ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON

Route Options Submissions Report

December 2012

Executive Summary

This report

Roads and Maritime Services (RMS) is currently undertaking investigations and community consultation to identify an additional crossing of the Clarence River at Grafton to address short-term and long-term transport needs. A *Route Options Development Report,* (RODR) detailing six route options, was placed on public exhibition in September 2012. This report, (*Route Options Submissions Report*) provides a summary of the issues raised in the submissions received during the recent phase of community consultation about the six route options put on display. This report also provides RMS responses to the issues raised in the submissions.

Community consultation

Community consultation regarding 13 preliminary route options began in December 2010 and concluded in March 2011. During the consultation process 41 suggested routes emerged. RMS explored each of these routes. In June 2011, RMS published a *Feasibility Assessment Report* which described the assessment undertaken on the 41 suggested routes. Twenty-five preliminary route options in five corridors were identified for engineering and environmental investigation.

In January 2012, six route options were announced for further investigation. The short-listed options and short-listing process are documented in the *Preliminary Route Options Report – Final* (RMS, January 2012).

On 10 September 2012 the RODR was placed on public exhibition and made available for community comment. A detailed Community Update, explaining the route options and key findings of the report, was made available at the same time. The RODR was available from 10 September 2012 on the RMS project website, from the project display office or by contacting the toll free project information line.

A range of consultation activities were also carried out including:

- Two staffed displays
- Two information sessions
- Two public forums
- A radio talk-back session
- An online forum

Summary of submissions

Submissions were accepted until Friday 19 October 2012. 118 submissions were received. A summary of submissions received is outlined in Table 1.1.

Table 1.1 summary of submissions received.

Submission group type	Number of submissions received
Individuals	106
Community Groups (each accompanied by a petition)	2
Government agencies	2
Businesses	3
Non-government organisations	5
Total	118

Submissions were received expressing support for and opposition to each of the options with the majority of the submissions providing comment about why they supported or opposed an option or options.

Many submissions either indicated a preference for an option away from the existing bridge described as 'out of town options' or a 'bypass of Grafton CBD' or for an option near the existing bridge, described as 'in-town' options.

The submissions that opposed options close to the existing bridge generally argued in favour of options located away from and up or downstream of the existing bridge. Growth of the city and removing heavy traffic from the CBD were cited as the primary reasons for choosing an out of town option. Submissions opposing options close to the existing bridge included a petition of around 1000 signatures. This petition, dated July 2010, was originally submitted to the RMS in July 2011 and was tabled by its coordinators at the second public forum on 9 October 2012.

Supporters for options close to the existing bridge generally argued that these options would be well used and relieve existing traffic congestion and would provide a convenient alternative for existing communities. Some of these submissions also expressed concern about, and opposition to, the out of town options. Among the key concerns about these was that these options would be ineffective in reducing traffic congestion and were too expensive. A petition with 203 signatures collected during 2012, opposed Options 14 and 15. This was also presented to RMS during the consultation period.

While the invitation for feedback did not ask submission writers to indicate a preference for a particular option, 97 of 118 submissions specifically expressed support for particular options. Some submissions simply stated support for the option that was preferred. The preference expressed for particular options is outlined in section 3.

Summary of issues raised

Strong opposition was raised to every option. Support was also expressed for every option. Submissions detailed concerns about traffic and transport, socio-economic, environmental, cost and value for money and other matters. Key issues raised, in no particular order, are included below:

- The importance of the unique, nationally significant, historical aspects of Grafton valued by the community, including avenues and individual trees, affordable and heritage listed housing, community connectivity, local businesses and local amenities.
- The need to protect the fabric of Grafton and avoid irreversible changes to areas of high amenity, heritage, natural and cultural value.
- General agreement that relief of traffic congestion was required, but with disagreement about how this could be best achieved.
- A desire to minimise the amount of heavy vehicle traffic within the centre of Grafton, near schools and other sensitive locations.
- Concern about introducing traffic and associated noise and air quality impacts to areas currently devoid of significant traffic.
- The value placed on the relationship of the town to the river and opportunities to protect and enhance recreation and natural and heritage features.
- The future of the region and Grafton's location relative to growth areas within the north coast and south east Queensland.
- Transport requirements for existing and growing urban areas, agriculture and industry in the region and inter-state and the role of Summerland Way within this context.
- Concern about the flooding and drainage matters that affect the town and how particular options might exacerbate them.
- Alternative suggestions about how congestion might be relieved by reducing demand for car travel before a long term solution is implemented.
- The need to maintain and improve the viability of bus services and ensure that bus users are not disadvantaged.
- A dissatisfaction with current levels of noise and volumes and driver behaviour of heavy vehicles and B-doubles in particular.
- Disagreement with the adequacy, scope and findings of the traffic investigations and the supporting traffic counts and population projections underpinning the conclusions of the RODR.
- Stated lack of trust in the findings of the traffic study and components was used as an argument in support of alternative views on the use that would be made of particular options and the related cost benefit of the options.
- Appreciation of the opportunity to participate in decision making but frustration with the cost, time and multiple attempts to resolve the issue.
- The need to take a long term view and ensure that investigations were based on accurate information about the likely future needs and character of the city.
- Ensuring the safety of other more vulnerable road users such as pedestrians, cyclists and school children.

There was general agreement that any option needs to address:

- The problems of congestion impeding free access between urban areas on either side of the river.
- The current and future needs of Grafton, surrounding suburbs and users of regional and inter-state transport.
- The delay caused by trucks and other large vehicles navigating the bridge.
- Access for emergency vehicles across the river.
- The impact of new works on flood flows, flood mitigation works, shifting islands.
- The protection of heritage, community amenity and safety and ecologically significant areas.

It is clear that the community perceives all options as having some level of disruption to private property and scenic values.

Community comments received on the six route options, the investigations undertaken and the outcomes of the value management workshop will contribute to a decision on the recommended preferred route option.

RMS aims to identify the recommended preferred option by the end of 2012 for community comment.

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1 Introduction

1.1 Purpose of the report

Roads and Maritime Services (RMS) is currently undertaking investigations and community consultation to identify an additional crossing of the Clarence River at Grafton to address short-term and long-term transport needs. A *Route Options Development Report (RODR)*, detailing six short-listed route options, was placed on public exhibition in September 2012.

This report, (*Route Options Submissions Report*) provides a summary of the issues raised in the submissions received following the public exhibition of the *Route Options Development Report (RODR)*.

An overview of the issues that were raised in submissions is provided in section 3. More detail about the issues raised and RMS' responses to them are included in section 4.

1.2 Project objectives

The key objectives for the additional crossing 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.

1.3 Background

The Grafton Bridge is a heavily used crossing of the Clarence River connecting south and north Grafton and the greater Grafton community. Summerland Way, a north / south inter and intra-State route to the Pacific Highway crosses the bridge. Grafton Bridge is situated towards the southern end of Summerland Way near the convergence of the Gwydir and Pacific Highways. It is congested in morning and afternoon peaks. The "kinks" in the bridge cause delay of traffic when large vehicles cross the bridge. The North Coast rail line is also accommodated by the bridge. The NSW government has asked Roads and Maritime Services (RMS) to investigate an additional crossing to address short term and long term transport needs for the road crossing of the Clarence River.

Planning for an additional crossing of the Clarence River at Grafton started in 2002. These investigations did not reach the implementation stage and were deferred in September 2005. The current program of investigation restarted in 2009. In December 2010 RMS (formerly Roads and Traffic Authority (RTA)) announced a revised approach to engage more effectively with the community and stakeholders in identifying a preferred route for an additional crossing. A detailed outline of the background to this project is outlined in the RODR.

Consultation regarding 13 preliminary route options began in December 2010 and concluded in March 2011. During the consultation process 41 suggested routes emerged. In June 2011, RMS published a *Feasibility Assessment Report* which described the assessment undertaken on the 41 suggested routes. Twenty-five preliminary route options in five corridors were identified for engineering and environmental investigation.

In January 2012, six route options were announced for further investigation. The process to short-list the options from 25 to six route options and results of the technical and environmental investigations are documented in the *Preliminary Route Options Report – Final* (January 2012).

Since the announcement of the six short-listed options, RMS has completed design refinements on these options and undertaken additional field and technical investigations. The *Route Options Development Report* (RODR) (September 2012) describes these investigations.

1.4 The short-listed options

The six short-listed options included in the RODR are:

Option E
Approximately 1km upstream of the existing bridge - from Cowan Street, South Grafton to Villiers Street, Grafton. New bridge would have one lane in each direction. Existing bridge would remain one lane in each direction.

Option A
Adjacent to the existing bridge upstream – from Bent Street, South Grafton to Villiers Street, Grafton via Fitzroy Street. New bridge would have one lane southbound and two lanes northbound. Existing bridge would become one lane southbound.

Option C
Adjacent to the existing bridge downstream – from the junction of the Pacific and Gwydir Highways, South Grafton to Villiers Street, Grafton via Pound Street. New bridge would have one lane in each direction. Existing bridge would remain one lane in each direction.

Option 11
Approximately 1km downstream of the existing bridge - from the Pacific Highway near McClaers Lane north of South Grafton to Villiers Street, Grafton via Fry Street. New bridge would have one lane in each direction. Existing bridge would remain one lane in each direction.

Option 14
Approximately 2.5km downstream of the existing bridge - from the junction of the Pacific Highway and Centenary Drive, north of South Grafton to Turf Street (Summerland Way), Grafton via Kirchner and North Streets. New bridge would have one lane in each direction. Existing bridge would remain one lane in each direction.

Option 15
Approximately 2.5km downstream of the existing bridge - from the junction of the Pacific Highway and Centenary Drive, north of South Grafton to Summerland Way, Grafton north of North Street via Kirchner Street. New bridge would have one lane in each direction. Existing bridge would remain one lane in each direction.

All options include ancillary works on roads affected by the route and all involve the acquisition of property to greater or lesser extents. The refined route options are summarised in a Community Update that was made widely available during the display of the RODR. Detailed descriptions of the options are provided in the RODR.

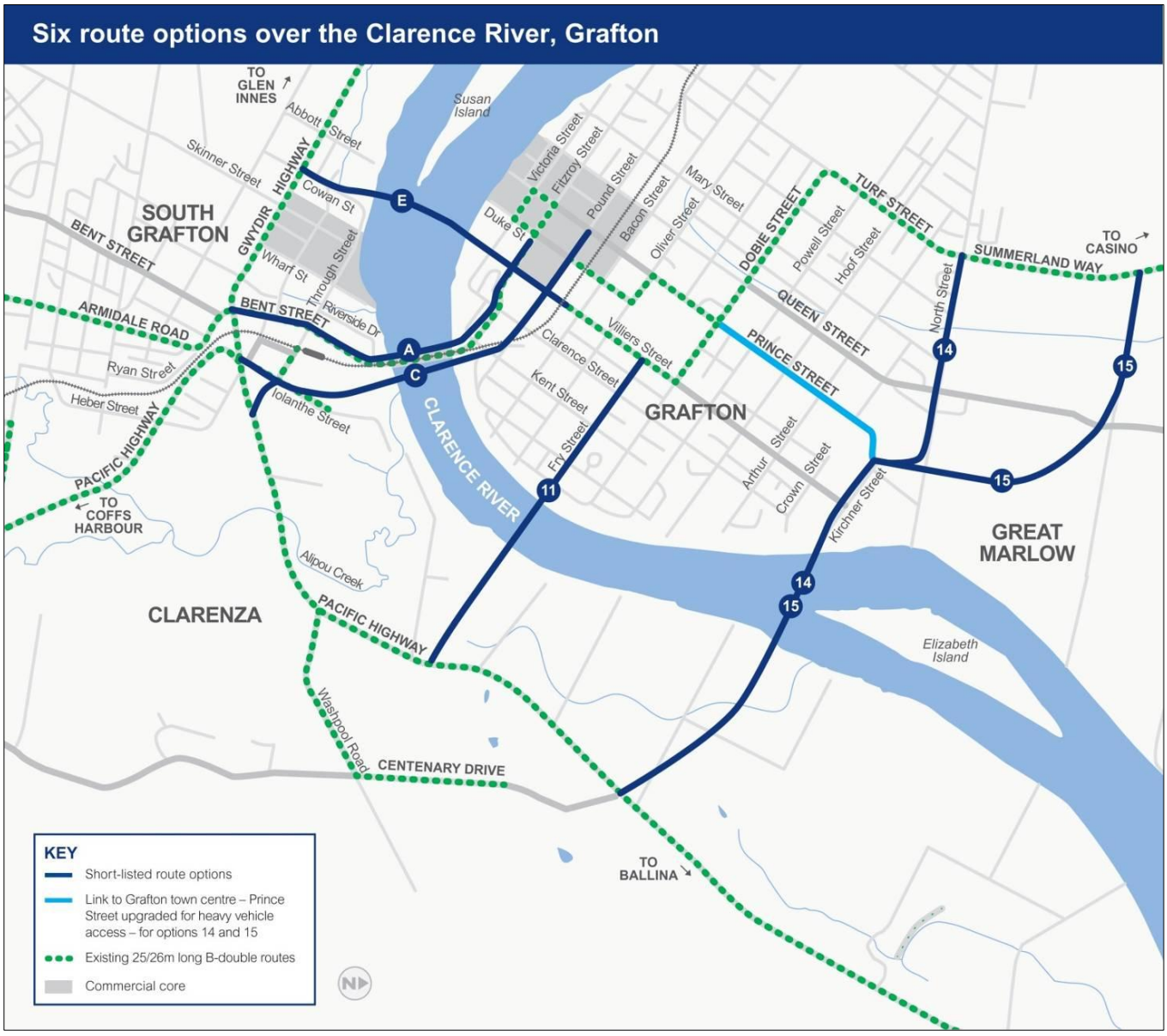

Figure 2 Source: *Route Options Development Report* 2012

1.5 Related projects

When considering the submissions received it is important to place this project within the context of the overall improvement of the Pacific Highway. While the Pacific Highway does not currently run through the centre of Grafton it brings traffic to within 2km of the existing river crossing. The Gwydir Highway runs south of the river and connects with the Pacific Highway east of the railway. Summerland Way runs from the Gwydir Highway to the north of Grafton and traffic on this route currently uses the existing bridge.

RMS is continuing to upgrade the Pacific Highway. Planning relating to the Pacific Highway includes a major diversion of the Pacific Highway from Glenugie south of Grafton to Tyndale north of Grafton. With this deviation the Pacific Highway would be relocated approximately 20km east of Grafton.

2 Display of the Route Options Development Report

2.1 The Route Options Development Report

The RODR (September 2012) describes the completed investigations of six short-listed route options. It assesses the six route options using technical and environmental investigations and describes the preliminary concept designs for each of the options. It includes technical papers on the following topics:

- Traffic assessment
- Social and economic issues
- Strategic cost estimates
- Economic evaluation
- Noise assessment
- Aboriginal heritage
- Non-Aboriginal heritage
- Ecology
- Landscape and urban character
- Flooding
- Geotechnical assessment for route options

2.2 Public exhibition

The RODR for the project was placed on public exhibition on the RMS project website from 10 September 2012. Copies were also made available for collection at the following locations:

- RMS display office 21 Prince Street Grafton
- Grafton Shoppingworld staffed displays
- Grafton Community Centre community information sessions
- South Grafton Ex-Servicemen's Club community information sessions

Two staffed displays, two information sessions and two public forums were held during the exhibition period. The project website provided up to date information including simulations of the traffic modelling for each option, interactive maps showing issues and potential constraints associated with planning an additional crossing of the Clarence River and a moderated feedback forum. The toll free project information line for the project and email allowed members of the community and other stakeholders to contact the project team with any comments or questions they had regarding the technical review.

Submissions were invited from the community and other stakeholders. Submissions were originally requested by 10 October 2012 but this was extended to 12 October 2012 following the addition of a second public forum. The extension of submissions was announced on 18 September 2012 and advertised widely, including on the RMS project website. A full list of consultation activities, dates, times and methods is outlined in Appendix A.

A public forum on the short-listed options was scheduled to be held at 6pm Tuesday 18 September 2012 at the Grafton Community Centre. The forum was set-up to provide community stakeholders with an opportunity to express their views on the short-listed options.

A briefing session for the community presenters at the forum was held on Friday 14 September 2012. In response to requests from the community representatives at the briefing session, RMS agreed to:

- Alter the public forum on the evening of Tuesday 18 September to provide more time for the project team to outline the results of the investigations into the short-listed options.
- Hold a second public forum on the evening of Tuesday 9 October to provide community stakeholders with an opportunity to comment on the short-listed options.
- Extend the closing date for submissions to Friday 12 October 2012.

2.3 Other consultation

Consultation with key stakeholders was carried out by RMS both prior to, during and after the exhibition period. This included a number of meetings on request by individual property owners and other stakeholders including Grafton Chamber of Commerce and Industry, Emergency Services groups and the Clarence Valley Council. Some individuals and organisations requested further information during the exhibition period.

During the display period, members of the project team and the community participated in a talk-back session on local radio station 2GF.

2.4 Seeking community feedback

To inform the community about the RODR display, the project team undertook the following activities:

- A direct mail out of letters and the Community Update to owners and occupiers of properties potentially directly affected by any of the route options
- Telephone calls to owners and occupiers of properties potentially directly affected by any of the route options
- Distribution of the Community Update to owners and occupiers of properties adjacent to the route options
- Post card mail out inviting input on the options to 30,000 residents in the wider Clarence Valley
- Advertising in local papers and radio stations
- The Community Update was made widely available, including for collection at the static and staffed displays
- Included relevant information on the project website
- Email from Grafton Bridge email to the email addresses on database.

Submissions on the RODR could be provided:

- At staffed displays and information sessions, recorded by the project team
- By mail or hand delivery
- By email
- By uploading to the project website
- By telephone to the project office and 1800 number

Submissions were received via all of these methods.

As well as providing general feedback, stakeholders were asked to address the following specific questions:

- What do you think is the most important consideration when determining the preferred route option?
- What do you like about some of the options?
- What don't you like about some of the options?

2.5 Submissions and petitions received

Submissions were accepted until Friday 19 October 2012. 118 submissions were received. A summary of submissions received is outlined in Table 2.1.

Table 2.1 summary of submissions received.

Submission group type	Number of submissions received
Individuals	106
Community Groups (each accompanied by a petition)	2
Government agencies	2
Businesses	3
Non-government organisations	5
Total	118

Two petitions were received by the project team. One petition included 203 signatures collected in 2012 and expressed opposition for an option downstream of the existing bridge, specifically referring to Options 14 and 15.

The other petition was a copy of a petition originally submitted in 2011 that was resubmitted during the exhibition period. This petition included about 1000 signatures collected during 2010 and 2011 and showed opposition to any option near the existing bridge. Both petitions were coordinated by community groups that have maintained an interest in reaching a decision on the project and participated in the public forums.

All feedback from submissions received is summarised in section 3 below. A detailed summary of submissions was documented in the *Draft Route Options Community Feedback* Report, October 2012 that was provided to participants in the Value Management Workshop and made available on the RMS website.

2.6 Categorisation of the submissions

A summary of the issues raised in the submissions is provided in section 3. The issues are grouped thematically around the following categories and topics:

Transport and traffic
- Traffic congestion
- Heavy vehicles and freight networks
- Connectivity
- Emergency vehicles
- Public transport
- Safety
- Local road impacts
- Traffic study
- Upgrade of Pacific Highway
- Construction issues
- Design and options and suggested modifications
- Implications for the railway
- Alternative suggestions

Socio-economic issues
- Noise and vibration
- Air quality
- Social Impact
- Amenity/ streetscape/ views
- Economic development
- Urban development
- Agriculture
- Property acquisition
- River use
- Cycling
- Public health

Environmental impacts
- Flooding and river flow
- Fauna
- Flora
- Non-aboriginal heritage
- Aboriginal heritage
- Other environmental issues

Cost benefit and value for money
- Value for money

Process
- Consultation
- Value Management Study

3 Summary of issues raised in submissions

Submissions covered a wide range of issues of concern to stakeholders and the community. One issue raised in many submissions centred on a key aim of the project, to improve traffic efficiency for travel between Grafton and South Grafton. However, submission writers were divided on the core goal of the crossing.

Those in favour of out of town options focused on the need to remove traffic from the centre of Grafton. Those in favour of the options close to the existing bridge focussed on the need to relieve existing congestion. Strong opposition was raised to every option by one or more submission writers detailing functional, socio-economic, environmental, cost and value for money and other concerns. Key issues raised, in no particular order, were:

- The importance of the unique, nationally significant, historical aspects of Grafton valued by the community, including avenues and individual trees, affordable and heritage listed housing, community connectivity, local businesses and local amenities.
- The need to protect the fabric of Grafton and avoid irreversible changes to areas of high amenity, heritage, natural and cultural value.
- General agreement that relief of traffic congestion was required, but with disagreement about how this could be best achieved.

- Concern about introducing traffic and associated noise and air quality impacts to areas currently devoid of significant traffic.
- A desire to minimise the amount of heavy vehicle traffic within the centre of Grafton, near schools and other sensitive locations.
- The value placed on the relationship of the town to the river and opportunities to protect and enhance recreation and natural and heritage features.
- The future of the region and Grafton's location relative to growth areas within the north coast and south east Queensland.
- Transport requirements for existing and growing urban areas, agriculture and industry in the region and inter-state and the role of Summerland Way within this context.
- Concern about the flooding and drainage matters that affect the town and how particular options might exacerbate them.
- Alternative suggestions about how congestion might be relieved by reducing demand for car travel before a long term solution is implemented.
- The need to maintain and improve the viability of bus services and ensure that bus users are not disadvantaged.
- A dissatisfaction with current levels of noise and volumes and driver behaviour of heavy vehicles and B-doubles in particular.
- Disagreement with the adequacy, scope and findings of the traffic investigations and the supporting traffic counts and population projections underpinning the conclusions of the RODR.
- Stated lack of trust in the findings of the traffic study and components is used as an argument in support of alternative views on the use that would be made of particular options and the related cost benefit of the options.
- Appreciation of the opportunity to participate in decision making but frustration with the cost, time and multiple attempts to resolve the issue.
- The need to take a long term view and ensure that investigations were based on accurate information about the likely future needs and character of the city.
- Ensuring the safety of other more vulnerable road users such as pedestrians, cyclists and school children.

There was general agreement that any option needs to address:

- The problems of congestion impeding free access between urban areas on either side of the river.
- The delay caused by trucks and other large vehicles navigating the bridge.
- The current and future needs of Grafton, surrounding suburbs and users of regional and inter-state transport.
- Mitigation of the impacts of any option on noise, air quality and socio-economic aspects.
- Access for emergency vehicles across the river.
- The impact of new works on flood flows, flood mitigation works, shifting islands.
- The protection of Aboriginal and non-Aboriginal heritage, community amenity and safety and ecologically significant areas.

Many submissions, whether in favour of in or out of town options, expressed concern that heavy vehicles in the centre of town pose a safety hazard. Submissions also observed that the existing noise and air quality impacts of these vehicles were currently a problem. B-double traffic is of particular concern to the community and the need for these trucks to travel within the centre of Grafton was questioned. Action to better understand, manage and limit this form of traffic was requested by residents from all areas within Grafton.

Options E, A, and C drew criticism for the potential to:

- contribute significantly to noise and air pollution
- affect quality of life and economic activity
- affect Aboriginal and non-Aboriginal heritage
- severely affect heritage buildings and streetscapes
- require the removal of significant street trees

Option 11 drew criticism for the potential to:

- introduce heavy traffic to currently quiet residential areas
- create noise, pollution, privacy, parking and amenity issues.
- remove the viability of productive farmland

Options 14 and 15 drew criticism for the potential to:

- remove the viability of productive farmland
- affect the aesthetic and recreational quality of river
- disrupt sites of indigenous significance
- affect bird life
- be poorly used by people within Grafton and South Grafton.
- cost substantially more than alternatives.

Many submissions argued in favour of the options skirting the city (generally Options 14 and or 15) on the basis that these options would allow traffic to “bypass” the CBD. A strong theme of the submissions that supported Options 11, 14 and or 15, was that much of the traffic using the existing bridge is through traffic and not local traffic. Submissions in favour of these options generally argued that trucks and through traffic did not need to access the CBD. Some submissions in favour of the out of town options in particular challenged the basis for the conclusions of the RODR’s traffic study.

Some submissions in favour of out of town options argued that these would be beneficial to existing and future residents of the city. In particular the ability of the out of town options to service the greater Grafton areas of Junction Hill, Clarenza and the lower river was mentioned.

A number of submissions argued that the core purpose of the project was to facilitate local traffic flow and argued that out of town or bypass options would not be used and would do little to relieve existing congestion. Many of these submissions observed that options close to the existing bridge would relieve congestion and be used primarily by local traffic (within greater Grafton).

While the invitation for feedback did not ask submission writers to vote for or specify a preference for a particular option, 97 of 118 submissions specifically expressed support for particular options. Some submissions expressed specific opposition to a particular option

while others debated the merits and disadvantages of all options. As well as arguing in favour of their preferred option, many respondents argued against the option that they opposed. Petitions are included in the total of 118 but not in the total of 97.

Table 3.1 outlines the preferences expressed in submissions.

Table 3.1 Support for particular options

Option	Number of submissions supporting option(s)
Single option supported	
E	12
A	9
C	8
11	8
14	3
15	18
More than one option supported	
E and C	1
E and 11	1
E, 11 and 15	1
E and 15	1
A modified	1
A and C	2
C modified	1
C, 11, 14 and 15	1
11, 14 and 15	2
14 and 15	24
14, 15 modified	1
15 modified	3
TOTAL	97

4 Issues and responses to community feedback

Issues raised by the community and stakeholders are summarised in the tables below. Many submissions writers raised similar issues. The summary table below indicates in which submission an issue was raised. Submissions were categorised by themes as outlined in section 2.6 above. The issues are numbered but this does not reflect an order of priority.

RMS' responses to submissions are based on the technical studies that were prepared for the RODR. These studies were prepared to assist RMS and the community to compare the six short listed route options and to identify a preferred option. Technical studies also aimed to identify any potential impacts of the options that could not be mitigated.

In some cases, a detailed evaluation of the issues raised in submissions will only occur after a preferred option is selected. This includes those issues that relate to concept design, environmental assessment or construction methodologies.

Once funding availability is determined, the concept design for the preferred option would be refined and a detailed environmental impact assessment would be displayed for community and stakeholder comment.

4.1 Traffic and Transport

4.1.1 Traffic congestion - submissions

Issue raised in submission	Submission number	Section Addressed
Traffic congestion		
1. In town options (E, A and C) would promote and relocate congestion by diverting traffic through the CBD.	3, 8,13,15,19,36,40, 43, 52,78, 98, 52, 71, 76, 78, 105, P2 (petition)	4.1.2.1 & 4.1.2.4
2. Options would take some time to implement and demand management should be considered immediately.	84,116	4.1.2.2
3. Options 14 and 15 would not be used and congestion would persist and worsen.	7,21,22,31, 33,36,62,67,78, 113,114,118 P1 (petition)	4.1.2.1
4. Option 11 is an ineffective option and would direct traffic to an area currently devoid of traffic and be ineffective for buses and B-doubles	3, 9,21,,22,25, 35,36,50,62, 67,76,98,114,118	4.1.2.1 & 4.2.2.2
5. Options in reasonable proximity to the bridge would be used and would relieve congestion.	101,104, P1, 113,114	4.1.2.1
6. Options 14 and 15 are best for the long term to remove heavy vehicles from the CBD and prevent congestion associated with growth within the region and interstate.	3,9,10,14,15,16,19, 23,24,25, 28,30,39, 42,43,44,46,50,52, 60,65,66,76,77,90, 94, 96,97, 105,115	4.1.2.1 & 4.1.4.1
7. Option 15 has the greatest traffic efficiency and would enable heavy vehicles (especially B-doubles) to bypass city streets, hockey fields, showgrounds and Westlawn School, increasing the amenity of the town.	3,4,13,14,18,27,44, 54,60,68,69,71,79, 90,93	4.1.2.1 & 4.1.4.1
8. Options that do not address bends would not relieve congestion.	21	4.1.2.4

Issue raised in submission	Submission number	Section Addressed
Traffic congestion		
9. Congestion around Grafton Hospital must be relieved and arrested. Options 14 and 15 preferred for this.	60,76	4.1.2.1 & 4.1.2.3
10. Without two lanes on approach to any new bridge congestion, would not be relieved.	71	4.1.2.4
11. Widening of roads would be required with some options, would disrupt local traffic and has not been anticipated in the RODR.	78	4.1.14.1
12. Existing congestion is related to school traffic and this could be addressed.	107	4.1.2.1
13. Even with a new bridge B-doubles and trucks through Grafton would create congestion as their numbers grow.	P2	4.1.2.1 & 4.1.4.1
14. Option 15 would reduce traffic on the existing bridge and operate as an overflow for peak hour traffic.	13,15,90,115	4.1.2.1 & 4.1.16.1
15. Option 15 would not solve the projected increase in local traffic travelling between Grafton and South Grafton using the existing bridge.	79	4.1.2.1
16. Demand management could include financial incentives; vehicle movement controls and strategies; user pays strategies; parking strategies; public transport initiatives; improving and promoting bicycle and pedestrian security, safety and access; car-pooling, education about advantages of buses.	96,116	4.1.2.2
17. Option E and A would create a bottleneck at Fitzroy and Villiers Street.	118	4.1.2.4
18. Option C would be best and would deliver the largest expected redirection of traffic from the existing bridge, improving traffic flow without bottle necks.	20,33,61,62,74,95,118	4.1.2.1
19. In town options would create connectivity issues with the closure of local roads.	P2	4.1.6.1
20. Option C would retain congestion unless bridge improvements or one-way streets were implemented.	22,111,114	4.1.2.1 & 4.1.2.2
21. Option E would bring higher levels of traffic to the CBD, has the lowest projected usage, would create a bottle neck and would be underutilised.	22,43,89,98,118	4.1.2.1

Issue raised in submission	Submission number	Section Addressed
Traffic congestion		
22. Any option other than A would have little effect in reducing Bent and Fitzroy Street's peak hour congestion.	75	4.1.2.1
23. Option A would not solve the expected growth in traffic.	79	4.1.2.1
24. Options E and C would address traffic congestion and benefit local traffic.	79	4.1.2.1
25. Options A and C do not improve traffic compared with 11 and E.	104	4.1.2.1
26. Option A would provide a quick trip for South Grafton residents and is the best option to improve cross river traffic flow.	9,17,58,75	4.1.2.1 & 4.1.6.1
27. Option C is the second best option to improve cross river traffic flow.	9	4.1.2.1
28. Options A and C would provide the required relief for traffic flow and could be used for each bridge to have all traffic one way.	22,45,64	4.1.2.1 & 4.1.22.3
29. Option A would improve travel time but retain bottlenecks on Bent, Villiers and Fitzroy Streets.	98	4.1.2.1 & 4.1.2.4
30. DPI believes there is a need to have good transport linkage from the subregion's towns and villages to Grafton so people can access services and jobs.	116	4.1.16.7
31. Option 11 provides for short-term relief of current crossing and long-term growth including Junction Hill and Clarenza.	11,52	4.1.2.1 & 4.1.6.1
32. Option 14 would be best thinking long term.	87	4.1.2.1
33. Options 14 and 15 would only improve life for people using Summerland Way and bypassing Grafton. Economic development for locals travelling from South Grafton to Grafton would not be improved.	7	4.1.2.1
34. Option E would not divert unnecessary traffic around CBD	44,50,114	4.1.2.1

4.1.2 Traffic congestion - RMS response

Many submissions received by RMS indicated the additional crossing should relieve congestion on the current bridge. Submissions supported the option or options the submitter

believed would achieve this. There were also suggestions that RMS should implement demand management measures to delay the need for an additional crossing, and also to deal with the existing and likely future congestion.

The six short-listed options were referred to in submissions as in town options, E, A and C, and out of town options, 11, and 14 and 15, and this terminology has been adopted for the purposes of this report. It is acknowledged there was some criticism of the out of town options because they would be less effective at reducing congestion on the existing bridge. However, Traffic modelling was undertaken to identify the extent to which the options would address the congestion problem.

4.1.2.1 Analysis of options to relieve traffic congestion

The purpose of the project is to identify an additional crossing of the Clarence River to address short-term and long-term transport needs. RMS recognises that there is lot of community support for a bypass option. However, the origin and destination of traffic crossing the river is an important consideration in the selection of the recommended preferred location for the additional crossing.

Most concerns that have been raised about congestion have related to peak hour congestion on the existing bridge and approaches. Some submissions also identified specific events or design features which cause congestion, such as school times, the design of the current bridge including the kinks, and the merge lanes on either side. Other concerns were raised regarding the impact of congestion around the Grafton Hospital.

Congestion is related to a variety of factors, including school traffic, trips associated with work start and finish times, and the configuration of the current bridge. All of these factors have been taken into account in the traffic modelling and design of the six short-listed options.

The analysis undertaken on traffic using the bridge shows that 97% of the traffic has an origin (start) or destination (finish) point in Grafton or South Grafton. This highlights that the majority of trips are local in nature.

The results of the traffic modelling, as presented Chapter 6.1 of the RODR show that at the time of the assumed year of opening (2019), all six route options would perform similarly, and result in substantial network improvements. However, as traffic demands increase in the later years (2039 and 2049), the options that are in close proximity to the existing bridge (Options E, A and C) perform better than those further downstream (Options 11, 14 and 15), in terms of average speed, travel times and total distance travelled.

The results also indicate:

- The “do minimum" results show that if the assumptions of growth are realised by 2029 the demands across the river would significantly reduce the performance of the network, potentially causing grid lock during the peak periods.
- All options with a new bridge in close proximity to the existing bridge (ie Options E, A and C) attract much more traffic away from the existing bridge when compared to those downstream (Options 11, 14 and 15).

- The network performance in Options 14 and 15 deteriorates in future years with average speeds in the AM peak up to 40 per cent less than the other options by 2049. This is a result of the majority of motorists still wanting to use the existing bridge with those options.

- From 2029 and beyond, point-to-point travel times indicate that Options E and C provide the shortest travel times between South Grafton and Grafton; and that Options 14 and 15 provide the shortest travel times between Butterfactory Lane and the Pacific Highway to the south via the new bridge.

- In 2049 Options E and C provide the best overall travel speeds in the AM and PM peaks. Options A and 11 perform well in the AM peak but average travel speeds drop off in later years during the PM peak, particularly for Option A.

In summary, the modelling presented in this report indicates that each of the options provide improved operation of the network, with the options close to the existing bridge (Options E, A and C) performing better than the options further downstream.

The microsimulation model also provides the likely distribution of cross-river traffic between the existing bridge and the additional crossing. The modelling shows that, during peak periods, a relatively high proportion of traffic (around 70 per cent) would use the new bridge with Options E, A and C. This proportion is relatively constant over time.

However, for the route options that are further downstream (Options 11, 14 and 15) a much lower proportion of traffic would use the new bridge. The proportion varies from 20 to 30 per cent in 2019 to 35 to 45 per cent in 2049. The reasons for lower utilisation of the new bridge with the downstream options is most likely a function of the trip origins and destinations with fewer motorists choosing to use the new bridge because of the longer travel distances. In later years, as congestion and delays on the existing bridge increase with the downstream options, more motorists then choose to use the new bridge.

4.1.2.2 Demand management

RMS will continue to consider demand management strategies while identifying a preferred option for an additional crossing as soon as possible. Demand management strategies currently in place include restrictions on heavy vehicles during peak times on the bridge and restricting turning movements on local streets close to either end of the bridge during peak times.

Further strategies would be investigated over time to manage demand around and over the existing bridge prior to completion of an additional crossing.

4.1.2.3 Hospital environs

All options include the upgrading of the Villiers Street and Dobie Street roundabout to improve turning movements for heavy vehicles. This upgrade would encourage heavy vehicles to use Dobie Street rather than Arthur Street, where the Grafton Hospital is located, to get to and from Villiers Street.

4.1.2.4 Design of the existing bridge and approaches

All options would relieve congestion by moving traffic away from the existing bridge and onto the new bridge, hence decreasing conflicts associated with the “kinks” on the existing bridge.

Articulated heavy vehicles which currently have problems negotiating the “kinks” on the existing bridge would be required to use the new bridge. This would occur through further restrictions on the existing bridge. By reducing the number of vehicles on the existing bridge and placing restrictions on articulated heavy vehicles, capacity on the existing bridge would increase, and congestion would reduce.

As there would be no “kinks” on the new bridge, providing two more traffic lanes across the river would more than double the capacity of the existing crossing. Detailed traffic modelling shows that one additional lane in each direction would cater for predicted traffic volumes through to 2049. Local intersection improvements would also be made to the existing local road network, which would alleviate most of the congestion associated with merging traffic. The road upgrades included for each option are designed for traffic growth through to 2049.

With the proposed upgrades in place, travel times in 2049 for Options E, A, C and 11 (between Bent Street/Gwydir Highway intersection South Grafton and Prince Street/Pound Street intersection Grafton) are predicted to be better than or similar to the existing travel times in 2012. These upgrades include improvements to various intersections within Grafton and South Grafton, such as the Fitzroy and Villiers Street intersection. Under both Options E and A the intersection of Villiers and Fitzroy Streets would be upgraded to provide increased capacity, turning movements and include traffic signals. Traffic modelling undertaken as part of the RODR indicates these upgrades are adequate to cater for traffic volumes to the year 2049.

In summary, as the existing bridge is currently congested during peak times, any additional crossing would benefit movements in and around Grafton and South Grafton.

4.1.3 Heavy vehicles and freight networks – submissions

Issue raised in submission	Submission number	Section Addressed
Heavy vehicles and freight networks		
1. Option E allows earlier diversion to Gwydir and gives two options for southbound travellers.	1,80,82	4.1.4.1
2. Options 14 and 15 are supported as they would remove heavy traffic from CBD.	3,9,10,14,15,16,19,23,24,25,28,30,39,42,43,44,46,50,52,60,65,66,76,77,90,94,96,97,105,115	4.1.4.1
3. Option11 would take traffic, heavy vehicles and buses out of CBD, provides an alternate crossing and clears traffic through to Villiers Street.	44,52,78,62,63,66,77,78,112	4.1.2.1 & 4.1.4.1
4. Option 15 would service heavy vehicles travelling to Casino, Lismore and other centres off Summerland Way.	14,23,24,39, 50, 90	4.1.4.1
5. Most semis coming to the CBD are there to service Grafton and few use Summerland Way.	74	4.1.4.1

Issue raised in submission	Submission number	Section Addressed
Heavy vehicles and freight networks		
6. Move the B-double route as well directing as many timber jinkers, semi-trailers and coaches as possible, to the new bridge on the outskirts of Grafton.	P2, 29	4.1.4.1 & 4.1.4.2
7. Options 11 and 14 divert unnecessary traffic including B-doubles through residential areas.	93	4.1.2.1 & 4.1.4.1
8. Option C is not as convenient to the outskirts of Grafton for larger vehicles.	112	4.1.2.1 & 4.1.4.1
9. Option 14 would allow access to the North St industrial centre without going through the CBD.	86	4.1.4.1
10. It would be desirable if traffic, particularly heavy vehicle traffic, can efficiently move between the Pacific Highway and Summerland Way in both directions without excessive impact.	116	4.1.4.1 & 4.1.4.2
11. Option A requires west bound B-doubles to round the Villiers Street Fitzroy Street roundabout in the right lane in order to merge onto the new bridge. This is not great traffic dynamics.	89	4.1.2.4
12. Department of Planning and Infrastructure (DPI) sees Summerland Way as being a strategic intra- and inter-state transport corridor which is likely to grow in importance in the future.	116	4.1.4.2 & 4.1.18
13. Traffic should be able to move efficiently between the Pacific Highway and Summerland Way in both directions without too much impact on Grafton.	116	4.1.4.1 & 4.1.18
14. Plans for the freight network from QLD to Coffs Harbour, including the Pacific Intermodal and Logistics and Summerdowns Rail Terminal, contemplate an upgrade of Summerland Way and a second bridge at Grafton.	P2	4.1.18
15. DPI believes it would be desirable if traffic, particularly heavy vehicle traffic, can efficiently move between the Pacific Highway and Summerland Way.	116, P2	4.1.4.1 & 4.1.18
16. A bridge crossing which provides an efficient, low-impact, route through/beside Grafton for heavy vehicles (and other through-traffic) would be desirable.	116	4.1.4.1
17. Options 14 and 15 move heavy vehicles out of town to an extent but seem economically unviable.	56	4.1.4.1 & 4.3.2

4.1.4 Heavy vehicles and freight networks - RMS response

The management of heavy vehicles through Grafton and South Grafton was raised consistently in submissions relating to traffic and transport matters. Many submissions argued that the out of town options, and in particularly Options 14 and 15, would remove the heavy vehicles from town. Option E was also suggested as a way to enable an earlier diversion for trucks using the Gwydir Highway.

4.1.4.1 Movement of Heavy Vehicles

In relation to the movement of heavy vehicles, vehicle surveys found that only 5% of traffic using the existing bridge is classified as heavy vehicles, which also includes rigid vehicles (including buses) and articulated vehicles (semi-trailers and B-doubles). Of this, 88% of trucks using the existing bridge are coming from or going to Grafton or South Grafton. Both Grafton and South Grafton contain shops and businesses that generate freight traffic through delivery of goods and services.

Trips made by heavy vehicles into these areas are also associated with activities such as, road maintenance, or construction activities. A relatively small proportion of heavy vehicles using the bridge is through traffic (12% of heavy vehicle numbers). This includes vehicles travelling from areas north of Grafton, such as Summerland Way, to areas south of Grafton (including the Pacific Highway and the Gwydir Highway).

Based on the origin and destination surveys, and supported by the traffic modelling results, Option 14 and 15 would not remove significant volumes of heavy traffic from the CBD. This is because the majority of the heavy vehicle traffic needs to access areas within Grafton and South Grafton.

With regard to Option E and the Gwydir Highway, surveys and traffic predictions showed that the majority of heavy vehicles crossing the existing bridge have an origin or destination on the east side of Bent Street in South Grafton (eg Pacific Highway and Armidale Road) rather than on the west side of Bent Street (eg Gwydir Highway).

4.1.4.2 Freight route

It is not the intention of the new crossing to provide an additional freight corridor through Grafton and South Grafton, or to change the role and function of local roads such as Centenary Drive to carry heavy vehicles. Further, the project is not seeking to attract more heavy vehicles onto Summerland Way. The role of Summerland Way is discussed in section 4.1.6 below relating to the Pacific Highway upgrade.

The new bridge would be designated for use by freight vehicles accessing Grafton or Summerland Way. B-doubles and semi-trailers currently using the existing bridge would be required to move to the new route. Buses would still be able to use the existing bridge. Arrangements for heavy vehicles would be further considered during the refinement of the concept design and environmental assessment for the preferred route.

4.1.5 Connectivity - submissions

Issue raised in submission	Submission number	Section Addressed
Connectivity		
1. Option E is preferred for access between North and South Grafton and links the south side at CBD level.	21,34,36,67,72,80,82	4.1.6.1
2. Options 14 and 15 would be a longer but convenient route with a direct connection to Prince Street - people would adapt to the fastest route.	28,43,60,115	4.1.6.1 & 4.1.16.1
3. Options 14 and 15 allow traffic to enter Grafton from all directions.	115	4.1.6.1 & 4.1.6.2
4. Options A, E and E convenient for South Hill residents	38	4.1.6.1
5. Options 14 and 15 convenient for Lower River travellers.	38, 39,43,96,98	4.1.6.1 & 4.1.6.2
6. Options 11, 14 and 15 provide access for Westlawn, Junction Hill and Clarenza and North Grafton.	52,111	4.1.6.1 & 4.1.6.2
7. Option C links more effectively to the Pacific Highway in two places.	70	4.1.6.1
8. Option 14 would connect Grafton and Yamba more effectively	86,105	4.1.6.1
9. Option 15 would link South Grafton and Trenayr.	50,98	4.1.6.1
10. The new bridge should serve the town and its residents and link North and South Grafton with a bridge beside the existing one.	P1,113	4.1.6.1
11. The existing bridge should accommodate mostly local traffic and a new bridge should be located downstream.	100	4.1.6.1 & 4.1.2.1
12. An in town option would create connectivity issues with closure of local roads.	115	4.1.6.1 & 4.1.6.2
13. In town options would divide the town by increasing traffic on Summerland Way.	P2	4.1.6.1, 4.1.2.1 & 4.1.4.2
14. Option A permits large vehicles with wider tracks to traverse the bridge and would enable the existing bridge to be upgraded to two lanes in the same direction.	22	4.1.22.3

Issue raised in submission	Submission number	Section Addressed
Connectivity		
15. Option A enables upgrading to two lanes in the same direction.	23	4.1.22.3
16. Request that RMS provides a continuous shared path for the entire route option.	90	4.1.6.3
17. Opportunities exist to incorporate cycling facilities into the design of the bridge.	88,89,90	4.1.6.3
18. Option 15 would be of use to industries in Junction Hill and future residents of Junction Hill to access Yamba, Wooli or Minnie Water.	14,28,93	4.1.6.2
19. Options 14 and 15 include two two-way routes for access allowing future growth.	39	4.1.6.1 & 4.1.6.2
20. Options E, A and C do not address the implications of the projected growth of Junction Hill and Clarenza.	52	4.1.6.2
21. Option E would tie in with Council's Precinct Plan.	82	4.1.6.1

4.1.6 Connectivity – RMS response

4.1.6.1 Connectivity between Grafton and South Grafton

One of the main objectives of the project is to improve traffic efficiency between and within Grafton and South Grafton, as well as ensuring the short and long-term transport needs of the community are addressed. This relates both to connectivity across the Clarence River and between the urban areas on either side.

All options would provide some improvement in the level of connectivity between Grafton and South Grafton. All options would increase connectivity across the Clarence River, with the in town options having a greater connection to the urban area of South Grafton and Options C, 11, 14 and 15 providing a link to the growth area of Clarenza. An additional crossing would also result in reduced congestion across the overall road network. The level of connectivity of each of the route options with existing and future residential areas, existing and future employment areas and the two CBDs is discussed in the RODR under section 6.4.1.

As noted in the RODR section 6.4.1, Option E provides a relatively more direct link between the two CBDs than the other options and would provide the strongest improvement to connectivity to this area. However the overall assessment of the options needed to consider access and connectivity to all areas including existing and future residential, employment, commercial and industrial areas.

4.1.6.2 Connectivity to growth areas

Options 14 and 15 provide improved connectivity between the two separate growth and employment areas of Junction Hill and Clarenza. However, they have only a low potential to improve connectivity between the Grafton and South Grafton CBDs compared with the in town options. All options perform similarly with regard to connecting existing and future residential areas with existing and future employment areas. All options would provide a connection to the growth area of Junction Hill either through the existing local street network, or via Turf Street / Summerland Way.

Further to this, all options include some restrictions to movements from the local roads onto the main connecting roads into Grafton and South Grafton, such as left-in left-out restrictions and cul-de-sacs. Where turning restrictions are required, alternative routes are available even though travel distances may increase in some cases. Connectivity across the town however would still be maintained.

4.1.6.3 Cycle path connectivity

All options incorporate a shared path 3.1m wide for pedestrians and cyclists on the new bridge and 2.5m alongside the main approach roads. The in town options would provide greater opportunities for pedestrian and cycle connectivity to the urban areas of South Grafton, with Option E providing the best connection to the South Grafton CBD.

The connection opportunities for pedestrian and cycle networks for each of the options is discussed in the RODR (page 141). Pedestrian and cycle paths on the local road network surrounding the new bridge would be discussed with Clarence Valley Council during the concept design phase.

While one option may benefit one specific area of the community, the project considers the entire Grafton and surrounds, and has to balance the benefits overall.

4.1.7 Emergency vehicles - submissions

Issue raised in submission	Submission number	Section Addressed
Emergency vehicles		
1. Options 14 and 15 would not improve emergency vehicle access between North and South Grafton.	31	4.1.8
2. Any option other than A would improve emergency access. A second crossing with alternate approaches would allow emergency vehicles two options for access. Option A uses the same approach roads for both bridges.	71	4.1.8
3. A second crossing with alternate approaches to allow two options for emergency vehicles is required.	71	4.1.8
4. Crossings should be located strategically to improve response times for emergency vehicles. This is best resolved by option 15.	93	4.1.8

4.1.8 Emergency vehicles – RMS response

The existing bridge is currently congested during peak times. Any additional crossing would benefit emergency vehicle access between Grafton and South Grafton.

In addition to this the following information has been provided on the project website following discussions with the emergency services:

Discussions with Fire and Rescue NSW indicate an overall preference for Option A or C as being the options most likely to reduce response times when fire trucks need to cross the Clarence River, with an overall preference for Option C.

Discussions with the Ambulance Service of New South Wales indicated that congestion on the existing bridge was rarely a critical problem for them and that because of wide variability in the locations of the ambulance and the incident it was not possible overall to identify a bridge option that would be better or worse for response times. As such they had no preference for one option over another.

4.1.9 Public Transport – Submissions

Issue raised in submission	Submission number	Section Addressed
Public transport		
1. This project is a tremendous opportunity to positively impact on the region's public transport network. Conversely some options could render significant harm to public transport if chosen.	73	4.1.10
2. Option A and E would remove the most traffic from the existing bridge and are preferred by the local bus company, Busways.	73	4.1.10
3. A fundamentally important outcome is linking Grafton and South Grafton by the shortest possible connection.	73	4.1.6.1
4. Option A would decrease congestion and maintain the coverage of and access to bus services and improve viability of public transport.	73	4.1.10 & 4.1.2.1
5. Option E would remove services from Through Street and the northern end of Skinner Street., affect bus transport for Clarence Valley Anglican Primary School and create safety issues and make crossing the Gwydir Highway difficult for buses.	73	4.1.10

4.1.10 Public Transport – RMS response

RMS is working with various stakeholders across the community, including public transport operators, to ensure the preferred location for an additional crossing takes into account all transport modes, including public transport.

Regardless of which option is chosen as the preferred option, there would be further discussions with Council and local bus companies to optimise the coverage and efficiency of bus routes once the new bridge is opened.

4.1.11 Safety – Submissions

Issue raised in submission	Submission number	Section Addressed
Safety		
1. Option 15 is preferred as it would avoid heavily populated areas and would take heavy trucks (especially B-doubles) away from residential areas.	3,13,18,52	4.1.4.1
2. Options A, C, E and 11 would cut through densely populated areas and endanger human lives.	3	4.1.2.1 & 4.1.12
3. Options 14 and 15 have high safety risks for the existing bridge.	7	4.1.12
4. Option 11 increases potential danger in a residential area with sporting fields.	8,43	4.1.12
5. Options 11, 14 and 15 are safer regarding heavy vehicles traversing residential areas.	52	4.1.4.1 & 4.1.12
6. Options E, A and C have heightened risk and safety issues regarding heavy vehicles manoeuvring through residential areas.	52	4.1.4.1 & 4.1.12
7. Option E would remove access to a fire panel associated with the Sisters of Mercy Convent and deny access to the Convent building for the fire brigade via Villiers Street.	59,109	4.1.14.2
8. Concern about the existing structural integrity of the bridge and ability to withstand construction impacts.	71,103	4.1.22.11
9. Option A would create dangerous access and pedestrian environment for residents from reversing movements from driveways.	71	4.1.12

Issue raised in submission	Submission number	Section Addressed
Safety		
10. Evacuation during times of flooding would be restricted by options A, C and E.	71	4.2.16.3
11. Option E would involve large vehicles at the end of Cowan Street and create safety problems for children.	77	4.1.12
12. Option 11 would make the streets safer for pedestrians with less large vehicle traffic flow.	112	4.1.12 & 4.1.4.1
13. All in town options have the highest impact on pedestrian and road safety.	P2	4.1.12
14. Options C, 11, 14 and 15 would cause more accident black-spots and traffic congestion including for those wishing to bypass Grafton until the Pacific Highway is upgraded.	45	4.1.12 & 4.1.2.1
15. Any out of town option would minimise and prevent impacts by improving safety for all – residents and tourists.	115	4.1.12 and 4.1.2.1
16. Option E involves increased traffic risks to children in the Victoria and Villiers area.	118	4.1.12

4.1.12 Safety – RMS Response

An additional crossing would improve road safety regardless of the location by decreasing the current conflicts on the existing bridge, particularly relating to heavy vehicles and the "kinks". Long, heavy vehicles cannot negotiate the kinks without crossing the centrelines. With articulated heavy vehicles required to use the new bridge, this conflict would be significantly reduced.

The road safety audit undertaken for the RODR identifies potential safety issues for all options, including safety issues relating to pedestrians and cyclists. The audit identified that Option A has the highest number of inherent safety issues, followed by Option E. Options C, 11, 14 and 15 have fewer inherent safety issues. However, Options 14 and 15 would result in increased travel demand on the existing bridge in the longer term, leading to more conflicts associated with the kinks on the existing bridge.

Specific to Options E, A and C, the Road Safety Audit identified potential safety issues around the continued exposure of vulnerable road users, such as pedestrians and cyclists, to heavy vehicles and through traffic. All options, including those out of town, introduce design elements which would increase potential for conflict between pedestrians and cyclists and motorised vehicles.

Any identified preferred location would undergo a concept design and environmental assessment phase. During this phase RMS would investigate measures to mitigate any identified safety concerns associated with the location and design of the bridge. This would include including ensuring safety for pedestrian and cyclists and providing appropriate access to adjacent properties on local roads. Upon construction commencing, RMS and its contractors would implement relevant traffic management measures to address any potential safety concerns that may arise during construction.

4.1.13 Local road impacts - submissions

Issue raised in submission	Submission number	Section Addressed
Local road impacts		
1. Option E would disrupt access and remove all parking options for Villiers Street. This would force more parking into Victoria Street which is already near capacity.	59, 98, 109	4.1.14.2
2. The loss of curtilage adjacent to the western façade of St Mary's Convent associated with Option E presents substantial access issues.	109	4.1.14.2
3. Access to the riverbank property for mowing and other maintenance is currently via Villiers Street and would be removed under Option E.	59	4.1.14.2
4. Option C would directly affect access from houses in Clarence Street because of traffic queuing at lights.	82	4.1.14.2
5. Option C would have a huge [negative] impact on entry into the TAFE College.	98	4.1.14.2
6. Option A could close part of Kent Street affecting access to the Dovedale area and the Sailing Club.	71	4.1.14.2
7. Steep grade issues on approach roads would prevent access to the second bridge to Villiers Street.	P2	4.1.14.2, 4.1.14.3
8. Any out of town option would alleviate congestion and capacity issues impacting on parking, access, pedestrians, and businesses.	115	4.1.2.1, 4.1.14.3 & 4.2.12
9. All in town options have the highest impact on essential car parking.	115	4.1.14.2
10. A four lane road with access to the TAFE for Option C would have significant road safety issues and limit access into and out of Clarence Street.	115	4.1.14.2 & 4.1.12

Issue raised in submission	Submission number	Section Addressed
Local road impacts		
11. Option A does not fragment existing settlement patterns.	22	4.1.14.1

4.1.14 Local road impacts – RMS response

4.1.14.1 Road widening

Designs for all options were developed to provide road widening necessary for local road upgrades to allow increased turning movements at specific intersections. The road widening and upgrades included for each option allow for traffic growth to 2049. The in town options would impact more on on-street parking than Options 11, 14 and 15. Opportunities to mitigate the impact of these options on parking would be considered further in the design development phase of the preferred option.

Option A was seen by some as having the least impact on the existing Grafton and South Grafton streetscape.

For Option A the approach road in South Grafton is mostly aligned with the street grid. However, the viaduct in Grafton would not be aligned with the street grid. This elevated approach road would affect the urban pattern between Craig Street and Fitzroy Street. There would also be road upgrades associated with Option A which would affect the existing streetscape, including:

- impacts on existing street trees on both sides of the river;
- a substantial widening of Fitzroy Street effectively splitting traffic across the existing bridge and the adjacent new bridge; and
- intersection treatments that include removing roundabouts and replacing these with traffic lights.

4.1.14.2 Access and parking

In upgrading local roads as a result of an additional crossing, access arrangements to properties and on-street parking may be affected.

Issues were also raised about Options E, A and C regarding grade issues preventing access to connecting local roads.

In relation to the specific concern regarding the potential changes to Kent Street, access to the Dovedale area and the Sailing Club. The design intent for Option A is that the roadway connection between Kent St and Fitzroy St would remain open to traffic.

Any identified preferred option would undergo a concept design and environmental assessment phase. Aspects such as access and parking would be assessed comprehensively during that phase. The aim of the concept design phase is to, amongst other things, minimise the impact on adjacent properties, minimise the loss of on-street

parking due to future road upgrades, and ensure access to existing properties can be accommodated, including for maintenance and fire safety reasons, while ensuring the safety of all road users.

4.1.14.3 Villiers Street

In relation to Villiers Street, all options would require the lowering of Villiers Street to enable heavy vehicles to service the Grafton central business district. This was an omission in the September Community Update, however was included in the RODR, under sections 4.6.2, 4.7.2, 4.8.2, 4.9.2, and 4.10.2– Road Network Upgrades.

The current design for Option E proposes that the Bridge approach on the northern side of the Clarence River be at ground level by the intersection with Villiers and Victoria Streets. For Options A and C, the approach roads would be at ground level at the intersections with Clarence Street and Pound Street respectively. As such, with the exception of the southern end of Villiers Street, access to adjacent properties, would not be an issue. For the properties at the southern end of Villiers Street with Option E, access would be obtained via Victoria Street.

Any identified preferred option would undergo a concept design and environmental assessment phase. Aspects such as access and parking would be assessed comprehensively during that phase.

4.1.14.4 Impacts on Streetscape

All options would have some effect on the Grafton and South Grafton streetscape. For Option A the approach road in South Grafton is mostly aligned with the street grid. However, the viaduct in Grafton would not be aligned with the street grid. This elevated approach road would affect the urban pattern between Craig Street and Fitzroy Street. There would also be road upgrades associated with Option A which would affect the existing streetscape, including:

- impacts on existing street trees on both side of the river;
- a substantial widening of Fitzroy Street effectively splitting traffic across the existing bridge and the adjacent new bridge; and
- intersection treatments that include removing roundabouts and replacing these with traffic lights.

The impact of a new crossing on streetscape would be further evaluated during the concept design phase.

4.1.15 Traffic study and demographics – submissions

Issue raised in submission	Submission number	Section Addressed
Traffic Study and Demographics		
1. Option A is the only option with a 3 lane configuration and all vehicles travelling in one direction so it cannot be compared with other options.	71	4.1.16.1

Issue raised in submission	Submission number	Section Addressed
Traffic Study and Demographics		
2. Concerned about the lack of traffic counters near schools at Clarenza	71	4.1.16.3
3. Traffic report assumes vehicles travelling between Junction Hill and South Grafton and Clarenza would not use Options 14 and 15. Lack of delays in school holidays contradicts this.	71	4.1.16.4
4. RMS could regulate to require that heavy vehicles and buses use the new bridge in a downstream location.	71	4.1.2.4
5. Traffic counts are of concern because: a. they were undertaken on a pension day and traffic is greater on those days; b. they were not done also on a Friday evening to reflect that peak; and c. some counters were broken.	71,93,115	4.1.16.5
6. Traffic counts show a number of heavy vehicles that use the bridge do not travel to the CBD.	71	4.1.4.1
7. Rate of population growth underpinning the traffic growth models are inconsistent with and greater than the Infrastructure NSW estimates.	84	4.1.16.7
8. Query about the annualising factor for traffic peaks relied on in the economic evaluation and the potential exaggeration of benefits.	84	4.1.16.8
9. 2011 traffic study report indicates that over 40% of traffic is not destined for the CBD.	P2	4.1.16.6
10. Accuracy of 2011 traffic study is doubted and comparisons with 2009 study questionable.	P2,115	4.1.16.6
11. Summerland Way is predicted to experience increased traffic from Grafton to Casino and Kyogle due to population and industry growth.	P2	4.1.18
12. Plans for the freight network from Qld to Coffs Harbour contemplate an upgrade of Summerland Way and a second bridge at Grafton.	P2	4.1.18
13. Within 30 years forecast is for 1,600 trucks per day on Villiers Street (currently 2,250 trucks on Pacific Hwy) 50,000 vehicles entering Grafton (5 times current Pacific Hwy traffic at South Grafton). This suggests that any out of town option would minimise impacts.	115	4.1.2.1 & 4.1.4.1
14. The RMS travel times only consider travel between and within Grafton and South Grafton. Figures are distorted and influenced by this focus.	115	4.1.16.5, 4.1.16.6, & 4.1.16.7
15. Current and future truck and traffic counts for the road network in and around Grafton especially Villiers Street and Summerland Way through Grafton appear not to have been fully addressed and considered, particularly given that truck company's depots are mostly in town	115	4.1.16.3 & 4.1.16.5
16. The Mid North Coast Regional Strategy (2009) identifies Grafton as a "major regional centre" in the hierarchy of the region's settlement.	116	4.1.16.7

Issue raised in submission	Submission number	Section Addressed
Traffic Study and Demographics		
17. Grafton's main role is to serve the Clarence Valley subregion with major services such as jobs, retailing, medical, sport and cultural facilities.	116	4.1.16.7
18. The RMS report (e.g. section 6.4.1 of the Main Report) tends to focus on linkages between Grafton and South Grafton, with much less emphasis in Grafton's wider role in the subregion.	116	4.1.16.5, 4.1.16.6 & 4.1.16.7
19. The current and planned future growth of employment land north of Junction Hill is likely to add to this need.	116, P2	4.1.16.4 & 4.1.16.7
20. The main population centres in Grafton's functional catchment are Maclean (including the growing community of Gulmarrad) and Yamba.	116, P2	4.1.16.7
21. Yamba and its population is not recognised the RODR.	116, P2	4.1.16.7
22. The RMS is only looking at the local picture and assumed traffic movements for the next 30 years. The impacts of major local population growth areas are not being fully considered into the future.	115	4.1.16.1, 4.1.16.5 & 4.1.16.7
23. The current and planned future growth of employment land north of Junction Hill is likely to add to current transport needs.	116	4.1.16.4 & 4.1.16.7
24. A second bridge is required to support regional growth.	118	4.1.16.9

4.1.16 Traffic Study – RMS response

4.1.16.1 Traffic model

The traffic model accounted for driver behaviour. The microsimulation traffic model that was used models the likely impact of changes in traffic patterns resulting from changes to traffic flow (demand) and/or changes to the physical environment (road network). While some drivers may choose to access either side of the river utilising an out of town bridge location, travel times associated with using these options tend to be longer. With Option 14 or 15 for example, traffic would need to travel back into town to access goods and services within the two CBD areas of Grafton and South Grafton after crossing the river. This is a less desirable outcome in terms of increasing travel time and vehicle kilometres, in addition to not addressing congestion in town.

The traffic analysis undertaken on traffic utilising the bridge shows that 97% of the traffic has an origin (start) or destination (finish) point in Grafton or South Grafton.

4.1.16.2 Comparing Option A with other options

Option A has a different lane configuration than other options. However, the number of vehicles travelling on the new bridge is not an assessment criterion. The assessment criteria are set out in the RODR. The assessment is based on how effectively an option achieves the goals of the project.

When looking at performance over the entire network, Option A is predicted to perform better than the out of town options in terms of reducing traffic congestion and reducing traffic delays.

4.1.16.3 Traffic counters

In terms of the placement of traffic counters, traffic counts used in the modelling included counts conducted at:

- Centenary Drive north of Helens Drive - 2009
- Centenary Drive - 2011
- Pacific Highway south of Centenary Drive - 2010
- Pacific Highway north of Centenary Drive - 2010
- Pacific Highway/Duncan's Lane intersection - 2006

The number and location of traffic counts in the Clarenza area is considered appropriate based on the current level of development.

With regard to some of the traffic counters not working, RMS acknowledges that some of the tube counters were faulty during some of the tube count data collection period. These were on four sites within the study area.

Only data recorded from outside of the times when the counters were either not recording, or providing incorrect data was used for the traffic assessments. The impact of the exclusion of such data from the reporting was considered and it was concluded that its exclusion would not impact on the results. This is because they represent a small percentage of the entire data set for all sites over the week.

4.1.16.4 Travel to and from Junction Hill and Clarenza

With regard to vehicles travelling between Junction Hill and Clarenza, the route choice in the traffic model is not an assumed input. The traffic model calculates the best route between Junction Hill and South Grafton or Clarenza. For example, based on travel time including the effects of congestion and distance, the modelling showed that motorists travelling between Junction Hill and Clarenza or Junction Hill and South Grafton would use the new bridge (in the Corcoran park area) for Options 14 and 15.

In terms of where these suburbs lie in relation to Grafton, Junction Hill lies within 6km of the Grafton post office, and Clarenza is within 3km of South Grafton, thus they are considered part of the larger Grafton and South Grafton areas respectively. Further, access to goods and services is primarily obtained through the Grafton / South Grafton CBDs due to the proximity of these localities to the main activity centres. As a result, for transport modelling purposes, Clarenza is considered as part of the South Grafton areas. Population growth in the Junction Hill area was included as part of the traffic modelling for future years.

Further, Clarence Valley Council advised that two of the future growth areas were Junction Hill and Clarenza. It was prudent to include these areas as, in the future, they will house a large proportion of the Grafton population and should be considered in the Grafton context.

4.1.16.5 Collection and interpretation of data

Traffic surveys are typically completed on a Tuesday, Wednesday or Thursday, as opposed to a Monday or Friday which experience variations due to being so close to the weekend. Thursdays are typically higher than the weekday average by 5 – 6%. However, the advantage of this information is that it allows RMS to utilise traffic data for a day which may place additional pressures on the overall system, thus exposing any potential problems in the network. This is consistent with RMS using the 85th percentile of traffic figures when recording and assessing the road network.

There has been a significant amount of traffic surveys and analysis undertaken since 2006 relating to the Grafton Bridge project. These include:

- Surveys undertaken on Thursday 15 and Friday 16 November 2007 between 7am – 10am and 4pm – 7pm investigating turning movements and origin and destination surveys.
- Traffic data supplied by the Clarence Valley Council comprising of two-way daily traffic volume counts at numerous sites across the study area. Counts were taken a number of times between 2006 up to 2009
- An Origin and Destination survey undertaken between 7am and 9am on Wednesday 11 March 2009 supported by automatic tube counts and turning movements counts undertaken in March 2009 for the *New crossing of the Clarence River at Grafton Traffic Study Report* (December 2009)
- Origin and Destination surveys undertaken between 5am and 7pm on Thursday 19 August 2010 supported by automatic tube counts undertaken over a week for the *Heavy Vehicle Study* in August 2010
- Automatic tube count data at numerous sites around the study area for two weeks in June / July 2011, as well as queue length surveys on southern side of the bridge in the AM peak and the northern side of the bridge in the PM peak
- Travel time surveys between the Gwydir Highway and Villiers Street in 2011 and 2012.

4.1.16.6 Comparing traffic survey results

The table below provides a summary of 2009 and 2010 survey findings:

	March 2009*		August 2010**	
Trip description	VPD***	%	VPD	%
External to External (through trips)	533	2%	728	3%
External to Grafton / South Grafton	12,219	53%	10,360	39%
Internal - Grafton to/from South Grafton	10,462	45%	15,466	58%
TOTAL	23,214		26,554	

* Representation of a origin-destination survey undertaken 7 to 9am on Wednesday 11 March 2009

** Actual counts based on Origin Destination Surveys undertaken 5am to 7pm on Thursday 19 August 2010

***Vehicles per day (VPD)

The 2009 survey identified a higher proportion of external to internal Grafton / South Grafton trips than the 2010 survey (53% vs 39% respectively). Correspondingly there were fewer internal to internal trips in 2009 than in 2010 (45% vs 58%).

The following factors need to be taken into account in any comparison between the two surveys.

- The 2009 survey counted trips between 7am and 9am whereas the 2010 survey counted trips between 5am and 7pm. Consequently, the 2010 survey was over a greater period of time than the 2009 survey and took into account off-peak travel.

- The 2009 survey did not include Junction Hill, Clarenza and South Grafton south of Vere Street within the internal trips category, whereas the 2010 survey did include these areas. Consequently, trips from Junction Hill, Clarenza and South Grafton south of Vere Street to Grafton / South Grafton were included in the external to internal counts for the 2009 survey whereas they were included in the internal to internal counts for the 2010 survey.

- Both surveys found similar proportions of through (external to external) traffic 2% in 2009, and 3% in 2010). Consequently, both surveys highlight the overwhelming contribution of the Grafton / South Grafton areas to the traffic crossing the existing bridge.

The extent of information ensured that the project team used a wide variety of data sources to ensure that no single figure would distort the overall traffic picture that is created from the various data sources. What has been found to date is that the data findings are all generally consistent in terms of origins and destinations and the nature of the journeys.

4.1.16.7 Population growth forecasts

The population growth forecast used for the RODR (p14) was based on information provided by Clarence Valley Council and the Department of Planning and Infrastructure. This information indicates that population growth is expected to occur at an average rate of 1.6% per annum between 2011 and 2049.

Various documents were considered in the context for an additional crossing of the Clarence River in Grafton, including:

- *Mid North Coast Regional Strategy (2009)*

- *Far North Coast Regional Strategy (2009)*

- *Northern Rivers Regional Plan 2011*

- *South Grafton Heights Precinct - A Strategy for the Future*

These documents assisted in understanding the growth of the Grafton area, how Grafton fits into the wider role in the subregion, and also Grafton's role in serving the Clarence Valley subregion with jobs, retailing, medical, sport and cultural facilities, consistent with the stated project objective to "*support regional and local economic development*".

With regard to submissions raising Maclean and Yamba as part of Grafton's functional catchment, while the employment catchment for Grafton extends to Maclean and Yamba, there is also a southern catchment for the town. Of the 97% of traffic that has an origin or destination point in Grafton or South Grafton, 39% of traffic is coming from/going to destinations external to Grafton or South Grafton. Traffic from Yamba and Maclean is included in this figure as well as traffic coming from a range of other destinations within the northern and southern catchment areas.

An allowance for population growth outside of the Grafton area was made as part of the traffic modelling. The RODR also assumes that the upgrade of the Pacific Highway to bypass Grafton would be complete by 2019.

4.1.16.8 Annualisation

The traffic modelling for the additional crossing of the Clarence River includes a forecast of the average weekday traffic flows. Economic analysis requires annualisation of daily traffic flows.

An annualisation factor is traditionally determined by using permanent traffic count data which record traffic for each day of the year.

RMS' consultant, Arup adopted two approaches for determining the annualisation factor based on recorded traffic count data and benchmarked the outcome against factors from other investigations.

The first approach was based on data recorded by a permanent traffic counter on Fitzroy Street. Data was available for 2009. Using the permanent traffic count data for 2009 and summing every recorded day and calculating an average weekday traffic volume a factor of 333 was determined.

Arup and its sub-consultant GTA also undertook traffic counts at different times throughout the study. These counts were over a number of weeks during typical periods of the year. The second approach was based on traffic count data recorded at the existing Grafton Bridge in 2010. Using this traffic count data, the ratio of weekly average to the weekday average was 0.918. This figure was consistent with previous documentation of traffic flows on the Grafton Bridge. Applying this factor across the entire year resulted in an annualisation factor of 335.

As the two annualisation factors are similar (333 and 335), the 335 annualisation factor was adopted. A review of annualisation factors elsewhere revealed that the factor of 335 was consistent with other regions where factors up to 350 have been adopted.

4.1.16.9 Need for an additional crossing

The existing Grafton Bridge is currently experiencing congestion and delays associated with morning and afternoon peak periods. Modelling for the predicted growth of Grafton and the associated growth in traffic indicates that by 2029 the current bridge would be heavily congested, with much of the local street network at gridlock.

In order to ensure future capacity on the network can be accommodated, planning for a new bridge is required. Once a preferred location is identified, it can be preserved to enable the crossing to be constructed when funds become available.

4.1.17 Upgrade of the Pacific Highway – submissions

Issue raised in submission	Submission number	Section Addressed
Upgrade of Pacific Highway		
1. A bypass option would not be required after the upgrade of the Pacific Highway.	1	4.1.18
2. Prefer options 11, 14 or 15 if Grafton is to be bypassed.	20	4.1.2.1 & 4.1.18
3. Should invest in the Pacific Highway upgrade first then understand the best option for Grafton after that.	101	4.1.18
4. Some options predicated on the upgrade of the Pacific Highway upgrade but it may not be delivered.	76	4.1.18
5. Completion of the Pacific Highway upgrade would reduce heavy vehicle traffic through Grafton but funding is not guaranteed.	75,76,118	4.1.18

4.1.18 Upgrade of the Pacific Highway – RMS response

The Pacific Highway is an important component of the National Highway network and is recognised as the main freight corridor linking Brisbane and Sydney along the east coast, with access to the inland towns of Lismore and Casino via east-west connections.

For the purposes of the Additional Crossing of the Clarence River in Grafton, it is assumed the Glenugie to Tyndale upgrade of the Pacific Highway (which bypasses South Grafton) would be open to traffic by the assumed date of opening of the additional crossing, being 2019.

Both the State and Federal governments have identified a high priority for the upgrading of the highway to dual carriageway. It is anticipated that the majority of freight traffic between Brisbane to Sydney would continue to use the Pacific Highway.

Summerland Way is recognised as a strategic link between the Darling Downs, Kyogle, Lismore, Casino and Grafton. Any future increases in traffic volumes on Summerland Way are likely to be primarily influenced by the extent of development along the corridor. An improved Pacific Highway is forecast to be more attractive north south route for freight traffic between Brisbane and Sydney and servicing the North Coast.

In relation to South Grafton, the upgrade would realign the Pacific Highway, resulting in an alignment located to the east of Tucabia and Pillar Valley. With this in place, the likelihood of trucks utilising local streets such as Centenary Drive and Heber Street, as a short cut back onto the Pacific Highway would be significantly reduced.

4.1.19 Construction issues – submissions

Issue raised in submission	Submission number	Section Addressed
Construction issues		
1. Option A does not require extensive earthworks and road lowering on the northern side.	22	4.1.14.1 & 4.1.20
2. Option A involves significant change to roads and pedestrian crossings on the northern approaches that would not be easy to construct.	71	4.1.20
3. Under Option A the road level at the junction of Fitzroy/Kent Streets does not leave enough room for vehicles to pass under the new bridge approach in the current configuration.	71	4.1.20

4.1.20 Construction issues – RMS response

All options would involve changes to local roads and intersections throughout Grafton and South Grafton. Further, all options have undergone adequate investigation to be confident in the ability to construct the new crossing and supporting local street upgrades. Costs for all options are based on strategic estimates with all options including allowances and contingencies to cover aspects such as geotechnical issues, property acquisitions, raising of the levee walls, and other matters that may arise during construction.

In relation to the specific concern regarding the potential changes to Kent Street, access to the Dovedale area and the Sailing Club. The design intent for Option A is that the roadway connection between Kent St and Fitzroy St would remain open to traffic. There is sufficient vertical clearance under the new approach viaduct to allow this link to remain open.

The preferred option would undergo a concept design and environmental assessment phase. Aspects such as constructability would be assessed comprehensively during that phase.

4.1.21 Design – Submissions

Issue raised in submission	Submission number	Section Addressed
Design options and suggested modifications		
1. Attach new bridge to the old to strengthen old bridge – refer to Auckland Bridge as an example.	2,29 62,67	4.1.22.4
2. Modify Option C to improve access between Armidale Road and Iolanthe Street.	6	4.1.22.7
3. Add traffic lights to each end of the existing bridge to manage emergencies until the new bridge is built	17	4.1.2.2

Issue raised in submission	Submission number	Section Addressed
Design options and suggested modifications		
4. Upgrade Centenary Drive as the designated B-double route.	23	4.1.4.2
5. Have a load limit on the old bridge and stop all trucks and buses using it and avoid traffic delays.	21	4.1.2.4
6. Enhance option 11 by the development of flood free land at Clarenza.	56,104	4.1.6.2
7. Account for traffic from Bi-Lo on Ryan Street, which is the only practical exit for South Grafton Residents.	114	4.1.14.2
8. Use existing bridge for cars only and direct trucks to the new bridge on option 15.	55	4.1.2.4
9. Move Option 15 by moving it 800 m to 1km further north.	5	4.1.22.8
10. Build a transport hub on the outskirts of town to offload big trucks onto smaller ones	19	4.1.22.14
11. Consider a new route along Turf Street with a bridge over Susan Island. Redirect the railway over the new bridge to Orara Way.	41	4.1.22.4 & 4.1.22.15
12. Use Heber Street instead of Centenary Drive for B-double route and connect with the northern end of the highway.	41	4.1.4.2
13. Include a centre bridge pylon on Elizabeth Island for a two span bridge.	50	4.1.22.15
14. Follow the existing railway easement next to Villiers Street.	74	4.1.22.12
15. All motorised traffic to use the new bridge. Old bridge to be used by pedestrians and cyclists and other uses as a tourist attraction.	88	4.1.22.6
16. Move the existing water supply from the existing bridge and make the span operational for water craft.	100	4.1.22.13
17. Have all traffic on each bridge in one direction to avoid merging and congestion.	102	4.1.22.3
18. Build the bridge approach to join KFC and the Villiers Street roundabout.	114	4.1.22.5
19. Upgrade Ryan Street to 4 lanes from Bent Street towards Skinner Street.	114	4.1.22.1
20. The 5 way roundabout proposed for Ryan and Bent Streets supported and request to bring construction forward regardless of option chosen.	114	4.1.22.2
21. Prefer not to introduce any traffic lights.	12,76	4.1.22.5
22. If roundabouts are required do not landscape them. Keep visibility clear and paint them instead.	39	4.1.22.10

Issue raised in submission	Submission number	Section Addressed
Design options and suggested modifications		
23. Villiers Street rail underpass has been lowered to its convenient and safe limit. Some options would require lowering roadways.	60	4.1.14.3 & 4.1.22.10
24. Option 15 would not require lowering the Villiers Street rail underpass.	76	4.1.14.3
25. Current bridge load limit was two engines. Now it accommodates trains up to 1500m long.	101	4.1.22.11

4.1.22 Design – RMS response

4.1.22.1 Road upgrades South Grafton

In relation to road upgrades in South Grafton associated with Options E and A, only Option E requires the upgrading of Ryan Street to 4 lanes from the Bent Street roundabout through to the proposed roundabout with Cowan Street. This upgrade would only be needed for Option E to accommodate the predicted increase in traffic in Ryan Street. This change would not be required under any of the other options.

4.1.22.2 Five-way roundabout

Option A is the only option which would require a 5 way roundabout to the current roundabout configuration with Bent Street, Gwydir Highway and Ryan Street. Traffic modelling identified that for this option a larger five-way roundabout with two circulating lanes was required to achieve the necessary capacity with all bridge traffic using Bent Street. Other options would require some upgrades to this roundabout. However, the traffic modelling showed that a four-way roundabout with two circulating lanes would be adequate for all other options.

4.1.22.3 Traffic lanes old and new bridge

The existing bridge is narrow and this narrow width combined with the kinks means that it could not operate safely with two lanes of traffic in the same direction. There would be an unacceptable risk of heavy vehicles side-swiping a vehicle in the adjacent lane when negotiating the kinks.

With Option A, conflicts at the merges and diverges on each side of the river meant that the new and existing bridges could not operate with one lane in each direction, and the narrow lanes and kinks meant that the existing bridge could not operate safely with two lanes of traffic operating in the same direction. Therefore, for Option A to be viable, it was necessary to provide 3 lanes on the new bridge and to convert the existing bridge to one lane southbound.

4.1.22.4 Modification to existing bridge or rail alignment

The Grafton Bridge is a State listed heritage item, and is an iconic structure for the Grafton community. An additional structure attached to the existing bridge may have an unacceptable impact on the current bridge, and would require some closures of the existing bridge while a new bridge was under construction.

Further, the purpose of the project is to identify an alternative crossing of the Clarence River in Grafton for road traffic, pedestrians and cyclists. The Grafton Bridge forms a strategic connection in the east coast rail line. Any changes to the current alignment of the railway line would be the responsibility of the ARTC.

4.1.22.5 Adjustments to the surrounding street network

All of the in-town options include traffic signalisation at specified intersections, with out of town options including upgrades to roundabouts to increase capacity and enable turning movements. Concept designs for intersections under each option are based on necessary upgrades at 2049.

Adjustments suggested to the surrounding street network have been reviewed. The suggestion to change the alignment of Option A slightly to follow along the southern end Fitzroy Street, continuing past KFC on the western side and connecting it through to the existing intersection with Villiers and Fitzroy Streets is not practical. The proposed alignment of the bridge for Option A would have to swing to the west more in order to connect to the southern end of Fitzroy Street. This change to the alignment is not seen as a viable option, as the new alignment would make it difficult to provide the lane configuration of one lane southbound and two lanes northbound on the new bridge, and one southbound lane of the existing bridge. Difficulties would result from the need to configure the local street network to enable one-way traffic on approach roads to the new and existing bridges on the Grafton side.

The amendment suggested would also affect the Clarence River Sailing Club, affect more residential properties on the Grafton side, quarantine an island of land between the new and existing bridges, and have undesirable urban design impacts as the new bridge would no longer be parallel to the existing bridge for most of its length.

4.1.22.6 Closing the existing bridge

A suggestion to close the existing bridge to vehicular traffic once a new bridge was opened, allowing only pedestrians and cyclists to use the existing bridge is not viable. Traffic modelling has shown there is a need for four transport lanes to cater for the growing Grafton community into the future. By creating a new bridge, and closing the existing one to vehicular traffic, the short and long-term transport needs for the Grafton and South Grafton area would not be addressed, and the project objectives would not be met. Alternatively, if the new bridge has two lanes in each direction, the increased width would add significantly to the cost of all options, and this could affect the financial viability of the project.

4.1.22.7 Modification of Option C

The upgrades associated with Option C include a new roundabout at the intersection of the Pacific Highway and Iolanthe Street, upgrading the Gwydir Highway between the Pacific Highway and Bent Street, upgrading the roundabout at the intersection of the Gwydir Highway and Bent Street, a new roundabout at the intersection of Ryan Street and Viaduct Road and upgrading the Gwydir Highway and the Pacific Highway intersection with a new roundabout. As such, access between Armidale Road and Iolanthe Street would be improved.

Further refinements may be made to the intersection upgrades in the event that Option C is selected as the preferred location for an additional crossing. The suggested modification to

improve access to Armidale Road and Iolanthe Street would be considered as part of investigations into design refinements opportunities.

4.1.22.8 Modification of Option 15

Modifications to Option 15 by moving the connection to Summerland Way 800m to 1km further north are not supported. The PROR included assessment of a number of other route options in Corridors 4 and 5 that were located further downstream than Options 14 and 15. As a result of the assessment process documented in the PROR, Options 14 and 15 were the two options short-listed as the best performing options within these corridors. Options further downstream added significantly to the costs to mitigate impacts on flooding, and also had greater impacts on the natural environment and potential impacts on aboriginal cultural heritage.

4.1.22.9 Grade of bridge connection to street level

The steepness of grades has been assessed as part of the RODR. All proposed new bridge options have similar grades into Grafton. Options E, A, 14 and 15 have grades of approximately 4% into Grafton and Options 11 and C have grades of approximately 5% into Grafton. The grades are required to:

- allow the in town options to connect to the existing street network at ground level within a shorter distance than the out of town options as a result of the density of the urban development in those locations
- The higher minimum vertical clearance for the navigable channels required for the out of town options.

All options have been designed using RMS design guidelines and a road safety audit has been undertaken on all of the route options. The results are reported in the RODR.

4.1.22.10 Safety of design

All options have been designed using RMS design guidelines and a road safety audit has been undertaken on all of the route options. The results are reported in the RODR.

Further refinements would be made to the intersection upgrades once a preferred route for the additional crossing. The design refinement process would consider the design matters raised in submissions.

4.1.22.11 Safety of existing bridge

The Grafton Bridge is an iconic structure and is listed on the State Heritage Register. The existing Grafton Bridge was completed and opened to traffic in 1932. The bridge consists of a steel double deck with a length of 438 metres, having 8 spans and 7 piers to support the bridge. The piers are concrete with foundations in solid rock at depths between 9 and 23 metres below the high water level. This is documented in detail in the PROR for the additional Crossing of the Clarence River at Grafton which is available on the RMS website.

Inspections, maintenance, repairs and rehabilitation of the existing bridge are carried out by Australian Rail Track Corporation Ltd (ARTC) and the RMS via a partnership agreement. Bridge structure maintenance work is carried out by ARTC, and the road deck, road surface, approach spans and the footway maintenance is carried out by the RMS.

The bridge inspections program includes regular visual, engineering and underwater dive inspections.

Extensive preliminary investigations were carried out on all the route options. This included geotechnical studies going back to 1975 where 5 boreholes were located in the river channel downstream of the existing bridge.

Additional investigations carried out in 2003 included boreholes either side of the river and bridge scour depth investigation. The details of these investigations, coupled with additional studies undertaken are reported in the RODR Volume 3.

There are currently no identified structural deficiencies with the existing bridge that would impede the ability of RMS to construct a new bridge in close proximity, or its current use, including the current level of traffic, both on road and rail.

Time of day access restrictions are placed on the bridge due to the geometric constraints of the kinks as opposed to a load limit on the bridge.

If the preferred option is close to the existing bridge, RMS would ensure any construction technique employed on site would mitigate potential impacts on the structural integrity of the existing bridge.

It is noted in terms of engineering solutions, there are many construction techniques now available which minimise vibration and disturbance to surrounding areas when constructing close to existing buildings.

4.1.22.12 Use of existing railway easement

Suggestions to use the existing railway easement through town as the approaches to a new bridge, or to building a new rail bridge to address the current congestion problems are not viable. With regard to the existing railway easement, it is not wide enough to support an additional road alongside, and would require the acquisition of many properties within the centre of town. The alternative of a new viaduct structure above, or tunnel below the existing railway easement, would be too costly and would not be supported, as would a new rail bridge, which would require the existing railway abutments either side of the river to be realigned to account for a new rail bridge location.

4.1.22.13 Water supply

The suggested removal of the existing water main from the lower deck so that the bascule span could be repaired to allow the passage of taller watercraft is not within the scope of this project. In relation to this the Grafton Bridge project is about identifying a location for an additional crossing of the Clarence River in Grafton. It is not the intention of the project to identify ways to increase access for water craft in and around the existing bridge. This would be a matter for the ARTC as the owners of the Grafton Bridge.

4.1.22.14 Transport hub

A proposal to create a transport hub on the outskirts of town to load goods onto smaller vehicle would not only introduce a significant cost to the project in creating a freight distribution centre on the outskirts of town, but also increase costs associated with double handing of goods for transport companies. Given the relatively small proportion of heavy

vehicles using the bridge, this is not considered a viable option for solving the current concerns associated with the existing Grafton Bridge and heavy vehicles in town.

4.1.22.15 Options involving Susan or Elizabeth Islands

In the Aboriginal and Non-Aboriginal Heritage reports undertaken for the Preliminary Route Options Report, Susan and Elizabeth Islands were assessed as significant places to the community, including its Aboriginal cultural values, non-Aboriginal cultural values, and possessing natural values.

Susan Island is a significant place to Aboriginal women, who have a close past and ongoing associated with the island and its rainforest. Elizabeth Island was identified as a sacred Aboriginal men's site with high significance to the Aboriginal community.

As such, any option which connects to Susan Island or Elizabeth Island would not be supported.

4.2 Environmental impacts

4.2.1 Noise and vibration - submissions

Issue raised in submission	Submission number	Section Addressed
Noise and vibration		
1. Existing noise experienced in several areas is unacceptable.	13	4.2.2.1
2. The noise report assumes that areas already affected would not be affected significantly and this is challenged.	71	4.2.2.2
3. All options would increase noise, particularly at night.	3,42,57	4.2.2.3
4. Noise associated with in town options would affect more residents with steep grades from the new bridge into town.	52,76,115,P2	4.2.2.3
5. Option E would have the highest night time noise impact.	22	4.2.2.3
6. Options A and C would disturb the nursing home. Any shortage of beds would be detrimental.	34,71	4.2.2.3
7. Increased noise could have an impact on health.	57	4.2.2.1

Issue raised in submission	Submission number	Section Addressed
Noise and vibration		
8. Option E would affect the St Marys Convent residential and administration areas and new conference facility in a severe and unacceptable way. Noise within the Convent would exceed the criteria in the NSW Road Noise Policy of 55dB(A) between 7am and 10pm and 50dB(A) between 10pm and 7am. More information is required to assess impacts.	59, 109	4.2.2.3
9. Noise and vibration impacts associated with Option E would render the new conference facility near the corner of Villiers Street and Victoria Street Grafton unviable.	109	4.2.2.3
10. The noise report contains significant errors which makes it difficult to interpret data.	71	4.2.2.2
11. Option A could increase noise more than predicted because of the elevation of the proposed bridge and inclusion of 3 lanes of traffic.	71	4.2.2.3
12. Options 14 and 15 would have less noise impact on residents.	76, 94,115	4.2.2.3
13. Options 14 and 15 would bring noise to a previously quiet residential area.	P1, 113	4.2.2.3
14. Option C would increase noise for properties on Clarence Street because of the location of the proposed road and installation of traffic lights.	82	4.2.2.3
15. Grafton Hospital would be sensitive to noise and trucks braking with exhausts.	P2	4.2.2.4
16. It appears that under Option A, construction of pier near the centre of Kent Street would lower the level of the proposed road and increase potential noise at 1 Fitzroy Street. It is unclear what was modelled in the noise report.	71	4.2.2.2
17. The Noise report does not address benefits of removing traffic if downstream options are adopted.	71	4.2.2.3
18. Increased noise associated with option 11 would be intolerable leading to an increased incidence of health problems and worsening quality of life. Health effects could include worse concentration, difficult communication difficulties with relaxation and sleep, impacts on hypertension and cardiovascular outcomes. Suggest new bridge be in a non-residential area.	57,79	4.2.2.3

Issue raised in submission	Submission number	Section Addressed
Noise and vibration		
19. The EPA notes that route option 11 would result in the highest number of residential properties affected by noise exceeding 55 dB(A) of a day and 50 dB(A) of a night. Option 11 also has the highest number of residential properties where relative noise levels increase by 12 decibels or more. The EPA therefore recommends that RMS give due consideration to the noise impacts of option 11 when making a decision on the final location for the additional crossing of the Clarence River at Grafton.	117	4.2.2.3

4.2.2 Noise and vibration – RMS response

4.2.2.1 Impact of noise on the community

RMS acknowledges that noise levels may impact on people's amenity and lifestyle. A discussion on the social impacts of noise is included in Volume 2 of the RODR: *Technical Paper: Noise Assessment* (page 5). This section notes that different groups within the community are vulnerable to different effects such as sleep disturbance, general annoyance, and physiological effects. It is also noted that there are individuals within the community who are more vulnerable to noise than the general population.

It is not within the scope of the project to identify solutions to existing noise problems, including noise associated with B-doubles, that may be experienced from the current travel patterns within Grafton. However, RMS recognises that this issue is of concern to the community and in consultation with other regulatory agencies, is trialling technology to better regulate vehicle noise impacts including the use of noise cameras.

The RODR assesses the comparative acoustic impacts of each of the six route options and the no build scenario.

4.2.2.2 Accuracy of the noise technical study

The noise report provides an assessment of both predicted absolute noise levels and the predicted change in noise levels for each option. The absolute noise levels are indicated by the number of residential properties where noise levels would be more than 50 dBA at night or 55 dBA during the day. The change in noise levels are indicated by the number of residential properties where noise levels would increase by 12 dB or more compared to a no build scenario at night or during the day. Both absolute noise levels and change in noise levels are appropriate for a comparative assessment of the noise impacts of the six route options. The report includes details of locations where noise levels would increase by more than 12 dB as well as showing details of locations where absolute noise levels are above 55 dBA.

The assessment criteria of an increase in noise level of 12dB, compared to a base case, is in accordance with guidelines set out in the NSW Road Noise Policy (RNP). The policy notes that a relative increase of 12dB represents slightly more than an approximate doubling of perceived loudness (AS2659.1-1988) and is likely to trigger community reaction, particularly in environments where there is a low existing level of traffic noise. RMS acknowledges that some properties could sit just below this threshold.

The noise modelling takes into account a wide range of factors, including the level and position of the new roadway.

In relation to errors within the report, it is acknowledged there is an error in regard to the logger locations. Three of the 15 loggers deployed for the 2011 noise survey were not used for the noise study due to a failure in the readings. Unfortunately, the data from one of these loggers was included in Appendix D of the report which resulted in the error in the reference number assigned to the logger. The report has been updated to address this error. The recorded information from the loggers included in the assessment remains true and accurate and does not impact on the overall noise assessment findings. Where there is a conflict in the current report, the reader should rely on the address associated with the location rather than the reference number.

4.2.2.3 Relative impact of different options

Noise modelling has been undertaken for the project for the purposes of route option comparison. In order to provide a direct comparison between options, identical receiver locations were used for each assessment. This allows for the benefit and disadvantage of each option to be considered. Where dwellings were identified for acquisition, those receivers were removed from the assessment. Predicted noise levels for all receivers were then fed into acoustic indicators used for the project.

This study assessed the predicted noise levels from each route option. Option 11 is identified as having the greatest impact from road traffic noise overall. Options E, A and C result in similar road traffic noise impact for all indicators although Option E tends to affect slightly more receivers due to its more remote alignment from the existing bridge. It also affects non-residential receivers that are otherwise less affected by the other options. Whilst Option 14 and 15 share the majority of their alignments, the realignment of Option 15 to the north redirects traffic away from receivers along North Street and hence significantly reduces the overall impact.

The number of properties that exceed the RNP criteria in the no build scenario is higher with some options and lower with others. This is a result of the redistributions of traffic that occur with the options and the proposed property acquisitions that are unique to each route alignment.

As identified in the RODR, all options with the exception of Option A would result in at least one property experiencing an increase in noise levels by 12dB or more at night 10 years after the anticipated opening of the additional crossing. The number of properties range from one residential property affected by Option C through to 51 residential properties affected by Option 11. Option 11 would direct additional traffic into Fry Street which is currently a quiet residential street.

Submissions also expressed concern about the potential impacts of Option A on the nursing home on Bent Street. Option A would involve the upgrade of Bent Street in front of the existing nursing home. The *Technical Paper – Noise Assessment* in Volume 2 of the RODR did not identify the nursing home as a property where noise levels would increase by 12dB or more compared to the no build scenario, 10 years after opening. It is however shown in the report that the noise levels during the daytime at the nursing home would be above the 55dBA criteria for all route options including the no build scenario.

In terms of increases in noise levels of 12dB or more, Options 14 and 15 would affect more properties than Options E, A and C by directing more traffic through what are currently quiet residential streets, including North Street, and Prince Street north of Dobie Street. Options 14 and 15 would have less impact on residential properties than Option 11. The numbers of impacted properties are shown in the table *Comparing the Options* in the September Community Update.

With regard to Option C, noise levels would increase by 12 dB or more on the property located at the corner of Clarence Street and Pound Street, 18A Clarence Street. This is identified in the Technical Paper – *Noise Assessment* in Volume 2 of the RODR. There are also several properties along Clarence Street between Fitzroy and Pound Street at which noise levels that would exceed the daytime Road Noise Policy criteria as identified in the RODR.

With regard to specific instances of RNP guideline exceedances, all reasonable and feasible mitigation measures would be considered and applied to control road traffic noise levels during the concept design and environmental assessment phase for the preferred option, RMS would consider the mitigation of the potential noise impacts of the new bridge as part of the preferred route assessment and design process.

4.2.2.4 Grafton Hospital

The detailed noise assessment does not identify the Grafton Hospital as being a differentiator with regard to traffic noise impacts from each option. Further, all options include the upgrading of the Villiers Street and Dobie Street roundabout to improve turning movements for heavy vehicles. This upgrade would encourage heavy vehicles to use Dobie Street rather than Arthur Street, where the Grafton Hospital is located, to get to and from Villiers Street.

4.2.2.5 Future investigations

A more detailed assessment of the impacts of road traffic noise on individual properties would be undertaken as a part of the future assessment of the preferred route option. Where noise levels are predicted to exceed the noise targets in the Road Noise Policy, mitigation would be considered in accordance with the RMS Environmental Noise Management Manual.

4.2.3 Air quality – submissions

Issue raised in submission		Submission number	Section Addressed
Air quality			
1.	All in town options would increase air pollution.	3,32,42	4.2.4
2.	Option E would have air quality and associated health impacts on the Convent residents and visitors.	59	4.2.4
3.	Out of town options would minimise localised air pollution impacts.	P2,115	4.2.4
4.	The EPA has reviewed the information provided and concluded that air and water quality issues can be readily managed across the various options and do not present significant constraints or have significant bearing on the route selection process.	117	4.2.4

4.2.4 Air quality – RMS response

With regard to the potential impacts on air quality, particularly for the in town options, the supporting objectives of the project included minimising the impact on residential amenity, including noise, vibration and air quality.

A comparative assessment of air quality for the route options is included in the RODR (p127-128). Fuel consumption is being used as a proxy for air quality. Fuel consumption in urban areas during the 8-9am morning and 4-5pm afternoon peak hours has been estimated as an indicator of relative air quality impacts. Options with higher fuel consumption are likely to have poorer relative air quality.

Options C and E would result in the least fuel consumption in urban areas. Option A is the next best performing. Options C, E and A reduce road network delay better than the downstream options and result in lower overall fuel consumption in urban areas.

Options 14 and 15 have the highest fuel consumption. These options do not reduce delays in the Bent Street/Craig Street/Fitzroy Street corridor to the same extent as the other options, resulting in lower speeds and higher fuel consumption in urban areas.

Air quality associated with construction activities would also be assessed during the environmental assessment phase for the preferred option. Reasonable and feasible mitigation measures would be put in place during construction to manage any localised impacts on air quality associated with construction activities.

4.2.5 Social impacts – submissions

Issue raised in submission	Submission number	Section Addressed
Social Impact		
1. Option E avoids the Dovedale area but would require some relocation of residents and affect others through noise and air quality impacts. It would require widening of streets and removal of homes and trees.	36,79.80,82,76,93, 42,46,50, 86,98, P2	4.1.14.2, 4.2.6, 4.2.6.1, 4.2.2.3 & 4.2.18.1
2. Option E would have significant, lasting and deleterious impacts on the Convent, its occupants and the functional use of the old and new buildings by the community.	59,109	4.2.6 & 4.2.6.1
3. Option E would require widening of streets and removal of trees.	98	4.2.6 & 4.1.14.1
4. Option A would require some relocation of residents and affect others through noise and air quality impacts. It would:	76, 42,46,50, 86,98, P2	4.2.12, 4.2.2.3 & 4.2.4
a. Isolate 1 to 7 Fitzroy Street from the Grafton community.	71	4.2.20
b. Require widening of streets and removal of homes and trees.	71,98	4.1.14.1
5. Option C would require some relocation of residents and affect others through noise and air quality impacts. It would:	76, 42,46,50, 86, P2	4.2.12, 4.2.2.3 & 4.2.4
a. Affect a large number of properties including construction of a road. RODR description of not being affected despite being one property away is not supported.	25,82,93,98	4.1.14.1 & 4.2.12
b. Isolate two properties in one section of Clarence Street leaving them between the bridge and the railway and opposite businesses.	82	4.2.6
c. Require widening of streets and removal of homes and trees.	98	4.1.14.1 & 4.2.18.1
d. Dislocate residents who purchased on the understanding that a future bridge would be upstream.	106	4.2.12
6. Option C would severely impact Grafton's unique character and charm and would cut a swathe through the heart of the older area of Grafton.	106	4.2.6.1
7. Option C would involve the relocation of the Gummyaney Aboriginal Preschool with severe consequences for children and families. Families using public transport may be unable to access a relocated preschool.	111,112	4.2.6.1
8. Land for expansion may not be available at a relocated site for the pre-school.	111,112	4.2.6.1 & 4.2.12

Issue raised in submission	Submission number	Section Addressed
Social Impact		
9. The pre-school is situated on Aboriginal land which is significant to the Aboriginal community and within a natural environment that is important to the children.	111,112	4.2.6.1
10. Option 11 has the least overall disruption for the community.	11	4.2.6
11. Option 11 would affect a working farm for which compensation would not be adequate.	51	4.2.6, 4.2.10 & 4.2.12
12. Option 11 would have the biggest negative impact on the largest number of people in their family homes.	8,25,93	4.2.2.3 & 4.2.6
13. Option 11 would have a detrimental impact on Fry Street.	104	4.2.2.3 & 4.2.6
14. Option 11 would provide an opportunity to install a cycle loop between old and new bridges improving open space.	89	4.1.6.3
15. Option 14 would affect existing houses on North Street.	98	4.2.2.3 & 4.2.6
16. Options 14 and 15 would avoid detrimental social and conservation impacts and affect the least residential and business areas, traversing farmland and bushland.	8, 115	4.2.6 & 4.2.12
17. Options 14 and 15 would bring heavy traffic into a previously quiet residential area. Would affect two working farms and recreational areas of significance.	P1, 113	4.2.2.3 & 4.2.6
18. Option 15 would avoid house frontages and has the least number of property impacts.	14,93.55	4.2.12
19. Option 11 would result in a loss of privacy with road impinging on fence lines.	8	4.2.6

4.2.6 Social impacts – RMS response

As shown in the table *Comparing the Options* in the September 2012 Community Update, all options for the additional crossing have potential social impacts.

The purpose of the project is to identify an additional crossing of the Clarence River at Grafton to address the short-term and long-term transport needs. While one option may benefit one specific area of the community, the project is looking at the entire Grafton and surrounds, and is seeking to provide an overall balance of benefits and impacts.

In terms of noise and amenity impacts from different options, the RODR Technical Paper: Noise Assessment highlighted the predicted noise levels from each individual option. Option 11 is identified as having the greatest impact from road traffic noise overall, particularly along Fry Street. Options E, A and C result in similar road traffic noise impact for all indicators although Option E tends to affect slightly more receivers due to its more remote alignment from the existing bridge. It also affects non-residential receivers that are otherwise less affected by the other options. Whilst Option 14 and 15 share the majority of their alignments,

the realignment of Option 15 to the north redirects traffic away from receivers aligning North Street and hence significantly reduces the overall impact.

Any option identified as the preferred location for the Additional Crossing of the Clarence River in Grafton would undergo a concept design and environmental assessment phase which would investigate measures to mitigate impacts identified in the technical papers under the RODR as well as impacts identified by the community.

4.2.6.1 Other Impacts

Many of the comments raised in the Social Impacts table have been addressed in other parts of Section 4, including noise and vibration, connectivity and property impacts. Notwithstanding this, the following comments are provided to address specific matters raised.

In relation to Option E, it is noted that the southern end of Villiers St is currently very quiet as a result of being a no through road. As a result of this, Option E would impact on the amenity of properties in this area due to the increased traffic along the southern end of Villiers St.

Option C would affect the existing street layout on the northern side of the new bridge. The creation of a new alignment from Pound Street for the approach to the new bridge on the northern side, is inconsistent with the underlying street layout.

Option C may also have property impacts on the Gummyaney Aboriginal Preschool site. Initial indications for Option C include a potential acquisition on the corner of the preschool site. Any potential acquisition would be minor and unlikely to require relocation of the preschool.

4.2.7 Amenity streetscape and views - submissions

Issue raised in submission	Submission number	Section Addressed
Amenity/ streetscape/ views		
Option E		
1. Has positive aspects but directs traffic through areas such as Victoria Street, which is a quiet and pristine heritage area.	56	4.2.6.1
2. Frames the old bridge without taking away from existing views.	62, 80	4.2.8.2
3. Would create loss of amenity and an impact on the aesthetics of the existing bridge.	P2	4.2.6 & 4.2.8.2
4. Would have a major impact on aesthetic issues.	78	4.2.6
5. Ties in with the river scheme and boardwalk.	80,82	4.1.6.1 & 4.2.6
6. Would have a large visual impact on the main riverscape of Grafton.	89	4.2.8.2

Issue raised in submission	Submission number	Section Addressed
Amenity/ streetscape/ views		
7. Would involve widening of streets and the loss of significant trees.	98	4.1.14.1 & 4.2.18.1
8. Would involve a substantial loss of aesthetics for the building and amenity impacts for the occupants, workers and visitors to the St Marys Convent and the conference facility.	109	4.2.6 & 4.2.6.1
Option A		
9. Would have a major impact on aesthetic issues.	56,78,P2	4.2.6
10. Would have minimal impact on existing streetscape.	9	4.1.14.4
11. Would obscure upstream views of the old bridge removing one of its greatest tourist attractions	71, 78, 89	4.2.8.2
12. Would create loss of amenity and an impact on the aesthetics of the existing bridge.	78	4.2.6 & 4.2.8.2
Option C		
13. Would have minimal impact on existing streetscape.	9	4.2.6.1
14. Would have a major impact on aesthetic issues.	56,78,P2	4.2.6
15. Would create loss of amenity and an impact on the aesthetics of the existing bridge.	78	4.2.6 & 4.2.8.2
Option 11		
16. Moves traffic through the quiet end of Fry Street	56	4.2.2.3
17. Does not affect views of the existing bridge.	78	4.2.8.2
18. Would allow access to a cycle path and recreational facilities at either side of the bridge and would contribute more to Grafton.	78,89	4.1.6.3
19. Is still close to the CBD and is a more suitable option than C.	112	4.1.2.1 & 4.2.2.3
Option 14 and 15		
20. Great Marlow and Kirchner Street picnic and boating areas are a stunning part of the Grafton landscape and would be disrupted by options 14 and 15	37	4.2.8.1 & 4.2.16.2
21. Would open another section of the river rarely seen to tourism and links to Corcoran Park.	76	4.2.8.1
22. Would severely impact Corcoran Park as it would be the only access to the river on the north side, currently a tourist stop for out of town families, river users and a year round access point for the Yacht Club.	P1, 113	4.2.8.1

Issue raised in submission	Submission number	Section Addressed
Amenity/ streetscape/ views		
23. An older residence as well as new housing developments from Arthur to North Street would lose their rural and river views to a long viaduct and fog-prone monolithic bridge.	P1, 113	4.2.8.2 & 4.2.16.2
24. Option 15 preserves amenity of Grafton.	3	4.2.6
25. Option 15 would avoid the detrimental impacts on the existing community.	115	4.2.6

4.2.8 Amenity streetscape and views – RMS response

4.2.8.1 Corcoran Park

Impacts to Corcoran Park and access to the river were noted as impacts of Options 14 and 15. Local road works associated with Options 14 and 15 would maintain links to Corcoran Park to ensure access is maintained. The Landscape and Urban Character technical paper identified potential negative impacts on Corcoran Park resulting from a new bridge as per Options 14 and 15.

4.2.8.2 Visual impacts

The *Technical Paper for Non-Aboriginal Heritage* identified that Options E, A and C would all have impacts on views to and from the existing bridge, with Option A having the greatest potential impact.

Option E would have a visual impact, both on views to the bridge from upstream areas of Grafton (including the public area at the southern end of Prince Street), South Grafton and Susan Island, as well as views from the bridge towards these locations. The impact was seen as indirect, given it would not impact on the structure of the bridge, but it was considered to be a “moderate to high” impact.

Option A would have a visual impact both on views to the bridge from upstream areas of Grafton (including the public area at the southern end of Prince Street), South Grafton and Susan Island, as well as views from the bridge towards these locations. The bridge’s landmark qualities would also be obscured on the upstream side of the bridge by Option A. The visual impact from Option A was considered to be a “high” impact.

Option C would have a visual impact both on views to the bridge from downstream areas of Grafton, as well as a moderate visual impact from public viewing areas on the upstream side due to being an addition to the bulk, scale and form of the existing bridge.

With regard to public views of the bridge, it is noted the two main public areas for viewing the bridge from the river bank are both located upstream of the existing bridge, one at the end of Prince Street in Grafton, and one along the levee wall and park area running from Cowan Street to the South Grafton Ex-Servicemen’s Club.

Concerns were also raised regarding visual amenity impacts. In this regard, it is noted that all options impact on the visual amenity of the riverscape of Grafton as all options introduce a significant piece of infrastructure crossing the Clarence River.

Refinement of the concept design of the bridge as a part of the future assessment of the preferred route option would investigate ways to minimise the impact of the new bridge on the existing character of the town.

4.2.9 Agriculture – submissions

Issue raised in submission	Submission number	Section Addressed
Agriculture		
1. Good farmland would be affected by options 14 and 15.	1,31	4.2.10
2. Significant compensation would be required for the total disruption of three working farms associated with option 14 and 15.	7,31	4.2.10 & 4.2.12
3. Option 11 would significantly disrupt agriculture on a 100-acre property that could not be replaced.	51	4.2.10
4. DPI supports the RODR's approach to regionally significant farmland, noting that loss of regionally significant farmland is an indicator of economic impact.	116	4.2.10
5. The Mid North Coast Farmland Mapping Project Final Recommendations Report recommends that the map should be used as an information resource when state agencies plan for public infrastructure.	116	4.2.10

4.2.10 Agriculture – RMS response

The *Mid Coast Farmland Mapping Project Final Recommendations Report* was used as a background document in the development of the RODR, with loss of regionally significant farmland used as an indicator of economic impact. The use of this mapping was endorsed by DP&I.

The RODR identifies Option 15 as having the highest impact upon regionally significant farmland, followed by Options 14 and 11. Option 15 also has the highest area and number of potentially directly affected rural properties as the alignment would mainly pass through undeveloped land.

If farmland was required to be acquired as part of the design and construction of an additional crossing, the RMS's property acquisition policy would be applied.

4.2.11 Property acquisition – submissions

Issue raised in submission	Submission number	Section Addressed
Property acquisition		
1. Options 14 and 15 would require the demolition of one house. Several houses made uninhabitable by noise and vibration would require compensation.	7	4.2.2.3 & 4.2.12
2. Desire to negotiate fairly for acquisition if Option E chosen and affects property.	11	4.2.12
3. Total number of properties affected by Option A is significantly higher than the next highest number of impacts.	71	4.2.12
4. Would like house acquired if option 11 is built as do not want traffic and noise near house.	97	4.2.12
5. Options 11, 14 and 15 have less impact on business.	52	4.2.12
6. Options A, E and C would affect established businesses.	52	4.2.12
7. Option A has the greatest impact on established businesses (21 compared with a maximum of 7), which is significant given the loss of a large number of employers.	71	4.2.12
8. Option E involves the loss of property value to the Convent and conference facility.	109	4.2.12

4.2.12 Property acquisition – RMS response

The term “directly affected property” was defined in the RODR as where a route option is likely to require full or partial acquisition of the property. The intention of defining this term relating to property acquisitions was to differentiate circumstances where property acquisition was necessary (thus there was a direct property impact) as opposed to other impacts including those associated with increased noise from changing travel patterns or changes in local road access arrangements. While the latter are acknowledged as impacts, they are considered to be indirect impacts.

In terms of numbers of properties directly affected by route options, Options 14 and 15 have the lowest number of property acquisitions associated with residential properties, and the highest number of rural properties potentially directly affected by property acquisitions. Conversely, Option C has the highest number of residential properties directly affected, closely followed by Options 11 and A. Option A has the greatest number of properties directly affected overall due to the number of potential property acquisitions along Bent Street. Option A also has the highest numbers of established businesses potentially directly affected, again due to the upgrade of Bent Street in South Grafton.

The current RMS policy relating to property acquisition relates to property required for road purposes as a result of an option being identified as a preferred option. There is currently no policy relating to compensation for indirect impacts. However, RMS seeks to minimise indirect impacts through concept design, including incorporating mitigation measures such as noise treatments.

After a preferred option is identified RMS can respond to requests for acquisition of directly affected properties. The decision on the recommended preferred route is anticipated before the end of the year, with the final decision on the preferred option expected in 2013. In the event that a property is required for road purposes resulting from an option being identified as the preferred option, the *Land Acquisition (Just Terms Compensation) Act* 1991 provides that, if and when the land is acquired by RMS under that Act, the amount of compensation would not be less than market value (assessed under that Act), unaffected by the proposal.

In relation to other submissions received for potentially "directly impacted properties", a more detailed assessment of the impacts on individual properties would be undertaken as a part of the future assessment of the preferred route option. Mitigation measures would be investigated during this phase to identify ways to minimise the impacts on properties potentially affected by the preferred route option, including minimising any property acquisitions, where possible.

4.2.13 Navigation and river use – submissions

Issue raised in submission		Submission number	Section Addressed
River use			
1.	Options A, E and C would create navigational issues on the river.	76	4.2.14
2.	Option 14 would have a higher clearance for navigation on the river.	76	4.2.14
3.	Options 14 and 15 would not grossly affect the tourism of the Bridge to Bridge Ski race; other options would.	76	4.2.14
4.	Option E would affect the waterfront and vessels using that section of the river.	101	4.2.14
5.	Options 14 and 15 are too close to Elizabeth Island and a boat ramp used by a sailing club, naval cadets and dragon boating.	101	4.2.14
6.	The height of the bridge would not allow the yacht club to access the Clarence River at Corcoran Park for its year round events. 17 metres proposed does not appear to allow for tidal variations.	P1, 113	4.2.14

Issue raised in submission	Submission number	Section Addressed
River use		
7. The lowered height would not allow ocean-going vessels up to the Grafton City end of the Clarence River.	P1, 113	4.2.14
8. Closure of the main boat ramp by a bridge under Option 14 or 15 would affect boating activity including the local sailing club on North Street.	P1, 113	4.2.14

4.2.14 Navigation and river use – RMS response

In terms of navigation impacts, all options would introduce additional pylons into the Clarence River, thus creating additional navigational constraints. All options have been designed to accommodate two 35 metre wide navigation channels. Options E, A and C would have a vertical clearance of 9.1 metres in height to be consistent with the height of the existing bridge. Options 11, 14 and 15, would have a vertical clearance of 17 metres in height, retaining access for vessels that currently moor at Dovedale. The clearances for the navigation channels were developed in consultation with NSW Maritime (now part of RMS), Clarence River Sailing Club, Big River Sky Club, Bridge to Bridge ski race, Clarence River yacht club and Clarence Valley Council.

It is acknowledged that Options 11,14 and 15 present a constraint to the very small number of vessels with masts of greater than 17 metres in height which may wish to sail up to the Grafton Bridge. Options 14 and 15 are less than 3km downstream of the existing bridge, and Option 11 is approximately 1km. In view of the facilities for yachts available at Corcoran Park, the benefits of enabling a very small number of large ocean going vessels to access a further 3km of the river upstream are far less than the costs associated with lifting the new bridge higher to accommodate these larger vessels.

Impacts to Corcoran Park and access to the river were also noted with Options 14 and 15. Local road works associated with Options 14 and 15 would maintain links to Corcoran Park to ensure access is maintained. The *Landscape and Urban Character* technical paper identified potential negative impacts on Corcoran Park resulting from Options 14 and 15.

A discussion of the restrictions to river use with each of the options is included in Volume 2 of the RODR under the Technical Paper: *Social and Economic*, page 48.

Further assessment of impacts on river use and the waterfront would be undertaken during the concept design and environmental assessment phase of once a preferred option is identified. Measures to mitigate impacts would be considered as part of the assessment.

4.2.15 Flooding – submissions

Issue raised in submission	Submission number	Section Addressed
Flooding and river flow		
1. Concerned about additional flood levee banks.	1	4.2.16.2
2. An embankment associated with options 14 and 15 and option 11 could have a detrimental effect on land drainage and flooding, disrupt floodplain flows and or require greater flood levee works.	7,22,31	4.2.16.2
3. Options 11, 14 and 15 are likely to have a reduced impact on flood mitigation issues.	52	4.2.16.1 & 4.2.16.2
4. Previous hydrology reports showed that a bridge outside the study area would have a lesser impact on raising river levels in flood times.	71	4.2.16.5
5. Any afflux would have a significant effect on the Grafton area, as the levee would only protect the town in a 1:20 Annual Exceedance Probability (AEP) 1 in 20 year flood.	71	4.2.16.1 & 4.2.16.2
6. If a new bridge is built and makes the existing flood situation worse, then flood protection to 1:100 AEP.	71	4.2.16.1 & 4.2.16.2
7. Option A's piers would obstruct the river and increase flood levels.	71	4.2.16.6
8. Options 14 and 15 would provide a road system not directly affected by floods.	76	4.2.16.1 & 4.2.16.2
9. Query how level under Kent Street viaduct can be achieved with known local ponding issues. The additional cost could be large.	82	4.2.16.4
10. Will work address the low-level flood prone highway on the south side of Grafton from the sawmill to the higher ground leading to Centenary Drive?	93	4.2.16.2
11. Option C involves the lowering of Pound and Grieves Street and would have intrinsic problems with flooding and be vulnerable to pump failure.	98,115	4.2.16.4
12. Option 14 and 15 in the floodplain would put a huge constraint on that area and would increase the difficulties during floods.	P1, 113	4.2.16.1 & 4.2.16.2

Issue raised in submission	Submission number	Section Addressed
13. Raising levee walls and adding additional levees for Options 14 and 15 would disrupt the landscape in the floodplain and increase the environmental impact.	P1, 113	4.2.16.2
14. Downstream residents would need expert advice about flood impacts.	P1, 113	4.2.16.1 & 4.2.16.6
15. Option C would lower Pound Street to pass the proposed road under the rail viaduct. This is infeasible as this area is already prone to flooding. A drain would be required under the RL. It would be vulnerable to pump failure.	98,106	4.2.16.4
16. Option E could expose St Mary's Convent to greater flood risk.	106	4.2.16.1 & 4.2.16.2
17. Any out of town option would improve evacuation during flood time with less congestion, improving contingency; and avoiding Option C-Pound Street approach road flooding at the railway viaduct, which occurs during most flood times.	115	4.2.16.3
18. Flood study did not address the impacts of the back eddy and flows at the existing bridge.	115	4.2.16.6
19. Excessive ponding, associated with Pound Street drainage, would bring with it the increased risk of water borne and mosquito borne infections such as Ross River Fever and Barmah Forest Virus.	106	4.2.16.4
20. The linkage of Option 14 with Centenary Drive would be of benefit in a flood and for B-doubles from Coffs Harbour.	76, 105	4.2.16.1 & 4.2.16.3

4.2.16 Flooding – RMS response

4.2.16.1 Flood immunity

In terms of the flood immunity associated with the six short-listed route options, all options were designed based on the following criteria:

Option Design:

- Waterway structures outside of the Grafton levee banks, including the main bridge and viaducts, must be of sufficient height to maintain a freeboard during a 100 year Average Recurrence Interval (ARI) design flood event.
- Bridges within the Grafton levees (Alumy Creek and minor drainage) must be flood immune during a 20 year ARI design flood event.

- The main approach roads to the new bridge must be flood immune during a 20 year ARI design flood event.

Flood Impacts:

- Proposed options should not adversely impact the flood immunity in Grafton and South Grafton. Where impacts are identified, design mitigation measures would be implemented to maintain the current level of flood immunity.

4.2.16.2 Alteration of existing levees

All options require lengths of the current levees to be raised by up to 0.1m. The length of levees to be raised ranges from 11.75km (Option E) to 19.5km (Option 11). There are no new flood levees included as part of the route option preliminary concept designs.

In relation to Options 14 and 15, it is acknowledged in Volume 2 of the RODR Technical Paper: Landscape and Urban Character that there are large viaducts, fill embankments and roundabouts that impact on the existing landscape character of the open floodplain. Further assessments into landscape and urban character would be undertaken during the concept design and environmental assessment phase once a preferred option is identified.

Several submissions requested that RMS increases the flood immunity of the Grafton and South Grafton areas as part of the construction of any additional crossing.

The current flood levees for the town of Grafton and South Grafton provide flood immunity for a flood approximately equivalent to a 1 in 20 year ARI design flood event. The intention of the project is to maintain the current level of immunity as a result of increased piers and structures within the Clarence River. Providing additional flood immunity for the Grafton area is outside the scope of the project.

4.2.16.3 Evacuation during floods

The RODR discusses the implications of each route option with regards to flooding emergency response. Options 11, 14 and 15 would provide an additional evacuation route out of Grafton in the event that the Grafton CBD routes are inundated or affected by a road crash or traffic congestion. It also notes that for Option C, the lowering of the bridge approach road under the railway viaduct may result in access to the new bridge being compromised earlier than in other options. One of the flooding design criteria for the route options included no adverse impacts on flood evacuation of Grafton.

4.2.16.4 Lowering of existing streets

Specific concerns were raised in relation to flooding of Option C which involves the lowering of Pound Street under the rail viaduct and also Option A in relation to flooding around Kent Street.

The current preliminary concept designs do not indicate any lowering of the road along Kent Street beneath the existing bridge approach viaduct or the railway viaduct.

As part of the RODR, the flood impact assessment undertaken for the six route options aims to:

- Estimate the flood impacts associated with each route option design

- Identify necessary mitigation measures required to maintain the current level of flood immunity within Grafton and South Grafton following the construction of the second crossing

- Identify qualitatively the effects of each option on flood evacuation.

As a result of local flooding impacts around Pound Street under the railway viaducts, further mitigation measures were identified in the RODR as being required for Option C to achieve immunity during the 20 year ARI event, including completing the following:

- Increasing the capacity of the existing gravity drainage system servicing the Pound / Kent Street area by the installation of three additional 1050mm flap gated culverts emptying into the Clarence River;

- A catch drain north of Option C;

- A detention basin south of Option C with a 560m^3 capacity and a design bed level of 0.7m AHD;

- A 2m^3/s capacity pump station to extract water from the detention basin; and

- 8 x 0.5m x 1m box culverts under Option C, providing connectivity between the catchment north of Option C and the proposed detention basin.

These mitigation measures would allow flood free access to the new bridge in a 20 year ARI event flood.

The above drainage features have been sized ensuring that the efficiency of the proposed drainage infrastructure is limited by the proposed pump capacity, not the associated detention basin or culverts under Option C

Although this drainage strategy has a primary objective focused on achieving the desired flood immunity requirements for Option C, this measure would have a residual benefit for surrounding property owners. The drainage strategy would reduce the occurrence of local stormwater flooding within an area of problem drainage within Grafton.

The conceptual drainage strategy has been designed to be free draining (not requiring pumping) during local rainfall events which occur when the Clarence River is not in flood. When the Clarence River is in flood, elevated water levels within the Clarence River do not allow for gravity drainage from Grafton, requiring the use of the pumps to drain the Pound/Kent Street area.

If Option C is selected as the preferred route option, further assessment of flood management measures would be undertaken to refine the drainage arrangements for the area. This assessment would include investigating the provision of a stand-by pump to manage the residual risks associated with pumping.

4.2.16.5 Location of a new bridge

A submission expressed the view that previous hydrology reports showed a bridge outside of the study area (presumably Grafton and South Grafton areas) would have a lesser impact on raising river levels in flood times.

The flooding assessment undertaken as part of the RODR assessed the flood impacts associated with the six route options only. It also identified necessary mitigation measures required to maintain the current level of flood immunity within Grafton and South Grafton following construction of the proposed route option design.

4.2.16.6 Flood modelling

As per the *RODR Technical Paper: Flooding*, the detailed flood model was completed using the lower Clarence River flood model, originally developed and calibrated as part of the Lower Clarence River Flood Study Review (WBM, 2004). The 2004 Lower Clarence River Flood model is the latest publicly available flood model of the lower Clarence River catchment; defining the regional flood behaviour between Mountain View, upstream of Grafton, and the Clarence River entrance at Yamba/Iluka. This model has been used in consultation and with the approval of Clarence Valley Council.

Further to this, the modelling also took into account pier locations in the river for each bridge design, which were developed as part of the latest route option design report.

Information to assist the Grafton community to understand the flood impacts associated with any of the six short-listed options is provided in Volume 2 of the RODR *Technical Paper*: *Flooding*.

4.2.17 Fauna and Flora – submissions

Issue raised in submission	Submission number	Section Addressed
Fauna		
1. Option 15 would disrupt significant fauna in Great Marlow. This includes nesting and resident ospreys, black swans, duck, transitory birds including jabirus and wedge tailed eagles and other birds.	7,31	4.2.18.2
2. Option E would disrupt flying foxes.	54	4.2.18.2
Flora		
1. Construction of Option E would require the removal of a large and significant fig tree at the corner of Villiers and Victoria Street and its removal would be of great concern.	59,109	4.2.18.1 & 4.2.18.2
2. If the second bridge is located beside the existing bridge it would involve the removal of many trees.	P2	4.2.18.1
Flora		
3. Options 14 and 15 and in town options (A, E, C and 11) cannot be accurately compared in terms of removal of trees en route because (A, C, E, and 11) trees have not been counted along the extent of the route to Summerland Way.	115	4.2.18.1

Issue raised in submission	Submission number	Section Addressed
4. Construction of Option C would not disturb ecologically sensitive areas not already affected by construction of the levee bank.	71	4.2.18.3

4.2.18 Fauna and Flora – RMS response

4.2.18.1 Removal of trees

In terms of impacts from each option, all options result in the loss of trees within the Grafton and South Grafton area. Removal of trees was considered in two of the papers.

1. The Technical Paper: Non-Aboriginal Heritage considers the comparative potential impact on plantings of cultural significance. This considers the contribution of trees as heritage items as well as their collective effect on streetscape and setting.
2. The Technical Paper: Landscape and Urban Character also considers the ability of each of the route options to retain the existing landscape character of the area, including minimising removal of trees.

Tree removal within the indicative road boundaries has been considered for each of the options. With the current design it is not anticipated at this stage that any tree removal outside of the indicative road boundary would take place as a result of the options. This is subject to further refinement and assessment during the concept design and environmental assessment phase for the preferred option.

With regards to impact on tree plantings of Non-Aboriginal cultural significance, Option 14 has the greatest impact on tree plantings of non-Aboriginal cultural significance in the area, with 140 trees potential impacted by works associated with the new crossing. Option E has the second greatest impact, with 116 trees potentially affected. Option A impacts on a total of 65 trees, which is the option with the least impact on planted trees.

It is also noted in the RODR under the landscape and urban character section that Option E impacts on existing landscape particularly on Villiers Street including the removal of some large fig trees. Also Option 11 impacts on existing landscape character particularly the Fry Street area including some large fig trees.

The RODR also made specific mention of Option E which would impact on foraging trees for the flying fox due to the removal of the large fig tree on the corner of Villiers and Victoria Streets.

4.2.18.2 Fauna

One of the submissions notes that Option E would disrupt flying foxes. As mentioned above the RODR states that Option E would impact on foraging trees for the flying fox due to the removal of the large fig tree on the corner of Villiers and Victoria Streets as well as potentially impacting on the flight path of the species from Susan Island where a breeding colony occurs, and thus the potential for bridge or vehicle strike.

Another submission expressed concern about Option 15 as the proposed road through the Great Marlow area could impact on threatened birds, which were believed to not be identified in the supporting technical papers.

Fauna habitat in the form of drainage soaks within potential freshwater wetlands and fauna habitat in the form of constructed drainage lines have been identified in proximity to Options 14 and 15. It is noted in the RODR that these form ephemeral habitats for many bird species (including the threatened black-necked stork). This includes habitat for wetland bird species such as ducks, swans and other wetland birds such as migratory and threatened species (e.g. Black-necked Stork). The threatened Black-necked Stork (or Jabiru) has been explicitly mentioned within the RODR as likely to infrequently use forging resources in proximity to Options 14 and 15.

As no nests were detected in proximity to the route options for large birds which would routinely use the same nest annually for breeding such as the Osprey, White-bellied Sea-eagle, Wedge-tailed Eagle or Black-necked Stork, these species were not identified within the RODR as a constraint.

4.2.18.3 Other Flora

One of the submissions noted that Option C would not disturb ecologically sensitive areas that have not already been impacted by levee construction. The RODR notes that Options E, A and C were found to have the lowest impact on areas of Endangered Ecological Communities as the majority of the routes are in urbanised areas. Options E and A only impact on small areas of reedlands. Option C also directly impacts on degraded riparian forest near Alipou Creek and also remnant eucalypts near the Pacific Highway.

Further assessments into flora and fauna (ecology) would be undertaken during the concept design and environmental assessment phase once a preferred route is identified. This would consider ways to minimise and manage impacts on ecology.

4.2.19 Non-Aboriginal heritage – submissions

Issue raised in submission	Submission number	Section Addressed
Non-aboriginal heritage		
1. Option 15 preserves heritage of Grafton.	3	4.2.20
2. Option 11 would destroy some iconic homes on the northern side of the river.	51	4.2.20
3. Options 11,14 and 15 have least impact on heritage.	52	4.2.20
4. Options A and C would have a major impact on heritage issues.	56	4.2.20
5. Option E would destroy the heritage value of St Marys Convent, which is of heritage significance for its association with the Sisters of Mercy and for former students and staff.	59,98	4.2.20

Issue raised in submission	Submission number	Section Addressed
Non-aboriginal heritage		
6. St Mary's Convent would be significantly interrupted and physically impacted by Option E including by removing views to and from the Convent.	59,109	4.2.20
7. Option E would also have indirect impacts on the heritage significance of the Convent in the context of the other local heritage items and significant trees on Victoria Street	109	4.2.18.2 & 4.2.20
8. The Convent building and archives could be affected by noise, vibration, emissions and construction associated with Option E.	59,109	4.2.2.3 & 4.2.20
9. The existing bridge is a state listed heritage item. Any bridge near the current bridge would impact the aesthetic value of the bridge.	62,71,89	4.1.22.4, 4.2.8.2 & 4.2.20
10. Option A would affect the historical aspect of the existing bridge including approach abutments.	62,71,89	4.1.22.4 & 4.2.20
11. Heritage listed *Induna* wreck is located slightly upstream of option A and could be damaged by construction.	62,71	4.2.20
12. Option A would affect areas of Fitzroy St that are part of the Council Heritage Area and on the National Trust Heritage list and also heritage houses in Bent St.	71	4.2.20
13. Options 11, E, C, 14 and 15 have less impact on heritage values than option A.	71	4.2.20
14. Option C would severely affect 36 Villiers Street Grafton, which was built in 1878 or before. Moving the house would not be practical because of its age and the important context within which it sits.	110	4.2.20
15. All in town options have the highest impact on non-Aboriginal heritage impacts.	115	4.2.20
16. Heritage impacts have not fully been considered for Option C. Pound Street, in particularly Dunvegan and also the viaduct being s170 heritage listed.	115	4.2.20

4.2.20 Non-Aboriginal heritage – RMS Response

This section discusses issues regarding the impact of a bridge location on the heritage aspects of Grafton and South Grafton, including the existing bridge. The heritage aspect of the bridge is dealt with in section 4.1.22.4

In terms of other heritage impacts, all options would have impacts on heritage values of Grafton and/or South Grafton. The extent of this is dependent on the location of the additional crossing, and the associated local road improvements. It is acknowledged the in town options have a greater impact due to their location in the more developed parts of the Grafton and South Grafton communities. Heritage impacts are only one of many criteria used to compare options in terms of how they meet the project objectives.

A detailed assessment of heritage values in and around Grafton and South Grafton was undertaken for the Technical Paper: *Non-Aboriginal Heritage* for the RODR. The assessment included heritage register searches to identify any recorded cultural heritage sites or items. Questions were raised in the submissions regarding the following properties. The list below notes the impact on each property as assessed in the RODR:

- 36 Villiers Street is potentially directly affected by Options E and C and potentially indirectly affected by Option A due to the upgrade of Pound and Villiers Street intersection
- The Sisters of Mercy property is potentially directly affected by Option E due to the upgrade to the Villiers and Victoria Street intersection, and changing access arrangements along the southern end of Villiers Street
- Houses at the eastern end of Fitzroy Street which are identified as a group of heritage items are potentially directly affected by Option A and potentially indirectly affected by Option C
- Houses at the end of Kent, Pound and Greaves Streets, sometimes referred to as the Kent Street Group and are potentially directly affected by Option C
- *Dovedale* at 1 Fry Street is potentially directly affected by Option 11
- The SS *Induna* which lies in the Clarence River riverbed is potentially directly affected by Option A
- *Dunvegan* property is potentially directly affected by Option C and potentially indirectly affected by Options E and A
- The railway viaducts through the town of Grafton are indirectly affected by all options

Potential impacts on plantings of cultural significance were considered as part of the RODR. The Technical Paper: Non-Aboriginal Heritage notes the contribution of trees as heritage items as well as their collective effect on streetscape and setting. The loss of these trees through road works is identified as an impact.

It is intended that once a preferred route is identified for the additional crossing, concept design and environmental assessment would be undertaken, with one of the outcomes seeking to minimise the impact on adjacent properties.

4.2.21 Aboriginal heritage – submissions

Issue raised in submission	Submission number	Section Addressed
Aboriginal heritage		
1. Option 15 affects an Aboriginal Heritage site "Tracker Robinson's Camp" as well as being an area of high potential for Aboriginal artefacts.	7,31	4.2.22.2
2. Option 11 has the least impact on Aboriginal heritage	77	4.2.22.2
3. Great Marlow is significant to Aboriginal heritage as it was the source of traditional food and medicinal plants and Option 15 cuts through this area.	P1, 113	4.2.22.2
4. Elizabeth Island has sacred significance and should not be impacted on or used in any way.	P1	4.2.22.1
5. Option C would involve the relocation of the Gummyaney Aboriginal Preschool community. It is situated on Aboriginal Land and is significant to the Aboriginal community.	111	4.2.6.1
6. All in town options have the highest impact on Aboriginal heritage.	115	4.2.22.2
7. Impacting Aboriginal heritage is of great concern with Option C Pound Street. The Golden Eel site could be potentially impacted physically, aesthetically and spiritually.	115	4.2.22.2
8. Impacts with downstream option on Aboriginal heritage can be minimized and mitigated as has occurred on Pacific Highway and regional RMS projects, in particular, such as Ballina and Kempsey.	115	4.2.22.2

4.2.22 Aboriginal heritage – RMS response

4.2.22.1 Elizabeth Island

It was noted in the PROR that Elizabeth Island is an Aboriginal men's site with high significance to the Aboriginal community. None of the six short-listed route options pass over Elizabeth Island.

4.2.22.2 Other areas of known Aboriginal cultural heritage

RMS notes the potential impact of the project on areas of Aboriginal cultural heritage significance. The RODR identifies the potential impact of Options 14 and 15 on the Great Marlow area, with Option 15 also potentially impacting on "Tracker Robinson's Camp" during construction.

Option C is located in close proximity to the Golden Eel site (a spiritual area of high significance to the Aboriginal people). In the RODR, Option C was identified as having potential impacts on the Aboriginal cultural heritage of this area during construction. Should

Option C be identified as the preferred option, careful consideration would be required, in consultation with the community, to the development and implementation of methodologies to minimise any impacts on the site.

Further assessment of Aboriginal heritage would be undertaken during the concept design and environmental assessment phase once a preferred option is identified. In the event that an option is chosen which has been identified as having potential impacts on items or areas of Aboriginal cultural or archaeological heritage, measures would need to be undertaken, in consultation with the community, to protect and/ or minimise impacts on Aboriginal cultural or archaeological heritage

4.2.23 Other environmental issues – submissions

Issue raised in submission	Submission number	Section Addressed
Other environmental issues		
1. Option 15 has the most merit if environmental and land and creek scarring could be reduced or eliminated.	76	4.2.24
2. High risk acid sulphate soils could be disturbed during construction of options 14 or 15 and reduce the river/groundwater quality during and after the construction.	P1,113	4.2.24
3. The environmental disturbance downstream would be significantly greater than upstream for Options 14 and 15.	P1,113	4.2.24
4. Option C would have considerable environmental impacts.	110	4.2.18.3 & 4.2.22.2
5. Impacts with downstream options, such as aboriginal heritage, environmental, acid sulphate, flooding, etc can be minimized and mitigated as has occurred on Pacific Highway and regional RMS projects, in particular, such as Ballina and Kempsey.	115	4.2.24
6. Option E could affect Susan Island in the long term, as the island is moving slowly downstream.	42	4.2.24

4.2.24 Other environmental issues – RMS response

All options would have some degree of ecological impact. It is noted in the RODR that Options 14 and 15 would have the greatest impact on EECs as these options pass through rural and semi-rural areas in Grafton and South Grafton which contain drainage soaks, some of which conform to the freshwater wetlands on the coastal floodplain EEC. Options 14 and 15 would also have the greatest impact on other vegetation and habitat and are noted to potentially impact a breeding colony area for the cattle egret. Other environmental impacts such as Aboriginal heritage, non-Aboriginal heritage and landscape and urban character are discussed in further detail in the RODR and technical papers.

The movement of Susan Island is a natural function of the erosion and deposition of the river and is likely to continue regardless of any of the bridge options. The rate of movement of the Island is controlled by a number of factors which include the depth and flow of the river (including large flood events) and the supply of material (rock and soil). Option E would be unlikely to substantially change these factors. Historical maps from the last 150 years suggest that there has not been significant movement of the island over the last 150 years.

Option E is located approximately 250m downstream of the Susan Island and as such it is unlikely that during normal river levels the local scour of the bridge piers would affect the island. Scour assessments to estimate general scour of the river channel and local scour around piers would be undertaken during the concept design and environmental assessment phase once a preferred option is identified. Option E would be designed to minimise scour at piers and abutments due to larger flood events and to take into account the geomorphology of the river.

Further to these issues, RMS received submissions expressing concern with acid sulphate soils (ASS), and the potential for environmental damage if these were disturbed. RMS guidelines for Management of Acid Sulphate Soils are consistent with the relevant state management guidelines. The RMS guidelines would be applied during the construction of the preferred route for the additional crossing of the Clarence River in Grafton to ensure construction in areas where there is potential ASS would be managed appropriately to minimise environmental harm.

4.3 Cost benefit analysis and value for money

4.3.1 Cost benefit analysis– submissions

Issue raised in submission	Submission number	Section Addressed
Cost benefit and value for money		
1. Options 14 and 15 are significantly more expensive by approximately $100 million and would be used by half as much as the other options.	7,22,31,P1, 104, 107	4.3.2
2. Costs of 14 and 15 could escalate when geotechnical issues are further investigated including settlement and acid sulphate soils.	7,31	4.3.2
3. Option A has a reasonable cost benefit ratio and is more readily approved.	22	4.3.2
4. Options A, C and E do not meet the needs of the wider community.	23	4.1.2.1 & 4.3.2
5. Option 11 is better for all road users and does not require a Prince Street upgrade.	30	4.1.2.1 & 4.3.2

Issue raised in submission	Submission number	Section Addressed
Cost benefit and value for money		
6. Option C is the best value for money. Located at the narrow part of the river keeping costs down.	33,70	4.3.2
7. Option 11 second best after 14 and 15.	38	4.3.2
8. Pacific Highway intersection for access to option 11 exists.	44	4.1.6.1 & 4.1.6.2
9. The cost of Options E, A, C and 11 would be far higher when property resumption and slowing of current road use is considered.	60	4.3.2
10. Option A is the least costly and more readily approved.	75	4.3.2
11. Option E would cost less than the other options.	77	4.3.2
12. The RMS has not presented a robust business case for the project.	84	4.3.2
13. The use of large estimates of vehicle growth rates has led to overestimates of benefits from any new bridge.	84	4.1.16.1 & 4.1.16.6
14. The economic analysis undertaken does not allow realistic comparison of options. The model assumes that vehicle users do not adapt to travel conditions and there is a hypothetical gridlock.	84	4.1.16.1 & 4.3.2
15. RMS policy requires a benefit cost ratio of at least 2:1 before investing public funds. The BCRs for this project do not meet this.	84	4.3.2
16. Option 11 has a very positive BCR and equivalent with some of the cheaper options. This option could be seen as a balanced option.	38	4.3.2
17. On a fair economic assessment basis this is a marginal project at best and other non-structural approaches need to be applied.	84	4.3.2
18. Doubt benefit of upgrading the Villiers St viaduct with any of the downstream options. Normal 6 axle semi-trailers could use the downstream options (11, 14 or 15) and the old bridge.	89	4.1.2.1, 4.1.4.1 & 4.1.14.3
19. Believe that State and Federal Government funding to commence construction of a second bridge should be secured as soon as possible.	P2	4.3.2

Issue raised in submission	Submission number	Section Addressed
Cost benefit and value for money		
20. The 6 options cannot be compared. Options 14 and 15 are strictly alternative access bypass routes with a longer road network, to meet future growth and demands and the rest (A, E, C and 11) are in town options. Different ancillary works are costed in each proposal.	115	4.1.16.1, 4.1.16.5 & 4.3.2

4.3.2 Cost benefit analysis – RMS response

The strategic cost estimates include allowances and contingency for:

- Concept development (based on the engineering drawings presented in the RODR
- Detailed design and documentation
- Geotechnical conditions including depth to rock and soft soil treatments
- Property acquisition costs (acquisition was identified via Geographic Information System (GIS) and estimated via historical property sales within the immediate area)
- Utility adjustment costs (cost allowances were estimated based on adjustments that may be required for major utilities potentially impacted by each of the route options)
- Infrastructure construction costs (which includes costs for flood mitigation)
- Handover costs.

Ground settlement associated with embankments may be an issue with Options 11, 14 and 15 and some ground improvement may be required. However, these issues are considered manageable and contingency allowances have been included in the strategic cost estimates.

In relation to the costs for each of the options, Options 14 and 15 have strategic cost estimates of $304M and $340M respectively, with Options E, A, C and 11 costing between $210M and $231M.

Options 14 and 15 are appreciably more costly than the other options due primarily to the longer bridge and viaduct lengths required.

Options E and 11 are the least costly options. While the total bridge and viaduct costs are slightly more expensive than for Options A and C, property acquisition costs are appreciably less.

Options A and C costs are similar, approximately $20 million more than Options E and 11, but still appreciably less than Options 14 and 15. Property acquisition costs and public utility adjustments are higher for Options A and C. Option C also has higher drainage costs

because of the additional drainage infrastructure required where it passes under the rail viaduct at Pound Street.

Long term modelling shows that Options E, A and C would perform better than Options 14 and 15 over the long term by reducing in-town congestion. The traffic modelling undertaken for the additional crossing indicates that in 2049 only 36% of traffic would use Option 14, with a predicted 35% using Option 15.

Option 11 has the highest Benefit Cost Ratio (BCR) of all options. Option 11 has a BCR of 1.7, compared to 1.6 for Options E and C and 1.3 for Option A. Options 14 and 15 have the lowest BCR of 1.0 and 0.9 respectively. A BCR that is greater than 1 indicates that the road user benefits exceed the costs.

The RMS *Economic Analysis Manual*, Version 2 (RMS 1999) does suggest a value of 2.0 as the cut-off value for a BCR. However, in practice RMS uses BCR as just one of a number of tools guiding the analysis, ranking and funding of RMS projects, and a minimum BCR value of 2.0 (or even 1.0) is not a fixed prerequisite. For example not all costs and benefits can be quantified in a road user cost benefit analysis, and issues such as equity or a reduction of fatalities, etc. may take precedence over economic worth in decision-making. The BCR is only one criteria used to decide on a preferred option for the additional crossing of the Clarence River in Grafton.

With regard to funding, the purpose of this project is to identify an additional crossing of the Clarence River at Grafton to address short-term and long-term transport needs. The indicative timing for the opening of the bridge is 2019, with construction to commence by 2015. This timeframe would depend on the availability of funding.

4.4 Consultation process

4.4.1 Consultation process – submissions

Issue raised in submission	Submission number	Section Addressed
Consultation		
1. Uncertainty related to lack of preferred option is of concern.	11	4.4.2
2. Should survey people travelling to and from or tracking companies driving through Grafton about whether they would use option 14 and 15 even though the existing bridge would remain.	28	4.4.2
3. RMS has the knowledge and expertise and should make the decision.	61,81	4.4.2
4. The process has taken too long, just make a decision.	62,68	4.4.2
5. Community consultation cannot result in a unanimous decision, frustrates the community and wastes time and money and resources.	74	4.4.2

Issue raised in submission	Submission number	Section Addressed
Consultation		
6. The consultation on the bridge has divided the Grafton community with adverse consequences. All proposed options result in the loss of homes and businesses for some people and a larger number would be seriously inconvenienced or would suffer anxiety and uncertainty for many years.	84	4.4.2
7. The construction of a second bridge across the Clarence River has been an issue of concern to the community for many years.	P2	4.4.2
8. The community has maintained a preference for a second bridge downstream of the existing bridge or at Elizabeth Island with access near or at North Street since 2003.	P2	4.4.2
9. Was unable to provide details of concerns at the public forum because of restricted time.	110	4.4.2
10. The relevant strategies and reports in the RODR have not been fully addressed and considered and cannot be until a preferred option is identified.	115	4.4.2
11. Input from trucking companies to the Heavy Vehicle Survey were incomplete, including no input from the company delivering to the large supermarket chains in Grafton CBD.	P2	4.4.2
Value Management Study		
1. Only people in Grafton and South Grafton who are affected by an option could apply.	7	4.4.2

4.4.2 Consultation process – RMS response

RMS understands the difficulties being experienced by the community due to the uncertainty regarding the location of the additional crossing, particularly those within the community whose homes or businesses are potentially directly affected by one or more of the six short-listed options. RMS is working as quickly as possible to identify a preferred option while ensuring that the process is thorough and robust.

Submissions were received criticising the timeframes, the extent of information prepared for the project and the perception that RMS just needs to make a decision. As the project is very important to the Grafton community, there is a high level of community interest in it. It is important that the six route options are thoroughly investigated to ensure all potential impacts and constraints have been properly considered.

RMS aims to finalise the decision as soon as possible, while also ensuring the assessment underpinning this decision is thorough and robust.

It is anticipated that a recommended preferred option will be identified in late 2012. Once a recommended preferred option is announced, there will be further consultation before finalising the preferred location for the second bridge. Information prepared as part of the RODR, Recommended Preferred Route Option Report and the Preferred Route Option Report will be used to inform further work on the concept design and environmental assessment for the preferred option.

RMS acknowledges that all options would have impacts on various parts of the community depending on where the bridge is located. Further, there are a wide range of views about the location of a second bridge, as shown in the initial consultation period where a total to 41 suggestions for the additional crossing were identified.

In relation to nominations to attend the Value Management workshop. These were open to members of the public who were potentially affected by, or in the vicinity of, one of the six short-listed options, or a regular bridge user. In the latter group, nominees could come from anywhere providing they were a regular bridge user.

RMS consulted a wide range of stakeholders and the community during the route option selection process. This included a range of freight and public transport operators. A full overview of the consultation process is included in section 2 of this report. As part of this, RMS issued widespread invitations to the community to attend the community forums, staffed displays and information sessions and to lodge submissions and contact the project team. Members of the transport industry were included in these invitations.

RMS considers that adequate and appropriate invitations have been provided to the community and stakeholders within the Grafton area to attend the community forums, staffed displays and information sessions and to lodge submissions and contact the project team.

In late 2011, RMS contacted the Clarence Valley Transport Committee as part of the process to identify representatives of the freight and public transport operators to attend a Community and Stakeholder Evaluation Workshop in November 2011. Following receipt of advice from the committee, RMS invited representatives of Herb Blanchard Haulage Pty Ltd and Busways Group Pty Ltd to attend the workshop on behalf of the freight and public transport industries respectively. Mr Robert Blanchard attended the workshop as a representative of the freight transport industry and Mr Chris Webb attended the workshop as a representative of the public transport industry.

Representatives of Herb Blanchard Haulage and Busways were also invited to attend the Value Management Workshop on behalf of the freight and public transport industries respectively.

Detailed traffic studies have been undertaken to analyse heavy vehicle movements in and around Grafton. The combination of the studies undertaken and the information received as part of the consultation process, is considered appropriate to provide RMS and its consultants a thorough understanding of heavy vehicles in and around Grafton.

4.5 Summary of responses to feedback

All options have potential impacts relating to the location of the additional crossing.

The project purpose is to identify an additional crossing of the Clarence River at Grafton to address short-term and long-term transport needs. This will need to consider which options provide the best balance overall between functional, social, environmental, value for money and cost considerations.

Any option identified as the preferred location for the additional crossing of the Clarence River in Grafton would undergo a concept design and environmental assessment phase which would investigate measures to mitigate impacts identified for the project.

5 Summary of other community feedback

5.1 Summary of online comments

The online community forum commenced on Monday 10 September and closed on Wednesday 10 October 2012. The online forum was created to allow informal discussion on the options. http://haveyoursay.nsw.gov.au/graftonbridge

In total 64 comments were posted by 18 users.

Generally the issues raised reflect those made in formal submissions. Contradictory views on the impact of the different options on congestion in the Grafton CBD and on the effectiveness of providing an out of town crossing were raised in the online comments.

A general concern with the safety, noise and amenity issues relating to large vehicle movements through the urban area was evident. The aesthetic impact of new bridges was a matter of interest, especially in the context of the tourist value of the existing 'bendy bridge'.

There was also consistent interest in maintaining the heritage value of, and tourist interest in, the city. The potential for flooding of the railway viaduct underpass under option C was raised in a number of posts. Concerns were raised about the occasional diversion of traffic through the Grafton CBD (along Summerland Way) across the existing bridge following closure of the Pacific Highway. No clear consensus on a preferred option is evident.

5.2 Summary of informal feedback at staffed displays

About 225 community members attended the staffed displays and information sessions. Project staff received a range of comments and questions about the project, the process moving forward to identify a preferred option and the six route options.

Where individuals asked for feedback to be captured as a formal submission, these have been collated in this report.

5.3 Overview of the public forums

The first public forum was held on Tuesday 18 September 2012 from 6pm to 9pm at the Grafton Community Centre. The public forum was facilitated. Project team members, including RMS, Arup and specialist consultants presented information about the project and an overview of the technical studies that underpinned the RODR. The PowerPoint presentations were made available on the project website after the forums.

Some community groups made brief presentations. Members of the audience were able to ask questions of the project team and community presenters. About 90 people were in attendance.

A second public forum was held on Tuesday 9 October from 6pm to 8pm at the Grafton Community Centre. The public forum was also facilitated. The RMS Project Manager presented an update on the project including a demonstration of the traffic visualisation

videos. The PowerPoint presentation and traffic visualisation videos were made available on the website after the forum.

Community groups also presented at the forum. Members of the audience were able to ask questions of the team and community presenters. About 40 people were in attendance.

Both the public forums were filmed and are available on the project website.

5.4 Value management workshop

A Value Management Workshop was held on Tuesday 23 and Wednesday 24 October 2012. This was a facilitated forum where participants reviewed and assessed options for a project against agreed assessment criteria. The options are then evaluated against each criterion.

The workshop was a key input onto to the identification of a recommended preferred option which is expected to the placed on display for community comment by the end of 2012.

6 Next steps

The process to identify a preferred option is shown in the flowchart overleaf.

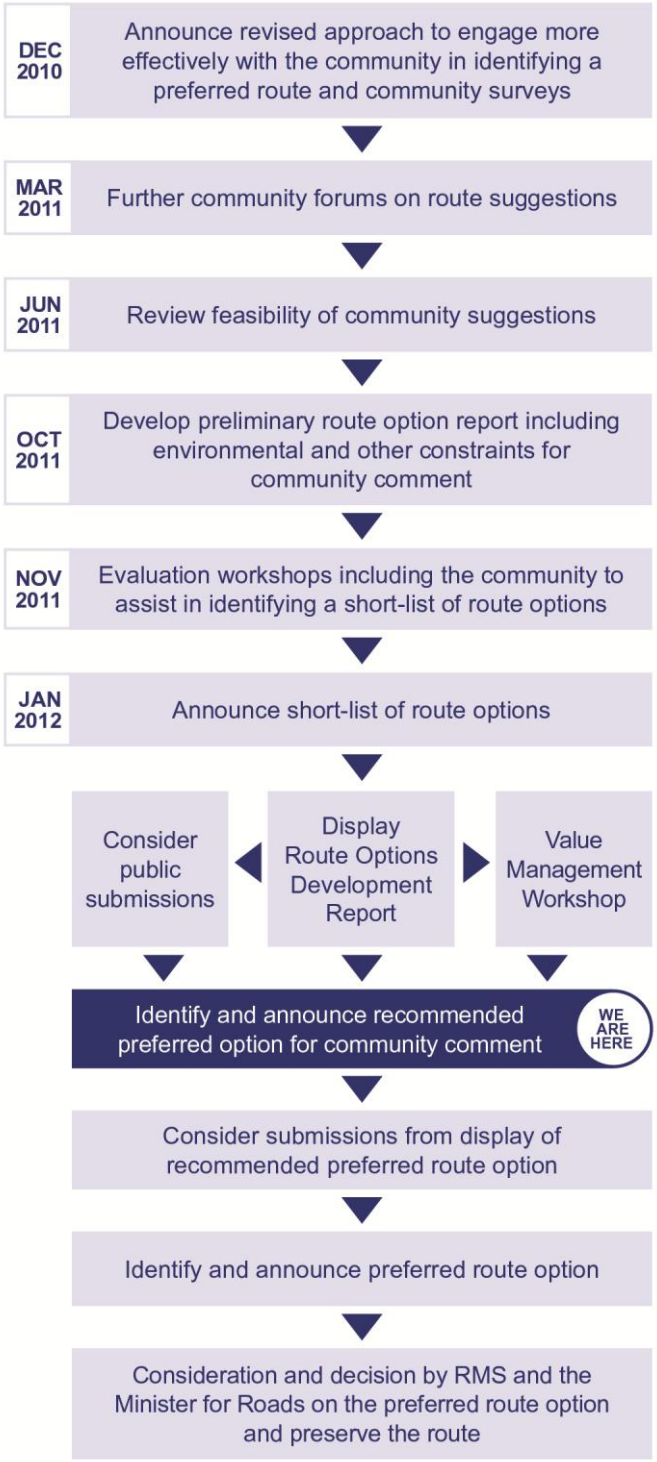

Figure 3 The process to identify a preferred option.

Appendix A

Summary of Community Consultation Activities for the RODR

Staffed displays

At the staffed displays the project team representatives (RMS and Arup) were available to take feedback and answer questions. Copies of the Community Update and RODR were available to pick up.

Displays were held at the following locations:

Grafton Shoppingworld
13 September and 4 October 2012, from 10am to 5pm

Information displays

These were informal sessions where members of the project team were available to talk one on one with the community. Large scale posters of the route options and maps from the RODR were available for discussions. Community members could ask questions, provide feedback for recording by staff, pick up a community update and request full copies of the RODR or pick up a version on CD.

Information displays were held at the following locations:

Grafton Community Centre
19 September 2012, from 11am to 2pm and 3pm to 6pm

South Grafton Ex-Servicemen's Club
25 September 2012, from 10am to 2pm

Static displays

Static (unstaffed) displays were placed on public exhibition from 10 September 2012 at the locations listed below. These included posters illustrating the route options, community event information and copies of the Community Update and at limited locations display reports.

- Roads and Maritime Services Pacific Highway Office, 21 Prince Street, Grafton
- Roads and Maritime Services Motor Registry Office, 3 King Street, Grafton
- Roads and Maritime Services Regional Office, 31 Victoria Street, Grafton
- Grafton Council Chambers and Grafton Library, 2 Prince Street, Grafton
- Ulmarra Petrol Station/Post Office, Pacific Highway, Ulmarra
- South Grafton News and Gifts, 38 Skinner Street, South Grafton
- General Store Coutts Crossing, Armidale Road, Coutts Crossing
- Junction Hill Family Store, 5 Casino Road, Junction Hill
- Maclean Council Office, 50 River Street, Maclean
- Yamba Library, Wooli Street, Yamba

Public forums

A public forum on the short-listed options was scheduled to be held at 6pm Tuesday 18 September 2012 at the Grafton Community Centre. The forum was set-up to provide

community stakeholders with an opportunity to express their views on the short-listed options.

A briefing session for the community presenters at the forum was held on Friday 14 September 2012. In response to requests from the community representatives at the briefing session, RMS agreed to:

- Alter the public forum on the evening of Tuesday 18 September to provide more time for the project team to outline the results of the investigations into the short-listed options.
- Hold a second public forum on the evening of Tuesday 9 October to provide community stakeholders with an opportunity to comment on the short-listed options.
- Extend the closing date for submissions to Friday 12 October.

Talk back radio

A radio forum was held on Thursday 10 October 2012 from 9am on 2GF radio station. The following panel presenters participated in the forum:

- RMS Project Director, Bob Higgins and RMS Project Manager, Chris Clark.
- Arup traffic consultant Gerard Cavanagh.
- Independent traffic reviewer Professor John Black, from the Institute of Environmental Studies, University of NSW.
- Representative from the Grafton Chamber of Commerce, James Patterson.
- Representative from the trucking industry, Robert Blanchard from Blanchard's Haulage.
- Representative from the Grafton Ngerrie Local Aboriginal Land Council, Brett Tibbett.

Community members were invited to call into the radio station with questions.

Moderated online forum

An online forum was provided to facilitate discussion about the merits of each option. Participants were able to lodge their comments as submissions on the options. This forum operated from 10 September 2012 to 10 October 2012.

Advertising

The exhibition of the RODR was advertised in the newspapers, on the radio and via a variable message signage on display near the Grafton Bridge for the length of the exhibition period. Newspapers and publication dates included:

Advertisement 1
Grafton Daily Examiner 11, 13, 15, 20 and 22 September
Yamba Clarence Valley Review 12 and 19 September
Maclean Coastal View 14 and 21 September

Advertisement 2
Grafton Daily Examiner 27, 29 September
Yamba Clarence Valley Review 26 September
Maclean Coastal View 28 September

Traffic modelling videos

From 24 September 2012 traffic modelling videos were made available on the project website. These illustrated peak hour travel across each proposed bridge option for the years 2011, 2019 and 2049. These were announced:

- by email mail out to people who had registered their interest in the project; and
- on the radio forum.

These were also shown at the second public forum.

Website

The website listed community events and displays, message updates from the project manager, key documents, the online forum and the traffic modelling videos as well as providing a complete project history and access to previous community and project documents.

Project email

A project email was maintained throughout the project and exhibition period. Enquiries and comments were acknowledged and responses provided as soon as technical investigations allowed.

Project telephone number

A toll free project number was maintained throughout the project and exhibition period. Phone calls were received by Id Planning staff and answered promptly. Project team members responded to technical enquires as required.

Project database

All contact with the project team was logged in the project database, provided by Consultation Manager.

RODR submissions

Submissions on the RODR were received:

- at staffed information displays, recorded by the project team
- by mail or hand delivery
- by email
- via the online forum
- by telephone to the project office and 1800 number

Each submission was logged registered, given a unique number and included in Consultation Manager. It was also summarised in this report.

Value Management Nominations

Nominations were received in person, by hand, by mail, telephone and email and registered by the project team.

Appendix 2 – Value Management Option Selection Workshop Report