5. The Route options

5.1 Description of the Route Options

5.1.1 Project Sections

Four options were initially developed as an outcome of the route options development process. The four options are described below and are shown on Figure 5.1. These four options were placed on public display between 21 October 2005 and 2 December 2005. Chapter 6 of this document provides further details on the public display of route options.

The project is also divided into five separate sections, (Sections A to E) as described in Table 5.1 below and as shown on Figure 5.1. There are lengths where all route options share the same corridor, as shown on Figure 5.1.

All options have been developed to allow each option to be connected to a different option in another section if additional benefits can be gained by combining options.

Table 5.1 Project Sections

Section	Description
A	Arrawarra Creek to the Tasman Street intersection. Key features within this section include connection to the Sapphire to Woolgoolga project, Wedding Bells State Forest and the village of Arrawarra.
B	The Tasman Street intersection to 500 metres south of Barcoongere Way. Key features within this section include the villages of Corindi Beach and Corindi, and the floodplains of Corindi River and associated tributaries.
C	500 metres south of Barcoongere Way to 400 metres south of Falconers Lane. Key features within this section include Dirty Creek Range, extensive blueberry plantations and Newfoundland State Forest.
D	400 metres south of Falconers Lane to, and inclusive of the intersection with Lemon Tree Road. Key features within this section include Yuraygir State Conservation Area and the recently completed Halfway Creek duplication.
E	Lemon Tree Road to Bald Knob Tick Gate Road. Key features within this section include the locality of Halfway Creek, Yuraygir State Conservation Area, Newfoundland State Forest and Wells Crossing Flora Reserve.

The following route option descriptions describe, where required, the provision of new local access roads or the use of existing local access roads and a possible grade separated interchange. Detailed investigations (environmental, community and engineering) have not been completed for the suggested local access roads or interchange. Those investigations would be undertaken during the next phase of the project.

5.2 How Were the Options Developed?

5.2.1 Overview

Initially, the upgrade was to be generally by duplication of the existing highway however a review of the existing highway has shown that duplication may not be appropriate in some sections of the study area. A duplicated alignment would still require considerable reconstruction of the existing highway and:

- Have potential impacts on the community including severance and access issues;
- Cause delays and access difficulties during construction; and
- May not be cost effective when compared to a new alignment.

Therefore, the approach adopted was to initially develop a preliminary design based on a Class M (Motorway) upgrade scenario to ensure that the ultimate upgrade strategy could be achieved in the long term. Consideration of possible deviations and the use of the existing highway as a local access road was undertaken to maximise the use of the existing asset and to aid rationalising accesses. The benefits of this philosophy are improved safety and better operations. Once Class M (Motorway) corridors were developed, condensed Class A (Arterial) preliminary designs were developed for comparison purposes and to determine which option(s) provide for an upgrade with minimal environmental impact as well as maximising cost effectiveness.

To aid in this process, the Infrastructure Corridor Analysis (INCA) software was utilised which was developed specifically for corridor selection studies (refer to Section 5.1.2 for more detail on INCA). INCA is run using a Geographical Information System (GIS) environment and was used to assist in the identification of viable corridor options to upgrade the highway that minimised both social and environmental impacts.

The process to identify these corridors can be divided into five main stages:

- Identification of issues / constraints;
- Collection of data on environmental constraints and social issues that are sensitive to the construction and operation of a road and constraint mapping;
- Assigning sensitivity values for each environmental and social issue;
- Selection of the least impact corridor option derived from the constraint mapping; and
- Field investigation to verify broad suitability of corridors.

Once viable corridor options were developed, engineering alignments were designed to fit within these corridors. Further assessment was then undertaken using GIS to rate the alignments in the options assessment phase. This rating was done in conjunction with the assessment criteria rating, value management workshop process and the submissions received from the public display of options.

5.2.2 Infrastructure Corridor Analysis (INCA)

INCA is a route planning software package that quantitatively assesses and evaluates the complex environmental and social issues that are associated with locating linear infrastructure.

The INCA software uses standard overlay techniques to prepare the constraint mapping. Models available in INCA have been used to assist with the identification of viable corridor options based on the environmental, economic and social data collected during the study.

Essential features of the INCA modelling include:

- A systematic, multidisciplinary approach;
- A rational and documented method of decision analysis;
- A quantitative assessment of impacts; and
- An approach that is flexible enough to allow regional and site specific analysis.

Selection of the optimum route takes into account all constraints while keeping the road to a reasonable length.

The benefit of this approach is that weightings for each factor can easily be changed. In this case placing different weightings on a variety of issues identified several route alignments, many of which were common to others.

INCA provides output mapping showing areas of least resistance and viable corridor options for use in developing engineering alignments.

5.2.3 Engineering Route Development

Following the development of constraint mapping and viable corridor options, further work was undertaken to develop viable route corridor options. The viable corridors must be able to fit a road with an alignment suitable for 110 km/h travel speed.

The broad alignments were initially developed by hand using large-scale topographic maps and scale drawing implements. The broad alignments were developed considering the INCA output, community and stakeholder input and all the known constraints.

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.

It should be noted that these initial investigations have not completely fixed an alignment but simply ensured the feasibility prior to further assessment. Within the route option corridors there is flexibility for refinement after further investigations and consultation in the subsequent stages of the project development process.

5.2.4 Issues and Constraints

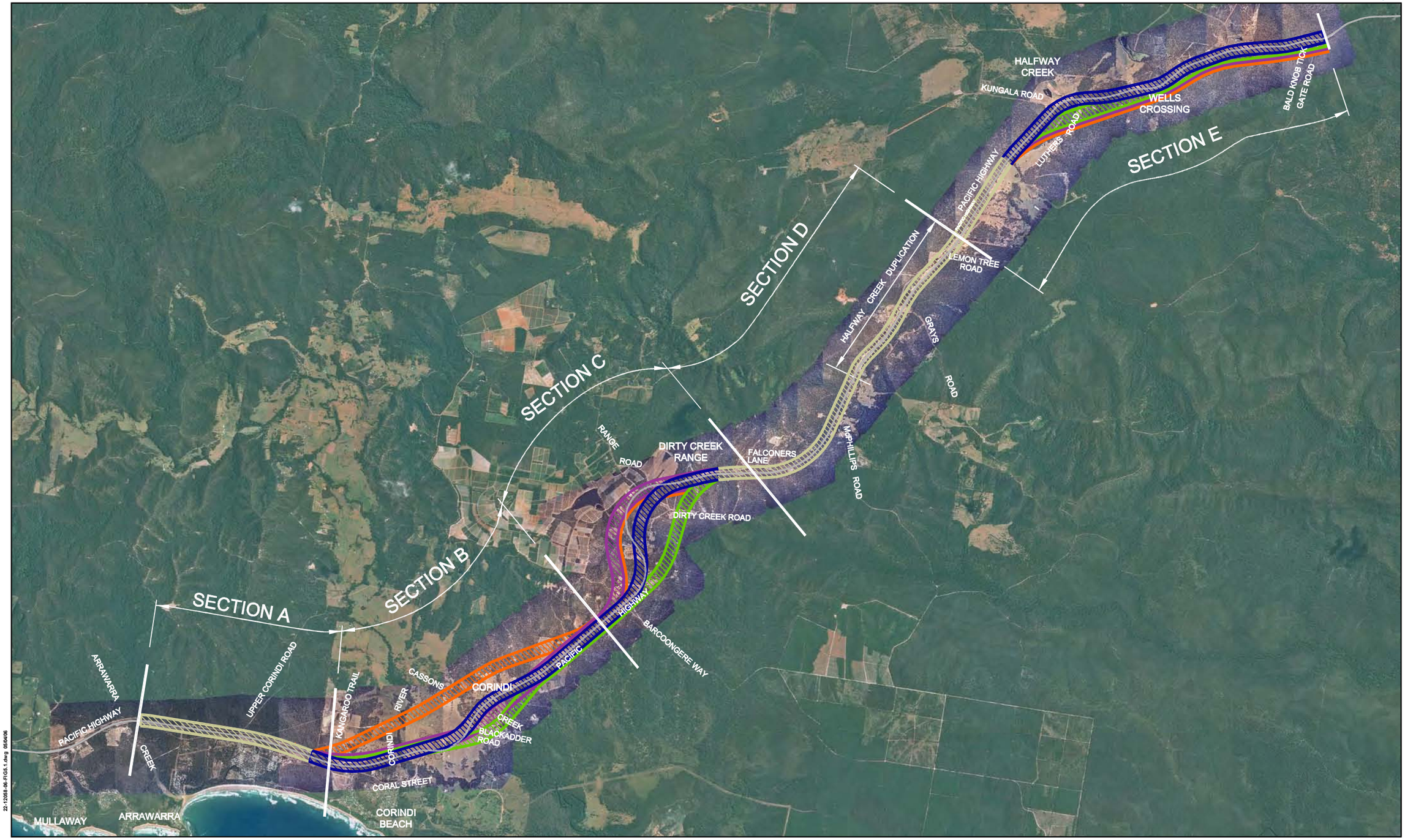
The initial investigations and community involvement identified that the social, built environment and environmental issues associated with the construction and operation of the highway include impacts on:

- Visual and landscape domains;
- Native vegetation and flora;
- National parks and wetlands;
- Surface waters and flooding;
- Existing land uses;
- Existing infrastructure; and
- Indigenous and non-indigenous heritage areas.

The key constraints identified within the study area include:

- Access from private property, businesses and local roads;
- Blueberry Farms Australia – it is a significant operation with considerable capital investment;
- Dirty Creek Range – the topography of this part of the study area presents some significant challenges in meeting the project design criteria;
- Halfway Creek duplication – this recently completed piece of the Pacific Highway Upgrade Program should be incorporated into the new route;
- Corindi floodplain – the floodplain would provide challenges in overcoming flooding issues and would dictate the form of the upgrade in this area;
- Heritage sites – the various cultural heritage sites that have been identified should be avoided where possible;
- National parks / conservation areas – these reserves should be avoided;
- SEPP 14 wetlands – these reserves should be avoided; and
- Project start and end points and the study area – these are key constraints for all route options.

Analysis of these issues and constraints was initially undertaken using INCA.



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.

5.2.5 Blue Option

Section A

The project starts at the northern end of the Sapphire to Woolgoolga project at Arrawarra Creek. The geometry of the existing highway in this area complies with the Pacific Highway Upgrade Program objectives. This option would involve a duplication to the west of the existing highway to create an additional carriageway, which would become the northbound carriageway while the existing road would become the southbound carriageway.

The existing highway would require some form of upgrade works to convert it from a two-way road to a southbound carriageway. The upgrade work, for example, would include new linemarking and signage.

Interchange options in this area include:

- The partial interchange proposed as part of the Sapphire to Woolgoolga project; or
- A full grade separated interchange in the vicinity of Arrawarra Beach Road.

Section B

The existing highway from the end of Section A to the Coral Street intersection is suitable for 110 km/h design speed. A new northbound carriageway on the western side of the existing carriageway is proposed for this option. The existing highway from Coral Street to Corindi would require realignment given the poor existing geometry and flooding history. From Corindi to the end of Section B, the vertical geometry is poor and does not achieve a 100 km/h design speed, although the horizontal alignment is suitable for a 110 km/h design speed. Therefore, a new southbound carriageway is proposed on the eastern side of the existing carriageway and the existing carriageway reconstructed (to achieve 110 km/h design speed) from Corindi to the end of Section B.

The realignment from Coral Street to Corindi would be essential given the poor existing geometry and flooding issues in this area. This option would maximise the re-use of the existing highway as a local access road in this area. A realignment for 110 km/h design speed would continue as a projection of the existing straight alignment south of Coral Street and the RTA has previously acquired land for such realignment.

An access connection to Corindi on the northern side of the Corindi River floodplain could be at one of several possible locations depending on constraints in the area. The Blue option will have an impact on the village of Corindi, as it is a small community directly adjacent to the existing highway (east and west side). The highway widening and eventual addition of local access roads through Corindi would have an impact on this small village with the acquisition of several residential properties and the effective severance of the community.

The reconstruction of the existing highway from north of Corindi to the end of Section B (Barcoongere Way) would cause notable road user delay and construction difficulties.

Section C

The existing highway through this section requires realignment to be suitable for 110 km/h design speed. The realignment occurs on the east side and west side of the highway.

Section C includes the Dirty Creek Range. As existing and proposed road grades through the range are steep, the area presents a challenge in improving heavy vehicle performance and reducing vehicle operating / freight costs. The existing road alignment is dictated by the topography causing weaving in alignment between prominent terrain features, which forces the highway to the southwest.

The existing highway grade through Dirty Creek Range is 7% for 700 metres. A fully loaded B-double (62. 4t GCM) climbing the range would have an approximate speed approaching the top of the range of 22-23 km/h. The study has investigated flatter grades of reduced length to improve operating speeds.

The minimum conforming upgrade in this area would require flattening the alignment by increasing curve radii (the existing curves are not suitable for a 110 km/h design speed) and flattening vertical curves. As a result, significant portions of the existing highway would become redundant.

Section D

The existing highway alignment 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 is proposed to the west of the existing highway from Falconers Lane to the Halfway Creek duplication.

The proximity of Halfway Creek watercourse and the Yuraygir State Conservation Area (National Park) limit the opportunity for a local access road on the eastern side of the highway. A local access road in the Class M (Motorway) upgrade scenario would switch from one side of the highway to the other bound by the elbow of Halfway Creek watercourse next to the highway and the State Conservation Area. These constraints may force a transverse bridge / underpass at or near Grays Road.

Investigations revealed that future widening to accommodate an ultimate six lanes for the Halfway Creek duplication would be difficult because of the independently graded carriageways through the Halfway Creek duplication and also due to the limited available cross section width.

It was also found that neither carriageway on the newly completed duplication aligns with the existing highway at the southeastern tie-in, which would necessitate the realignment of 500 metres of the newly completed work or reconstruction of nearly one kilometre of the existing highway (for 110 km/h design speed).

Section E

The existing alignment in Section E has two distinct areas, the first being the section from Lemon Tree Road to Kungala Road and the second from Kungala Road to the end of the project. The Lemon Tree Road to Kungala Road section is generally suitable for 110 km/h design speed, whereas the section from Kungala Road north is poor vertically and horizontally and requires complete reconstruction or realignment to achieve 110 km/h design speed.

The Blue option would duplicate the existing highway from Lemon Tree Road to Kungala Road on the southern side of the existing carriageway. The short horizontal curve midway between Lemon Tree Road and Kungala Road would need to be increased to achieve minimum curve length criteria. Increasing the curve radii to gain sufficient curve length may force the carriageway to encroach on an elbow of Halfway Creek (located very close to the existing highway on the inside of this curve). The construction of a local access road on the western side of the existing highway to Class M (Motorway) standard would have property and environmental impacts.

North of Kungala Road, the minimum conforming option assumes reconstruction within the existing road reserve. The reconstruction along this part of the alignment would cause property access, acquisition impacts and environmental impacts. This would lead to the consideration of alternatives that retained the existing highway as a local access road.

The highway is realigned on the east side of Halfway Creek, between Kungala Road and Luthers Road as the existing curve in the highway is not suitable for 110 km/h design speed.

5.2.6 Green Option

Section A

The Green option is the same as the Blue option through this section.

Section B

Between the end of Section A and Coral Street the Green option is the same as the Blue option. From Coral Street to one kilometre north of Corindi, the Green option is a realignment of the existing highway to the east of Blackadder Road and Corindi. North of Corindi through to the end of Section B, two new carriageways are proposed on the eastern side of the existing highway, generally parallel and adjacent to the existing highway.

Realignment to the east of Corindi would avoid impacting directly on the community and provides an opportunity to consolidate Corindi and the small cluster of dwellings on Blackadder Road into a larger community.

The existing highway would be utilised as a local access road for access to the Corindi and Blackadder Road communities. Connections to the upgraded road network would need to be considered. The Coral Street intersection would be bypassed by the realignment and the existing highway, in a local access road capacity, could be connected directly to Coral Street as a progression of the local access road.

In a Class M (Motorway) upgrade scenario this scheme would result in additional traffic through Corindi Beach, particularly from heavy vehicle traffic generated by the blueberry farm area (via Range Road) and the logging operations in Yuraygir State Forest (via Barcoongere Way), if additional access is not provided. The additional traffic would have an impact on the Corindi Beach community by reducing amenity and increasing noise.

The construction of two new carriageways to the east of the existing alignment north of Corindi to Barcoongere Way would allow the re-use of the existing asset to be maximised (a Pacific Highway Upgrade Program objective). The road reserve is generally wider on the eastern side of the existing highway and one private property would be impacted whereas there are several properties on the western side, which have limited residual road reserve width. The construction of two new carriageways in this area would assist in access rationalisation and could initially provide a Class M (Motorway) facility. This option may be staged.

Section C

The Green option is a proposed realignment from Barcoongere Way to Falconers Lane on the east side of the existing highway alignment. The realignment is up to 750 metres east of the existing highway and passes through Dirty Creek Range. As with the Blue option, flatter curves have been used to achieve 110 km/h design standard. This alignment option utilises a spur adjacent to Dirty Creek Road to climb the range and cuts through a saddle near the intersection of Dirty Creek Road and Range Road East. This option would represent the most eastern and shortest alignment through the range. The preliminary grading for this option indicates that a large improvement would be achieved for heavy vehicle operation.

The existing highway would be utilised as a local access road for access to Range Road, the blueberry farming area and dwellings on Dirty Creek Road.

Section D

The Green option is the same as the Blue option from the start of Section D through to McPhillips Road. Duplication of the existing highway (as two new carriageways) is proposed on the west side from McPhillips Road through to the start of the recently completed Halfway Creek duplication.

Along the Halfway Creek duplication the option proposes that the southbound carriageway of the duplication forms a local access road on the northern side of the highway, negating the “leap-frogging” of the local access road in the Class M (Motorway) upgrade scenario. This scheme would require the construction of one additional carriageway adjacent to the northbound carriageway through to Lemon Tree Road (thereby changing the existing northbound carriageway into the southbound in the duplication). This could be staged in the Class A (Arterial) upgrade scenario.

Section E

The Green option is the same as the Blue option from Lemon Tree Road to south of Kungala Road, where duplication of the existing highway is on the south side. From south of Kungala Road the option is a realignment of the highway on the eastside through to Bald Knob Tick Gate Road.

At Halfway Creek the proposed two new carriageways bypass the intersections of Kungala Road and Luthers Road and the existing service station. Further north, the two new carriageways bypass the intersection of Parker Road.

The existing highway would revert to a local access road, maintaining the connectivity between Kungala Road and Parker Road.

5.2.7 Purple Option

Section A

This option would retain the existing highway as a local access road in the Class M (Motorway) upgrade scenario with construction of two new carriageways. The new carriageways would be located on the western side of the existing highway to limit the impact on the old Pacific Highway and the caravan parks on the eastern side. The existing road reserve is wider on the western side therefore the impact to the Wedding Bells State Forest would be minimised and there are no private property accesses on the western side of the existing highway. This arrangement would allow the possibility of an initial upgrade directly to Class M (Motorway) if required.

Interchange options in this section are the same as the Blue option.

Section B

As an alternative to diverting local traffic through Corindi Beach, this option would provide two new carriageways in the Class M (Motorway) upgrade scenario adjacent to and on the west side of the existing carriageway from Tasman Street to beyond Coral Street. Between Coral Street and north of Corindi this option is a realignment of the existing highway (straightening of curves) through the Blackadder Gully and Corindi areas to achieve the 110 km/h design speed. From north of Corindi to the end of Section B, the Purple option is the same as the Blue option. Therefore, construction of a new carriageway on the east side of the existing highway and reconstruction of the existing highway to achieve 110 km/h design speed for the northbound carriageway.

The existing highway would be utilised as a local access road between Tasman Street and Corindi and connections to the proposed carriageways would need to be considered.

Construction of this option could be staged in the Class A (Arterial) upgrade scenario to limit initial capital expenditure.

Realignment to the east of Corindi would avoid a direct impact on the Corindi community. However, the Purple option in this area has a direct impact on dwellings around Blackadder Road.

Section C

The Purple option explores a deviation of the highway to the south of the existing highway alignment before Dirty Creek Range (west of Flinty Road) and then through Dirty Creek Range, adjacent to the constraint of the blueberry farming area. Impact on the blueberry farming area would be minor with this option. The escarpment along the southeastern side of the blueberry farming area also presented a notable obstacle to the vertical grading of the proposed highway alignment. Ultimately, an option was determined that skirted the southeastern side of the escarpment on approach to Dirty Creek Range. This option would enable the climb up the range to be broken into two sections to aid heavy vehicles negotiating the climb through Dirty Creek Range.

The connection of this option back to the existing alignment was proposed in close proximity to the existing Pacific Highway / Range Road intersection. However, a connection at Range Road would present several problems with an ultimate upgrading to a Class M (Motorway) standard. There would be a need for a local access road connection or a grade separation at the top of Dirty Creek Range. A local access road would need to be constructed as a new roadway, whilst off and on ramps for a grade separated facility here would be difficult to construct due to the steep terrain.

Section D

The Purple option is the same as the Green option through this section.

Section E

The Purple option is the same as the Green option through this section.

5.2.8 Orange Option

Section A

The Orange option is the same as the Purple option through this section except for a realignment of the two new carriageways to the west at the northern end of the section.

Interchange options in this section are the same as the Blue option.

Section B

The Orange option is a proposed realignment of the highway some distance to the west of the existing alignment. This alignment would deviate from the existing highway south of Tasman Street at the start of Section B, cross Kangaroo Trail Road and pass west of Blackadder Gully and Corindi community and rejoin close to the existing highway at the end of Section B. This would allow re-use of the existing highway throughout the section as a local access road past Corindi Beach and Corindi.

The alignment would be located further west across the Corindi floodplain where the impacts of flooding afflux upstream would be minimised. Therefore it would require shorter waterway crossings and have shorter sections on soft soils. Terrain shielding would aid in noise reduction for both Corindi Beach and Corindi.

Section C

The Orange option is the same as the Purple option through this section.

Section D

The Orange option is the same as the Purple option through this section.

Section E

The Orange option is the same as the Purple option through this section.

5.3 Summary of Characteristics of Route Options

A broad summary of the key characteristics of each route option within each section of the study area is presented in Tables 5.2 to 5.6. Where applicable, the data within the tables has been updated since the publication of the *Woolgoolga to Wells Crossing Route Options Development Report* in October 2005 as a result of additional investigations.

The characteristics of each option have been categorised in three categories as follows:

- Engineering and Operational (functional) characteristics;
- Community characteristics; and
- Environmental characteristics.

Table 5.2 Characteristics of all Route Options – Section A

Section A				
Characteristics	**Blue option**	**Green option**	**Purple option**	**Orange option**
Engineering and Operational				
Total length (km)	3.5km	3.5km	3.5km	3.5km
Maximum depth of cuttings	N/A	N/A	N/A	4m
Length of route to be constructed on floodplain	N/A	N/A	N/A	N/A
Number of Interchanges	1	1	1	1
Significant public utility constraints	All options require some protection for Telstra Optic Fibre. All options require some relocation of electrical infrastructure.			Relocation of an additional 19 x 11kV poles.
Preliminary Cost Estimate – Class A (Arterial) ($M)	$30M	$30M	$40M	$35M
Preliminary Cost Estimate – Class M (Motorway) ($M)	$35M	$35M	$50M	$40M
Community				
Potential noise impact (measured by weighted noise impact)	137	137	129	129
Approximate area of potential property acquisition (ha)	1ha	1ha	7ha	16ha
Number of properties potentially affected	8	8	16	18

Section A				
Characteristics	**Blue option**	**Green option**	**Purple option**	**Orange option**
Impact to state forest, national park or nature reserve	No	No	Yes (strip acquisition of Wedding Bells State Forest)	Yes (strip acquisition of Wedding Bells State Forest)
Impacts on known Aboriginal Heritage	No impacts to listed heritage. All options traverse areas of cultural sensitivity.			
Impacts on known Non-Aboriginal Heritage	No	No	No	No
Environmental				
Impact to SEPP 14 wetlands	No	No	No	No
Extent of vegetation clearing (ha)	22ha	22ha	27ha	30ha
Extent of endangered ecological communities clearing (ha)	22ha (potential EEC)	22ha (potential EEC)	27ha (potential EEC)	30ha (potential EEC)
Impact to NPWS designated wildlife corridors	Nil	Nil	Nil	Nil

Table 5.3 Characteristics of all route options – Section B

Section B				
Characteristics	**Blue option**	**Green option**	**Purple option**	**Orange option**
Engineering and Operational				
Total length (km)	5.6km	5.7km	5.6km	5.3km
Maximum depth of cuttings (m)	N/A	N/A	N/A	8m
Length of route to be constructed on floodplain (m)	2670	3080	2870	2260
Number of Interchanges	0	0	0	0
Significant public utility constraints	Protection / relocation of Telstra Optic Fibre required Protection / relocation of Electrical infrastructure required 100mm and 300mm water mains require relocation	Protection / relocation of Telstra Optic Fibre required Protection / relocation of Electrical infrastructure required 100mm and 300mm water mains require relocation	Protection / relocation of Telstra Optic Fibre required Protection / relocation of Electrical infrastructure required 100mm and 300mm water mains require relocation	Protection / relocation of Telstra Optic Fibre required Protection / relocation of Electrical infrastructure required No impact on water and sewer infrastructure.
Preliminary Cost Estimate – Class A (Arterial) ($M)	$105M	$100M	$95M	$85M
Preliminary Cost Estimate – Class M (Motorway) ($M)	$120M	$105M	$115M	$90M
Community				
Potential noise impact (measured by weighted noise impact)	142	136	140	69
Approximate area of potential property acquisition (ha)	22ha	28ha	26ha	48ha

Section B				
Characteristics	**Blue option**	**Green option**	**Purple option**	**Orange option**
Number of properties potentially affected	41	33	38	21
Impact to state forest, national park or nature reserve	No	No	No	No
Impacts on known Aboriginal Heritage	No impacts to listed heritage. All options traverse areas of cultural sensitivity.			
Impacts on known Non-Aboriginal Heritage	No	No	No	No
Environmental				
Impact to SEPP 14 wetlands	No	No	No	No
Extent of vegetation clearing (ha)	19ha	27ha	21ha	26ha
Extent of endangered ecological communities clearing (ha)	13ha	20ha	15ha	21ha
Impact to NPWS designated wildlife corridors	Widening of existing cleared corridor through two sub-regional wildlife corridors.			Creation of new cleared corridor through one sub-regional wildlife corridor. Widening of existing cleared corridor through one sub-regional wildlife corridors.

Table 5.4 Characteristics of all Route Options – Section C

Section C			
Characteristics	**Blue option**	**Green option**	**Purple / Orange option**
Engineering and Operational			
Total length (km)	4.4km	4.1km	4.6km
Maximum depth of cuttings (m)	20m	40m	22m
Length of route to be constructed on floodplain	N/A	N/A	N/A
Number of Interchanges	0	0	0
Significant public utility constraints	Five crossings of Telstra Optic fibre requiring relocation / protection Some relocations of electrical infrastructure No impact upon water and sewer infrastructure	1.4km of Telstra Optic fibre requiring relocation / protection Some relocations of electrical infrastructure No impact upon water and sewer infrastructure	1.5km of Telstra Optic fibre requiring protection Some relocations of electrical infrastructure No impact upon water and sewer infrastructure
Preliminary Cost Estimate – Class A (Arterial) ($M)	$45M	$55M	$55M
Preliminary Cost Estimate – Class M (Motorway) ($M)	$55M	$60M	$65M
Community			
Potential noise impact (measured by weighted noise impact)	18	16	6
Approximate area of potential property acquisition (ha)	22ha	21ha	26ha

Section C			
Characteristics	**Blue option**	**Green option**	**Purple / Orange option**
Number of properties potentially affected	31	15	33
Impact to state forest, national park or nature reserve	Yes (minor severance of Newfoundland State Forest)	Yes (major severance of Newfoundland State Forest)	No
Impacts on known Aboriginal Heritage	No	No	No
Impacts on known Non-Aboriginal Heritage	No	No	No
Environmental			
Impact to SEPP 14 wetlands	No	No	No
Extent of vegetation clearing (ha)	30ha	30ha	29ha
Extent of endangered ecological communities clearing (ha)	3ha	5ha	1ha
Impact to NPWS designated wildlife corridors	Widening of existing cleared corridor through two sub-regional wildlife corridors and one regional wildlife corridor	Creation of new cleared corridor through one sub-regional wildlife corridor and widening of existing cleared corridor through one sub-regional wildlife corridor and one regional wildlife corridor.	Creation of new cleared corridor through one sub-regional wildlife corridor and widening of existing cleared corridor through one sub-regional wildlife corridor and one regional wildlife corridor.

Table 5.5 Characteristics of all Route Options – Section D

Section D		
Characteristics	**Blue option**	**Green / Purple / Orange option**
Engineering and Operational		
Total length (km)	5.8km	5.8km
Maximum depth of cuttings (m)	6m	N/A
Length of route to be constructed on floodplain	N/A	N/A
Number of Interchanges	0	0
Significant public utility constraints	All options would require some protection or minor relocation of Telstra Optic Fibre and electrical infrastructure.	
Preliminary Cost Estimate – Class A (Arterial) ($M)	$30	$55
Preliminary Cost Estimate – Class M (Motorway) ($M)	$40	$80
Community		
Potential noise impact (measured by weighted noise impact)	27	28
Approximate area of potential property acquisition (ha)	32ha	36ha
Number of properties potentially affected	61	51
Impact to state forest, national park or nature reserve	Yes (strip acquisition from Newfoundland State Forest)	

Section D		
Characteristics	**Blue option**	**Green / Purple / Orange option**
Impacts on known Aboriginal Heritage	One indigenous heritage item listed on the State register occurs within or in close proximity to the options. All options traverse areas of cultural sensitivity.	
Impacts on known Non-Aboriginal Heritage	No	No
Environmental		
Impact to SEPP 14 wetlands	No	No
Extent of vegetation clearing (ha)	20ha	22ha
Extent of endangered ecological communities clearing (ha)	None known subject to further detailed investigations during concept design.	None known subject to further detailed investigations during concept design.
Impact to NPWS designated wildlife corridors	All options would require the widening of existing cleared corridor through two regional wildlife corridors.	

Table 5.6 Characteristics of all Route Options – Section E

Section E		
Characteristics	**Blue option**	**Green / Purple / Orange option**
Engineering and Operational		
Total length (km)	7.8km	7.8km
Maximum depth of cuttings(m)	N/A	N/A
Length of route to be constructed on floodplain	N/A	N/A
Number of Interchanges	0	0
Significant public utility constraints	920m of Telstra Optic Fibre to be relocated Minor relocation / protection of electrical infrastructure would be required	2km of Telstra Optic fibre may require protection / relocation Minor relocation / protection of electrical infrastructure would be required
Preliminary Cost Estimate – Class A (Arterial) ($M)	$75M	$75M
Preliminary Cost Estimate – Class M (Motorway) ($M)	$100M	$85M
Community		
Potential noise impact (measured by weighted noise impact)	42	38
Approximate area of potential property acquisition (ha)	33ha	38ha

Section E		
Characteristics	**Blue option**	**Green / Purple / Orange option**
Number of properties potentially affected	28	18
Impact to state forest, national park or nature reserve	Yes (strip acquisition from Wells Crossing Flora Reserve and Glenugie State Forest)	Yes (strip acquisition from Wells Crossing Flora Reserve)
Impacts on known Aboriginal Heritage	No impacts to listed heritage. Potential minor impact upon two parcels of vested land. Traverses areas of cultural sensitivity (historical campsites / movement corridors)	No impacts to listed heritage. Major impact on one parcel of vested land. Traverses two unlisted areas of historical campsites / movement corridors. Potentially impacts on ceremonial site in vicinity of Halfway Creek.
Impacts on known Non-Aboriginal Heritage	No	No
Environmental		
Impact to SEPP 14 wetlands	No	No
Extent of vegetation clearing (ha)	73ha	92ha
Extent of endangered ecological communities clearing (ha)	None known subject to further detailed investigations during concept design.	None known subject to further detailed investigations during concept design.
Impact to NPWS designated wildlife corridors	Widening of existing cleared corridor through one regional wildlife corridor, and on the edge of one sub-regional wildlife corridor.	Creation of a new cleared corridor through one regional wildlife corridor.