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PACIFIC HIGHWAY UPGRADE WOOLGOOLGA TO BALLINA URBAN DESIGN REPORT LANDSCAPE CHARACTER & VISUAL IMPACT ASSESSMENT

Prepared for Roads and Maritime Services NSW
September 2012

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Upgrading the Pacific Highway Woolgoolga to Ballina

Landscape character and visual impact assessment report Urban design report

Sept 2012 Rev 09

Prepared for

Roads and Maritime Services NSW

By

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“This picturesque landscape setting requires a strong urban design response to integrate the proposed new infrastructure into the existing urban structure whilst retaining and enhancing the natural setting”

The Roads and Maritime Service (RMS) is seeking approval for the Woolgoolga to Ballina Pacific Highway upgrade (the project). The project involves upgrading about 155 kilometres of the Pacific Highway on the mid and far north coast of NSW, between Woolgoolga and Ballina. This urban design report and landscape character and visual impact assessment has been prepared as part of the EA process to address the visual and landscape character issues associated with the project, to introduce measures to minimise its potential impact, and to provide direction for future detail design and documentation work.

Landscape character

Landscape character impact assessments are provided in chapter 2.

Landscape character assessment determines the impact of development on the aggregate of an area's built, natural and cultural character or sense of place. The project is a very large development passing through numerous landscape types. The landscape character analysis identifies nine landscape character types in the study area and 54 character precinct areas representing the wide range of settings through which the project passes.

A whole of corridor landscape character impact assessment identifies that the project would have a moderate character impact. Areas of high impact would occur at:

- _The cutting through Dirty Creek Range
- _The major cuttings at the interchange at Tyndale (Bondi Hill)
- _The Richmond River bridge

Visual assessment

Visual impact assessment is provided in chapter 3. Visual impact helps to define the day to day visual effects of a development on people's views. It is based on an assessment of a selection of viewpoints that are rated according to the magnitude of change proposed by a development and sensitivity to the change. For this large project it is difficult to summarise the raw visual impact ratings because the conditions of the project, the setting, and the sensitivity change considerably. The major benefit of visual impact assessment is to identify the areas of high impact in order that they can be addressed through engineering and urban design changes and mitigation strategies.

A total of 75 viewpoints form that basis of the visual impact assessment. This equates to one view point for just over two kilometres of new highway development, however the selected viewpoints are not evenly spaced over the corridor. They are focused around the areas of highest anticipated magnitude and sensitivity, that is, at the proposed major interchanges and bridges, and the areas where there are most people and the most sensitive settings. The above methodology is helpful because it focuses attention where there is highest impact, but it can skew the overall visual assessment results if they are read without considering that lower impact viewpoints were not selected because they were considered less critical.

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Out of the 75 selected viewpoints visual impact ratings were determined as follows:

- _Seven viewpoints have high visual impact
- _Twenty-one viewpoints have high to moderate impact
- _Twenty-nine viewpoints have moderate impact
- _Fourteen viewpoints have moderate to low impact
- _Four viewpoints have low impact

Areas of high impact would occur at:

- _The major cutting in sensitive forest such as at Dirty Creek Range, Pine Brush State Forest and Tyndale (Bondi Hill)
- _The proposed bridge over the Clarence River
- _The new overpass at New Italy
- _Major interchanges affecting local residents

High-moderate impacts were generally recorded in areas of forest removal and new interchanges affecting local residents, or where the project follows a new alignment through particularly scenic landscapes, for example, near Wardell. Moderate-low impacts were recorded in less sensitive agricultural areas where no elevated interchanges are proposed or where views of the project are distant. Low impacts also generally occur in less sensitive agricultural areas and where views of the project are distant. Moderate impacts result from a variety of conditions where magnitude or sensitivity ratings are high.

Landscape and urban design

A landscape and urban design strategy is provided in chapter 4. This comprises design strategies for the full length of the corridor (1:20,000 scale plans) and more detailed resolution at major intersections and other project features (1:5000 scale plans). A series of site sections as well as typical landscape treatments for major project conditions (1:1000 plans and sections) are also provided in this chapter.

The design strategies are accompanied by a series of design measures aimed to minimise the impact of the project. These include general project wide mitigation strategies as well as more detailed measures specific to each of the 11 nominated project sections.

A detailed list of landscape and urban design recommendations are also provided to ensure optimum landscape and urban design outcomes are achieved for the project. Through careful design of all road elements from bridges to embankments, noise mitigation measures and road furniture, a unified design theme can be created to link these elements and achieve an elegant, simple and durable design solution to the project which minimises visual impacts, retains and highlights the existing landscape character and provides an inspiring and memorable journey for road travellers.

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_Introduction

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1.1_ The project

NSW Roads and Maritime Services (RMS) is seeking project approval for the Woolgoolga to Ballina Pacific Highway upgrade project (the project) which is located on the NSW North Coast. The approval is sought under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The project would upgrade around 155 kilometres of highway, forming a major part of the overall Pacific Highway Upgrade Program. The project would provide a four-lane divided carriageway from around five kilometres north of Woolgoolga to around six kilometres south of Ballina.

The project has been divided into eleven sections between tie-ins with the existing Pacific Highway to aid description, and the impact assessment for the project is described for each of these sections (refer to Table 01).

Table 01_ Project sections and lengths

Project section	Location	Station (km)		Length (km)
		Start	Finish	
01	Woolgoolga to Halfway Creek	0	17.1	17.0
02	Halfway Creek to Glenugie upgrade	17.0	28.7	11.7
03	Glenugie upgrade to Tyndale	33.8	68.8	35.0
04	Tyndale to Maclean	68.8	82.0	13.2
05	Maclean to Iluka Road, Mororo	82.0	96.4	14.4
06	Iluka Road to Devils Pulpit upgrade	96.4	105.6	9.2
07	Devils Pulpit upgrade to Trustums Hill	111.1	126.4	15.3
08	Trustums Hill to Broadwater National Park	126.4	137.6	11.2
09	Broadwater National Park to Richmond River	137.6	145.1	7.5
10	Richmond River to Coolgardie Road	145.1	158.6	13.5
11	Coolgardie Road to Ballina bypass	158.6	164.0	5.4

An overview of the project alignment and project sections are shown in Figure 01.

While the project is for a four-lane motorway standard upgrade, the construction and opening of the project would be staged. Staging could include some sections being constructed and opened initially as a four-lane arterial standard upgrade.

The project does not include the Pacific Highway upgrades at Glenugie and Devils Pulpit, which are located between Woolgoolga and Ballina, as Glenugie is now complete and Devils Pulpit is under construction. Together with the Glenugie and Devils Pulpit upgrades, the project would complete a total of 164 kilometres of upgraded highway between Woolgoolga and Ballina.

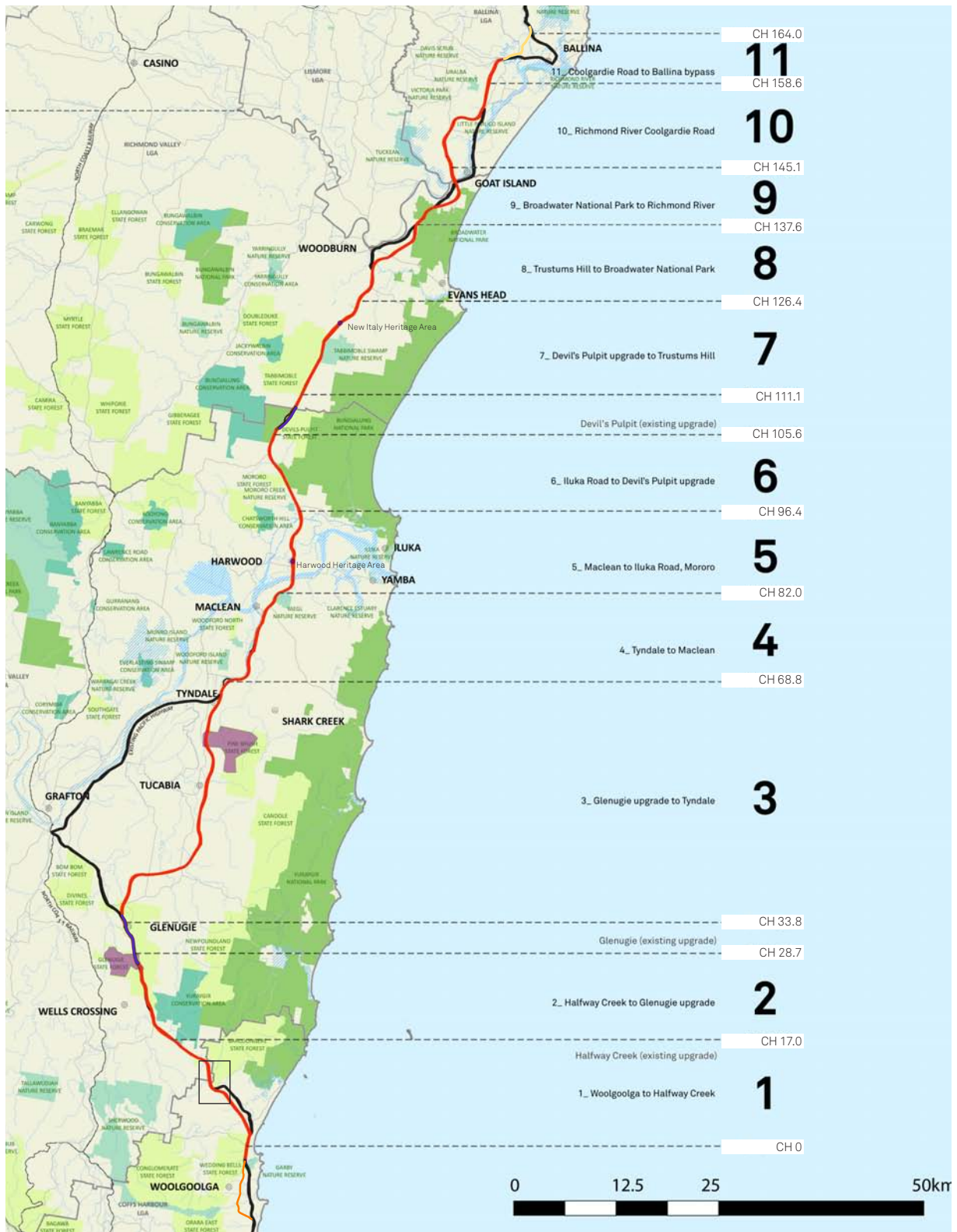


Figure 01_ Project Outline

Legend

- Woolgoolga to Ballina upgrade project centreline
- Existing Pacific Highway
- Local Government Area
- State Forest
- National Park
- Nature Reserve
- State Conservation Area
- Wetlands
- Other Pacific Highway Upgrades
- Sapphire to Woolgoolga upgrade project
- Ballina Bypass upgrade project
- High Conservation Old Growth Forest

Locality



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4 The key features of the project include:

- _ Around 155 kilometres of motorway standard highway, comprising a four-lane divided carriageway (two lanes in each direction) that can be upgraded to a six-lane divided carriageway in the future, if required
- _ Bypasses of Grafton, South Grafton, Ulmarra, Woodburn, Broadwater and Wardell
- _ Ten interchanges to provide access to and from the upgraded highway at:
 - _ Range Road (Corindi)
 - _ Glenugie (Eight Mile Lane)
 - _ Tyndale (Sheeys Lane)
 - _ Maclean (Goodwood Street)
 - _ Yamba Road (Harwood)
 - _ Watts Lane (Harwood)
 - _ Iluka Road (Woombah)
 - _ Woodburn (Trustums Hill Road)
 - _ Broadwater (Evans Head Road)
 - _ Wardell (Coolgardie Road)
- _ About 40 bridge crossings of waterways or floodplains, including bridges over the Clarence and Richmond rivers
- _ About 55 over bridge and underpasses structures to maintain access along local roads crossed by the project
- _ Viaducts located where the project would cross low-lying or flood-prone areas
- _ Service roads and access roads to maintain connections to existing local roads and properties
- _ Structures to help wildlife cross above or below the project including crossings for tree-dwelling mammals, dedicated culverts under the highway and over-land fauna bridges
- _ Rest areas located at around 50 kilometre intervals for both northbound and southbound traffic. These are located at:
 - _ Tucabia (north and southbound)
 - _ North of Mororo Road (southbound)
 - _ South of Old Bagotville Road (north and southbound)
- _ Heavy vehicle weigh station located near Halfway Creek

In addition to these key features, the project would include construction sedimentation basins, operational water quality basins and construction facilities such as compounds and matching plants.

Construction would be staged from 2013 onwards following project approval, depending on the availability of funding. Construction of the project would generally comprise the conventional techniques employed on most major highway projects, modified for specific environmental or engineering constraints. RMS seeks approval for construction working hours for all day (8am–5pm) on Saturdays and between 6am and 7pm on weekdays.

An indicative outline of construction activities may include:

- _ Establishment of the construction site and ancillary facilities
- _ Enabling works, including adjustments to utilities, property adjustments, works to existing drainage and provision of construction access roads
- _ Clearing and grubbing of vegetation, stripping of topsoil and stockpiling for re-use
- _ Construction of road cuttings and embankments
- _ Treating areas of soft soil to stabilise the underlying soil sub-layers
- _ Installing drainage and bridging structures
- _ Laying of pavement materials
- _ Installing pavement markings, signposting, street lighting and progressive landscaping

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The project would not be built in one phase. The project would be delivered in stages as further funding becomes available and to best manage construction and material resources. Stages would be identified that priorities and target upgrades and works that would best deliver safety and traffic efficiency improvements, and best deliver value for money outcomes.

This working paper assesses the potential impacts of the full motorway standard upgrade for construction and operation. Where there are relevant differences between the full motorway standard upgrade and the initial upgrade to arterial standard, those impacts are also assessed. Impacts are generally identified through the eleven project sections identified above.

Further information on the description of the project and the assessment of other environmental aspects can be found in the main volume of the environmental impact statement.

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1.2 Purpose and scope of this assessment

This report documents the landscape character and visual assessment of the project, provides urban and landscape design strategies based on the current proposal and detailed recommendations for each proposed element of the project. It will inform future detailed concept designs for each of the project sections.

This work has been undertaken concurrently with development of the engineering design in an iterative and collaborative process which has allowed coordination of engineering, urban design and landscape aspirations. The purpose of landscape character and visual assessment is to improve design outcomes, identify impacts and propose mitigation strategies. Design and assessment iteration leads to better outcomes with lesser impacts and fewer costly mitigation measures.

Director-General Environment Assessment Requirements

Director-General requirements relating to the urban and landscape design and landscape character and visual assessments been determined for the project. The following table indicates the chapter of the report that addresses each issue raised.

Table 02_ Director General Requirements

<i>Discipline</i>	<i>Key Issue</i>	<i>Report reference</i>
Visual amenity, urban design and landscaping	A description of the visual significance of the affected landscape, particularly where the corridor traverses greenfield areas.	Chapter 2 (Landscape character assessment).
	An assessment of the visual impact of the project on the landscape character of the area, including built form (materials and finishes) and the urban design (height, bulk and scale) of key components including bridge crossings, floodplain, embankments, interchanges and views to and from projects.	Chapter 3 (Visual impact assessment).
	Details of landscaping treatment and design (including noise barriers, retaining walls and landscaping) consistent with the overall design of the Pacific Highway upgrade program and integration with the existing (and desired) character of affected localities,	Chapter 4 (Landscape and urban design strategy) .
	Taking into account the <i>Noise Wall Design Guideline</i> (Roads and Traffic Authority, 2006).	Chapter 4 (Landscape and urban design strategy)

Chapter 4 outlines four key guiding strategies for the overall project and a series of landscape and urban design strategies for each of the 11 nominated sections of the project based on specific local and project conditions. A series of strategy drawings and details demonstrate the application of these strategies in the project.

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Detailed recommendations for all proposed landscape and urban design elements anticipated in the project are also provided. Elements addressed include the following:

- _Bridges
- _Acoustic barriers
- _Retaining walls
- _Cuttings and embankments
- _Signage
- _Road barriers
- _Fences
- _Planting
- _Clear zones
- _Topsoil management
- _Construction compounds
- _Water quality control ponds
- _Fauna crossings
- _Rest areas
- _Place marking

1.3_ Report structure

This report is presented into the following parts:

- _Landscape character assessment (chapter 2)
- _Visual impact assessment (chapter 3)
- _Landscape and urban design (chapter 4)

1.3.1_ Landscape character analysis

A comprehensive landscape character analysis for each of the 11 sections of the project has been carried out in accordance with the RMS Environmental Impact Assessment Guidance Note: Guidelines for landscape character and visual impact assessment (RTA Guide EIA-N04). It presents a broad scale and strategic landscape character assessment of the 155 kilometre project and assesses the likely character impacts of the project. Detail on the landscape character assessment process is provided in chapter 2.

1.3.2_ Visual impact assessment

A detailed visual impact assessment of the project is undertaken in accordance with the RTA Guide EIA-N04. It determines the anticipated visual impact of the project based on assessments made at 75 nominated vantage points along the project alignment. Specific landscape and urban design recommendations for each viewpoint are also provided. Details on the visual impact assessment process is provided in chapter 3.

1.3.3_ Landscape and urban design strategy

A landscape and urban design strategy has been developed based on the landscape character and visual impact assessment. The strategy aims to minimise character and visual impacts from the project and provide optimum landscape and urban design outcomes. This work has been carried out with regard to the requirements and recommendations contained in the RMS suite of landscape and engineering guidelines documents (refer 1.5.2).

A series of typical urban and landscape design recommendations for anticipated elements in the project are also provided in this chapter to guide future detailed design effort.

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1.4_ Basis of this assessment

Reports and drawings made available to HASSELL relating to the landscape, visual and urban design components of the project have been used as the basis for this visual assessment and urban and landscape design strategy.

Previous development assessments relating to the project include separate assessments which were undertaken for the previous development projects.

- _Woolgoolga to Wells Crossing
- _Wells Crossing to Iluka Road
- _Iluka Road to Woodburn
- _Woodburn to Ballina

The reports and associated working papers for each of the previous development assessments were completed before the publication of the RTA guide EIA-N04 which was first issued on 24 March 2009. As such, none of the previous working papers were prepared using methodologies consistent with EIA-N04 or with each other.

The methodology for analysis and visual impact assessment in this report reviews and updates the previous work consistent with the requirements of EIA-N04 for the entire project.

This assessment was carried out based on concept engineering and bridge design drawings. Further design development of the concept drawings would be carried out in liaison with relevant disciplines, including biodiversity and noise, at the detail design stage. At this stage, noise modelling has indicated that no noise walls are anticipated (refer to section 4.6.3) and this assessment has been based on this assumption.

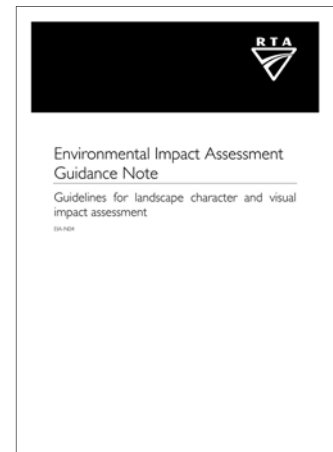
1.5_ RMS Urban design policies and guidelines

1.5.1_ RMS Environmental Impact Assessment Guidance Note EIA-N04

The RMS guide EIA-N04 differentiates between visual assessment (the impact on views), and landscape character assessment (the impact on the aggregate of an area's built, natural and cultural character or sense of place). Landscape character and visual impact assessment tasks as outlined in the guide are listed below:

- _Analyse landscape character
- _Identify landscape character zones
- _Assess landscape character impacts
- _Assess the visibility of the proposal
- _Identify key viewpoints
- _Assess visual impacts
- _Refine the concept design to avoid and minimise landscape character and visual impacts
- _Develop a mitigation strategy to minimise landscape character and visual impacts

This report clearly addresses each of the above tasks to inform the project approval authority, other agencies and the community about the landscape character and visual impact of the proposal and what mitigation strategies should be implemented.



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1.5.2 RMS Landscape guide documents

The RMS has published a comprehensive list of design guideline documents that aim to produce best practice design outcomes along the roads of New South Wales.

The current published documents include:

- _Beyond the Pavement (RMS, 2009)
- _Pacific Highway Urban Design Framework (RMS, 2005)
- _Landscape Guideline (RMS, 2008)
- _Water Sensitive Urban Design Guideline (RTA, 2009)
- _Noise Wall Design Guideline (RMS, 2007)
- _Bridge Aesthetics (RTA, 2004)
- _Shotcrete Design Guide (RMS, 2005)

The proposed landscape and urban design outcomes listed in chapter 04 reference these documents.



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