

1. Introduction

The Woolgoolga to Wells Crossing project involves the proposed upgrade of approximately 25.9 km of the Pacific Highway on the North Coast of NSW. The project commences approximately 5.9 km north of Woolgoolga at Arrawarra Beach Road and ends at the intersection of the highway and Bald Knob Tick Gate Road adjacent to the Wells Crossing Flora Reserve.

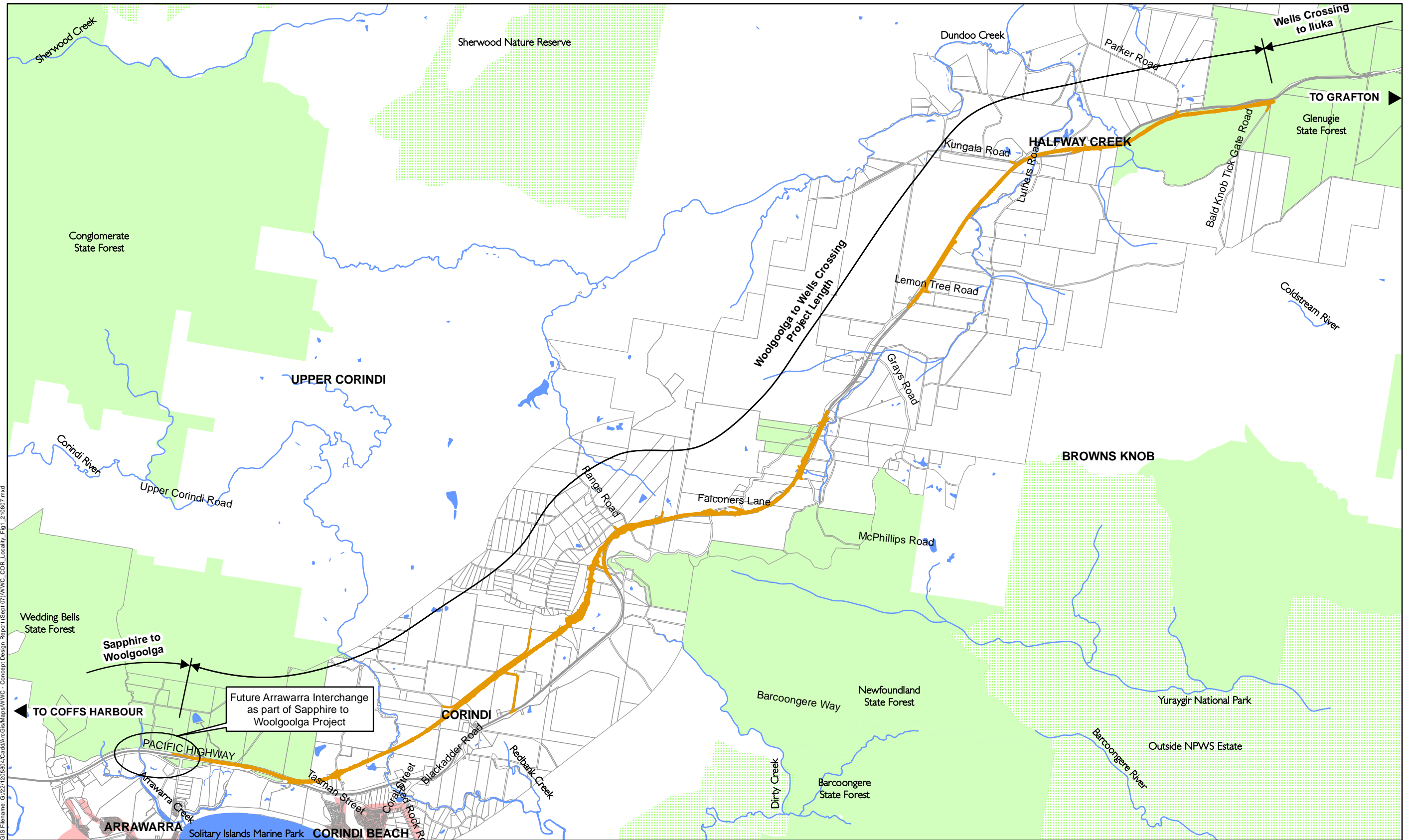
1.1 Project boundaries

The southern project boundary is at Arrawarra Beach Road, where it joins the proposed Sapphire to Woolgoolga project. Within the northern limits of the Sapphire to Woolgoolga project, a proposed all movements grade separated interchange is located at Arrawarra Beach Road, where the Sapphire to Woolgoolga project rejoins the existing highway.

The northern project services boundary for this project is the intersection of the existing highway and Bald Knob Tick Gate Road and joins with the Wells Crossing to Iluka project in the north.

The location of the project is shown on Figure 1.

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<p>SCALE 1:70,000 @ A3</p> <p>0 0.45 0.9 1.8 Km</p> <p>Map Projection: Universal Transverse Mercator Horizontal Datum: Geodetic Datum of Australia 1994 Grid: Map Grid of Australia, Zone 56</p>		<p>Legend</p> <ul style="list-style-type: none"> — Preferred Route — Watercourse Cadastre Builtup areas National parks, Nature reserves State forests
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Spatial layers courtesy of Coffs Harbour City Council, NSW Department of Lands, NSW Roads & Traffic Authority, Geoscience Australia, NSW Department of Environment & Conservation, NSW Department of Primary Industries.

Location of the Preferred Route

Figure 1

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1.2 Project definition

The project brief provides the following definition:

Project:	Woolgoolga to Wells Crossing
RTA Region:	Pacific Highway Office, Major Infrastructure Directorate
Road Name:	Pacific Highway
Road Number:	State Highway Number 10
Project Location:	32.3 km to 58 km north of Coffs Harbour
Project Length:	25.7 km
Local Government	
Areas:	Coffs Harbour and Clarence Valley

1.3 Highway upgrade scenarios

Design standards for the Pacific Highway Upgrade Program require two lanes in each direction, with provision for the future addition of a third lane each way, separated by a median with a desirable width of 12 m.

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

- Arterial style highway (referred to as Class A) — two lanes in each direction (median width to accommodate future upgrading to three lanes in each direction), 100 km per hour posted speed, limited access condition roadway with at grade intersections.
- Motorway style highway (referred to as Class M) — two lanes in each direction (median width to accommodate future upgrading to three lanes in each direction), 110 km per hour 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. The upgrade to arterial road standard may be followed by a subsequent upgrade to motorway standard. Upgrading may also be completed on a staged basis. Staging considerations are discussed in more detail in Section 23.

1.4 Overview of the project methodology

The planning phase of the project consists of the following listed in Table 1-1 below. Further information regarding the process leading up to the concept design is provided in Section 0:

Table 1-1 Overview of project methodology

Task / Phase	Status
Preliminary investigations — to determine the opportunities and constraints for route options.	Complete.
Development of route options — the outcomes of this stage of the project have been documented within the Route Options Development Report.	Complete.
Selection of the preferred route — the route options have been assessed and a preferred route selected. The outcomes of this stage of the project have been documented within the Preferred Route Report.	Complete.
Concept engineering design of the preferred route — the outcomes of this stage of the project are summarised in this report.	Complete.
Environmental impact assessment and planning approval of the preferred route.	To be undertaken.

1.5 Project objectives

The objectives of the Woolgoolga to Wells Crossing project are to:

- Develop a dual carriageway road with potential to reduce crash rates over the project length.
- Develop a refined design that meets or exceeds B-double requirements, including at intersections, where required.
- Maximise the use of the existing road reserve, where feasible.
- Integrate input from local communities into development of the project through the implementation of a comprehensive program of community consultation and participation.
- Satisfy the technical and procedural requirements of the RTA with respect to the design of the project.
- Provide for transport developments that are complementary with land use.
- Allow for all connections, modifications and improvements necessary to upgrade the existing highway where it is retained as part of the project.
- Consider delay management strategies to minimise disruption to local and through traffic, and maintain access to affected properties and land during construction.
- Provide flood immunity on at least one carriageway in accordance with:
 - Target a one in 100 year flood event 1 per cent annual exceedance probability.
 - Minimum of at least a one in 20 year flood event 5 per cent Annual exceedance probability.
- Provide intersections designed to achieve at least a level of service 'C' 20 years after opening for the 100th highest hourly volume.
- Develop solutions that address community expectations for access to the new highway.

- Retain or replace existing rest areas within the study area.
- Develop a refined design generally meeting the criteria for a 110 km per hour design speed for the vertical alignment and horizontal alignment.
- Ensure the project outcomes achieve value for money.
- Provide a strategy for future upgrades to be easily integrated into the project from both engineering and environmental perspectives.
- Minimise the need to modify the preferred route option and refined design during subsequent project phases.

1.6 Purpose and scope

This Concept Design Report has been prepared by GHD to summarise the concept design associated with the Woolgoolga to Wells Crossing project.

1.7 Drawing content

The concept design drawings have been prepared to accompany this Concept Design Report submission. The concept design for the highway and the drawings have been checked in accordance with the Pacific Highway Upgrade Program Design Checklist, which is included as Appendix A. The drawings include the following information:

- Cover sheet and index.
- Amendment register.
- General arrangement plans.
- Detail plans showing the highway alignment and arrangements for the arterial road standard design.
- Final boundaries based on the motorway standard design including allowance for water quality treatments etc.
- Profiles of main line and side roads.
- Typical sections.
- Cross sections.
- Intersection gradings.
- Preliminary lines and signs drawings.
- Cross drainage and water quality details.
- General arrangements for structures.
- Landscaping.
- Identification of services relocations.
- Pavement details.
- Pavement plan.
- Details of other minor works eg fencing/barriers.
- Staging drawings.

The aforementioned plans are provided in the following drawing scales:

- 20 m interval cross sections at 1:200 scale.
- General arrangement plans 1:20,000.
- Detail plans 1:2000.
- Longitudinal sections H1:2000 and V1:400.
- Preliminary layouts of intersections 1:1000.

1.8 Report content

This Concept Design Report includes:

- Outcomes of community consultation which have been addressed in the concept design development process.
- Traffic volumes — (volumes/B double routes/heavy traffic on side roads/separation of local from through traffic/connectivity across the highway for local traffic).
- The recommended access strategy.
- Geometry of main alignment including constraints.
- Strategy for conversion to six lanes.
- Cross-section elements to be adopted on main line, access roads, service roads and bridges.
- Design criteria to be adopted for service roads and access roads (based on Austroads specifications and the Roads and Traffic Authority's Road Design Guide).
- Rest areas, u-turn bays, emergency crossovers, telephones, truck lay-bys.
- Provision for buses, cyclists, emergency services and state forests.
- Lighting.
- Major and minor structures.
- Corindi River floodplain modelling and targeted flood immunity.
- Minor drainage.
- Pavement design adopted for the upgraded highway, service roads and access roads.
- Earthworks.
- Urban design aspects including preliminary landscape plans (at 1:10,000 scale).
- Utilities relocation strategy.
- Delineation.
- Signage strategy.
- Roadside furniture including guide posting and traffic safety barriers.
- Assessment of existing road infrastructure assets (pavement and structures) proposed to be reused.
- Ecological impacts and proposed mitigation measures.
- Noise impact of the upgraded highway and indicative mitigation measures.
- Heritage (indigenous and non-indigenous) impacts and indicative mitigation measures.
- Water quality, including indicative controls (location and sizing).

- Proposed road boundary, acquisition plans and mitigation measures for private properties.
- Constructability issues/construction staging (including traffic management during construction).
- Sources of construction resources (sourced both internal and external to the project).
- Temporary infrastructure.
- Road user delay management, with a focus on minimising during construction.
- Stage 2 road safety audit.
- Occupational health and safety, including an update of the risk register and potential mitigation measures.
- Actions arising from the value-engineering workshop, which occurred on 16 July 2007.

1.9 Specialist investigations

During the concept design development phase of the preferred route, a range of related specialist investigations and studies have been undertaken to inform the design process. Summaries of the outcomes of the following investigations, and their influence on the development of the concept design are included in this report:

- Concept estimate.
- Urban and regional design/landscape and visual assessment.
- Construction resources.
- Temporary infrastructure.
- Detailed traffic/transportation assessment.
- Property impacts and adjustments.
- Utilities and service adjustment.
- Road safety audits.
- Biological impacts.
- Indigenous heritage.
- Non-indigenous heritage.
- Water quality assessment.
- Hydrology/hydraulics.
- Geotechnical investigations of preferred route.
- Occupational health and safety.

Summaries of the outcomes of these investigations, and their influence on the development of the concept design are included in this report.