing section of the highway does not occur, it is projected that by 2016, there would be an average of 1.5 fatal crashes per annum and 16 serious injury crashes per annum. By 2036 this would increase to an average of 2.5 fatal crashes per annum and 27 serious injury crashes per annum.

The results of the preliminary traffic investigations indicate that the Arrawarra Creek to Corindi Beach section and the Dirty Creek Range section of the highway requires upgrading prior to 2016 and that traffic growth would be defined by the underlying growth in heavy vehicles along the corridor.

Through traffic accounts for approximately 37% of northbound and 44% of southbound traffic volume. Heavy vehicles make up approximately 13% of the existing daytime (7am to 7pm) traffic volume. The percentage of heavy vehicles approximately doubles at night (7pm to 7am).

A total of 111 crashes have occurred in the study area between July 2000 and June 2005 leading to two fatalities, 52 serious injury crashes and 57 other minor damage or injury crashes.

Horizontal and Vertical Alignment

The horizontal and vertical geometry of the existing highway contains long lengths that do not comply with the 110 km/h design standards for the Pacific Highway Upgrade. Approximately 80% of the horizontal and 40% of the vertical curves do not meet the current design standards. The main areas in which the alignment is deficient are between Corindi River to the top of Dirty Creek Range and from Lemon Tree Road to Bald Knob Tick Gate Road.

Intersections

Of the 27 intersections within the project, 13 do not comply with the 100 km/h sight distance criteria. The majority of the non-compliant intersections are located adjacent to horizontal curves or crest curves that restrict visibility. There are 42 access roads / tracks of which 24 do not comply with the 100 km/h sight distance criteria.

Highway Accesses

There are a total of 69 accesses to the highway. The proposed upgrade needs to consider providing access to the highway via local access roads, controlled access points, intersections and / or interchanges.

Heavy Vehicle Rest Stops

Rest areas that cater for heavy vehicles currently exist at Lemon Tree Road adjacent to both the northbound and southbound carriageways. These rest stops would be either retained in their current locations or relocated as part of the upgrade. Consideration would also be given to constructing a new truck stop / rest area between Arrawarra Creek and Corindi Beach.

Indigenous Heritage

The NSW Department of Environment and Conservation Aboriginal Heritage Information Management System Register has identified that 15 Aboriginal heritage sites are located within the study area. These include two isolated artefacts, three artefact scatters, five shell middens, a shell midden and artefact, two scarred trees, a natural mythological site and scarred tree and a burial site.

Consultation with the local Aboriginal community has identified a number of unregistered sites of cultural significance within or in close proximity to the study area.

In addition, the predictive model of site location indicates that additional indigenous heritage resources (in particular stone artefacts) are likely to occur throughout the study area. Detailed field survey is required during the concept design phase to assess the presence of such resources.

Non-Indigenous Heritage

There are no listed heritage items situated within or in the immediate vicinity of the study area. However, historical records indicate that a range of industries and activities were carried out in the locality. Evidence of these activities (in the form of historical relics) has the potential to occur within the study area.

Visual Amenity

The visual amenity of the study area is characterised by forested areas and cleared agricultural land in the south of the study area, the steep forested slopes of Dirty Creek Range in the middle of the study area, and the predominantly heavily vegetated areas of the Halfway Creek floodplain interspersed by small areas of cleared agricultural land in the north. The highest level of visual constraint occurs in the area surrounding Corindi Beach and the steeper forested parts of the study area, particularly within and in the vicinity of Dirty Creek Range. The lowest levels of visual constraint occur in the relatively flat rural areas, mainly in the Corindi area.

Noise

The majority of residences are located in the south of the study area within the caravan parks north of Arrawarra, and in the villages of Corindi Beach and Corindi. Rural residences are otherwise scattered throughout the study area. The results of noise modelling indicate that 55, or approximately 8% of the potential receivers currently experience daytime noise levels that exceed the DEC's "Redeveloped Highway" criteria of 60 dB(A). It has been found that 178, or approximately 25% of the potential receivers experience night time noise levels that exceed the DEC's "Redeveloped Highway" criteria of 55 dB(A).

The majority of the receivers subject to noise levels above these criteria are located to the southwest of Corindi Beach and in the caravan parks to the east of the existing highway, south of Corindi Beach. Additional isolated receivers are distributed along the remainder of the existing highway.

Terrestrial Ecology

Desktop investigations and targeted field work in key parts of the study area indicate that there is suitable habitat present for a number of threatened flora and fauna species, and rare flora species. The Commonwealth Department of Environment and Heritage Protected Matters Search Tool identified seven terrestrial migratory species that may use the area for nesting habitat and require consideration.

Three endangered ecological communities listed under the *Threatened Species Conservation Act 1995* have been identified within the study area, while a further three have been recorded in the vicinity of the study area and have the potential to occur.

A number of designated wildlife corridors have been mapped by DEC that pass through or within the immediate vicinity of the study area. In addition, a number of patches of key habitats mapped by DEC are located within the study area.

Aquatic Ecology

Database searches revealed that there are no records of aquatic species within the study area listed as threatened under relevant Acts. There is known habitat for the endangered fish species, Oxelayan Pygmy Perch, within Redbank Creek and Cassons Creek.

There are two wetlands listed by State Environmental Planning Policy No. 14 – Coastal Wetlands (SEPP 14) within the study area, both located between Arrawarra and Corindi Beach. There are also two SEPP 14 wetlands located downstream of the study area, to the north of Corindi Beach and wetlands associated with Halfway Creek. Other estuarine wetlands are located in the southern part of the study area, with a number of freshwater wetlands located along the Halfway Creek floodplain.

Topography

The study area can be divided into three distinct terrain domains: coastal, range and tableland. Within the study area, the land rises from sea level to heights of up to 200 metres. The topography in the southeast is generally flat. Further northwest, the coastal plain gradually transitions to undulating ground before reaching the foothills of Dirty Creek Range in the middle of the study area. Dirty Creek Range features very steep terrain with well-defined peaks, ridgelines, gullies and escarpments. West of the range the landform flattens out to the tableland domain.

Regional Geology

The coastal plains in the southeast of the study area feature extensive low lying alluvial, aeolian and estuarine swamp deposits, which occur between lowland hills and beach / dune landscapes. Some of the larger coastal river systems also contain Quaternary alluvial deposits extending inland towards the Dirty Creek Range.

Immediately inland from the coastal plains are the carboniferous aged Coramba Beds forming a lowland range topography of hills, spurs and ridges. Dirty Creek Range consists of Triassic / Jurassic aged sedimentary strata. The geological units from east to west include Corindi Conglomerate, Marburg Formation, and Walloon Coal Measures.

West of the range the land is formed by Jurassic / Cretaceous aged sedimentary strata and is made up by the Grafton Formation overlying Kangaroo Creek Sandstone.

Soil Issues

Preliminary drilling did not encounter any soft soils in the low-lying terrain south of Tasman Street at Corindi Beach. Soft soils were encountered in the Blackadder Creek area in a thin layer (1.5 metres) at a depth in excess of 20 metres. Therefore, limited settlement may be expected as a result of embankment construction in this area.

The crossing of the alluvial floodplains would require removal of the topsoil and / or the introduction of material to create a trafficable surface for construction equipment. Good quality fill for use in embankment construction would most likely be available from cuts within the Dirty Creek Range, assuming these sections of the project are constructed concurrently.

A high risk of encountering acid sulphate soils has been identified in the vicinity of Corindi River and varying levels of risk have been identified in the vicinity of Arrawarra Creek.

There is some potential for soil contamination in the study area. Past and present activities that may have caused contamination include agriculture, operation of service stations, sawmills and quarries and wastewater treatment. Cattle dip sites are located in close proximity to the existing highway.

Geotechnical Issues

Geotechnical features of the study area were assessed using available information including known properties of geotechnical domains and the performance of embankments and rock cuttings along the existing highway.

Rock cuttings up to 30 metres depth are likely to be required for the new alignment. Visual evidence indicates the existing cut batters are performing satisfactorily, apart from cuttings through the Lower Marburg formation. Batter slopes of 2H:1V are recommended in this area.

Hydrology and Flooding

The main areas of complexity are near Corindi River, Blackadder Creek and Cassons Creek. In these areas frequent highway closures have occurred due to flooding.

Hydraulic modelling has determined the structures necessary to provide levels of flood immunity across Blackadder Gully and adjacent waterways for the existing highway. Structures range from 7 x 3.3m x 1.8m reinforced concrete box culverts (RCBC) for 20% annual exceedance probability (AEP) immunity to 25 x 3.3m x 1.8m RCBC for 1% AEP immunity.

5. Route Options

Development of Route Options

The options were initially developed with the assistance of the Infrastructure Corridor Analysis (INCA) modelling program, which is run in a geographical information system (GIS) environment. INCA was used as a tool to establish a range of possible alignments, based on weightings assigned to the constraints within the study area.

Following the identification of possible alignments using INCA, further work was undertaken to develop feasible route options based on the project design criteria.

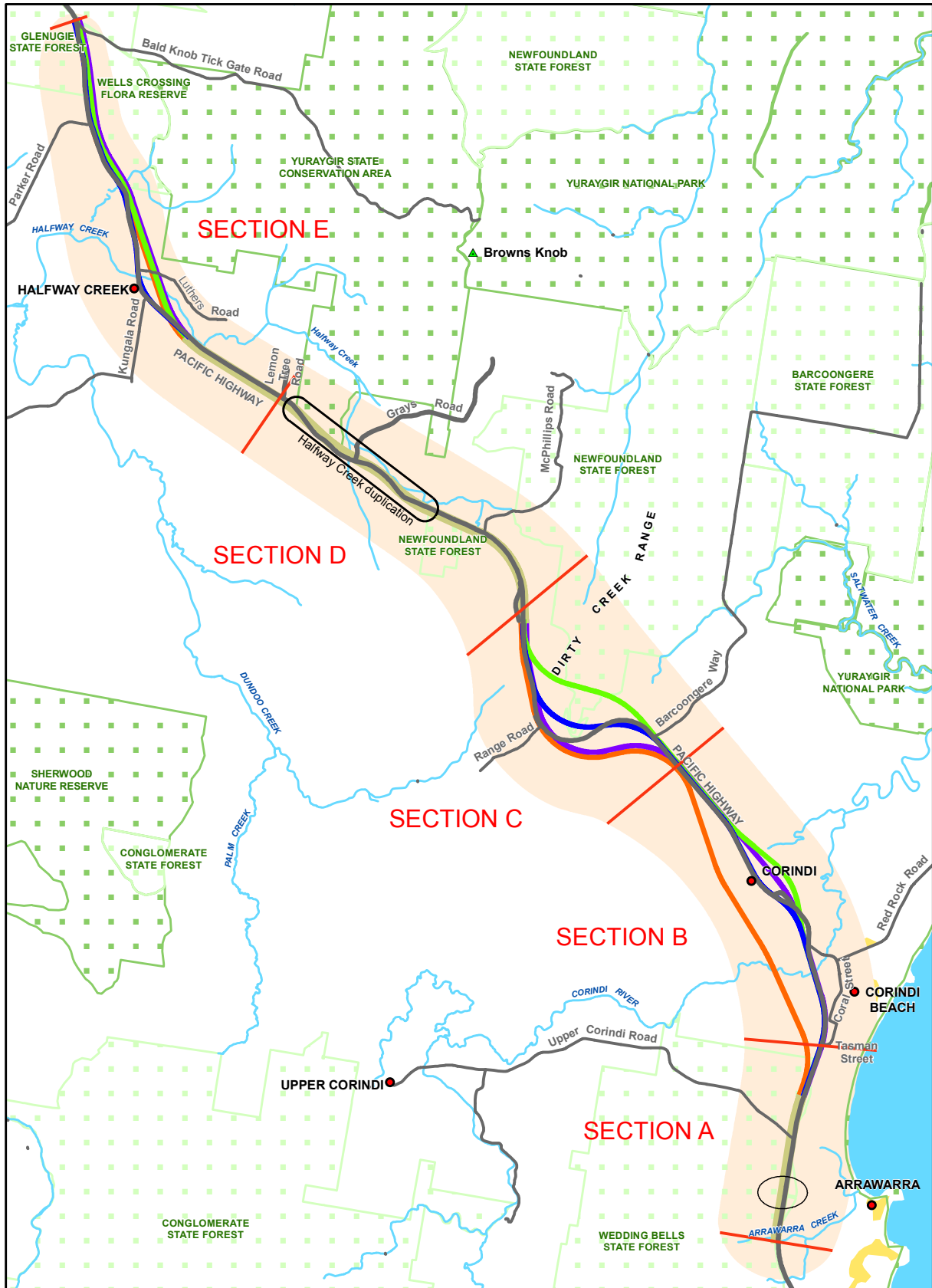
Once an alignment was developed horizontally the viability of the option was assessed vertically using mx road design software. This enabled the project team to assess grades, particularly with respect to heavy vehicle performance and estimate earthworks volumes for cost estimating purposes.

Four route options (blue, green, purple and orange), as shown in the figure below, were identified which provide broad corridors within which it is considered feasible to build the new highway. The options include a common corridor through some of the project sections. The corridors provide flexibility for refinement following further investigations and community consultation.

Each of the route options has varying lengths of duplication or realignment. A summary of the options is provided in the table below. Further information on the options is provided in Chapter 5 of this document.

Summary of Route Options placed on Public Display

Option	Description
Blue	For the majority of the route, the Blue option involves the duplication of the existing highway. Where new alignments are required, e.g. through the Corindi River floodplain and Dirty Creek Range, two new carriageways would be constructed. Elsewhere, this option includes the rebuilding of the existing highway to current Pacific Highway Upgrade standards.
Green	The Green option generally follows the alignment of the existing highway. Realignment is proposed to the east of the highway near Corindi Village and over the Dirty Creek Range between Barcoongere Way and Falconers Lane. The Green option also deviates from the existing highway to the south of Luthers Road.
Purple	For the majority of the route, the Purple option involves the construction of two new carriageways. However, between Corindi River floodplain and Dirty Creek Range, one new carriageway would be constructed and the existing carriageway reconstructed to Pacific Highway Upgrade standards. The Purple option deviates to the east of the existing highway over Dirty Creek Range, and then generally follows the existing alignment until the end of the project.
Orange	The Orange option is generally a realignment of the highway, diverting to the west of the existing highway past Corindi Beach and Corindi village before rejoining the existing highway south of Barcoongere Way. The Orange option then follows the same alignment as the Purple option until the end of the project.



<p>SCALE 1:100,000</p> <p>0.5 0 0.5 1 1.5 Kilometres</p> <p>Map Projection: Universal Transverse Mercator Horizontal Datum: Geodetic Datum of Australia 1994 Grid: Map Grid of Australia, Zone 56</p>	<p>GRID N</p>	<p>Legend</p> <ul style="list-style-type: none"> — Blue Option — Green Option — Purple Option — Orange Option — Common Corridor Study Area Urban Area Possible Interchange Location — River/Creek ● Locality ▲ Hill/Mountain Highway Main Rd State Forest Nat Park / Reserve 	<p>Note: Coloured options represent a 250m wide corridor, which includes 4 lanes, ie 2 lanes each way, separate by a landscaped area.</p>
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Route Options Plan

6. Outcomes of the Public Display

The Woolgoolga to Wells Crossing route options were on public display from 21 October to 2 December 2005. A number of consultation activities took place during the display period to publicise the display, inform the community and other stakeholders about the options under consideration and invite feedback on the options. The public display of route options was one input into the process for determining the preferred option for the project.

A number of issues, comments and concerns were raised, which are discussed in Chapter 6 of this document. The top five issues considered most important by the community when deciding the preferred route were:

- ▶ Improvements to road safety and travel times on the highway;
- ▶ Separation of local and through traffic;
- ▶ Noise impacts from traffic on the highway;
- ▶ Maintenance of improvement to access to surrounding towns; and
- ▶ Does not cause division of communities.

The majority of respondents (61%) felt that Orange option best addressed the issues, however many of the feedback forms received were from people who lived in Section B (76%). As Section B of the Orange option offers a bypass of Corindi to the west, many community members may have selected the Orange option purely on this basis.

The public submissions contributed to the assessment criteria and performance measures that have provided the framework to assess the options and establish the need for further investigations (where relevant) and potential route modifications.

7. Value Management Workshop – Assessment of Route Options within Sections B, C and E

A two-day Value Management Workshop (VMW) was held in December 2005 following the public display of the route options. During the VMW, only route options within Sections B, C and E of the project were assessed as the route options within Sections A and D all share a single common corridor, and therefore did not require assessment (i.e. there were no corridor options to choose from).

- ▶ A VMW was seen as an appropriate tool to bring together a wide range of stakeholder interests and expertise to review the investigations undertaken to date, and on the balance of issues, to assess the options (within Sections B, C and E) against agreed assessment criteria and recommend a preferred direction to progress the project.

The key outcomes from the VMW were:

- ▶ In **Section B**, the **Orange option** was recommended as the preferred option to move the project forward for more detailed investigation and development because it had the highest assessment in terms of functionality, social and economic criteria and has the ability for improvement to its environmental performance with some slight alignment adjustments at the southern end of the Section;
- ▶ In **Section C**, the **Orange option** was recommended as the preferred option because it had a consistently higher ranking, on average, across all three criteria categories and the cost variations between options were not considered to be significant. The Orange option also has the greater opportunity for alignment improvements if considered desirable after further investigations;

- ▶ In **Section E**, the **Orange option** was recommended as the preferred option to move the project forward for more detailed investigation and development. However, this recommendation was made subject to further investigation regarding various environmental and heritage impacts;
- ▶ The group also suggested that the project team investigate the feasibility of straightening the alignment of the Orange option in Sections B, C and E (i.e. moving the corridor further to the west) in an attempt to improve the potential performance of the highway upgrade in several areas, including:
 - Further reduce the length of the highway upgrade and minimise the length of new local access road to be constructed;
 - Minimise environmental and indigenous heritage impacts;
 - Improve accessibility for local road users and reduce impacts on private property; and
- ▶ This new option in Sections B, C and E has been referred to in this document as the **Refined Orange option**.

8. Project Team Route Selection Workshop – Assessment of Route Options within Sections B, C and E

A two-day Project Team Route Selection Workshop (RSW) was held in March 2006 to assess the four route options (within Sections B, C and E) placed on public display against the assessment criteria. The RSW also assessed the Refined Orange option, which was developed following the recommendations of the VMW.

The assessment criteria used in the RSW was developed specifically to address the Pacific Highway Upgrade Program objectives as well as the specific project objectives. The RSW was seen as an appropriate tool to bring together the relevant technical team members of the GHD project team and RTA representatives to:

- ▶ Review the four route options placed on public display;
- ▶ Review the outcomes of investigations undertaken to date;
- ▶ Review the details of submissions received in response to the Public Display of route options;
- ▶ Review the outcomes of the VMW including details of the new Refined Orange option which was developed following and in response to the recommendations made by participants at the VMW;
- ▶ Assess all five options against the assessment criteria; and
- ▶ On balance of the assessment and taking into consideration the submissions received during the public display and the outcomes of the VMW, recommend a preferred route for the RTA's consideration.

The recommended preliminary route corridors in Sections B, C and E from the RSW process were:

- ▶ In Section B the Refined Orange Option;
- ▶ In Section C the Refined Orange Option; and
- ▶ In Section E the combination of the Blue, Refined Orange and Orange Options.

9. Preferred Route

In March 2006 and after consideration of the following:

- ▶ Issues raised in community submissions from the public display of route options which took place between 21 October 2005 to 2 December 2005;
- ▶ Recommendations from the Value Management Workshop held in December 2005;
- ▶ The findings of further technical studies undertaken following the Value Management Workshop;
- ▶ Recommendations from the Project Team Route Selection Workshop held in March 2006; and
- ▶ The preferred corridor for each project section is summarised in the table below and shown on the following figure.

The Preferred Route

Section	Section Description	Preferred Option
A	Arrawarra Creek to Tasman St intersection	Orange option (Common Corridor)
B	Tasman St intersection to 500m south of Barcoongere Way	Combination of Orange and Refined Orange options
C	500m south of Barcoongere Way to 400m south of Falconers Lane	Combination of Orange and Refined Orange options
D	400m south of Falconers Lane to Lemon Tree Road intersection	Blue option (Common Corridor)
E	Lemon Tree Road intersection to Bald Knob Tick Gate Road	Combination of Blue, Orange and Refined Orange options.

Description of the Preferred Route

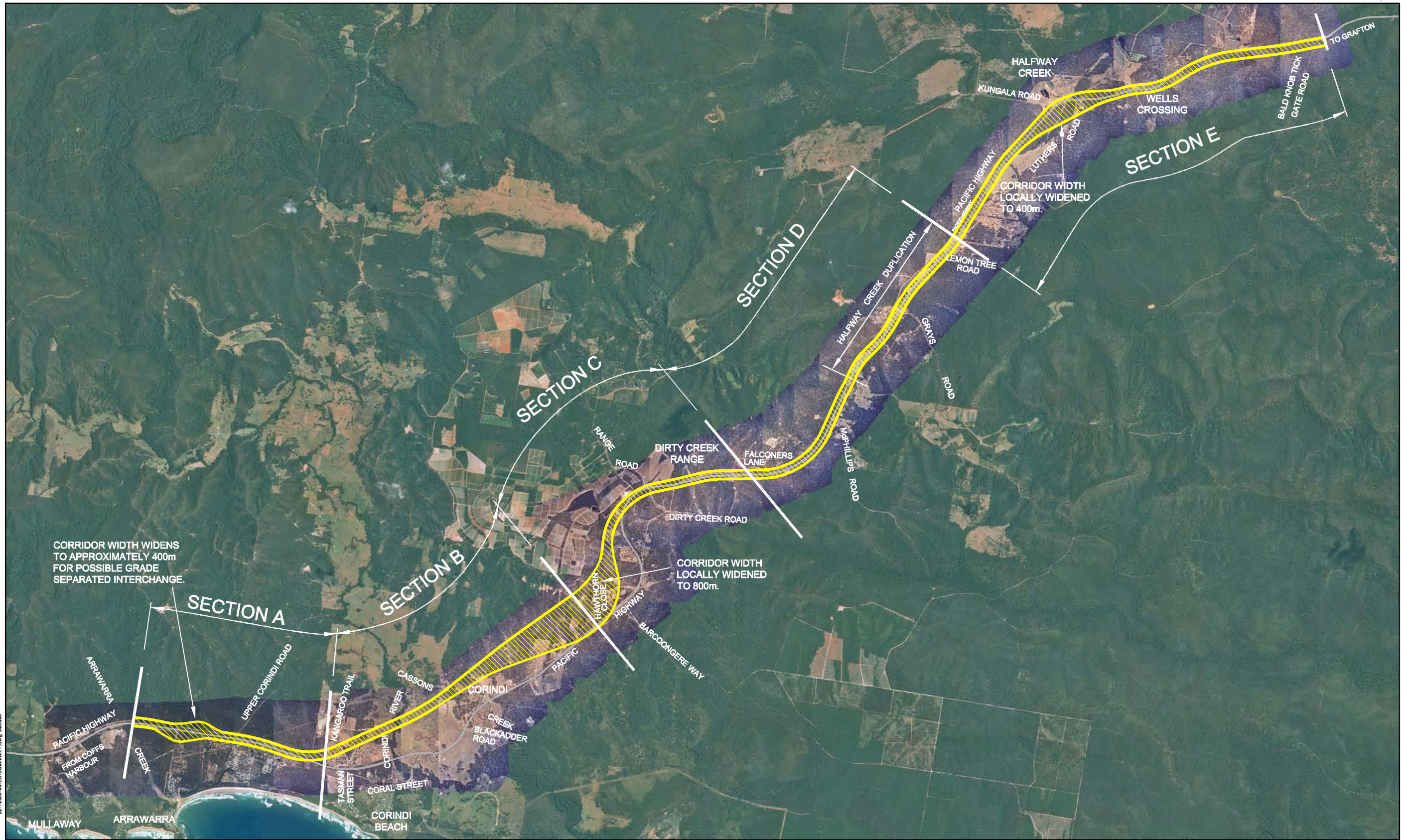
Section A

The Orange option would start at the northern end of the Sapphire to Woolgoolga project, at Arrawarra Creek. In a Class A (Arterial) upgrade scenario the preferred route would generally involve the construction of one new carriageway to the west of the existing highway, retaining the existing highway as a southbound carriageway. There are no private property accesses on the western side of the existing highway. Where feasible, existing local roads would be connected to the highway via a grade separated interchange, using the local road network. Consideration would be given to using the old Pacific Highway (known as Eggins Drive) as a local access road to connect the existing highway north of Eggins Close. Access to the highway would be via an interchange within Section A.

The location of the grade separated interchange would be determined as part of detailed investigations to be undertaken during the concept design phase. One possible location being investigated for a grade separated interchange is in the vicinity of Arrawarra Beach Road where there is sufficient width between the existing highway and the old Pacific Highway (Eggins Drive) to accommodate an interchange. Consideration would also be given to constructing a new truck stop and rest area between Arrawarra Creek and Corindi Beach.

In a Class M (Motorway) upgrade scenario the preferred route would generally involve the construction of two new carriageways to the west of the existing highway thereby retaining the existing highway as continuous local access road.

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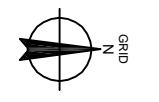
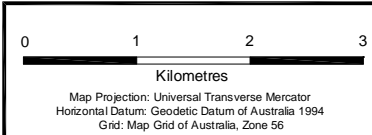


CORRIDOR WIDTH WIDENS TO APPROXIMATELY 400m FOR POSSIBLE GRADE SEPARATED INTERCHANGE.

CORRIDOR WIDTH LOCALLY WIDENED TO 800m.

CORRIDOR WIDTH LOCALLY WIDENED TO 400m.

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LEGEND	
	150m wide Corridor (unless noted otherwise)
	Existing Highway

Spatial layers courtesy of Coffs Harbour City Council, NSW Department of Lands, NSW Roads and Traffic Authority, Geoscience Australia, NSW Department of Environment and Conservation, NSW Department of Primary Industries.

Section B

Within Section B a proposed realignment of the existing highway is proposed. Travelling north, the preferred route corridor would begin to deviate to the west of the existing highway just south of Tasman Street, cross Kangaroo Trail Road in cutting, pass to the west of Post Office Lane and bypass the village of Corindi.

A wider preferred route corridor has been adopted through the northern part of Section B to enable further investigations and assessment to be undertaken before a preferred alignment is determined. This wider corridor is defined by the Refined Orange option to the west and the Orange option to the east.

Depending on the preferred road alignment adopted within this wider route corridor, the majority of the existing highway through this section would be reused as a local access road. If a road alignment to the west of the dis-used quarry is adopted then access to the existing highway for residents living on the western side of the existing highway just south of Barcoongere Way would not be affected. If however, a road alignment to the east of the dis-used quarry is adopted then access to residences living on the western side of the existing highway just south of Barcoongere Way would be affected as the new highway would rejoin the existing highway near the intersection of Hawthorn Close.

In a Class A (Arterial) upgrade scenario, access to the proposed highway upgrade from the existing highway would be via a grade separated interchange in Section A and an at grade intersection within Section C of the project.

In a Class M (Motorway) upgrade scenario, access to the proposed highway upgrade would be via a grade separated interchange located within Section A of the project.

Section C

For the same reasons described in Section B above, a wider preferred route corridor within the southern portion of Section C is also proposed. This wider route corridor is a continuation of the route corridor in Section B. Travelling north (from Hawthorn Close), the wide corridor provides the RTA with the flexibility to develop a road alignment that would minimise the grade (ascent) up Dirty Creek Range.

The preferred route corridor would pass to the west of Flinty Road before reconnecting with the existing highway near Range Road. North of Range Road the preferred route would generally involve a duplication of the existing highway to a point 500m south of Falconers Lane. This would not impact on the packing shed associated with the Blueberry Farm.

In a Class A (Arterial) upgrade scenario, access to the proposed highway upgrade (depending on the final road alignment adopted) would be either via:

- ▶ A new intersection connecting the existing highway with the proposed highway upgrade in the vicinity of Flinty Road as well as an at-grade intersection at Range Road permitting all turning movements; or
- ▶ A new intersection connecting Hawthorn Close and a new length of service road with the proposed highway upgrade in the vicinity of Hawthorn Close as well as an at-grade intersection at Range Road permitting all turning movements.

In a Class M (Motorway) upgrade scenario, access to the proposed highway upgrade would be via a grade separated interchange located within Section A of the project.

Section D

The existing highway in Section D has been identified as generally suitable for the 110 km/h design speed and includes the recently completed Halfway Creek duplication. A new carriageway would be constructed on the western side of the existing highway from a point 500m south of Falconers Lane to the southern end of the Halfway Creek duplication. The Halfway Creek duplication would remain as is with little or no work required to this section of the highway. The northern end of the Halfway Creek duplication ends near Lemon Tree Road.

A local access road in the Class M (Motorway) upgrade scenario would switch from one side of the highway to the other via a bridge over (or an underpass under) the proposed highway upgrade at or near Grays Road in order to avoid the elbow of Halfway Creek watercourse next to the highway and the Yuraygir State Conservation Area.

Section E

Due to a number of constraints in this section the preferred route corridor is generally a combination of the Blue, Refined Orange and Orange options. Generally the preferred route corridor would follow the Blue option from Lemon Tree Road until a point approximately 600 metres south of Kungala Road, and the Orange option from approximately 1.5 kilometres north of Kungala Road through to Bald Knob Tick Gate Road.

Between these two locations, from approximately 600 metres south of Kungala Road to approximately 1.5 kilometres north of Kungala Road, a widened corridor has been shown that generally encompasses the Refined Orange option and the Blue option. There are significant constraints in this vicinity that have prevented the clear determination of a preferred route alignment. These constraints include:

- ▶ The poor geometry and condition of the existing highway;
- ▶ The presence of established businesses (service station and general store, Benefields Rose Farm and shopfront and Big Garden Furniture);
- ▶ Rural residences;
- ▶ Riparian vegetation in the vicinity of Halfway Creek with potentially high value habitat for threatened flora and fauna;
- ▶ The presence of two parcels of land vested in Grafton-Ngerrie LALC under the Aboriginal Land Rights Act 1983 that have been identified as being of cultural significance; and
- ▶ The presence of an Aboriginal ceremonial site in the vicinity of Halfway Creek.

The widened corridor will be subject to further detailed investigations, including ecological and Aboriginal heritage, engineering design and consultation with potentially affected parties, to determine the final alignment of the preferred route for concept design.

Project Cost Estimates

Strategic cost estimates have been prepared for the preferred route for the Class A (Arterial) and Class M (Motorway) upgrade scenarios. The estimates were based on plans and long-sections of the preferred route as well as preliminary geotechnical investigations of the study area.

The total cost of the project has been estimated at \$280 million for a Class A (Arterial) upgrade scenario and \$330 million for a Class M (Motorway) upgrade scenario. The estimated cost of the preferred route in each section is provided in the table below.

These estimates assume that the upgrade will be undertaken in one stage, however it is likely that the highway upgrade will be undertaken in stages, ultimately to a Class M (Motorway) facility.

Strategic Cost Estimates for the Preferred Route

Cost of Preferred Route (\$ Million 2006)						
Scenario	Section A ⁽¹⁾	Section B ⁽¹⁾	Section C ⁽¹⁾	Section D ⁽¹⁾	Section E ⁽¹⁾	Total ⁽¹⁾
Class A	\$30	\$85 ⁽²⁾	\$55 ⁽²⁾	\$30	\$80 ⁽²⁾	\$280
Class M	\$40	\$85 ⁽²⁾	\$65 ⁽²⁾	\$45	\$95 ⁽²⁾	\$330

Note: (1) Total rounded to the nearest \$5 Million. Values are in 2006 dollars.

(2) The costs within Sections B, C and E may vary depending on final alignment of the preferred route.

10. Next Steps

The proposed next steps for the Woolgoolga to Wells Crossing Project are to:

- ▶ Refine the alignment and prepare the concept design for the preferred route;
- ▶ Submit the proposal to the Department of Planning for approval under Part 3A of the Environmental Planning and Assessment Act 1979. The proposal would be the subject of an environmental impact assessment, which would examine in more detail the potential impacts of the preferred route. The environmental impact assessment may include a statement of commitments in respect of environmental management and mitigation measures proposed to be undertaken if the project is approved;
- ▶ When completed, the environmental impact assessment would be publicly exhibited and submissions sought. The RTA may be asked to prepare a report on the submissions, consider modifications to the project to minimise environmental impacts and revise its statement of commitments; and
- ▶ The Department of Planning would consider the environmental impact assessment, the public submissions and any report requested from the RTA in recommending to the Minister for Planning whether the project should be approved.