



Transport
Roads & Maritime
Services

ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON

STATE SIGNIFICANT INFRASTRUCTURE APPLICATION REPORT

AUGUST 2013

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Executive summary

The project

Roads and Maritime Services (RMS) is seeking approval for a new bridge over the Clarence River at Grafton on the NSW Mid North Coast. The project involves:

- Building a new bridge about 70 metres downstream of the existing bridge (which would be retained)
- Upgrading parts of the road network in Grafton and South Grafton to connect the new bridge to the existing road network.

The need for the project

The project is needed to address short term and long term transport needs in Grafton. The existing bridge, built in 1932, is the only crossing of the Clarence River in the Grafton area. Peak hour traffic flows across the bridge are at, or very close to, the practical capacity of the bridge. Traffic congestion associated with the bridge, and the resultant delays, are affecting the efficiency of the Summerland Way and the Grafton community. RMS forecasts that this traffic congestion will worsen over time, and substantially affect the performance of the state and local road network.

Impacts of the project

RMS has formed the opinion that the project would be likely to significantly affect the environment and require the preparation of an environmental impact statement under the *Environmental Planning and Assessment Act 1979* (EP&A Act). Accordingly, the project is State Significant Infrastructure under Part 5.1 of the EP&A Act. Approval from the Minister for Planning and Infrastructure is required for the project. The outcomes of preliminary environmental investigations undertaken as part of an extensive options development phase has identified that the following key environmental issues will require further detailed assessment and may require project-specific impact mitigation measures:

- Traffic and transport
- Flooding and hydrology
- Noise and vibration
- Non-Aboriginal heritage
- Aboriginal heritage
- Socio-economic, property and land use
- Urban design, landscape character and visual impact.

This report

This report supports an application under section 115X of the EP&A Act to carry out State significant infrastructure. It aims to assist the formulation of environmental assessment requirements by the Director-General under section 115Y of the EP&A Act.

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Abbreviations and Glossary

AHIMS	Aboriginal Heritage Information Management System
AM peak	Morning traffic peak period in Grafton, that is, from 7 am to 9 am
Australian Height Datum	A common national plane of level approximately equivalent to the height above sea level
Average recurrence interval	Average recurrence interval (measured in years) is a term used to describe flood frequency. It is the long term average number of years between floods of a certain magnitude. For example, a 100-year ARI flood is a flood that occurs or is exceeded on average once every 100 years
CBD	Central business district
CEMP	Construction environmental management plan
DECCW	Department of Environment and Climate Change and Water (former)
EEC	Endangered ecological community
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	<i>Fisheries Management Act 1994</i>
LGA	Local government area
OEH	Office of Environment and Heritage
PMF	Probable maximum flood
RMS	Roads and Maritime Services
RMS	NSW Roads and Maritime Services
RTA	Former Roads and Traffic Authority (now part of RMS)
Scour	Removal of soil or fill material by the river flow. The term is frequently used to describe storm-induced, localised conical erosion around bridge pilings and other foundation supports where the obstruction of flow increases turbulence
SEPP	State environmental planning policy
SWMP	Soil and water management plan
The project	Proposed bridge over the Clarence River at Grafton
TSC Act	<i>Threatened Species Conservation Act 1995</i>
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>

1 Introduction

Roads and Maritime Services (RMS) is seeking approval for a bridge over the Clarence River at Grafton (the project). This chapter provides an overview of the project and the purpose of this report.

1.1 Overview of the project

The project involves:

- Building a new bridge about 70 metres downstream of the existing bridge (which would be retained)
- Upgrading parts of the road network in Grafton and South Grafton to connect the new bridge to the existing road network.

Grafton is located in the Clarence Valley local government area, on the NSW Mid North Coast, about 610 kilometres north of Sydney. It is a major regional centre in the NSW Mid North Coast region. The general location of the project is shown in Figure 1 while key elements of the project are presented in Figure 2.

1.2 Purpose of this application report

RMS has prepared this application report to support a State significant infrastructure application under section 115X of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Clause 1 of Schedule 3 of the State Environmental Planning Policy (State and Regional Development) 2011 specifies infrastructure or other development that would be an activity for which the proponent is also the determining authority and would, in the opinion of the proponent, require an environmental impact statement to be obtained under Part 5 of the EP&A Act.

RMS formed the opinion that the project is likely to significantly affect the environment and will require an environmental impact statement; consequently, the project is State significant infrastructure under Part 5.1 of the EP&A Act.

The requirements of clause 192 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) for applications seeking approval of the Minister for Planning and Infrastructure to carry out State significant infrastructure are addressed in Attachment A to this report.

The purpose of this application report is to assist the formulation of environmental assessment requirements by the Director-General under section 115Y of the EP&A Act. This report serves this purpose by:

- Describing the project
- Considering the potential environmental issues associated with the project
- Identifying the key environmental issues associated with the project.

The application report and Director-General's environmental assessment requirements will inform the preparation of an environmental impact statement for the project. The form and content of the environmental impact statement will be in accordance with clauses 6 and 7 of Schedule 2 of the EP&A Regulation.



Figure 1 Location of the project at Grafton on the NSW Mid North Coast

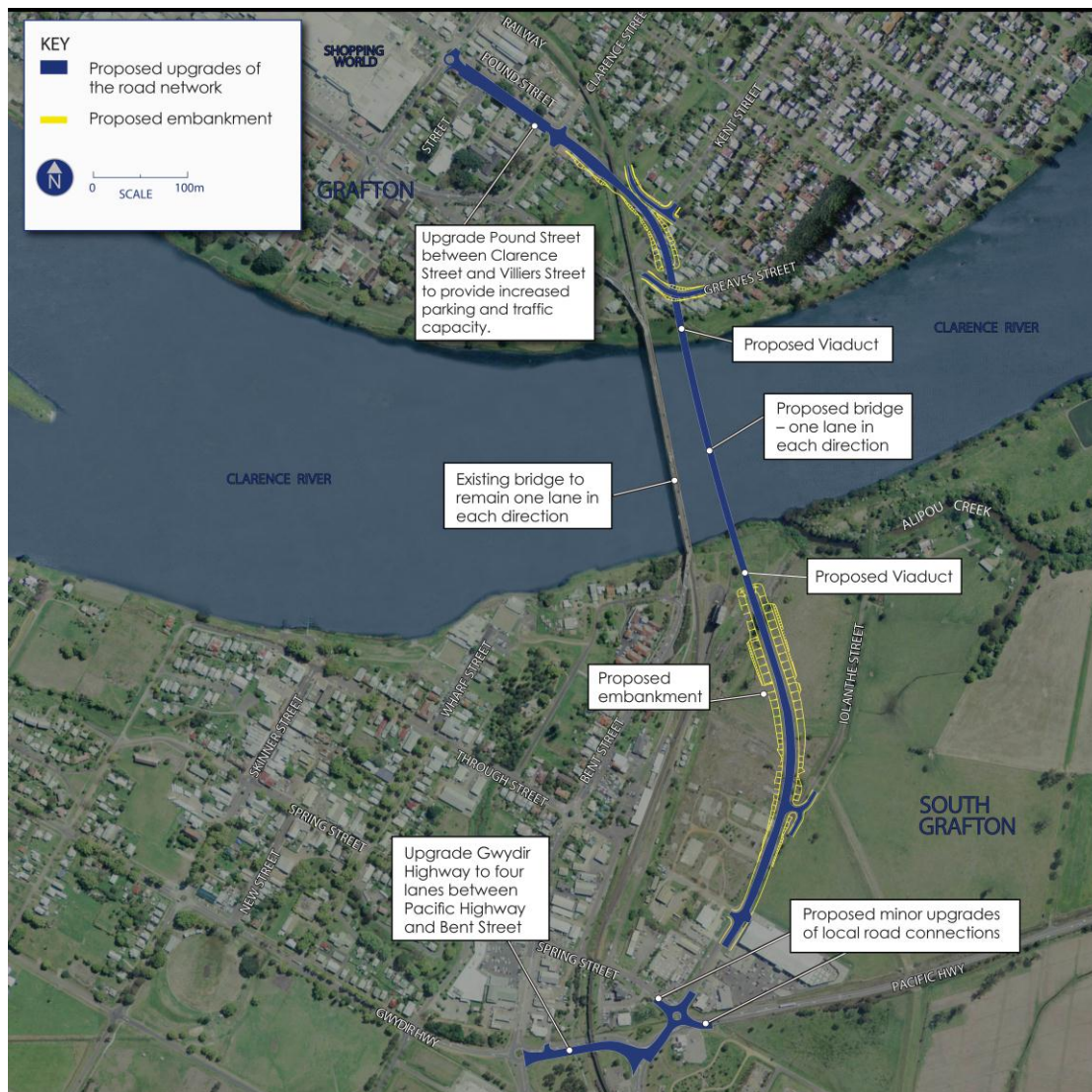


Figure 2 Key elements of the project (Note: project elements shown in this figure are subject to further refinement)

2 Background

This chapter describes why the project is needed, the project objectives, the process followed to identify the preferred option for the new Grafton Bridge, and the issues identified by the community during the consultation process.

2.1 The need for the project

Currently, the Grafton Bridge is the only crossing of the Clarence River in the Grafton area. The bridge forms part of Main Road 83 Summerland Way, a classified road that provides an inland link between southern Queensland to the north, and the Richmond River and Clarence River Valleys in northern NSW.

The Grafton Bridge is a steel double deck bridge completed and opened to traffic in 1932. The upper deck of the bridge supports one northbound lane and one southbound lane for vehicles connecting to Bent Street in South Grafton and Fitzroy Street in Grafton. The lower deck supports two-way railway lanes and pedestrian/cyclist lanes on either side.

Road users travelling between Grafton and South Grafton, including those making both local and through trips, use the bridge as there is no practical alternative route. The bridge also forms part of the alternative regional north–south road link when the Pacific Highway is closed due to road traffic accidents or flooding.

RMS considers that the project is needed to improve road safety and the efficiency of the local traffic network. This stems from the following issues with the existing bridge:

- Kinks in the alignment: The bridge has pronounced kinks in its horizontal alignment at the northern and southern ends. Long, heavy vehicles cannot negotiate the kinks without crossing the centreline, creating a risk of crashes and causing traffic in both directions to slow, which contributes to congestion and delays. This is compounded by narrow lane widths and reduced lateral clearances on the existing bridge
- Delays due to merging: There are two lanes of traffic in each direction approaching the bridge (Fitzroy Street carries southbound traffic, and Bent Street carries northbound traffic). However, the bridge has only one lane in each direction, so the two lanes of traffic must merge into a single lane in each direction. This merging contributes to queuing and delays on the bridge approaches
- Peak hour congestion: Due to the above issues, traffic flows across the bridge during peak periods are slow; in the morning peak hour, northbound traffic speeds are 16 kilometres per hour. Lower speeds affect the efficiency of commuter and freight movements across the bridge
- The alignment of the existing bridge limits freight efficiency.

RMS undertook traffic modelling to predict future traffic demand over the bridge (RMS, 2012a). The modelling found that future traffic demand will increase, which will further deteriorate the performance of the bridge during peak periods.

RMS also undertook traffic modelling to investigate whether a ‘do minimum’ scenario

(i.e. no additional crossing, but additional roadworks to address local congestion and capacity constraints) would solve the traffic congestion over the bridge (RMS, 2012a). The traffic modelling predicted a substantial deterioration in the performance of the local road network in future years. In particular, by year 2049 under a 'do minimum' scenario:

- The total number of trips across the bridge are forecast to increase by 83 per cent
- The total number of vehicle kilometres travelled are forecast to increase by 118 per cent
- The total number of vehicle hours travelled are forecast to increase by 1000 per cent
- The average vehicle speed on the bridge is forecast to decrease to less than three kilometres per hour, as shown in Figure 3.

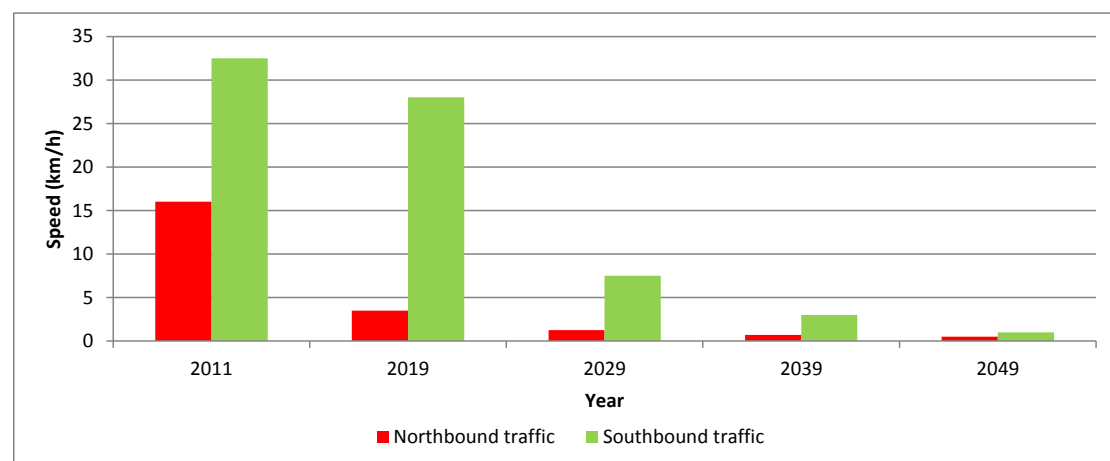


Figure 3 Grafton Bridge average travel speed under a 'do minimum' scenario in the am peak (Source: RMS, 2012a (modified))

2.2 Consistency with strategic planning

The project is consistent with strategic planning, as documented in the following reports:

- *NSW 2021: A Plan to Make NSW Number One* (NSW Government, 2011). The project supports the Plan's transport goals by reducing travel times between Grafton and South Grafton and improving road safety
- *The State Infrastructure Strategy 2012 – 2032* (NSW Government, 2012). The project supports the Strategy's infrastructure priorities in regional NSW by improving local transport in Grafton
- *NSW Long Term Transport Master Plan* (TfNSW, 2012). The project supports the Plan's vision of improving connectivity for regional NSW and support more reliable access to quality services, and to employment and educational opportunities
- *Mid North Coast Regional Strategy* (DP&I, 2009). The project supports the implementation of the Regional Strategy as it would enhance the ability of Grafton to meet its functions as a major regional centre

- *Far North Coast Regional Strategy* (DP&I, 2006). The project acknowledges the Strategy and the towns of Casino and Kyogle as settlements connected to Grafton via the Summerland Way
- *Northern Rivers Regional Plan 2011* (Regional Development Australia – Northern Rivers, 2011). The project is consistent with the Plan's vision by supporting the economic development in Grafton, South Grafton and surrounds
- *Clarence Valley Settlement Strategy* (Grafton Council et al, 1999). The project is consistent with the Strategy as it responds to the traffic demands of the existing population and forecast growth areas of Grafton and South Grafton while alleviating the traffic pressure over the existing bridge
- *Clarence River Way Masterplan* (CVC and Clouston Associates, 2009). The project maintains the existing maritime access and maritime uses of the Clarence River at Grafton
- *Grafton Waterfront Precinct Masterplan* (CVC and Clouston Associates, 2011). The project fits well with the proposed development along the foreshore areas of the Clarence River at Grafton
- *Bike Plan and Pedestrian Access and Mobility Plan* (CVC and QED, 2008). The project complements the Plan by providing an additional pedestrian and cyclist connection over the Clarence River
- *Clarenza Cycleway Options Study* (CVC and Lewis Ford & Associates Consulting Engineers, 2012). The project complements the Study by providing a shared path on the new bridge which could be linked to the Clarenza cycleway
- *South Grafton Heights Precinct – A Strategy for the Future* (CVC, 2007). The project meets the future transport demands generated by the South Grafton Heights Precinct development
- *Upgrading the Pacific Highway: Technical Review of Inland Corridor (via Summerland Way)* (RTA, 2006). The project improves access to the State road network and addresses local traffic issues by responding to the existing and future local transport demands between Grafton and South Grafton
- *Draft NSW Freight and Ports Strategy* (TfNSW, 2012). The project improves access to the State road network and addresses local traffic issues by responding to the existing and future local transport demands between Grafton and South Grafton.

The project development has also taken into consideration the ecologically sustainable development principles outlined in Schedule 2, numeral 7 of the EP&A Regulation.

2.3 Project objectives

The purpose of the project is to address short-term and long-term transport needs within Grafton and South Grafton.

The project objectives are to:

- Enhance road safety for all road users over the length of the project
- Improve traffic efficiency between and within Grafton and South Grafton
- Support regional and local economic development

- Involve all stakeholders and consider their interests
- Provide value for money
- Minimise impact on the environment.

2.4 The option selection process

In December 2010, RMS announced a revised approach to engage more effectively with the community and stakeholders. It issued a 'community update' newsletter (December 2010), which identified 13 preliminary route options and invited community comment via a postal survey. Subsequent phone and business surveys were also carried out. Respondents to the postal survey identified 28 additional suggestions for the additional crossing. These, together with the 13 identified in the community update, brought to 41 the total number of suggestions for an additional crossing.

RMS then used the following process to select a preferred option:

- RMS assessed the 13 preliminary route options and 28 suggestions put forward by the community, and documented its findings in a *Feasibility Assessment Report* (RMS, June 2011). The report identified 25 preliminary route options in five corridors for further engineering and environmental investigation
- RMS undertook further investigations and assessments to reduce these 25 preliminary route options to six route options. It documented the shortlisted options and the short-listing process in a *Preliminary Route Options Report – Final* (RMS, January 2012)
- RMS undertook design refinements and further field and technical investigations on the six route options. These were documented in the *Route Options Development Report* (RMS, September 2012)
- RMS assessed the six route options in October and November 2012 to identify a preferred location for an additional crossing of the Clarence River. The assessment process was based on community feedback, technical investigations, the outcomes of a value management workshop and a review by RMS. The process identified two shortlisted options: Option E and Option C. RMS then undertook a comparative assessment of these two options, which resulted in Option C being identified as the recommended preferred option. The assessment process and the preferred option are documented in the *Recommended Preferred Option Report* (RMS, December 2012).

On 23 April 2013, the Minister for Roads and Ports announced Option C as the preferred option for an additional crossing of the Clarence River at Grafton.

2.5 Community involvement in selecting a preferred option

RMS prepared and implemented a comprehensive community liaison plan to fully involve the community and stakeholders at all stages of the option selection process. RMS used a range of consultation methods to seek input, identify issues and help identify the preferred option. These methods included:

- Dedicated project website (www.rms.nsw.gov.au/grafonbridge)
- Project telephone line (1800 633 332)

- Project email address (griftonbridge@rms.nsw.gov.au)
- 'Community update' newsletters
- Project manager and project director updates
- Public display of studies and investigation reports
- Online interactive maps
- Online traffic modelling videos
- Online discussion forums
- Public forums
- Radio forums
- Staffed and unstaffed project displays at various locations
- Telephone surveys and telephone contact with property owners potentially directly affected
- Community and stakeholder briefing sessions
- Aboriginal community consultation; these followed the procedures outlined in the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (RMS, 2011a).

RMS has considered all issues raised by the community and stakeholders during the consultation process. Wherever possible, these issues were addressed during the route selection process and incorporated into the preferred option. The consultation process and the results of consultation are detailed in the following reports:

- *Preferred Option and Submissions Report* (RMS, 2013)
- *Recommended Preferred Option Report – Main Report: Appendix 1 Route Options Submissions Report* (RMS, 2012a)
- *Draft Route Options Community Feedback Report* (RMS, 2012c)
- *Postal Survey December 2010 to March 2011 Feedback Report* (RMS, 2011b)
- *Telephone Survey Report* (RMS, 2011c)
- *Online Business Survey Report* (RMS, 2011d).

These reports are available on the project website:

http://www.rta.nsw.gov.au/roadprojects/projects/north_eastern_region/grifton_bridge/index.html

RMS will continue to consult with government authorities, the Aboriginal community, specialist interest groups, utilities and service providers, and the public, including community groups and adjoining and affected landowners during the preparation of the environmental impact statement. The environmental impact statement will document the consultation process, consultation undertaken and the issues raised.

3 Project description

This application report is for those elements of the preferred option (announced by the Minister for Roads and Ports on 23 April 2013) that are required to provide acceptable traffic performance at least to year 2039. These elements are described in this chapter.

The main components of the project are:

- Building a new bridge about 70 metres downstream of the existing bridge (which would be retained)
- Upgrading parts of the road network in Grafton and South Grafton to connect the new bridge to the existing road network.

The project would also include ancillary works, structures and facilities required for the purposes of the project.

3.1 Proposed bridge

The proposed bridge would be located about 70 metres east (downstream) of the existing bridge.

The bridge would be about 458 metres long and 16 metres wide, and would be on a constant 4500-metre radius over the Clarence River. The bridge deck would have one northbound lane and one southbound lane for vehicles and a shared path (for pedestrians and cyclists) about 3.1 metres wide on the western side that would connect to the Pacific Highway at Iolanthe Street in South Grafton and to Pound Street in Grafton.

The width of shared path will be confirmed during concept design development and will consider relevant guidelines (eg the *Guide to Road Design – Part 6A: Pedestrian and Cyclist Paths*), likely level of use and Council's *Bike Plan and Pedestrian Access and Mobility Plan* (CVC and QED, 2008).

The existing bridge would be retained with one northbound lane and one southbound lane.

B-doubles and semi-trailers would be required to use the proposed bridge. At this stage it is not anticipated that time of day restrictions will be placed on heavy vehicle use of the proposed bridge. Buses and smaller heavy vehicles would be able to use either bridge.

Beneath the proposed bridge would be two clear navigable channels with a minimum width of 35 metres and a minimum vertical clearance of 9.1 metres.

There would also be approach viaducts on each side of the bridge; these would be about 64 metres long on the South Grafton side, and 58 metres long on the Grafton side.

The current design for the proposed bridge may be refined as part of the environmental assessment and concept design phase of the project.

The location of the proposed bridge is shown in Figure 4.

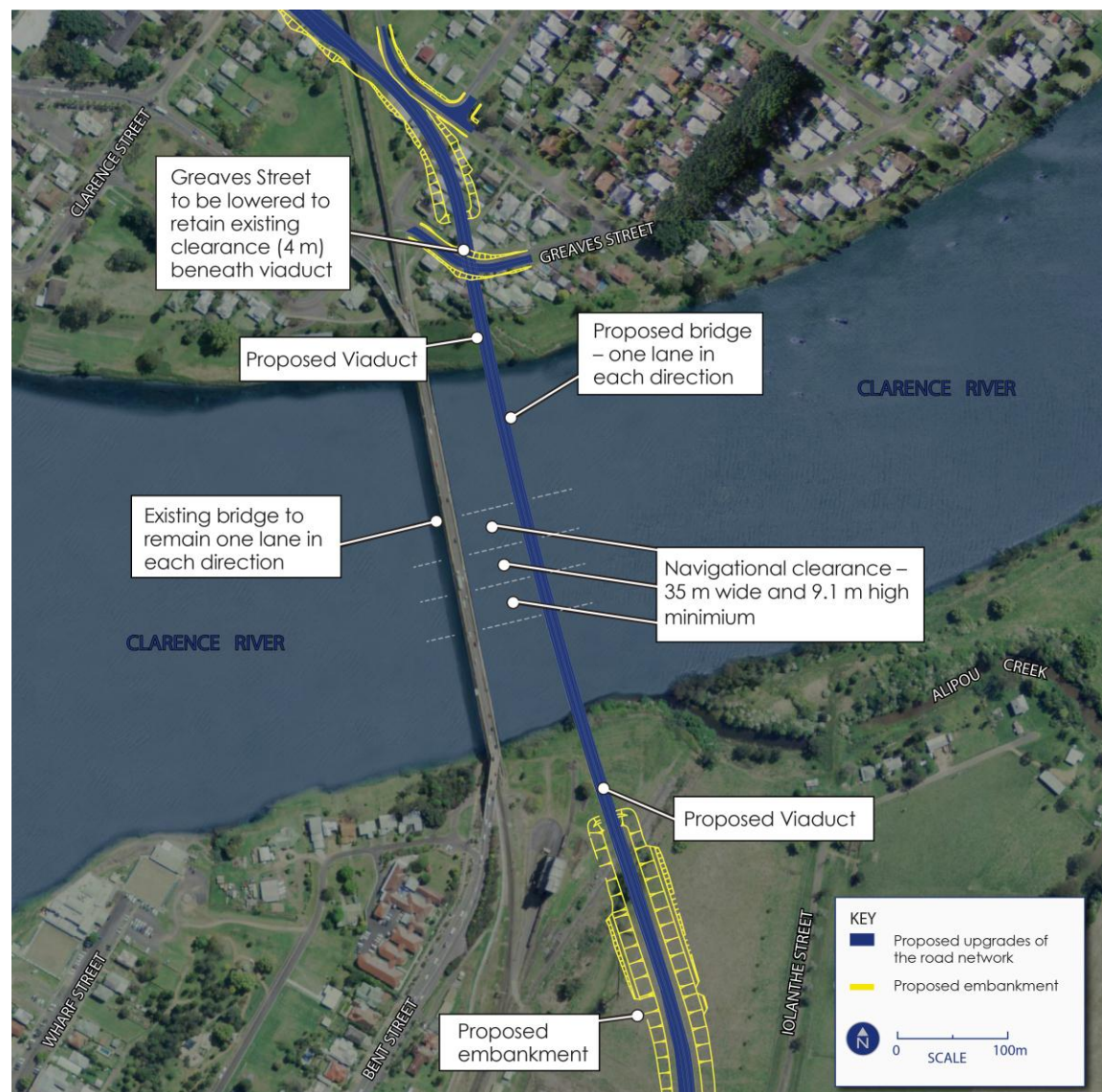


Figure 4 Proposed bridge over the Clarence River at Grafton (Note: project elements shown in this figure are subject to further refinement)

3.2 Proposed road network upgrades in South Grafton

The proposed road network upgrades in South Grafton are shown in Figure 5 and presented in Table 1. The extent of these network upgrades may be refined as additional traffic modelling information becomes available.

Table 1 Proposed road network upgrades in South Grafton

Upgrade type	Location	Description
New connection	Proposed bridge – southern approach	A new road connection would be built between the Pacific Highway / Gwydir Highway intersection and the proposed bridge, just east of the existing bridge.
Existing road upgrades	Gwydir Highway	The Gwydir Highway would be upgraded to four lanes between Pacific Highway and Bent Street.
	Bent Street / Gwydir Highway	Upgrade the existing Bent Street / Gwydir Highway roundabout to suit widened Gwydir Highway on east side.
	Pacific Highway / Spring Street / Iolanthe Street	A new roundabout would be built at the intersection of Pacific Highway / Spring Street / Iolanthe Street.



Figure 5 Proposed road network upgrades in South Grafton (Note: project elements shown in this figure are subject to further refinement)

3.3 Proposed road network upgrades in Grafton

Building a new bridge over the Clarence River would require parts of Grafton's road network to be upgraded. Based on the current design for the project, the proposed upgrades are presented in Table 3 and illustrated in Figure 6. The extent of these

upgrades may be refined as part of the environmental and concept design phase of the project.

Table 2 Proposed road network upgrades in Grafton

Upgrade type	Location	Description
New connection	Proposed bridge – northern approach	A new road connection would be built between the Clarence Street / Pound Street intersection and the proposed bridge, just east of the existing bridge.
Upgrades of existing roads	Greaves Street	Greaves Street would be lowered beneath the approach viaduct.
	Pound Street	Pound Street would be widened to two lanes between Clarence Street and Villiers Street, with additional turning lanes at the intersections. Parking would be upgraded between Clarence and Villiers Street. Increase Pound Street vertical clearance beneath the railway viaduct.
Road closures	Kent Street would be closed at Pound Street. Pound Street would be closed near Bridge Street.	

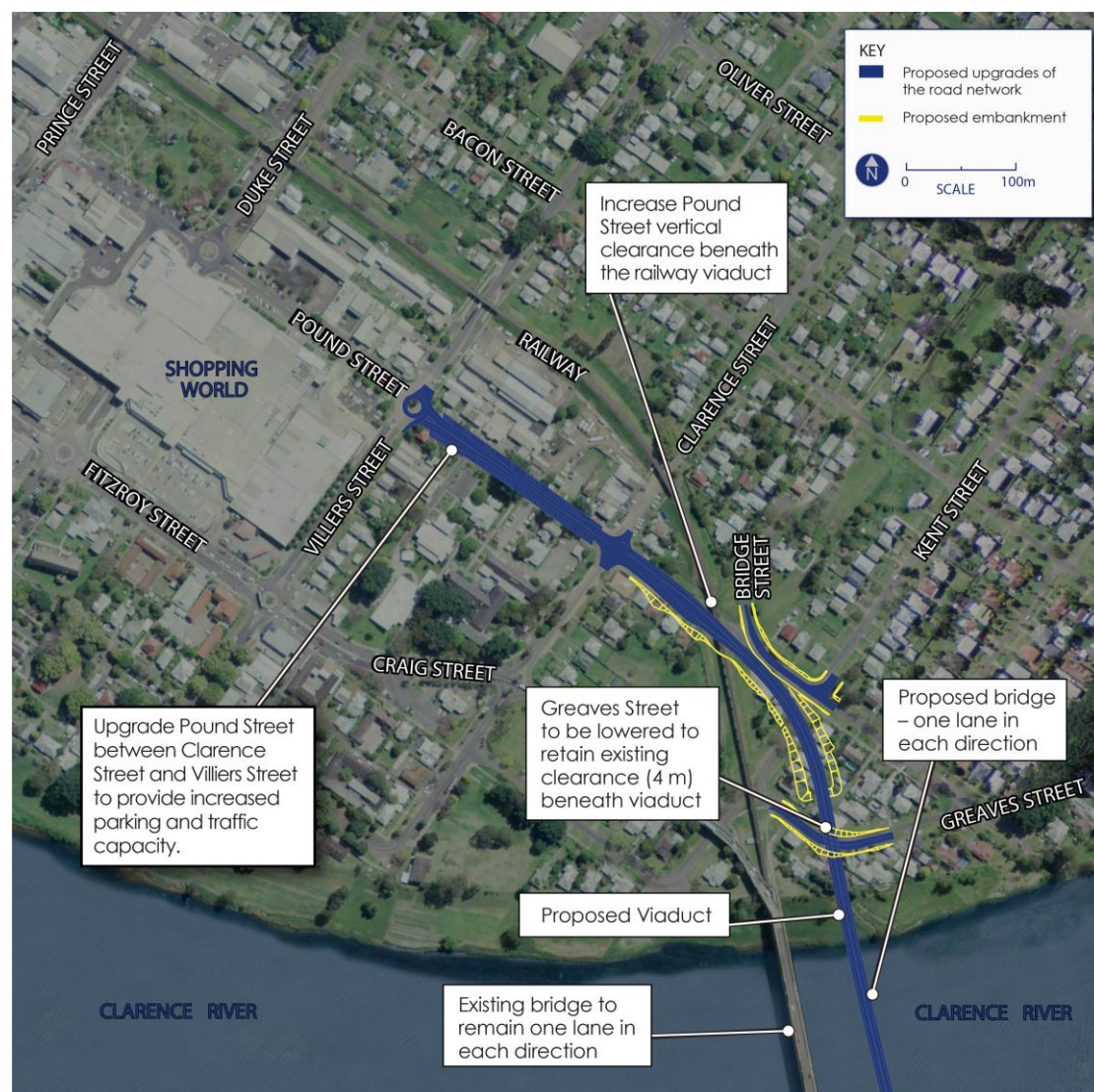


Figure 6 Proposed road network upgrades in Grafton (Note: project elements shown in this figure are subject to further refinement)

3.4 Possible longer term road network improvements (outside the scope of this project)

The *Recommended Preferred Option Report* (RMS, 2012a) describes road network upgrades that may be required to enable the road network to function efficiently beyond 2039. These road network upgrades are not included in the project scope and will not be considered in the Environmental Impact Statement as they would occur as and if required in the longer term. These road network upgrades would be subject to separate assessment at that time.

Based on the current design for the project, these future upgrades to the local road network include widening roads to four lanes to improve capacity and upgrading intersections (eg converting some roundabouts and priority intersections to traffic signals) to improve travel efficiency during peak periods.

Should the preparation of the concept design identify that any of the longer term upgrades are needed at the time the bridge opens, they will be included in the project scope and assessed as part of the Environmental Impact Statement.

3.5 Ancillary works

Temporary ancillary works will be required to enable the construction of the project. The type and extent of ancillary works required will depend on the construction methodology and construction techniques chosen by the construction contractor.

Temporary ancillary works could potentially include the following:

- Demolition of houses and other structures
- Public utilities adjustment, relocation, protection
- Construction site fences and site establishment
- Installation of temporary noise barriers, sediment and erosion control measures and other environmental controls
- Installation of signage (eg road signs)
- Construction of temporary access roads and car parks
- Installation of construction site office, staff amenities (eg toilets, lunch room, induction room, etc), sheds
- Crane and hard stand area set up
- Excavated and filling material storage areas
- Concrete batching plant
- Casting yard (if contractor decides to cast on site)
- Temporary maritime works for scour, bridge pier foundations and abutments protection; silt curtains
- Temporary pontoons.

The assessment of the impacts of potential ancillary works would be included in the EIS report.

4 Key environmental issues

The investigations undertaken to date have identified a number of key environmental issues relating to the project during both its construction and operation. Key issues are those that may have high or moderate impacts (actual or perceived) and assessment is necessary to determine the level of potential impact and to develop appropriate measures to mitigate and manage the impacts. These issues are:

- Traffic and transport
- Flooding and hydrology
- Noise and vibration
- Non-Aboriginal heritage
- Aboriginal heritage
- Socio-economic, property and land use
- Urban design, landscape character and visual impact.

These key environmental issues will require further detailed assessment during the environmental impact statement process and may require project-specific impact mitigation measures.

This chapter provides an overview of these key issues and of the further detailed assessment that RMS will undertake as part of the environmental impact statement process.

RMS has also identified a number of other environmental issues have also been identified. These issues are outlined in Chapter 5 and are considered to be of lesser consequence taking into consideration the project scope, the existing environment, and the implementation of standard management and safeguard measures. It is expected that these other environment issues would not likely be key issues; however the potential impact of these other environmental issues will be assessed in the environmental impact statement.

4.1 Traffic and transport

4.1.1 Overview

RMS undertook detailed traffic studies and modelling for the route options development and route selection process (GTA, 2010, 2011a, 2011b and 2012). These studies provide an overview of the existing and likely future traffic conditions in the Grafton area. Under a “do minimum” scenario, the traffic studies show a continuing deterioration in network efficiency as described in Section 2.1.

Traffic management and access

The main access roads to the Grafton area are:

- The Summerland Way from the north
- Armidale Road and Orara Way from the south
- The Pacific Highway from the east
- The Gwydir Highway from the west.

Important roads within the local road network include:

- Bent Street (part of Summerland Way) in South Grafton, which connects Grafton via the existing bridge with South Grafton, Armidale Road and the Gwydir Highway. It is where most of the highway related businesses are located in South Grafton
- Skinner Street in South Grafton, which functions as South Grafton's main street
- Fitzroy Street (part of Summerland Way) in Grafton, which links the existing bridge with Grafton's CBD. It is where most of the highway related businesses are located in Grafton and the main access road to Grafton Shoppingworld
- Prince Street in Grafton, which functions as Grafton's main street and is also part of the Summerland Way, but not part of the designated heavy vehicle route
- Victoria Street in Grafton, where many of the administrative and institutional activities are located
- Villiers Street and Dobie Street in Grafton, which form part of the designated heavy vehicle route for vehicles that travel to and from the Summerland Way, north of Grafton.

The annual average daily traffic across the Clarence River in Grafton has been increasing steadily over the last two decades. RMS (2012b) reports annual average daily traffic volumes of 20,548, 23,641 and 24,193 vehicles over the Grafton Bridge for years 1990, 2004 and 2009 respectively.

An origin-destination survey undertaken for the project between 5am and 7pm on Thursday 19 August 2010 found 26,554 vehicles crossed the Grafton Bridge (both directions) during the survey period (GTA, 2011b). Of these trips, 1,388 vehicles (5.2 per cent of the total) were heavy vehicles. The origin-destination survey results for all vehicle types showed that three per cent of the trips are through trips that originate and terminate outside Grafton and South Grafton. The majority of trips (97 per cent) crossing the bridge have an origin and/or destination within Grafton or South Grafton (Figure 7).

The survey confirmed the findings of earlier origin-destination surveys carried out for the project during the AM and PM periods on 11 March 2009 at key locations, which also found that through traffic is only a small percentage of all traffic using the bridge (GTA, 2009).

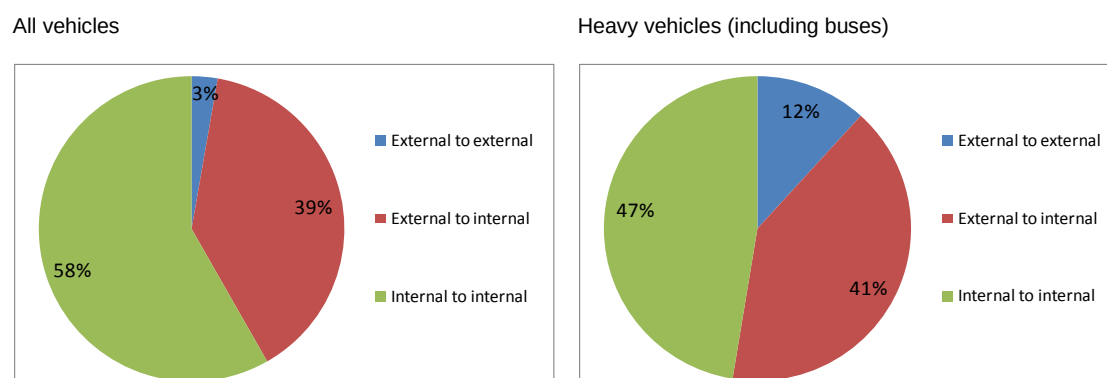


Figure 7 Vehicle trip types crossing Grafton Bridge on 19 August 2010 (5 am - 7 pm) (Source: RMS, 2012b)

Bicycle and pedestrian access

The existing bridge provides dedicated shared bicycle and pedestrian paths on either side of the bridge at the rail line level (lower deck). The paths are provided with safety railings. No dedicated pedestrian or bicycle paths are provided at the vehicular level (upper deck).

Public bus service

The main public bus operator in Grafton, Busways, provides regular services within Grafton and South Grafton and also provides connections to and from Ulmarra, Maclean, Yamba, Iluka, Copmanhurst and Jackadgery.

Busways operates from 5.30am to 8.30pm Monday to Friday, and from 7.30am to 3.30pm on Saturdays. Its fleet moves about 2500 students each morning and about 2000 general passengers per day.

There are also long-distance coach companies that provide services to Grafton. These include:

- Greyhound, which provides coach services between Grafton and Sydney, and between Grafton and Brisbane
- Country Transport, which provides coach services between Grafton and Lismore, Copmanhurst, Coffs Harbour, Moree, Byron Bay, Sydney and Brisbane.

Road safety

Crash statistics from the RMS CrashLink database show there were 450 crashes within the Grafton area between 1 July 2004 and 30 June 2009. Most crashes occurred on the roads carrying the greatest volumes of traffic (ie Pacific Highway and Bent Street in South Grafton and Fitzroy Street in Grafton).

A total of fifteen crashes occurred on the bridge southern approach (along Bent Street between Gwydir Highway and Through Street), three on the bridge northern approach (along Fitzroy Street between Clarence Street and Kent Street) and sixteen on the bridge between Through Street and Kent Street.

None of the crashes on the bridge and bridge approaches resulted in fatalities. Fifteen crashes were reported to be rear-end collisions while five were head-on collisions. None of the crashes on the bridge and bridge approaches involved pedal cyclists and only one crash involved a pedestrian (on the southern approach)..

Maritime traffic and access

A desktop review undertaken during the route option development stage found the largest vessel working on the river near Grafton is a barge, with an air draft of seven metres (RMS, 2012b). The Boral barge transits the river four times a day, six days a week.

Maritime access to the Clarence River at Grafton is via a number of line moorings located along the foreshores, the yacht club located downstream of the existing bridge and the Grafton rowing club and sailing club located upstream of the bridge. Recreational maritime traffic over the Clarence River is known to increase during major water competition events.

RMS (Maritime) advised that the proposed bridge would require a minimum vertical

clearance of 9.1 metres above Mean High Water Springs, and a minimum horizontal clearance of 60 metres or two spans of 35 metres.

4.1.2 *Summary of issues*

Construction

The construction of the project is likely to have the following impacts:

- Road traffic, pedestrians and cyclists would be temporarily disrupted, and there would be increased traffic volumes from construction vehicles on Iolanthe Street in South Grafton and Pound Street in Grafton
- Vehicle access to some properties close to the bridge approaches and construction sites would potentially be impacted
- Maritime traffic on the Clarence River could be temporarily disrupted.

Operation

Once the project is operating, it would have the following impacts:

- There would be permanent changes to existing traffic movements and permanent road modifications at Iolanthe Street, Pacific Highway/Gwydir Highway, Greaves Street, Villiers Street, Pound Street, Bridge Street and Clarence Street
- A section of Kent Street at Pound Street and a section of Pound Street near Bridge Street would be permanently closed.

In addition, the project would have the following benefits:

- Overall transport network efficiency would be improved
- It would provide an additional pedestrian/cyclist shared path that would connect Grafton and South Grafton
- It would be consistent with Council's proposed *Bike Plan and Pedestrian Access and Mobility Plan* (CVC and QED, 2008) and *Clarenza Cycleway Options Study* (CVC and Lewis Ford & Associates Consulting Engineers, 2012)
- It could potentially be integrated with Council's proposed *Clarence River Way Masterplan* (CVC and Clouston Associates, 2009).

4.1.3 *Proposed further assessments*

RMS will undertake a more detailed assessment of the traffic, access and safety impacts of the project. The assessment will:

- Describe how construction traffic may access the project (including ancillary facilities) and any impacts on the Grafton and South Grafton road network
- Identify and assess the operational traffic and transport impacts of the project on the local and regional road network, including impacts of the proposed bridge alignment through Grafton and South Grafton

- Describe how the project would integrate with Council's *Bike Plan and Pedestrian Access and Mobility Plan* (CVC and QED, 2008), the *Clarenza Cycleway Options Study* (CVC and Lewis Ford & Associates Consulting Engineers, 2012), and the proposed *Clarence River Way Masterplan* (CVC and Clouston Associates, 2009)
- Identify and assess impacts of the project on maritime access, traffic and safety, and the future maritime and recreational uses of the Clarence River
- Identify feasible and reasonable mitigation measures for the construction and operational stages of the project.

4.2 Flooding and hydrology

4.2.1 Overview

RMS undertook preliminary flood modelling and assessment for the project as part of the route option development process (BMT WBM, 2012).

The proposed Grafton Bridge would be located within the Clarence catchment which has an area of approximately 22,716 square kilometres. The main watercourses located in the Grafton area are the Clarence River, Alipou Creek, Swan Creek and Carrs Creek.

Due to the size of the Clarence River catchment upstream of Grafton, relative to its various downstream tributary catchments, the flooding behaviour of the Lower Clarence River floodplain is dominated by the flow originating from upstream of Grafton in terms of both peak flood levels and duration of inundation. The flow typically contributes 80% to 90% of the total volume of floodwaters that enters the lower floodplains during main river flood events. Clarence River floods typically occur from low rainfall intensity events that last several days or even weeks.

Grafton has experienced frequent and significant flooding in the past. Construction of various levee banks and drainage improvements has been progressively undertaken over the years to help reduce the frequency of flooding. These works commenced in about 1890 with the construction of drainage improvements and minor levees along low sections of the riverbank. However, it was not until the 1960's that a major program of levee construction at Grafton and South Grafton was initiated. Since that time, additional levee banks were gradually constructed, or the height of existing levees increased, to further reduce the frequency of flooding. Today, Grafton is protected by a series of seven levees that, in addition to natural high ground and the elevated railway embankment, surround the town (Bewsher Consulting, 2007).

The Grafton and South Grafton levees begin to overtop when flood levels are at, or close to, eight metres on the Prince Street gauge, which translates to about a 20-year average recurrence interval flood event. Following overtopping, significant areas of Grafton and South Grafton are inundated by floodwater.

Based on geotechnical data from early investigations, it is expected that the groundwater in the Grafton area may be saline given that the tidal limit reaches over 100km inland up to Copmanhurst. Groundwater testing in close proximity to the South Grafton approach have reported groundwater levels between RL 1.1 and 0.2 metres Australian Height Datum (Arup, 2012b).

4.2.2 *Summary of issues*

Construction

The construction of the project would need to take account of the following issues:

- The southern approach road to the proposed bridge would traverse flood-prone land and would need to be constructed on an embankment or a viaduct
- A large flood in the Clarence River occurring during construction would have the potential to impact construction works
- A major rainfall event would have the potential to impact on the proposed lowering of Pound Street under the rail viaduct and associated drainage upgrades. This area experiences local flooding during major rainfall events.

Operation

Once the project is operating, it would have the following impacts:

- Depending of the type of bridge chosen during the concept design, there would be potential for afflux impacts as the bridge would be a new structure in the Lower Clarence River floodplain (afflux is the rise in water level on the upstream side of a structure)
- Viaducts and new structures may change the velocity, location and flooding characteristics, including time of inundation, depths, rates of recession and could cause scour (scour is the removal of soil material by the river flow)
- There would be localised flooding and drainage changes.

4.2.3 *Proposed further assessments*

RMS will undertake an assessment of the flooding impacts of the project. The assessment will:

- Describe the existing flood and drainage conditions in the Grafton area relevant to the project and update the existing Lower Clarence Valley flood model
- Assess the flooding impacts and characteristics to and from the project including assessment of impacts to agricultural land, residential areas, infrastructure and other land uses. The assessment will consider the 100 year average recurrence interval and probable maximum flood events and the impact of climate change
- The assessment will input into the concept design and will identify feasible and reasonable mitigation measures for the construction and operational stages of the project.

4.3 Noise and vibration

4.3.1 *Overview*

RMS conducted a preliminary noise assessment for the route options assessment and selection process (Arup, 2012a).

The preliminary noise assessment found the following noise-sensitive land uses in Grafton and South Grafton: residences, schools, school playgrounds, hospitals, aged care facilities, churches and recreation areas. The majority of sensitive land uses

relevant to the project are in Grafton.

Currently, the main noise source in Grafton and South Grafton is from vehicular traffic.

4.3.2 *Summary of issues*

Construction

The construction of the project is likely to have the following impacts:

- Some construction work may need to be undertaken outside standard working hours to minimise impacts on business and areas of high traffic flow. This may have impacts on noise-sensitive receivers
- A number of noise-sensitive receivers would be impacted by construction traffic and the operation of plant and equipment. The extent of impact would vary according to the relationship of the construction works to the receiver location, intervening structures and the nature of construction work at various stages of the construction process
- There is potential for construction vibration impacts on nearby buildings, heritage items and other structures. The level of impact would depend on the construction techniques used and the offset distances between the vibration source and the sensitive receiver.

Operation

Once the project is operating, new traffic noise would be introduced to areas with existing low noise background levels. There would be potential for traffic noise exceedances on sensitive receivers located along impacted roads. There would also be potential for some reductions in noise levels for receivers that are close to roads where traffic volumes would be reduced.

4.3.3 *Proposed further assessments*

RMS will undertake an assessment of the construction and operational noise and vibration impacts of the project in accordance with *Assessing Vibration: a Technical Guideline* (DEC, 2006), *Interim Construction Noise Guideline* (DECC, 2009), the *NSW Road Noise Policy* (DECW, 2011) and the *Environmental Noise Management Manual* (RMS, 2001). The assessment will:

- Describe the existing noise environment in Grafton and South Grafton and identify sensitive receivers
- Assess noise and vibration impacts, during construction and operation, on the identified sensitive receivers (the impact assessment will be made against the relevant noise and vibration criteria)
- Identify feasible and reasonable noise mitigation measures to address noise exceedances at sensitive receivers
- Assess noise and vibration attenuation measures, where appropriate, and provide these measures as input into the assessment of heritage impact and visual and landscape impacts.

4.4 Non-Aboriginal heritage

4.4.1 Overview

RMS undertook non-Aboriginal heritage baseline investigations for the route options development and selection process (Biosis Research, 2011a and 2012a).

The town of Grafton did not exist officially until 1849 when the plan of the surveyor William Darke was adopted. The town obtained its city status in 1884 when it had become the seat of a Church of England Bishop following the dedication of Christ Church Cathedral in 1884. As well as the focus for land transport, Grafton and South Grafton were ports for ocean steamers trading to and from Sydney, and handled a considerable amount of inter-colonial trade in timber to Victoria and New Zealand. Following World War II, secondary industry was boosted in Grafton by the construction of the Grafton Brewery in 1952 and Peters Dairy factory in 1954. Other initiatives included the taking over of the abattoir by the Clarence River Co-operative Meat Society in 1946 and the opening of South Grafton Brickworks around 1948 (Gardiner, 2010).

The Grafton community takes pride in the town's strong heritage character, which includes the Clarence River, the collection of historic buildings and streetscapes, and street trees and parks.

The existing bridge over the Clarence River is an important icon for the local and regional communities, and is a strong reminder of the history of the area (the bridge was completed and opened to traffic in 1932).

The bridge is listed on the NSW State Heritage Register and is the only double-deck road/rail structure in NSW. The bascule span of the bridge (ie the movable section of the bridge with a counterweight that continuously balances the span) is of an unusual type in Australia; although it is no longer in use, it is the largest railway bascule built in Australia. The bridge is the second-last steel truss rail bridge built in NSW and was constructed at the height of popularity of this type of bridge. The State Heritage Register listing boundary for the existing bridge includes the structure, piers, abutments, embankments and track formation for a distance of 10 metres in all directions from those elements.

The project investigations to date have identified heritage items along the route alignment which are not State heritage listed but have local (and in some cases regional) significance. Some of these items include:

- The Grafton Heritage Conservation Area
- The former Glyndon Private Hospital (4 Greaves Street, Grafton)
- The 'Dunvegan' house (part of the TAFE)
- Cultural plantings (eg Brachychiton, Ficus, Jacaranda trees) along the road reserves
- Various dwelling houses.

The investigations also identified the following sites as having archaeological potential:

- TAFE grounds

- The 'Grafton Punt', which is identified on the Australian National Shipwrecks Database
- The railway terminus in South Grafton
- Potential former maritime sites on the banks of the Clarence River and riverbed.

4.4.2 *Summary of issues*

Construction

The construction of the project is likely to have the following impacts:

- There would be adverse direct and indirect impacts on several listed heritage items, including buildings and cultural plantings. About eleven heritage items would be directly impacted, but none of these items are listed on the State Heritage Register. Direct impact refers to situations where the project would result in a physical change to the item and/or the construction footprint and/or road reserve boundary would be likely to occur on part of the property on which the item is located. Indirect impact refers to impacts on the value of a heritage item where direct impact does not occur (such as visual impacts)
- There would be potential impact on the following archaeological sites:
 - TAFE grounds (potential archaeological site)
 - Potential former maritime sites on the banks of the Clarence River and riverbed
 - The 'Grafton Punt', which is identified on the Australian National Shipwrecks Database
 - The railway terminus in South Grafton
- There would be direct impact on areas listed within the Grafton Heritage Conservation Area (as defined in the Clarence Valley Local Environmental Plan 2011)
- There would be indirect impacts on the Grafton Bridge, which is listed on the State Heritage Register.

Operation

Once the project is operating, it would have the following impacts:

- There would be visual impacts on the heritage value of the existing Grafton Bridge
- There would be permanent changes to the vistas to and from listed heritage items adjacent to the project.

4.4.3 *Proposed further assessments*

RMS will undertake an assessment of the impacts on State and local historic heritage including archaeology, heritage items and conservation areas. The assessment will:

- Describe the existing non-Aboriginal heritage and archaeological heritage values relevant to the project

- Identify non-Aboriginal heritage items that may be directly or indirectly impacted by the project. These would include the Grafton Bridge (which is an item of State significance), a range of heritage listed buildings and groups of buildings, archaeological sites, portions of the Grafton conservation area and a number of mature trees listed on the Clarence Valley Council Local Environmental Plan 2011
- Assess the significance of heritage items that would be potentially impacted in accordance with the *Burra Charter* (Australia ICOMOS, 1999), *NSW Heritage Manual* (OEH, 2001) and the *Statement of Heritage Impact* (Heritage Office and DUAP, 2002)
- Prepare Statements of Heritage Impact for impacted items
- Identify feasible and reasonable mitigation and management measures, including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures. The measures would be generally consistent with the guidelines in the *NSW Heritage Manual* (Heritage Office and DUAP, 1996).

As noted in Section 4.7, an assessment of urban design, landscape character and visual impact will be conducted to identify and assess potential impacts on non-Aboriginal heritage items. Similarly, a noise and vibration assessment will be conducted to identify impacts during construction and operation and to identify feasible and reasonable mitigation measures required for heritage buildings (refer to Section 4.3).

4.5 Aboriginal heritage

4.5.1 Overview

RMS conducted baseline Aboriginal archaeological and cultural heritage investigations during the route option development and selection process (Biosis Research, 2011b and 2012b).

The Clarence River and Grafton are within the area previously inhabited by the Gumbainggir people. These people also inhabited the steep terrain of the escarpment zone, located south of Grafton (Witter, 2000).

The first recorded interaction between the Aboriginal inhabitants of the Grafton region and the incoming European settlers came in 1825 in the form of an escaped convict, Richard Craig. Conflict between the Aboriginal population and the incoming settlers followed soon after initial European settlement. Killings were carried out by both communities and stock was speared by the local people to drive the new settlers off land. Violence, displacement and disease reduced the numbers of Aboriginal people in the area. By 1891 it was reported that the police had brought 'peace'. Nine reserves were created to house the remaining Aboriginal population and many Aboriginal people were employed in European industry as stockmen, cane strippers and fishermen (NSW Heritage Office, 1996).

A community of Aboriginal people remain in Grafton to this day, many of them with strong spiritual links to the area and important knowledge of past ways of life.

The project falls within the Grafton-Ngerrie Local Aboriginal Land Council area. RMS is consulting with the Aboriginal community in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) and

the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (RMS, 2011a).

The project investigations report 13 registered Aboriginal sites within the Grafton area, including the following culturally significant sites:

- The Golden Eel site, located on the southern bank of the Clarence River to the east of the proposed bridge. The Golden Eel site is a spiritual area of high significance to all of the neighbouring tribal groups
- Clarence River, related to the dreaming/creation story
- Susan Island, a ceremonial ring women's site
- Elizabeth Island, an Aboriginal ceremony and dreaming men's site.

The project investigations have also identified sections of the proposed bridge southern approach in South Grafton as being over areas with Aboriginal archaeological potential.

4.5.2 Summary of issues

Construction

The construction of the project is likely to have the following impacts:

- There could be potential impacts on the Golden Eel site as a result of construction of the southern bridge approach
- There could be potential direct impacts on unknown or unidentified archaeological items that may be uncovered, disturbed, damaged or destroyed during construction works.

Operation

Once the project is operating, the presence of the bridge would impact on the intrinsic Aboriginal cultural value of the Clarence River and the Golden Eel site and its surrounds.

4.5.3 Proposed further assessments

RMS will prepare an assessment of impacts on Aboriginal heritage including cultural and archaeological significance. In undertaking the assessment, RMS will:

- Consult with the Grafton-Ngerrie Local Aboriginal Land Council and the Aboriginal community throughout the environmental impact assessment process to help identify areas of Aboriginal cultural significance and appropriate management strategies
- Identify and investigate the Aboriginal archaeological and cultural heritage values that are known or are predicted to be present by undertaking field survey, test excavations and consultation with the registered Aboriginal stakeholders and Aboriginal knowledge holders as required
- Undertake investigations in accordance with the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010), *Code of Practice for Archaeological investigation of Aboriginal Objects in NSW* (DECCW, 2010) and the *Procedure for Aboriginal cultural heritage consultation and investigation* (RTA, 2011)

- Assessment of the potential impacts, including cumulative impacts, on Aboriginal archaeological and cultural heritage values, including intangible cultural values
- Identify feasible and reasonable mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the measures).

4.6 Socio-economic, property and land use

4.6.1 Overview

RMS conducted socio-economic baseline investigations during the route options development and selection process (BBC Consulting Planners, 2012a and 2012b). The investigations looked at population growth, the economic base and land uses.

At the time of the 2011 Census, Grafton had a population of 10,205 while South Grafton had a population 6392. The main future residential growth areas are Clarenza (south-east Grafton) and Junction Hill (north Grafton).

The main employment sectors in the Grafton area are manufacturing, retail, construction and public administration. Commercial and retail activity is concentrated along Fitzroy and Prince streets in Grafton and Skinner Street in South Grafton. Bent Street is where most of the highway-related businesses (eg service stations and motels) are located in South Grafton. Fitzroy Street is where most of the highway related businesses are located in central Grafton and along with Pound Street are the main access roads to Grafton Shoppingworld.

Tourism is also an important economic activity. Grafton is attractive to tourists because of its heritage character, river access, water sports, and several high-profile annual events including the Jacaranda Festival and the Bridge to Bridge Ski Race.

Existing land uses along the South Grafton approach to the proposed bridge include agriculture, bulky goods retail, and infrastructure (rail and road). There is also vacant (undeveloped) land. Existing land uses along the Grafton approach include public open space (park and reserve), residential, educational (TAFE), and commercial/retail uses within the Grafton CBD. Recreational aquatic activities occur on the Clarence River at Grafton.

Table 3 identifies the values of the Grafton community based on the feedback gathered through the various forms of community consultation undertaken during the route options development and selection process.

Table 3 Community values identified during community consultation (Source: BBC Consulting Planners, 2012a)

Upgrade type	Description
Safety	Heavy vehicles travel through and around town safely Pedestrians and cyclists are able to move around Grafton City in safety Major roads take into account the location of community facilities and residential areas Roads and other infrastructure reliable in times of flooding.
Neighbourhood character	Residential areas are peaceful and quiet Roads in residential areas are low-key and service the surrounding neighbourhood.

Upgrade type	Description
Town character	Historical character of Grafton Grafton's quiet country town character Aboriginal and non-Aboriginal heritage value Presence of high-quality infrastructure Dispersed traffic maintains town amenity Unique visual value of existing Grafton bridge.
Lifestyle	Timely and trouble-free car transport within and through the town Congestion-free roads High levels of amenity Recreational use of the river Ease of access to shops, businesses and workplaces.
Infrastructure and planning	Infrastructure planning accounts for future traffic and population growth Planning is strategic and provides benefits for the community Community involvement in the decision-making process Flooding a consideration in planning process Areas with existing traffic congestion are noted and planned for accordingly, particularly the CBD Planning considers a range of route options Efficiency and expediency in planning and construction.
Equity	High levels of neighbourhood amenity and quality of life for all community members Good standards of infrastructure for all users, not just residents Everyone who uses the roads is able to do so in safety.
Community	Presence, safety and amenity of community facilities Traffic avoids places where children and elderly are likely to be.
Traffic and efficiently	Heavy vehicles should travel efficiently around town Dispersal of traffic to maintain town's character Grafton CBD's traffic-free quality Residential areas being free of heavy vehicle traffic Minimal traffic-based disturbance to residents.

4.6.2 Summary of issues

Construction

Impacts during the construction stage would largely relate to the need to acquire about 43 properties, either partially or fully, to build the project. These properties would be mostly in Grafton. The impacts would include:

- Direct impacts on residents affected by acquisition
- Direct impacts on community facilities (such as Basmar Hall on Pound Street, Grafton, which is used for community activities and training courses) and on open public space areas located adjacent to the Clarence River
- Impacts on about 4.5 hectares of regionally significant farmland, which is located across two rural properties in South Grafton
- Temporary impacts on the amenity of residents and road users as a result of construction work.

Other potential impacts would include impacts to local business and residents as a result of temporary changes on amenity (eg construction noise and vibration) and

temporary road and footpath closures and detours.

Operation

Once operational, the potential socio economic, property and land use impacts include:

- The amenity of residents along Greaves Street, Grafton is likely to be impacted by the presence of the northern bridge approach and increased road traffic
- There would be potential impacts on community cohesion in the Greaves Street and Bridge Street areas of Grafton due to changes in access to properties and the introduction a physical barrier along Pound Street
- There would be changes to access arrangements to residential and agricultural properties on Butters Lane, off Iolanthe Street in South Grafton, and the TAFE in Grafton
- The diversion of traffic from existing routes may have minor adverse impacts on businesses in Bent and Fitzroy streets, but a cluster of businesses in Pound Street (between Clarence Street and Duke Street) is likely to benefit
- Land required for the project would be permanently changed to road infrastructure. This includes land currently zoned as Business Development (B5), Infrastructure (SP2), Tourist (SP3) and Primary Production (RU1) in the South Grafton area, and land currently zoned as Public Recreation (RE1) and General Residential (R1) in the Grafton area
- The Clarence River Visitor Information Centre would lose visual prominence and is unlikely to be seen by southbound tourists entering Grafton.

The project would also have the following benefits:

- The additional bridge across the Clarence River would reduce traffic congestion and travel times during peak hours.
- There would be road safety improvements stemming from the removal of heavy vehicles from the existing bridge and improved access for service delivery and emergency services
- Grafton and South Grafton would be better integrated, economically and socially, through improved access to employment, health and community services, retail and community centres and recreation sites. Connectivity would improve between the Iolanthe Street business area in South Grafton, and Grafton generally; in particular, there would be better connection to the residential area in the east of Grafton, connecting an established residential area with employment zones. The project would also provide better connectivity to the Clarenza growth area, the South Grafton growth area, and between the Grafton and South Grafton CBDs
- The project would allow improvements to the public transport network and improve pedestrian and cyclist access across the river.

4.6.3 Proposed further assessments

RMS will undertake an assessment of socio-economic, property and land use impacts for the construction and operation of the project. The assessment will investigate and identify:

- The socio-economic conditions and values of the Grafton area, existing community and recreation facilities, community service providers, businesses, land uses and land use access arrangements relevant to the project
- Property acquisition requirements
- The potential direct and indirect impacts of the project, including:
 - Impacts to changes to population and demography
 - Impacts of land use changes
 - Impacts of local amenity changes
 - Impacts of access and connectivity changes
 - Impacts on property
 - Impacts on local business, including agriculture
 - Impacts on local tourism
 - Impacts on social and recreational infrastructure
 - Impacts on community values
- Feasible and reasonable project-specific measures to avoid, manage or mitigate potential land use, property, social and economic impacts; and to maximise benefits.

4.7 Urban design, landscape character and visual impact

4.7.1 Overview

RMS conducted baseline investigations as part of the route options development and selection process (Spackman Mossop Michaels, 2011 and 2012). These investigations provide an overview of the project as it relates to street pattern, landscape character and visual considerations.

Street pattern

The two original urban settlements of Grafton and South Grafton are located on either side of the Clarence River, on the floodplain immediately adjacent to the river. Grafton and South Grafton were laid out with a regular square grid pattern of streets. Although the proportions of the Grafton and South Grafton grids are essentially identical, their orientations differ slightly.

North of the river, the grid is a defining characteristic of the urban experience. With few exceptions, the urban area of Grafton conforms to the historical grid. Where the geometry of the grid is interrupted (for example, at the road and rail viaduct approaches to the bridge), the effect is immediately apparent and is perceived in dramatic contrast to the uniform regularity of the grid elsewhere.

South of the river, the historical grid is much less prevalent. Only the older parts of South Grafton, those areas closest to the river, are laid out on the original grid. The historical grid terminates at Cambridge Street, which cuts across the old grid and establishes a new, less regular, street grid to its south. South of Tyson Street, the grid geometry disappears altogether as the newer areas of South Grafton extend onto higher ground and an irregular street pattern of looping roads and cul-de-sacs prevails. While the Gwydir Highway conforms to the local urban patterns, being aligned with the historical grid, the other regional infrastructural elements in south Grafton (the railway line, the Pacific Highway and Bent Street / Summerland Way) have their own individual geometries that cut across the local 'grain'.

Landscape character

The main landscape character types in Grafton are:

- The Clarence River
- The two town centres of Grafton and South Grafton, which form the civic and commercial urban cores on either side of the river
- The established residential areas immediately connected to the town centres, with housing stock of varying ages
- Newly developing residential areas on the outskirts of town
- Industrial areas, generally situated along primary regional transport routes and on the outskirts of town
- The rural hinterland, consisting of low-lying river floodplain and rolling hills, with intermittent buildings in the landscape
- Elizabeth Island and Susan Island, two large undeveloped islands in the river, which are significant landmarks for the town.

Visual setting

The visual relationship between Grafton and the Clarence River is fundamental to the urban experience of the town. As the dominant visual feature on the river, the existing Grafton Bridge is a key urban landmark that contributes significantly to the identity of the town. There are two main views to the bridge:

- Proximate views from the riverfront public spaces at Grafton and South Grafton and from the river
- Long-range views from elevated vantage points throughout the district, primarily south of the river.

The views of Grafton from the bridge are also an important component of the urban experience, providing a strong visual sense of the relationship between the town and the river. The best views from the bridge are from the two pedestrian and cyclist paths, located at the rail deck level on either side of the bridge. The views from passing trains are partially screened by the bridge's steel truss, while the views vehicles on the road deck are partially obscured by the bridge parapet.

4.7.2 Summary of issues

Construction

The construction of the project is likely to have the following impacts:

- Construction activities related to the bridge structure would impact the visual amenity of people looking towards the existing bridge, and of sensitive receivers located near the riverbank
- Road network upgrades along sections of Pound Street, Greaves Street, Clarence Street and Villiers Street in Grafton would have impacts on the visual amenity of some sensitive receivers located near construction work, and on road and river users.

Operation

Once the project is operating, it would have the following impacts:

- There would be impacts on views to the existing bridge
- There would be impacts on the visual character of the existing bridge
- The close proximity of the existing and proposed bridges would limit the opportunity for the proposed bridge to have its own visual expression
- The landscape character would be impacted on both sides of the river, particularly the Greaves Street and Pound Street area
- Urban patterns on both sides of the river would be impacted as the two proposed approach roads would not align with existing road reserves.

4.7.3 *Proposed further assessments*

The following preliminary urban design objectives have been developed for the project:

- Retain the character of the two townships on either side of the river
- Minimise the footprint of the corridor to maintain the town's existing character
- Minimise the approach road footprints in order to reduce private property impacts
- Minimise the removal of vegetation
- Maximise the potential of excess land to be allocated as public open space following the completion of the project
- Maximise pedestrian and cyclist movements onto and across the new bridge.

These objectives will be incorporated into the development of the concept design for this project to produce an integrated engineering and urban design outcome.

RMS will prepare a landscape and visual impact assessment of the project. The assessment will include:

- A contextual analysis of the landscape character (both built and natural) and public domain character of Grafton
- A review and update of the preliminary urban design objectives listed above and the development of urban design principles for the project
- A landscape character impact assessment
- A visual impact assessment of the project in the whole and the parts on the landscape and urban character of the area, views to and from the proposed bridge and relationship to the existing historic bridge
- An overshadowing impact assessment of the project on both private properties and the public domain. The assessment will include foreshore areas, open space, parks and reserves, adjoining residential land uses and heritage listed items
- The identification of feasible and reasonable measures to mitigate impacts. Identified mitigation measures will be incorporated into the project design.

5 Other environmental issues

The preceding chapter addresses the key environmental issues relating to the project. This chapter identifies other environmental issues that also need to be addressed but are considered to be of lesser consequence taking into account the nature of the project, the existing environment and the implementation of standard and best practice management and mitigation measures. These other issues are:

- Ecology
- Soils, contamination and water quality
- Air quality
- Greenhouse gases and climate change
- Utility infrastructure
- Resource and waste management.

While it is considered unlikely that these would be key issues, RMS will undertake further assessment as part of the environmental impact statement for the project. Any environmental management and safeguard measures required to minimise and mitigate impacts would be documented in the environmental impact statement.

5.1 Ecology

5.1.1 Overview

The proposed project alignment is mostly through the urbanised areas of Grafton and South Grafton, with a small section in vacant and rural land and the Clarence River riparian zone.

Biosis Research consultants conducted baseline investigations for the route options development process (RMS, 2011c and 2012c) and found three endangered ecological communities (EECs) in the Grafton area:

- Freshwater wetlands on coastal floodplain EEC, found predominantly along the Clarence River riparian zone
- Sub-tropical coastal floodplain forest EEC (degraded state), found predominantly along the riparian zone of small water bodies
- Lowland rainforest on floodplains EEC, found predominantly on Susan Island (upstream of existing bridge).

Surveys by Biosis Research did not record any threatened flora species, and only small areas of potential habitat for regionally threatened plants were identified in the Grafton and South Grafton area.

During fauna surveys, Biosis recorded six fauna species listed as vulnerable under the *Threatened Species Conservation Act 1995* with varying degrees of confidence. These were:

- Four microbats, which were definitively recorded using ultrasonic call recording

- One microbat, which was recorded as probable using ultrasonic call recording
- The masked owl, which was potentially recorded from regurgitated pellets.

Biosis Research also recorded five migratory fauna species listed as migratory under the *Environment Protection and Biodiversity Conservation Act 1999*. These were:

- Cattle egret (including a breeding colony)
- Australian reed-warbler
- White-bellied sea-eagle
- Rainbow bee-eater
- Common tern.

In habitat surveys across parts of the Grafton and South Grafton area, Biosis recorded attributes suitable for an additional 52 threatened and/or migratory fauna species.

Aquatic surveys undertaken by Biosis Research in 2011 recorded ten native fish species, two introduced fish species, two native vertebrate species and one native invertebrate species. No aquatic flora or fauna species listed as threatened pursuant to the *Environment Protection and Biodiversity Conservation Act 1999*, *Threatened Species Conservation Act 1995* or the *Fisheries Management Act 1994* were recorded during the surveys. Nine threatened aquatic fauna species are considered to have low to marginal potential habitat within the Grafton and South Grafton area.

There are no declared areas of critical habitat for flora or fauna within the locality.

5.1.2 Potential impacts

Construction

The construction of the project is likely to have the following impacts:

- There would be a potential impact (eg construction noise, lighting on additional crossing, etc) on known habitat for threatened fauna species including the little bentwing-bat, eastern bentwing-bat (found roosting under the existing Grafton Bridge), eastern freetail bat, and southern myotis (found foraging in the riparian zone)
- A small section of freshwater wetlands on coastal floodplain EEC would need to be cleared
- Native and exotic plantings would need to be cleared
- There would be potential for the introduction and/or spread of weeds, including noxious weeds
- There would be potential impacts on aquatic vegetation and habitat through the installation of in-stream structures likely to require clearing and disturbance of the river banks and bed
- There would be potential mobilisation of sediments and pollutants, which may enter Alipou Creek and/or the Clarence River.

Operation

Once the project is operating, it would have the following potential impacts:

- There would be an impact on remaining riparian vegetation along the Clarence River through the increase in edge effects
- The bridge and its lighting would potentially impact bats and other fauna species.

5.1.3 *Proposed further assessments*

RMS will undertake an assessment of impacts on the biodiversity values of the project site and adjoining areas including terrestrial, riparian and aquatic areas. The assessment will:

- Update database searches relating to terrestrial and aquatic flora and fauna
- Involve fieldwork during spring or summer to complement surveys undertaken to date. These will include:
 - Field surveys to confirm the extent of the freshwater wetlands on coastal floodplain EEC
 - Anabat surveys in accordance with the *Survey Guidelines for Australia's Threatened Bats* (DEWHA, 2009)
 - Searches of hollow-bearing trees for evidence of use by fauna
- Assess the potential for the study area to support habitat for threatened species
- Assess the impacts on critical habitats, threatened species, populations or ecological communities and their habitats taking into account the *Draft Guidelines for Threatened Species Assessment* (Department of Environment and Conservation, 2005)
- Identify feasible and reasonable mitigation measures relevant to the construction and operational stages of the project consistent with the *Biodiversity Guideline – Protecting and managing biodiversity on RTA projects* (RTA, 2011).

RMS do not expect the project would trigger a referral under the *Environment Protection and Biodiversity Conservation Act 1999* based on previous studies not finding significant impact on any nationally threatened species and ecological communities, migratory species or any other matter of national environmental significance. This will be re-confirmed during the field investigations to be conducted as part of the EIS.

5.1.4 *Management and safeguard measures*

Ecology issues are commonly encountered on RMS road projects and can be managed and mitigated through the implementation of standard management and safeguard measures, which RMS will detail in the environmental impact statement. They would include:

- Fencing prior to the start of site preparation and construction activities
- Construction sediment and erosion control plans and construction spill emergency procedures as part of the construction environmental management plan for the project
- Operational incident response during major spills.

5.2 Soils, contamination and water quality

5.2.1 Overview

Soils

Preliminary geotechnical investigations undertaken for the project (RTA, 2004) and the *North Coast Mineral and Petroleum Resource Assessment* (McEvilly et al, 2004) indicate that the bedrock underlying the Grafton area consists of the Grafton Formation, which includes sandstone, siltstone, claystone and minor coal. Quaternary alluvium is indicated to overlie the Grafton Formation and is described as stream alluvial deposits that are sandy to silty with minor gravels.

The 1:25,000 scale *Acid Sulphate Soil Risk Map of the Grafton Map Sheet* (Milford, 1997) indicates that the project would be in areas of high and low acid sulphate soil risk.

Contamination

A search of the NSW Office of Environment and Heritage's Contaminated Land Public Record of Notices found no records of contaminated sites in the Grafton area (OEH, 2013a). None of the sites listed Contaminated Land Public Record of Notices would be impacted by the project.

However, the Australian Rail Track Corporation reported a contaminated site close to the western side of the proposed bridge's southern approach at the South Grafton Railway Station Yard (ARTC, 2012).

Water quality

The proposed Grafton Bridge would be located within the Lower Clarence catchment area. The main watercourses located in the Grafton area are the Clarence River, Alipou Creek, Swan Creek and Carrs Creek.

The *Beachwatch Partnership Program* (OEH, 2013b) has collected water quality information for the Clarence River at Grafton in the following locations:

- Prince Street, upstream of the existing bridge
- Corcoran Park, downstream of the existing bridge
- Grafton Sailing Club, downstream of the existing bridge.

Water quality monitoring results are documented in *NSW State of the Beaches 2010–2011: Far North Coast Region* (OEH, 2013b). Monitoring found elevated enterococci levels at the three sites during both dry and wet weather conditions. The poor water quality at Prince Street, Corcoran Park and Grafton Sailing Club has been investigated by OEH and Clarence Valley Council, with inspection and testing of the sewerage system and faecal sterol analysis of the river water to identify the source of contamination; however, the results were inconclusive.

The *NSW State of the Beaches 2010–2011: Far North Coast Region* report states that Council plans to undertake further investigations, including a review of the performance of North Grafton Sewage Treatment Plant (adjacent to Corcoran Park) and a review of sewer and stormwater issues in the Sailing Club and Prince Street catchments.

5.2.2 Potential impacts

Construction

The construction of the project is likely to have the following impacts:

- There would be potential erosion due to the exposure of soils. This could impact on the water quality of Alipou Creek and the Clarence River
- There would be potential for water quality impacts from the accidental spill of materials (including chemicals) during construction, and runoff from exposed or unclean surfaces
- There would be potential for groundwater contamination if construction activity intersects with groundwater
- Acid sulfate soils could be exposed to the air as a result of excavation and construction activity, resulting in the potential for sulphuric acid to impact groundwater, soils and waterways in addition to the built environment
- There would be potential to find, expose and disturb contaminated land.

Operation

Once the project is operating, it could have the following impacts:

- Water quality could be affected by any spills that may occur from bridge maintenance activities or vehicle accidents
- Water quality could be affected by road runoff containing suspended solids, nutrients from atmospheric fallout, spills and other pollutants from vehicle, tyre and pavement wear.

5.2.3 Proposed further assessment

RMS will undertake an assessment of impacts on soils and water quality. The assessment will:

- Undertake geotechnical field investigations and laboratory testing to further characterise the existing soil geotechnical conditions along the proposed bridge and approaches
- Identify sensitive surface and groundwater receiving environments
- Identify any actual or potential acid sulfate soils and recommend an appropriate management approach, if required in accordance with the *Acid Sulfate Soils Manual*
- Identify and assess any potential land contamination based on historical aerial photographs and land property information
- Assess erosion and sediment impacts on the Clarence River during construction and operation. This task would include an assessment of water quality
- Assess impact on groundwater and groundwater receiving environments
- Identify feasible and reasonable management and mitigation measures to prevent water pollution, and details of the proposed stormwater management measures to contain pollutants. Measures will take into consideration the *Managing Urban Stormwater: Soils and Construction* (The Blue Book) publications.

5.2.4 *Management and safeguard measures*

Soil, contamination and water quality issues are commonly encountered on RMS road projects and can be managed and mitigated through the implementation of standard management and safeguard measures, which RMS will detail in the environmental impact statement. They would include:

- A remedial action plan or appropriate construction environmental management plan prepared in accordance with the relevant EPA guidelines, if it is necessary to address contaminated areas
- Construction sediment and erosion control plans and construction spill emergency procedures as part of the construction environmental management plan for the project.

5.3 Air quality

5.3.1 *Overview*

Air quality in the Clarence Valley area is affected by pollution from bushfires, controlled burning for hazard reduction, burning for agriculture (including burning of cane for harvesting), industrial discharges (licensed and unlicensed), solid fuel heaters, backyard burning of green waste, transport pollution, commercial cooking activities, sewage treatment plants, landfills, dust from agriculture and building activities and indoor air pollution such as smoking and heating (CVC, 2009).

5.3.2 *Potential impacts*

Construction

During construction, air quality impacts are likely to be caused by dust generation and emissions from earthworks, spoil storage and transport, vehicles, and plant and equipment.

Operation

Once the project is operational, potential impacts on air quality would result from changes to the patterns of vehicle emissions in the Grafton area. However, it is not anticipated that pollutant levels would exceed relevant guidelines at nearby receptors as a result of the project.

5.3.3 *Proposed further assessment*

RMS will undertake an assessment of air quality impacts to identify activities that have the potential to impact on local and regional air quality, and to identify mitigation measures to prevent the generation and emission of dust. The assessment will:

- Identify relevant air quality goals and standards, sensitive receptors, activities and weather conditions potentially impacting air quality
- Identification of sensitive receivers for air quality and activities and weather conditions potentially impacting air quality
- Assess air quality impacts during construction and operation
- Identify feasible and reasonable management measures (particularly dust suppression measures) to be implemented during construction.

5.3.4 Management and safeguard measures

The potential for air quality impacts on RMS road projects is common and can be managed through the development of construction management plans and appropriate consideration of air quality issues during detailed design. RMS will detail the management measures and safeguards to be implemented during construction in the environmental impact statement. Safeguards would include the implementation of appropriate dust control measures during construction.

5.4 Greenhouse gases and climate change

5.4.1 Overview

The *NSW Climate Impact Profile* (DECCW, 2010c) identifies the following projected climate change impacts for the NSW North Coast region:

- By 2050, the climate is virtually certain to be hotter, with rainfall increasing in summer and decreasing in winter. However, changes in weather patterns that cannot be resolved by the climate models mean that rainfall in coastal regions is difficult to simulate
- Runoff and stream flow are likely to increase in summer and autumn and decrease in spring and winter
- Sea level is virtually certain to keep rising, which will almost certainly pose a major risk to property and infrastructure; developments closest to the shore and on sand spits will be most at risk
- Soil erosion is likely to increase on steeper slopes in the upper catchments, potentially causing sedimentation on the floodplains; gully erosion is likely to ease
- Increases in brief, heavy rainfalls are expected to increase the likelihood of flooding along urban streams
- Towns on coastal plains and near estuaries are likely to suffer additional risk of flooding
- Sea level rise is virtually certain to have a substantial impact on estuarine and foreshore ecosystems
- Sea level rise, increased temperatures and changes in hydrology and fire regimes are likely to have a substantial impact on terrestrial and freshwater ecosystems
- Vulnerable ecosystems include saline wetlands, low-lying coastal ecosystems and fragmented forests and woodlands in the hinterland.

5.4.2 Potential impacts

Construction

The construction of the project would generate direct and indirect greenhouse gas emissions.

Operation

Once the project is operating, greenhouse gas emissions would be generated from electricity use for road lighting and the use of equipment, machinery and materials to maintain the bridge and approach roads.

In addition, the project could be impacted by climate change due to changes in sea level rise, rainfall intensity and extreme temperatures, which may potentially impact the operation of the bridge.

5.4.3 Proposed further assessment

RMS will undertake:

- A greenhouse gas assessment as defined by the Greenhouse Gas Protocol
- A climate change risk assessment based on *Draft Australian Standard (DR AS 5334) Climate change adaptation for settlements and infrastructure, AS/NZS ISO 31000:2009 Risk management – Principles and guidelines and ISO/IEC 31010:2009 Risk management – Risk assessment techniques*
- An identification of feasible and reasonable opportunities and mitigation measures that may be implemented to reduce greenhouse gas emissions associated with construction of the project, and adaptation options to respond to the identified climate risks associated with its operation.

5.4.4 Management and safeguard measures

Greenhouse gas and climate change issues are commonly encountered on RMS road projects and can be managed and mitigated through the implementation of standard management and safeguard measures, which RMS will detail in the environmental impact statement. These would include:

- Incorporating climate change considerations into the project design
- Minimising vegetation clearance wherever possible
- Minimising waste and re-using materials wherever possible
- Reducing construction transport requirements through use of local staff, resources, suppliers, and landfills wherever possible.

5.5 Utility infrastructure

5.5.1 Overview

The major utilities and services in the Grafton area are:

- Water supply and sewerage infrastructure provided by North Coast Water (a business unit of the Clarence Valley Council)
- Stormwater infrastructure provided by Clarence Valley Council
- Telecommunications infrastructure provided by Optus, AAPT, Telstra and Telstra NextGen networks
- Electricity infrastructure provided by Essential Energy.

The installation of National Broadband Network infrastructure in Grafton and South

Grafton was scheduled to commence in April 2013 (NBN, 2013). On 15 May 2013, it was reported in the Grafton media that construction of the National Broadband Network has begun in Grafton and South Grafton (*The Daily Examiner*, 15 May 2013).

5.5.2 Potential impacts

Existing public utilities and services within or close to the project alignment have the potential to be disrupted or may need to be relocated.

5.5.3 Proposed further assessment

RMS will consult with utility providers during the concept design stage to identify:

- Utility requirements for the project
- Utilities and services that would be temporarily disrupted, or would need to be relocated or adjusted.

5.5.4 Management and safeguard measures

RMS road projects commonly need to disrupt or relocate utility infrastructure. RMS will further assess the need to disrupt or relocate utility infrastructure during concept and detailed design, and identify management and mitigation measures. RMS will:

- Consult with the relevant utility providers to gain their input into the location and construction methods for the utilities
- Notify the community regarding any disruptions to services, should these be required
- Specify standard construction safety protocols.

5.6 Resource and waste management

5.6.1 Overview

The project would require construction resources and manufactured items during the construction stage. These may include but not limited to:

- Fill material (eg rock, sand, gravel, sandstone, brick)
- Bitumen and asphalt
- Timber and Steel
- Concrete and cement
- Water and fuel
- Soil and plant species (eg for landscaped areas)
- Composite materials
- Manufactures items (eg poles, pipes, cables, signs).

The main waste streams that are likely to be produced during construction of the project are:

- Excavate material (eg rock, gravel, clay, sand)
- Demolition waste
- Vegetation waste
- Packaging materials
- Liquid wastes
- Construction materials.

5.6.2 Potential impacts

Construction of the project would generate liquid and solid waste. Also, resource use requirements for the project may affect the availability of resources for other uses.

5.6.3 Proposed further assessment

RMS will assess the resource and waste management impacts of the project. The assessment will:

- Identify waste streams generated during the construction stage of the project
- Assess waste management impacts associated with the construction activity
- Identify feasible and reasonable management options for spoil reuse and disposal, construction waste management procedures and mitigation measures.

5.6.4 Management and safeguard measures

Resource and waste management issues are commonly encountered on RMS road projects and can be managed and mitigated through the implementation of standard management and safeguard measures, which will be detailed in the environmental impact statement. These would include the following measures:

- Construction waste management would follow the waste hierarchy principles of avoid, reduce, reuse, recycle, recover, treat and dispose
- All generated wastes would be managed and disposed of in accordance with relevant State legislation and government policies including the *Waste Avoidance and Resource Recovery Act 2001*, the *Waste Avoidance and Resource Recovery Strategy 2007* (DECC, 2007) and the NSW Government's *Waste Reduction and Purchasing Policy*. The *Waste Classification Guidelines* (DECCW, 2008) would also be used to classify the different types of waste
- Waste materials would be transported to and from the site by covered trucks where possible
- A waste register would be maintained for the site. It would detail the types of waste collected, amounts, date/time and details of disposal
- The construction contractor would be required to re-use materials where feasible, including material collected on site

- Solid waste materials awaiting disposal would be appropriately contained and stored in a manner that would ensure they do not escape into the environment
- Training in waste minimisation principles and measures would be provided as part of site inductions.

6 Conclusion

RMS is seeking approval for a bridge over the Clarence River at Grafton. The project would involve building a bridge over the river and upgrading parts of the road network in Grafton and South Grafton.

RMS has formed the opinion that the impacts of the project would be likely to significantly affect the environment and require the preparation of an environmental impact statement under the EP&A Act.

The project is State significant infrastructure under Part 5.1 of the EP&A Act, and requires approval from the Minister for Planning and Infrastructure.

RMS considers that the key issues will be:

- Traffic and transport
- Flooding and hydrology
- Noise and vibration
- Non-Aboriginal heritage
- Aboriginal heritage
- Socio-economic, property and land use
- Urban design, landscape character and visual impact.

The environmental impact statement will include the following:

- A description of the proposed bridge and road upgrades
- A description of the construction activities
- An assessment of the potential impacts on the key issues. This would include a description of the existing environment, an assessment of potential direct and indirect impacts, and construction, operation and staging impacts
- A description of measures to be implemented to avoid, minimise, manage, mitigate, offset and/or monitor the potential impacts
- Issues raised by stakeholders during the environmental impact statement, and how they would be addressed in the construction and operation of the project.

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Attachment A

Requirements of the Environmental Planning and Assessment Regulation 2000

Clause 192 of the *Environmental Planning and Assessment Regulation 2000* requires that an application for approval of the Minister to carry out State significant infrastructure must include:

- (a) details of any approval that would, but for section 115ZG of the Act, be required for the carrying out of the State significant infrastructure, and
- (b) details of any authorisations that must be given under section 115ZH of the Act if the application is approved, and
- (c) a statement as to the basis on which the proposed infrastructure is State significant infrastructure, including, if relevant, the capital investment value of the proposed infrastructure.

Approvals that would otherwise apply

Approvals that may be required to carry out the SSI, if not for section 115ZG of the EP&A Act, include:

Authorisations not required for approved State significant infrastructure	Would otherwise be required for the project?*
Concurrence under Part 3 of the <i>Coastal Protection Act 1979</i>	No
A permit under section 201, 205 or 219 of the <i>Fisheries Management Act 1994</i>	No
An approval under Part 4, or an excavation permit under section 139, of the <i>Heritage Act 1977</i>	No
An Aboriginal heritage impact permit under section 90 of the <i>National Parks and Wildlife Act 1974</i>	No
An authorisation referred to in section 12 of the <i>Native Vegetation Act 2003</i>	No
A bush fire safety authority under section 100B of the <i>Rural Fires Act 1997</i>	No
A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the <i>Water Management Act 2000</i>	Section 89 water use approval and section 90 water management work approval.

* Note: Approvals that would otherwise apply will be reconfirmed by the investigations to be undertaken as part of the EIS.

Authorisations if the application is approved

Authorisations listed under section 115ZH of the EP&A Act are presented below. None of these authorisations are expected to be required for the project.

Authorisation	Required for the project?
An aquaculture permit under section 144 of the <i>Fisheries Management Act 1994</i>	No
An approval under section 15 of the <i>Mine Subsidence Compensation Act 1961</i>	No
A mining lease under the <i>Mining Act 1992</i>	No

Authorisation	Required for the project?
A production lease under the <i>Petroleum (Onshore) Act 1991</i>	No
An environment protection licence under Chapter 3 of the <i>Protection of the Environment Operations Act 1997</i>	No
A consent under section 138 of the <i>Roads Act 1993</i>	No

Other legislation that could potentially apply to the project includes:

- *Land Acquisition (Just Terms Compensation) Act 1991* for the compulsory acquisition of any land required for the project
- *Crown Lands Act 1989* for the acquisition of land reserved under this Act
- *Contaminated Land Management Act 1997* requires notification to the EPA in the event of discovering or causing contamination
- *Aboriginal Land Rights Act 1983* if there is any affected land subject of an Aboriginal Land Claim made under this Act

It is unlikely the project would impact any matter of national environmental significance (eg listed threatened species and ecological communities and/or migratory species protected under international agreements) under the *Environment Protection and Biodiversity Conservation Act 1999*. This will be reconfirmed during the investigations to be undertaken as part of the EIS.

State significant infrastructure statement

Clause 14(1) of State Environmental Planning Policy (State and Regional Development) 2011 provides that development is declared to be State significant infrastructure pursuant to section 115U(2) of the Act if it is permissible without development consent under Part 4 of the Act under a State environmental planning policy; and is specified in the categories of development in Schedule 3.

State Environmental Planning Policy (Infrastructure) (ISEPP) permits development for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. As the proposed Grafton Bridge is for a road and road infrastructure facilities, and is to be carried out by RMS, the project is permissible without development consent under Part 4 of the EP&A Act.

Schedule 3 of State Environmental Planning Policy (State and Regional Development) 2011 provides that general public authority activities for infrastructure or other development that (but for Part 5.1 of the EP&A Act and within the meaning of Part 5 of the Act) would be an activity for which the proponent is also the determining authority, and would, in the opinion of the proponent, require an environmental impact statement to be obtained under the EP&A Act.

For the Grafton Bridge, RMS has formed the opinion that the impact of the project on traffic and transport, flooding and hydrology, noise and vibration, heritage, socio-economic, property and land use, urban design, landscape character and visual impact would be likely to significantly affect the environment and would require an environmental impact statement to be obtained under Section 112 of the EP&A Act.

On this basis the project is State significant infrastructure. Approval from the Minister for Planning and Infrastructure is required under section 115W of the EP&A Act.