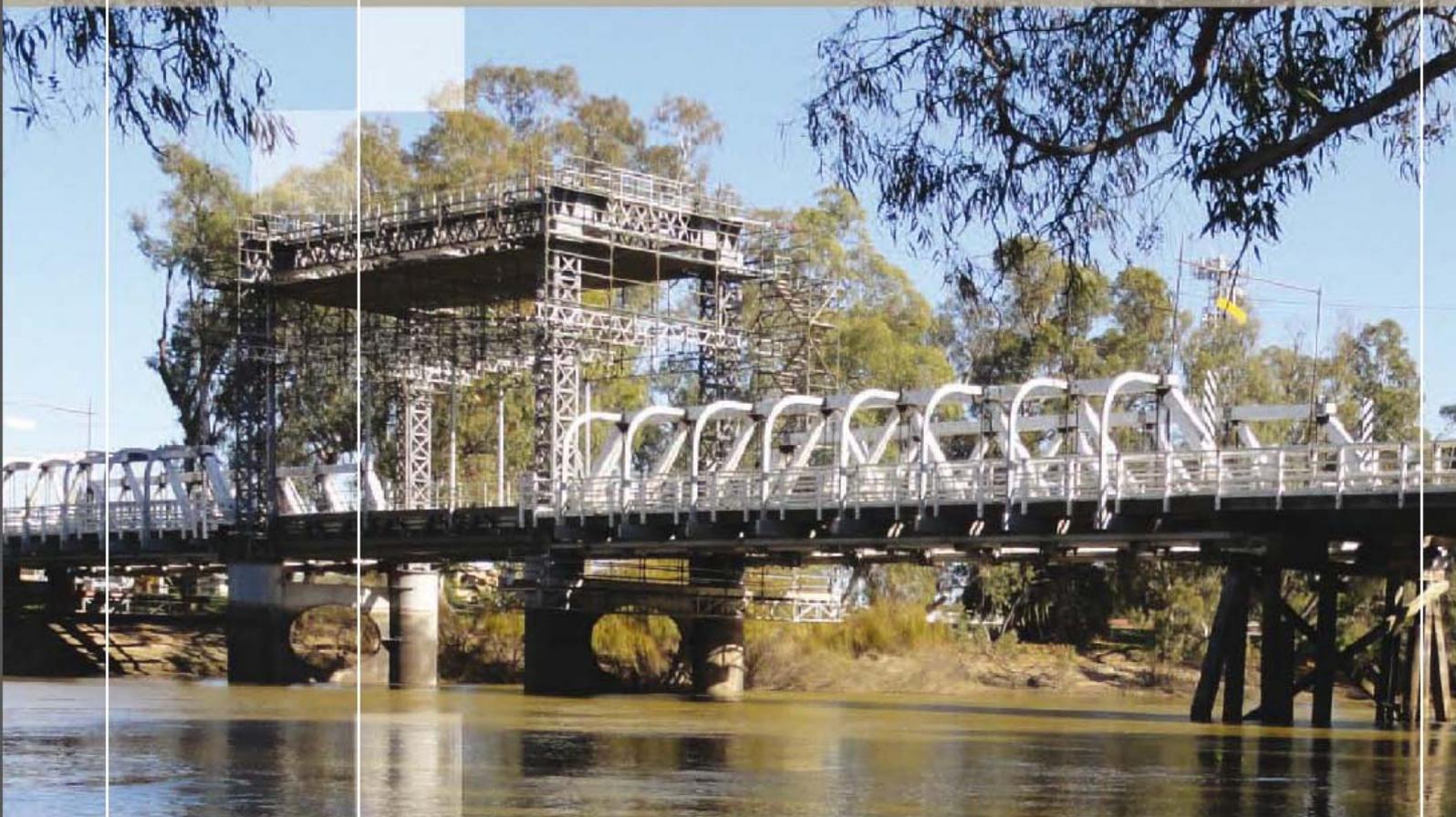




Transport
Roads & Maritime
Services



Replacement Murray River bridge crossing at Swan Hill

Environmental Investigation Submissions Report

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Roads and Maritime Services

Replacement Murray River bridge crossing at Swan Hill

Environmental investigation

Submissions report

2 July 2013

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Executive summary

Roads and Maritime Services and VicRoads propose a preferred alignment for a replacement Murray River bridge crossing at Swan Hill upstream of the existing bridge (the proposal). The proposal consists of works within Victoria and New South Wales (NSW). Swan Hill is located on the western bank of the Murray River, in Victoria, about 300 kilometres north of Melbourne and about 500 kilometres west of Canberra. The proposal is located within the Wakool local government area in NSW and Swan Hill Rural City Council in Victoria.

VicRoads and Roads and Maritime have considered a number of route options for a replacement bridge crossing of the Murray River at Swan Hill. The development of the preferred option was overseen by a project steering committee. The preferred option, Option 9A, was identified in 2009.

Roads and Maritime completed an environmental investigation and VicRoads prepared a planning assessment report to assess the environmental, social and economic effects of the replacement Murray River bridge. The purpose of the Roads and Maritime environmental investigation is to provide information to help with the selection of a road corridor for inclusion in Wakool Shire Council's Local Environment Plan. The NSW environmental investigation and the Victorian planning assessment report were exhibited between 16 June 2011 and 27 July 2011 at four locations. The environmental investigation was placed on the Roads and Maritime and VicRoads websites and made available for download. The exhibition locations and website link were advertised in the Swan Hill Tribune.

Forty seven submissions were received. In Victoria an Independent Panel formed by the Minister for Planning (Victoria) reviewed the submissions about VicRoads' proposed amendment to the Swan Hill Planning Scheme (to reserve land for the construction of the preferred option within Victoria (Amendment C41)). The Independent Panel made recommendations as outlined in the Swan Hill Planning Scheme Amendment C41 Replacement Murray River Bridge Panel Report (Panel Report) (Independent Panel, 2011). Roads and Maritime has considered the recommendations of the Panel Report in this submissions report.

This submissions report addresses the submissions received during the public exhibition that are relevant to NSW (45 of the 47 submissions). This report also considers the recommendations of the Panel Report where relevant to the proposal in NSW. The issues raised were analysed, grouped and a response provided as part of this submissions report.

No submissions objected to the replacement of the Murray River bridge. Rather, a number of submissions expressed a preference for options other than Option 9A, the majority indicating a preference for a modified version of an option identified in the environmental investigation as Option 4B. The main issues raised in submissions related to the design of the lift span bridge, traffic issues, river navigation concerns, land use, heritage and the future use of the existing bridge.

There are no changes to the preferred option proposed in NSW as a result of the submissions. Option 9A has been confirmed as the preferred option. Roads and Maritime will recommend that Wakool Shire Council include the preferred alignment corridor in the Wakool Local Environment Plan to ensure that landowners and developers adjacent to the preferred option corridor are notified.

The Swan Hill Planning Scheme has been amended to allow the development of the preferred option (subject to minor changes outlined in the Panel Report) within Victoria. The Victorian Minister for Planning approved Amendment C41 to the Swan Hill Planning Scheme on 2 August 2012.

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1 Introduction and background

1.1 Purpose

This submissions report relates to the environmental investigation prepared for the Replacement Murray River bridge crossing at Swan Hill (Roads and Maritime, 2011a), and should be read in conjunction with that document.

VicRoads and Roads and Maritime have considered a number of route options for a replacement bridge crossing of the Murray River at Swan Hill. Community input was part of the options assessment process. The development of the preferred option was overseen by a project steering committee consisting of representatives from Wakool Shire Council, Swan Hill Rural City Council, Roads and Maritime and VicRoads. Following consideration of comments received, the preferred option was identified in 2009. The preferred option in NSW (the proposal) is described in Section 1.2.

The planning assessment report and environmental investigation were placed on public display in mid 2011. VicRoads received all submissions on both documents on behalf of Roads and Maritime Services (Roads and Maritime). This submissions report summarises the issues raised that relate to the NSW component of the preferred option and provides responses to each issue (Chapter 2). It also details the need for future assessment and environmental management (Chapter 3).

The purpose of the environmental investigation is to inform the selection of a road corridor in NSW that matches the corridor in Victoria. Roads and Maritime would request the inclusion of the corridor in the Wakool Shire Council's Local Environment Plan. The purpose of the submissions report is to acknowledge and address issues raised in regards to the proposed corridor in NSW, confirm the selection of the preferred option and inform the scope of any future investigations or assessment.

VicRoads has completed a separate planning process for the proposal in Victoria. A planning assessment report was prepared by VicRoads in June 2011 (VicRoads, 2011) to provide an assessment of the environmental, social and economic effects of the replacement Murray River bridge.

1.2 The proposal

It is proposed to reserve a corridor for a replacement Murray River bridge crossing at Swan Hill upstream of the existing bridge. The proposal is identified as the 'preferred option' (as documented in the Roads and Maritime environmental investigation) or 'Option 9A' (as documented in the VicRoads planning assessment report).

The preferred option consists of works within Victoria and New South Wales (NSW). The Victorian and NSW border lies on the high water mark on the western bank of the Murray River.

Swan Hill is located in the Swan Hill Rural City municipality on the western bank of the Murray River, in Victoria, about 300 kilometres north of Melbourne and about 500 kilometres west of Canberra. The proposal is located within the Wakool local government area in NSW.

The preferred option would provide a new Murray River crossing located about 110 metres south (upstream) of the existing Swan Hill Bridge. The proposal includes:

- The construction of a new bridge over the Murray River about 192 metres long which would include:
 - Two traffic lanes (one in each direction).

- A shared pedestrian and cyclist path.
- Three sets of piers within the Murray River.
- A lift span over the navigation channel to provide access under the bridge for large river craft.
- Realignment of the Swan Hill-Moulamein Road to the south of the existing road to meet the proposed bridge. This realignment would be located on an earthen embankment to position the road above the flood plain. The new alignment would include:
 - Two traffic lanes (one in each direction).
 - A shared pedestrian and cyclist path.
- Upgrade of a section of the existing Swan Hill-Moulamein Road at the eastern end of the proposal to facilitate the realignment.
- Adjustments to property access and boundaries to facilitate the realignment. Adjustments would occur to:
 - Access to the Federal Hotel.
 - Access to the Wamba Wamba Aboriginal community property (located about 125 metres north of the Federal Hotel).
 - Access to an unnamed dirt road on the north side of the Swan Hill – Moulamein Road.
 - The boundary of and access to the Cornerstone community property (located about 200 metres east of the existing Swan Hill Bridge).
 - The boundary of and access to the Buildpro property located about 300 metres east of the existing Swan Hill Bridge).
 - Access to Pickerings Transport (located about 350 metres east of the existing Swan Hill Bridge).
- Water quality control ponds to collect and treat stormwater and sediment.
- Landscaping including planting of vegetation in the road reserve.

Refer to Figure 1-1 for an overview of the preferred option.

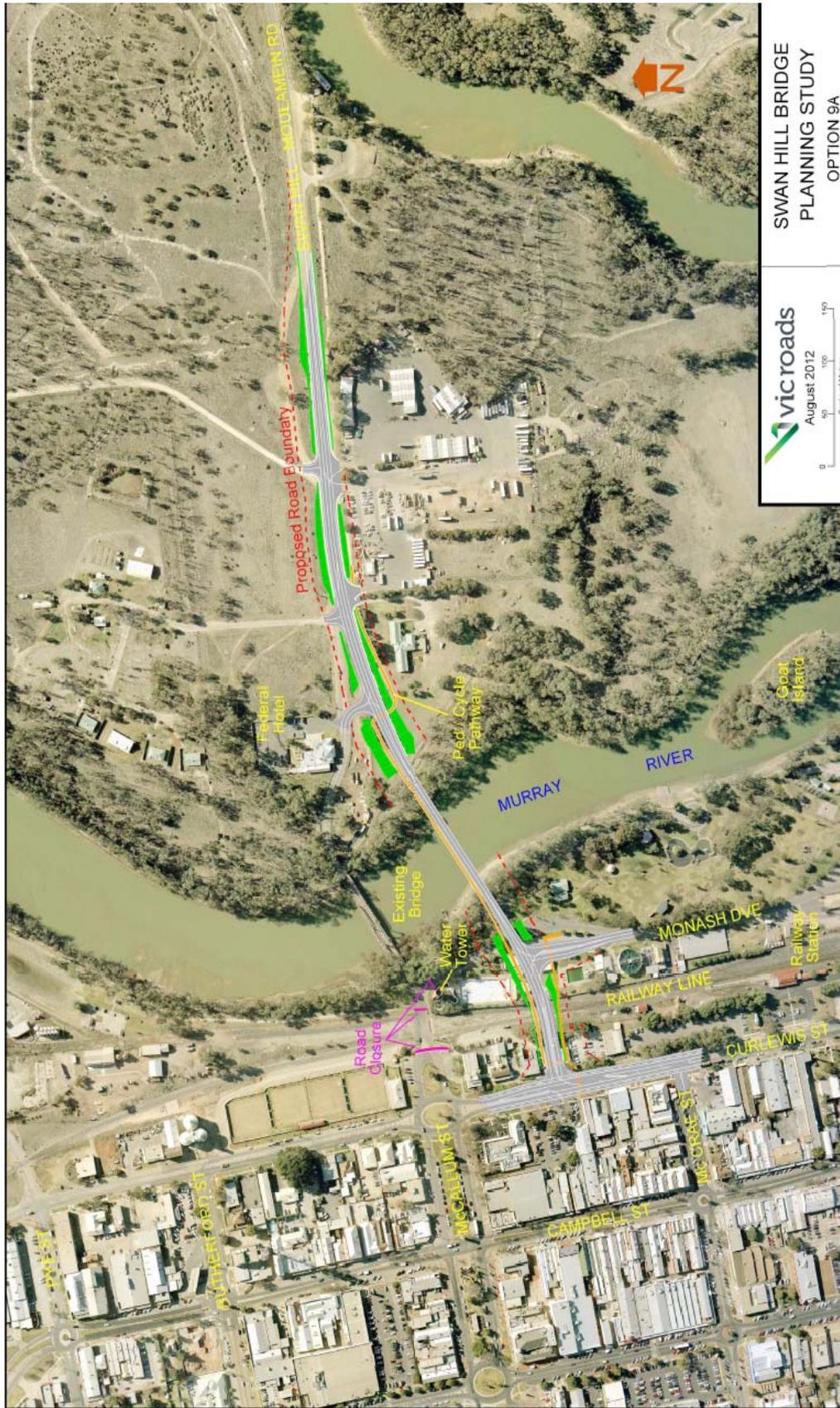


Figure 1-1: Proposed Murray River crossing at Swan Hill

1.3 Environmental investigation display

Roads and Maritime prepared an environmental investigation to examine the environmental impacts of the preferred option in NSW. The environmental investigation was prepared to assist the ongoing design development and inform the community of progress to date. The environmental investigation will also inform strategic land use planning under the Wakool Shire Council Local Environment Plan for the NSW component of a future crossing.

The environmental investigation was exhibited between 16 June 2011 and 27 July 2011 in conjunction with the VicRoads planning assessment report at four locations, as detailed in Table 1-1. The environmental investigation was placed on the Roads and Maritime and VicRoads internet websites and made available for download. The exhibition locations and website link were advertised in the Swan Hill Guardian on 15 and 17 June 2011 and The Age on 15 June 2011.

Table 1-1: Display locations

Location	Address
Shire of Wakool office	Tualka Terrace, Moulamein, NSW
Roads and Maritime Services South West Regional Office	1 Simmons Street, Wagga Wagga, NSW
Swan Hill Rural City Council office	45 Splatt Street, Swan Hill, Victoria
VicRoads Northern Regional Office	57 Lansell Street, Bendigo, VVictoria

1.4 VicRoads planning scheme amendment

VicRoads proposed to amend the Swan Hill Planning Scheme to reserve land to enable the construction of the preferred option within Victoria (Amendment C41). Amendment C41 proposed a single process for assessment and approval of the development of land, removal of vegetation, and construction of the preferred option. A planning assessment report was prepared to support Amendment C41 (VicRoads, 2011). The amendment sought to reserve land within Victoria, for the preferred option's western approach road and associated works.

Submissions received by VicRoads on the planning scheme amendment were submitted to the Minister for Planning (Victoria) for assessment by an Independent Panel. The Independent Panel considered submissions in respect of Amendment C41, and made recommendations as outlined in the *Swan Hill Planning Scheme Amendment C41 Replacement Murray River Bridge Panel Report* (Panel Report) (Independent Panel, 2011).

Roads and Maritime agreed that this submissions report would follow the release of the Panel Report and consider its recommendations. This allows Roads and Maritime to consider the key recommendations made by the Independent Panel during its planning of the proposal.

The Victorian Minister for Planning approved the Amendment C41 to the Swan Hill Planning Scheme, subject to minor amendments, on 2 August 2012.

2 Response to issues

VicRoads received and reviewed all 47 submissions, including 12 late submissions. Subsequently, the Independent Panel, formed by the Minister for Planning (Victoria) reviewed all 47 submissions and provided recommendations on the Planning Scheme Amendment (Amendment C41), as outlined in the Panel Report (Independent Panel, 2011). The Panel Report is also considered as a submission in this report (see Section 2.1 below).

Table 2-1 lists the respondents and each respondent's allocated submission number. The table also indicates where the issues from each submission have been addressed in this report.

Table 2-1: Respondents

Respondent	Submission No.	Section number where issues are addressed
Individual	1	Section 2.2.2, Section 2.2.3, Section 2.2.4, Section 2.3.1, Section 2.7.
Individual	2	Section 2.2.3, Section 2.2.4.
Individual	3	Section 2.2.2, Section 2.2.4.
Goulburn-Murray Water (VIC)	4	Section 2.4.
Individual	5	Section 2.2.3, Section 2.2.4, Section 2.2.5.
Individual	6	Section 2.2.2, Section 2.2.4, Section 2.3.2, Section 2.3.3, Section 2.3.4, Section 2.4.
Aboriginal Affairs Victoria, Department of Planning and Community Development (VIC)	7	Not relevant to NSW.
Individual	8	Section 2.5.1, Section 2.8, Section 2.10, Section 2.11.1.
Individual	9	Section 2.2.3, Section 2.2.4.
Individual	10	Section 2.2.3, Section 2.2.4, Section 2.3.3.
Individual	11	Section 2.2.4.
Individual	12	Section 2.2.4.
Individual	13	Section 2.2.4.
Individual	14	Section 2.2.4, Section 2.2.6, Section 2.3.4, Section 2.10.
Individual	15	Section 2.2.2, Section 2.2.4.
Individual	16	Section 2.2.2, Section 2.2.3, Section 2.2.4, Section 2.2.5, Section 2.3.2, Section 2.3.4.
Individual	17	Section 2.3.2, Section 2.11.1.
Bridge Position Action Committee (Swan Hill and Murray Downs community group, including petition signed by 1150 individuals)	18	Section 2.2.4, Section 2.3.1, Section 2.3.2, Section 2.3.4, Section 2.4, Section 2.5.1, Section 2.6, Section 2.9.

Respondent	Submission No.	Section number where issues are addressed
Individual	19	Section 2.2.3, Section 2.2.4, Section 2.3.4, Section 2.6, Section 2.7.
Individual	20	Section 2.2.4, Section 2.5.1.
Individual	21	Refer to submission 22. Submission 22 was provided as a revision to submission 21.
Individual	22	Section 2.2.4, Section 2.2.5, Section 2.6, Section 2.8.
Individual	23	Section 2.2.3, Section 2.2.4, Section 2.2.5, Section 2.3.2, Section 2.5.1, Section 2.5.2, Section 2.6.
Individual	24	Section 2.2.4.
Individual	25	Section 2.2.4, Section 2.3.1.
Individual	26	Section 2.2.2, Section 2.2.4, Section 2.2.5, Section 2.3.2, Section 2.6, Section 2.8.
Individual	27	Section 2.2.2, Section 2.2.4, Section 2.7.
Individual	28	Section 2.11.1.
Individual	28	Section 2.2.2, Section 2.2.3, Section 2.2.4, Section 2.2.5, Section 2.3.2, Section 2.3.3, Section 2.7.
Individual	30	Section 2.2.2, Section 2.2.4, Section 2.5.2
Individual	31	Section 2.11.1.
Individual	32	Section 2.2.2, Section 2.2.4, Section 2.3.2, Section 2.6.
Individual	33	Section 2.2.2, Section 2.2.3, Section 2.2.4, Section 2.2.5, Section 2.3.2.
Individual	34	Section 2.2.4, Section 2.6.
Individual	35	Section 2.2.4, Section 2.2.5, Section 2.4.
Individual	36	Section 2.2.3, Section 2.2.4.
Individual	37	Section 2.2.2, Section 2.2.4, Section 2.11.2.
Individual	38	Section 2.2.2, Section 2.2.4, Section 2.4.
Individual	39	Section 2.2.2, Section 2.2.3, Section 2.2.4, Section 2.3.4, Section 2.9.
Wamba Wamba Local Aboriginal Land Council	40	Section 2.8, Section 2.11.1.
Individual	41	Section 2.2.3, Section 2.2.4.
Individual	42	Section 2.2.4, Section 2.2.5, Section 2.3.3, Section 2.3.5, Section 2.6.
Individual	43	Section 2.11.1.
Swan Hill Rural City Council (VIC)	44	Section 2.11.1.
Department of Transport (VIC)	45	Not relevant to NSW.
Individual	46	Section 2.2.4, Section 2.5.1, Section 2.5.2.
Wakool Shire Council	47	Section 2.11.1.
Independent Panel (Panel Report)	48	Section 2.2.1, Section 2.4, Section 2.6, Section 2.10.

2.1 Overview of issues raised

2.1.1 Individual and government submissions

A total of 47 submissions were received in response to the exhibition of the environmental investigation and planning assessment report. 45 submissions were relevant to the preferred option in NSW comprising:

- One submission from the Swan Hill Rural City Council (Victoria).
- One submission from the Goulburn-Murray Water (Victoria).
- One submission from the Wakool Shire Council.
- One submission from the Wamba Wamba Local Aboriginal Land Council (LALC).
- 42 submissions from the community, including one submission from the Bridge Position Action Committee (a community group), supported by a petition including 1150 signatures.

Submissions that were not relevant to the Roads and Maritime environmental investigation have not been considered further (submissions 7 and 45).

2.1.2 Panel report

This report also considers the recommendations of the Panel Report (Independent Panel, 2011) where relevant to the component of the preferred option in NSW. The panel recommended that the Amendment C41 should proceed with changes, and made a number of recommendations for the consideration of VicRoads and Swan Hill Rural City Council.

Table 2-2 outlines the recommendations from the Panel Report that are relevant to the preferred option in NSW, and where in this document these recommendations are discussed.

Table 2-2: Panel Report recommendations as relevant to the preferred option in NSW

Recommendation	Section number where issues are addressed
The Amendment C41 to the Swan Hill Planning Scheme should be adopted with the following change: <ul style="list-style-type: none">• Delete the northern connection from the bridge access road to Monash Drive (western bridge approach). Refer to Section 1.2 of the Panel Report, recommendation A1.	Section 2.2.1.
Design the bridge abutment to be set back from the river frontage as far as possible. Refer to Section 1.2 of the Panel Report, recommendation B7.	Section 2.6.
Design the abutment, batter and retaining walls of the bridge approach to integrate into the adjoining parkland and use sloping terraces rather than earthen embankments to minimise the footprint and loss of vegetation. Refer to Section 1.2 of the Panel Report, recommendation B8.	Section 2.6, Section 2.10.

Recommendation	Section number where issues are addressed
Design the bridge to be aesthetically responsive to its setting. Refer to Section 1.2 of the Panel Report, recommendation B9.	Section 2.6.
Ensure the appropriate flood mitigation measures are incorporated into the design of the proposed bridge. Refer to Section 1.2 of the Panel Report, recommendation B10.	Section 2.4.

2.1.3 Approach to the review of submissions

Each submission has been examined individually to understand the issues being raised. The issues in each submission and the Panel Report recommendations have been extracted and collated. Corresponding responses to the issues have been provided. Similar issues in different submissions are provided one response. The issues and Roads and Maritime response forms the basis of this chapter.

Around 85 percent of the 45 relevant submissions objected to the proposal. The remaining 15 percent of submissions supported the proposal, which included submissions from the Swan Hill Rural City Council, the Wamba Wamba LALC and five individual submissions.

Most issues related to the lift span bridge design, traffic, safe river navigation, land use, heritage and the future use of the existing bridge.

A number of submissions expressed a preference for other options. Option 4B (or a modified version of Option 4B) was preferred by the majority of submissions, including the petition. Roads and Maritime and VicRoads previously investigated Option 4B.

2.2 Design

2.2.1 Monash Drive connection

Submission number

48

Issue description

Recommends that the Planning Scheme Amendment C41 delete the northern connection of the proposed full cross intersection at the junction of the bridge access road with Monash Drive.

Response

The Independent Panel recommended that VicRoads delete the northern connection from the bridge access road to Monash Drive (Independent Panel, 2011). While the recommendation does not have a direct impact on the NSW component of the preferred option, there are indirect impacts on the function of and maintenance requirements for the existing bridge.

Deletion of the northern leg of the intersection with Monash Drive would remove access for light vehicles, excepting infrequent access for emergency and maintenance vehicles. Without regular light vehicle traffic (and resultant vibration) the decay of timber in the deck and trusses of the existing bridge would be accelerated. A lack of vibration and cleaning leads to a build up of dust and vegetation against timber in the bridge. This sets up an ideal environment for microbial activity leading to timber decay. This would result in the need for more regular maintenance and an

increase in maintenance costs.

Roads and Maritime recognise that the approved Planning Scheme Amendment effectively removes light vehicle access to the existing bridge. While the existing bridge would be available for use by pedestrians, cyclists, and emergency vehicles, due to the indirect impacts of removing light vehicle traffic, should the proposal move towards construction, the detailed design, planning, and approval process would require further consideration of this closure when determining the future use of the existing bridge. Further assessment would be carried out in consultation with VicRoads. Refer Section 2.3.4.

The removal of light vehicle traffic may also impact the heritage value of the existing bridge. This is because the bridge would no longer function as a vehicle crossing point, the purpose for which it was originally constructed. Refer Section 2.5.2.

2.2.2 Lift span bridge

Submission numbers

1, 3, 6, 15, 16, 26, 27, 29, 30, 32, 33, 37, 38, 39, 48.

Issue description

In summary, the respondents raised the following issues:

- A lift span bridge does not present an appropriate or modern design solution. It provides a bridge design reminiscent of the 1800s.
- Concern that a lift span bridge would be more expensive to build and have high ongoing maintenance costs.

Response

Bridge type is principally driven by design constraints. The intermediate level lift span bridge was preferred as it allows the bridge approaches to integrate with the surrounding land uses. For example, the preferred option allows for a vertical alignment that meets with the height of the railway level crossing in Victoria.

As outlined in Section 3.3.1 of the environmental investigation, the proposed intermediate level bridge has been designed to meet the following criteria:

- Design speed of 60 kilometres per hour.
- A bridge width of 12 metres, including two travel lanes of 3.5 metres, and two outside shoulders of one metre. A barrier separated shared pedestrian and cyclist path on the north side of the bridge.
- The height of the proposed bridge deck would be above the 1 in 100 year flood level.
- A lift span would be provided to allow clearance for the passage of vessels to match the clearance of the existing bridge in the fully open position.
- The height of the bridge in the closed position would allow the passage of double deck houseboats without the need to open the lift span during average summer river flows.

The proposed intermediate level bridge would provide sufficient clearance for the passage of most of the river traffic, including the passage of double deck houseboats during normal summer river flows. The lift span would only need to be opened to allow the passage of larger vessels such as paddle boats. This is expected to occur infrequently (around four times a year). During times of high river flows, the frequency of lift span operation may increase (Independent Panel, 2011).

The costs of construction and operation (maintenance) of a lift span intermediate level bridge have been considered in the selection of this design as the preferred option. The options assessment (as detailed in Section 2.3 of the environmental investigation) included an assessment of each option against the project objectives and provided a cost benefit ratio. The proposed intermediate level lift span bridge responds to the design constraints, meets the nominated design criteria and provides the best cost benefit ratio.

2.2.3 Navigation of boats

Submission numbers

1, 2, 5, 9, 10, 16, 19, 23, 29, 33, 36, 39, 41.

Issue description

In summary, the respondents raised the following issues:

- The addition of another lift span bridge will add to wait times for boats moving up and down the Murray River.
- The lift span bridge will impede river traffic and limits future development of river traffic
- Two lift span bridges, in such close proximity to one another, would create an issue for the safe navigation of boats.

Response

The proposed concept bridge design has considered the safe navigation of river traffic. The proposed intermediate level bridge would provide sufficient clearance for the passage of most river traffic, including the passage of double deck house boats during normal summer river flows. The lift span would only need to be opened to allow the passage of larger vessels including paddle boats, expected to occur infrequently (around four times a year). During times of high river flows, the frequency of lift span operation may increase. This is considerably less than the frequency of the existing lift span operation, that typically requires opening around 12 times per year (Independent Panel, 2011). The time required to open and close the proposed bridge is around five minutes, compared with up to one hour for the existing bridge. The infrequent and relatively quick lift span operation would not likely result in additional delays for boats travelling up and down the Murray River as the five minutes required to open and close the proposed bridge lift span would occur within the time required to open the existing bridge lift span.

It should be noted that Roads and Maritime have recently completed maintenance on the existing Swan Hill Bridge. The maintenance work was independent of the proposed second crossing. It included the refurbishment of the lift span mechanism to improve the operation of the lift span and reduce current wait times for larger vessels travelling past Swan Hill on the Murray River.

The distance between the proposed and existing bridges would be around 100 metres. As outlined in the VicRoads Planning Assessment Report (VicRoads, 2011), the Murray Rivers Skippers Association note that this distance would allow sufficient space for a paddle boat to negotiate the proposed bridge and then safely align to navigate through the lift span of the existing bridge. The design also allows the opening of the two bridges to be staged so that only one lift span would be open at any one time.

During the detailed design phase, Roads and Maritime and VicRoads would consider the location and orientation of the bridge piers to maximize maritime navigation. Appropriate signage would be provided to direct boat operators to safely navigate the

channel around the proposed and existing bridges. Other measures to ensure the safe navigation of the channel may be considered, such as timber piles.

2.2.4 Preference for an alternate design

Submission numbers

1, 2, 3, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 46.

Issue description

Respondents rejected the preferred option (Option 9A) primarily due to the perceived traffic impacts of the proposed 'T' intersection into Swan Hill at the western bridge approach. A preference for one of the following alternate designs was identified:

- Option 4B as identified in the environmental investigation.
- 'Modified Option 4B'. This is an option put forward by respondents that amends Option 4B (as identified in the environmental investigation). The principal change is the realignment of the Option 4B Swan Hill – Moulamein Road alignment on the north side of the Wamba Wamba community property. The respondents consider that Modified Option 4B solves the problems presented by Option 4B relating to noise impacts at the Wamba Wamba community property, and warrants further investigation.
- An alternate (and undefined) design.

Response

The selection of a preferred option for the new bridge crossing was a two phase options assessment process and included community input (refer to Section 4.1 of the environmental investigation). This process was overseen by a project steering committee consisting of representatives from Wakool Shire Council, Swan Hill Rural City Council, Roads and Maritime and VicRoads.

Option 4B was investigated and assessed during the options assessment (refer to Section 2.3 of the environmental investigation). Option 4B considered construction of a new bridge about 420 metres downstream of the existing bridge.

This assessment identified that Option 4B was not preferred for the following reasons:

- While Option 4B involves a road reservation that was surveyed 1987 and subsequently gazetted in 1999, the road reservation, immediately north of the Wamba Wamba community, would require construction of about one kilometre of new road in NSW, which would substantially increase the cost of the proposal.
- Direct impacts to Aboriginal heritage including two scar trees, a potential burial site (on the Victorian side) and a large area of archaeological sensitivity.
- In NSW the road embankment would need to be five to eight metres high immediately adjacent to the Wamba Wamba community. This would pose amenity, noise and visual impacts for the Wamba Wamba residents.
- In Victoria the road would be adjacent to residential areas, which would present unacceptable amenity, noise and visual impacts for the residents.
- The majority of westbound traffic using the Swan Hill bridge crossing go to or through the Swan Hill city centre. Given the dominance of this traffic movement, Option 4B would extend travel times for the majority of traffic.

- Option 4B would deliver a poor cost benefit ratio.

While Modified Option 4B was not assessed during the options assessment, it is expected that Modified Option 4B would have similar environmental impacts and cost implications to Option 4B, as follows:

- Similar to Option 4B the Modified Option 4B would require construction of about one kilometre of new road in NSW, which would substantially increase the cost.
- Similar to Option 4B the Modified Option 4B would impact a potential burial site in Victoria and a large area of Aboriginal archaeological sensitivity in NSW.
- Similar to Option 4B the Modified Option 4B would require a road embankment five to eight metres high adjacent to the Wamba Wamba community. While Modified Option 4B may result in less operational noise impacts when compared to Option 4B (as the distance to these residents is increased), the amenity and visual impacts for the Wamba Wamba residents would be similar to those presented by Option 4B.
- Modified Option 4B would take the road closer to residential areas in Victoria and result in additional amenity, noise and visual impacts for those residents.
- Similar to Option 4B, the Modified Option 4B would extend travel times for the majority of traffic.
- Similar to Option 4B, the Modified Option 4B would deliver a poor cost benefit ratio as the construction methodologies and costs would be similar to Option 4B.

Considering the performance of Option 4B and the similarity in design features, Modified Option 4B is not likely to meet the majority of project objectives, including those relating to traffic, noise and heritage.

As outlined in Section 2.4 of the environmental investigation, the preferred option was selected as a result of rigorous options assessment. When compared with all other options, the preferred option is considered to collectively meet the objectives well. The other options collectively meet the objectives moderately or poorly. The preferred option also delivers the highest cost benefit ratio.

2.2.5 Options assessment

Submission numbers

5, 16, 22, 23, 26, 29, 32, 33, 35, 42.

Issue description

In summary, the respondents raised the following issues:

- The cost estimate should include all ancillary impacts such as costs on rail and the relocation of civic structures.
- Query as to how the cost for each option can be estimated when there is no design.
- Request for clarity on the large cost difference between the preferred option and Option 4B.
- The lower cost of the preferred option should not influence decision-making.
- The safety and traffic considerations should have more weight in the options assessment.

- Impacts on the Riverside Park in Victoria should have more weight than impacts on properties in NSW.

Response

As outlined in Section 2.2.2 of this report, the preferred option was identified through an options assessment process. The process included an assessment of each option against the project objectives and consideration of the cost benefit ratio of each option. The cost benefit analysis includes an estimated cost to construct and operate the proposal. This estimate is based on the current market price of bridge and road construction projects in Australia, and includes the costs of ancillary impacts such as land acquisition and relocation of infrastructure.

The estimated cost of construction of each option was outlined in the Planning Assessment Report (VicRoads, 2011). The estimate uses the same assumptions to determine the cost of each option for the bridge crossing. The additional cost of Option 4B includes the cost of installing flood relief structures to manage flood risk, as well as the additional length of the approach road in NSW. The cost estimates are first order estimates including a contingency and are appropriate for comparison purposes.

The options assessment process includes an evaluation of the performance of each option against the following project objectives:

- To improve safety and meet the long term traffic needs of Swan Hill and the wider region including the provision for freight.
- To meet current road design standards while maintaining existing navigation clearances for boats, access to properties and provision for rail.
- To provide a viable level of economic performance for the local and regional economy of Swan Hill.
- To protect existing land uses and the character of landscapes, open space and recreation values to the extent practicable.
- To protect resident's amenity and well-being by minimising dislocation and severance of residents to the extent practicable.
- To minimise impacts on Aboriginal cultural heritage and determine appropriate mitigation measures to the extent practicable.
- To minimise impacts on non-Aboriginal cultural heritage and provide appropriate mitigation measures to the extent practicable.
- To minimise impacts on biodiversity and provide appropriate mitigation measures to the extent practicable.
- To minimise impacts on surface water quality, flood risks and groundwater.
- To minimise the noise impacts on residents and provide appropriate mitigation measures to the extent practicable.

Each objective is given an equal weighting when considering the overall performance of each option. As detailed in Section 2.2.5 the preferred option best meets the project objectives.

2.2.6 Utilities

Submission numbers

14.

Issue description

Raised concern that the documentation provides no certainty around what utilities are to be relocated.

Response

As identified in Section 3.4.4 of the environmental investigation, the requirement for, and extent of, adjustments to public utilities such as electricity, water, stormwater, sewage, gas, street lighting and telephone services will be addressed during the detailed design phase.

Section 6.1 of the environmental investigation identifies that further assessment on terrestrial ecology, Aboriginal heritage, non-Aboriginal heritage, land use and property, and socio-economic impacts would be undertaken once more information is available on the need for and extent of utilities relocation. In most major road and bridge projects the impact of utilities adjustments form a minor part of the project.

2.3 Traffic and access

2.3.1 Traffic implications of the lift span bridge

Submission numbers

1, 18, 25.

Issue description

- Concern that the lift span bridge design will interrupt the flow of traffic into Swan Hill.
- Concern that the lift span bridge design will not accommodate the need to move increasing size and volumes of agricultural machinery between States.

Response

When in operation the proposed lift span would temporarily interrupt the flow of traffic into and out of Swan Hill. However as the proposed bridge lift span is likely to operate infrequently (around four times per year), and the time required to open and close the proposed lift span is around five minutes (refer to Section 2.2.2 and Section 2.2.3), the frequency and duration of potential traffic impacts is limited.

To further mitigate potential traffic impacts, during detailed design VicRoads would ensure that traffic signals would be linked (and interlocked) with the Curlewis Street intersection and a 'keep clear' area will be clearly marked at the intersection (Independent Panel, 2011).

The proposed bridge and intersections would be designed to cater for the movement of oversized loads, including agricultural machinery. The proposal is able to cater for the movement of any agricultural machinery that is able to use the adjacent road network in either State and would improve access for heavy vehicles crossing the Murray River at Swan Hill.

2.3.2 Traffic data

Submission numbers

6, 16, 17, 18, 23, 26, 29, 31, 33.

Issue description

In summary, the respondents raised the following issues:

- Concerns that the traffic data has not included traffic from future population growth in NSW, for example from the Murray Downs subdivision and golf club expansion.
- Concern that the initial traffic survey was completed in the month of October, which is misrepresentative due to low traffic volumes at that time of year. October survey does not capture traffic generated by harvest activities, recreational river users or school holidays.
- The traffic study should consider the potential for the future use of B-Triples on the proposed bridge.

Response

The traffic survey was conducted in October 2006. The traffic survey identified an average two-way traffic volume on Swan Hill Bridge of 3700 vehicles per day (including 480 heavy vehicles). Most vehicle crossings were for local trips between Swan Hill and Murray Downs. This number is expected to increase to 5400 vehicles per day by 2026 (including 690 heavy vehicles).

The traffic model calculated future traffic volumes based on forecast land use, population, employment, retail floor space and external trip estimates. The forecast traffic volumes include a predicted population growth at Swan Hill over the next 25 years of around 1400 people, up from an estimated 10,170 in 2011. Traffic forecasts also included a predicted increase to the Murray Downs population from 200 to 600 over the next 25 years.

The Traffic Modelling Report (VicRoads, 2007) included a sensitivity analysis of an increase in forecast population at Murray Downs. The analysis considered an increase in population from the best-estimate value of 600 to 1900 by the year 2026. A Murray Downs population increase to 1900 would result in an increase of approximately 3500 vehicles per day in bridge traffic. This would increase the vehicles per day from an estimated 5400 to 8900 vehicles per day by 2026. At 8900 vehicles per day the proposed bridge would have a volume to capacity ratio below 0.5, which would result in little traffic delay. The sensitivity analysis concluded that the proposed bridge would have the capacity to cater for a significantly higher forecast population growth at Murray Downs and / or golf club expansion.

It is recognized that the traffic survey data collected in October may not have captured seasonal traffic. As an example, traffic generated by agricultural machinery and trucks involved in seasonal harvest, or school holiday traffic. Traffic counts during the harvest may increase traffic counts in the order of an additional 1000 vehicles per day. As outlined above, the proposed bridge has capacity to accommodate more than the forecast 5400 vehicles per day. The proposed bridge would have capacity for around 16,000 to 20,000 vehicles per day. While the traffic survey carried out in October may not reflect traffic volumes during peak periods, the proposed bridge and alignment design would accommodate any seasonal increase in traffic.

B-triples were considered in the traffic study through the consideration of heavy vehicle movements along the route. While the existing bridge can only carry heavy

vehicles up to B-double size at general mass limits, the proposed bridge design and construction standards would allow the passage of heavy vehicles, including B-triples, operating at higher mass limits.

B-triple vehicles access to the adjacent road network would then be a matter for the consideration of the relevant road authority on each side of the bridge, that is Wakool Shire Council and Swan Hill Rural City Council.

2.3.3 Access for emergency services

Submission numbers

6, 10, 29, 42.

Issue description

In summary, the respondents raised the following issues:

- The existing bridge should provide a crossing point for emergency services.
- The lift span bridge will impact on access for emergency services. Emergency vehicles will not be able to cross the Murray River when the lift span is open, and will have to navigate traffic queuing on both sides of the bridge.

Response

As outlined in Section 2.2.1, the Independent Panel recommends the removal of the northern connection from the bridge access road to Monash Drive (western bridge approach). While this would close the existing bridge to light vehicles, the Panel recommends that emergency vehicle access to the existing bridge be retained. The future use of the existing bridge would be determined should the proposal move towards construction, however it is anticipated that the existing bridge will remain operational, accessible by pedestrians, cyclists, maintenance and emergency vehicles.

As outlined in Section 2.2.2 the opening of the proposed lift span bridge is likely to occur infrequently (around four times per year). The time required to open and close the proposed bridge is around five minutes, and the design allows for the staged opening of the proposed and existing bridges.

As the design allows for the staged opening of the proposed and existing bridges, when the proposed bridge lift span is operational, emergency vehicles could cross the Murray River on the existing bridge.

The opening of the bridges are planned events. The time of opening has to be booked in advance by boat operators and is scheduled for an appropriate time to minimise disruption. In the unlikely event that both bridges are opened at the same time, or that the existing bridge is not accessible to emergency vehicles, the impact on emergency vehicle access would be limited to the time required to open and close the proposed bridge, around five minutes. Due to the planned nature of these events, the emergency services may, at their discretion, choose to position vehicles on both sides of the river to ensure that response times may be maintained.

Regardless of whether the existing bridge remains open for emergency vehicles, given the less frequent and quicker operation of the proposed lift span, the proposal would improve overall access for emergency vehicles between States, when compared to the existing bridge.

2.3.4 Future use of the existing bridge

Submission numbers

6, 14, 16, 18, 19, 39, 48.

Issue description

In summary, the respondents raised the following issues:

- The existing bridge should remain open for use by light traffic, cyclists and pedestrians. Keeping the existing bridge open to cars would assist with potential traffic congestion, provide easy access to the Swan Hill city centre and preserve its function as a crossing point.
- To close off access to the bridge would be a waste of public infrastructure.
- The northern connection from the bridge access road to Monash Drive (western bridge approach) should be removed. The existing bridge should remain open to pedestrians, cyclists and emergency and maintenance vehicles.
- The existing bridge should be removed. The lift span could be relocated to Pioneer settlement, and used to connect the Pioneer Settlement to an adjacent island in the Murray River.

Response

As outlined in Section 2.3.3, the future use of the bridge is not confirmed. The Independent Panel recommends the removal of the northern connection from the bridge access road to Monash Drive (western bridge approach). While this would close the existing bridge to light vehicles, the Panel recommends that it remain open to pedestrians, cyclists, emergency and maintenance vehicles.

Should the existing bridge be closed to regular vehicular traffic (resulting in less frequent vibration), the decay of timber elements in the timber deck and trusses on the existing bridge would be accelerated. This may result in the need for more regular maintenance and an increase in maintenance costs.

Removal of light vehicle access may also impact the bridge's heritage significance, as the bridge would no longer function as a crossing point, the purpose for which it was originally designed.

As the existing bridge is listed on the State Heritage Register (NSW), Register of the National Estate, and the Victorian Heritage Register (Victoria), the proposal seeks to limit impacts to the heritage significance of the existing bridge. It is unlikely that the removal or relocation of the bridge would meet this objective.

The future use of the existing bridge would be determined should the proposal move towards construction. As outlined in Section 6.3 of the environmental investigation, due to the heritage significance of the existing bridge, any future assessment would be in accordance with the NSW *Environmental Planning and Assessment Act 1979* and *Heritage Act 1997*. A future assessment would consider the need to meet heritage-specific legislative requirements, permits or approvals relating to any proposed change of use for the existing bridge. At this point in time Roads and Maritime *Timber truss road bridges, A strategic approach to conservation* (Roads and Maritime 2011c), indicates that the existing Swan Hill bridge will likely be conserved.

2.3.5 Property access

Submission numbers

42.

Issue description

The property access arrangements on the Swan Hill – Moulamein Road will increase the safety hazard for vehicles entering and exiting these properties.

Response

As outlined in Section 3.3.3 – 3.3.7 of the environmental investigation, the realignment of the Swan Hill – Moulamein Road would require alteration of access to the Federal Hotel, Wamba Wamba community property, an unnamed dirt road, the Cornerstone community, Buildpro and Pickerings Transport. The new or upgraded access points would be provided for safe access and/or egress.

The proposed road corridor allows sufficient room for protected turning arrangements for all property accesses on the Swan Hill – Moulamein Road. A turning slip lane can also be accommodated for right turn movements into the new Federal Hotel access road from the realigned Swan Hill – Moulamein Road.

All intersection and property accesses would be reviewed and designed in accordance with relevant road standards during detailed design. Property accesses would be designed in consultation with the affected property owners.

2.4 Hydrology

Submission numbers

4, 6, 18, 35, 38, 48.

Issue description

In summary, the respondents raised the following issues:

- The proposal has been designed following ten years of drought and demonstrates a lack of knowledge of the river.
- The proposal should include appropriate flood mitigation measures.
- The Swan Hill – Moulamein Road should be protected in a 1 in 100 year flood event.
- The proposal will have downstream flood impacts at Tyntynder Flats. A weir should be created, and a canal should direct water to Lake Tooim (in NSW) to alleviate downstream flooding impacts.
- Development proposals should not impact detrimentally on flow and water quality of surface water and groundwater.

Response

The environmental investigation included a hydrology study (Cardno Lawson Treloar, 2009), and an addendum hydrology study (Cardno Lawson Treloar, 2011).

The analysis used best practice hydrological and hydraulic modelling techniques to provide an indication of the expected hydrological impacts of the proposed bridge. The 100 year average recurrence interval flow was predicted using a flood frequency analysis of the recorded flow data from the Swan Hill gauge. Flow data was obtained for the period 1 January 1909 to 31 December 2007 (Cardno Lawson Treloar, 2009). This historic data set accounts for pre-drought conditions.

The proposed bridge has been designed so as to not increase the height of floodwaters by more than 50 millimetres in a 1 in 100 year flood event. Hydrologic modelling indicates that in NSW the proposal would result in a decrease in flood depth on the northern side (down stream) of the proposed bridge and road approach, while a small increase (50 millimetres) in flood depth on the southern side (up stream) of the proposed bridge and road approach is expected. The proposal would be constructed so that the bridge abutments are located outside the main levee banks on both sides of the river, and would result in no impact on normal river flows. The proposal is unlikely to have any significant impact on water flows in the river or on the flood plain during flood events if the appropriate flood mitigation measures are incorporated into the design (Independent Panel, 2011). Detailed design will ensure that the proposed bridge includes appropriate flood mitigation measures.

As outlined in Section 5.5.1 of the environmental investigation, the height of the existing Swan-Hill Moulamein Road prevents the 1 in 20 and 1 in 50 year flood events from overtopping the road. In flood events of greater magnitude such as the 1 in 100 and 1 in 2000 year events floodwaters overtop the road and flow onto the floodplain in NSW.

The proposal's realigned Swan Hill – Moulamein Road would be inundated by a maximum of 150 millimetres of flood water along about 240 metres of the proposal during the 1 in 100 year flood event. The proposed new approach road would be designed to maintain the existing access during flooding and would not increase the height of floodwaters in a 1 in 100 year event by more than 50mm.

The regulation of the Murray River, through the installation of weirs to manage flooding, is outside the scope of this proposal.

As outlined in Section 5.3.4 of the environmental investigation, the proposal would include the following elements to address potential impacts on water quality and flow:

- The drainage system would capture and adequately treat oil or chemical spills on the bridge and road approaches.
- Stormwater outlet energy dissipaters would be used to reduce flow velocities to acceptable levels at discharge locations.
- Short-term construction controls (eg construction sediment basins) and long term drainage design (eg permanent stormwater basins) would be used to address runoff and scouring.

2.5 Heritage

2.5.1 Aboriginal heritage

Submission numbers

8, 18, 22, 23, 46.

Issue description

In summary, the respondents raised the following issues:

- The impacts on Aboriginal heritage remain unknown for all options and there is no evidence to support the existence of a burial site. Further assessment is required in order to adequately identify impacts on Aboriginal heritage in order to compare the potential impacts of the options.
- More consultation with the Aboriginal community is required. Further consultation may enable potential impacts on Aboriginal heritage to be negotiated.

- The proposal would result in acceptable impacts on cultural heritage and avoids damage to scar trees.

Response

Aboriginal cultural heritage assessment formed part of the environmental investigation. This assessment included an extensive study of the potential Aboriginal cultural heritage sites covering a large area on both sides of the Murray River (Independent Panel, 2011). The Aboriginal cultural heritage assessment was carried out in consultation with representatives from the NSW Wamba Wamba local Aboriginal land council and local Aboriginal communities in Victoria. The NSW Office of Environment and Heritage and Aboriginal Affairs Victoria were also consulted.

The Aboriginal cultural heritage assessment included field survey. Surveys identified a pre-1860 burial site within Swan Hill, a number of scar trees and areas of potential archeological sensitivity. The results of the Aboriginal cultural heritage assessment have informed the selection of an option with the least impact on Aboriginal (and non-Aboriginal) heritage. The preferred option avoids impacts on Aboriginal scar trees and potential burial sites, and impacts a relatively small area of potential archeological sensitivity. The preferred option results in impacts on cultural heritage deemed acceptable by the Aboriginal community.

Should the proposal proceed to construction, further assessment and mitigation of Aboriginal heritage impacts would be carried out in accordance with the requirements of the NSW *National Parks and Wildlife Act 1974* and consultation requirements outlined in the *Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (Roads and Maritime, 2011b).

2.5.2 Non-Aboriginal heritage

Submission numbers

23, 30, 46.

Issue description

In summary, the respondents raised the following issues:

- The existing bridge should be removed or relocated when maintenance costs become too high or it becomes unserviceable to light traffic.
- Relocation to the Pioneer Settlement would allow the bridge to function as a tourist attraction while still retaining its heritage value.
- Relocation should be considered by NSW Heritage Branch.

Response

As outlined in Section 2.3.3 and Section 2.3.4, the future use of the existing bridge is not confirmed. It is likely that the bridge will remain operational, accessible by pedestrians, cyclists, maintenance and emergency vehicles.

The existing bridge is listed on the Stage Heritage Register (NSW), Register of the National Estate and the Victorian Heritage Register (Victoria). Accordingly, the proposal seeks to limit impacts to the heritage significance of the existing bridge. It is unlikely that the removal or relocation of the bridge would meet this objective.

The future use of the existing bridge would be further investigated should the proposal move towards construction. The bridge's heritage significance is one aspect that would be considered when determining the best option for its future use. As outlined in Section 6.3 of the environmental investigation, due to the heritage significance of the existing bridge, any future assessment carried out in accordance with the NSW *Environmental Planning and Assessment Act 1979*, would consider the

need to meet heritage-specific legislative requirements, permits or approvals relating to any proposed change of use of the existing bridge. The Heritage Branch, NSW Office of Environment and Heritage would be consulted during any assessment of impacts on the State Heritage listed item in accordance with the NSW *Heritage Act 1977*.

2.6 Visual amenity

Submission numbers

18, 19, 22, 23, 26, 32, 34, 42, Panel Report.

Issue description

In summary, the respondents raised the following issues:

- Design the bridge to be aesthetically responsive to its setting.
- Design the bridge abutment to be set back from the river frontage as far as possible.
- Design the abutment, batter and retaining walls of the bridge approach to integrate into the adjoining parkland and use sloping terraces rather than earthen embankments.
- The proposed bridge will impact on the landscape values of the Murray River for the local community and visitors.
- The proposed bridge will impede views of the existing bridge.
- The visual impacts at the Wamba Wamba community property could be mitigated through landscaping or through the adoption of Modified Option 4B.

Response

The detailed design phase would ensure that the proposed bridge design is responsive to the aesthetics of the area. The proposed bridge would be architecturally designed to complement the adjacent heritage structure.

The potential visual impact of the bridge would be mitigated through design and high quality landscaping on the bridge approaches.

The bridge abutment would be designed to integrate into the surrounding landscape and to minimise the impacts to vegetation and land use along the riverbank. The detailed design of the bridge would be carried out in accordance with the VicRoads urban design guidelines and *Beyond the Pavement* (RTA, 2009), the Roads and Maritime urban design policy, procedures and design principles including Roads and Maritime guidelines for landscape character and visual impact assessment.

As outlined in Section 5.7.4 of the environmental investigation the detailed design phase would ensure the following principles are adopted to minimise the impact of the proposal on views of the existing bridge and the scenic quality and landscape setting of the Murray River generally.

- The bridge would be architecturally designed to complement the adjacent heritage structure. The new bridge would not emulate the existing bridge but be of equal aesthetic standing.
- The structural supports for the bridge would be visually permeable where possible so that views are provided through the elements. All elements would be designed to appear visually slender where possible; views through the structure would be preserved where possible from the water's edge and the top of embankments.

- The materials used would respond to the wider local landscape character including the local setting, existing bridge and river corridor.
- Any fittings or fixtures including furniture, lighting, railings and other elements would be integrated with the bridge to complement the architectural forms.
- The physical footprint of the area of impact would be optimised to reduce impacts as much as possible.

The detailed design would consider the following additional design principles.

- Design the bridge abutment to be set back from the river frontage as far as possible.
- Design the abutment, batter and retaining walls of the bridge approach to integrate into the adjoining parkland and use sloping terraces rather than earthen embankments.

The detailed design phase would ensure that the proposed bridge design is responsive to its setting.

As outlined in Section 2.2.5 Option 4B was considered during the options assessment. While it is noted that screening and / or landscaping may mitigate some of the visual impacts associated with Option 4B, Option 4B was not preferred as it does not meet the project objectives and returned a poor cost benefit ratio. The Modified Option 4B is expected to perform similarly despite a potential reduction to visual impacts on the Wamba Wamba community property.

2.7 Land use and property

Submission numbers

1, 19, 27, 29.

Issue description

In summary, the respondent(s) raised the following issues:

- Land acquisition and zoning has already occurred in NSW and Victoria and should be utilised.
- The proposal must maintain the existing Travelling Stock Route, and should not result in the movement of stock through the Swan Hill city centre.

Response

An existing road reservation, immediately north of the Wamba Wamba community, was gazetted in 1999. This road reservation (corresponding to Option 4B) was considered during the options assessment phase as outlined in Section 2.2.5. Option 4B performed poorly against the project objectives. The preferred option (Option 9A) was identified as the preferred option as it best meets the project objectives and delivers the best cost benefit ratio.

The proposed realignment of Swan Hill-Moulamein Road would require the acquisition of two parcels of land:

- Acquisition of a strip of land from the front of a single lot currently occupied by the Cornerstone community and Buildpro. The acquisition would increase from about seven metres wide in the east to about 60 metres wide in the west.
- Acquisition of a strip of land at the front of the property currently occupied by Pickerings Transport. The strip acquisition would be about seven metres wide.

All property acquisition would be undertaken in accordance with the Roads and

Maritime's Land Acquisition Policy. Compensation would be negotiated in accordance with the *NSW Land Acquisition (Just Terms Compensation) Act 1991*.

The proposed road boundary (Figure 1) provides an indicative location of future road boundaries based on the concept design. Roads and Maritime would recommend to Wakool Shire Council that the Local Environment Plan include the proposed road boundaries and that land use zoning in the area is compatible with its future use as road reserve (refer to Section 5). Further, Roads and Maritime would ask Wakool Shire Council to advise any prospective developers of Roads and Maritime' future plans to realign the Swan Hill-Moulamein Road.

Section 5.10.3 of the environmental investigation indicated that any future assessment would consider the current status of the former Travelling Stock Reserve along the Murray River riparian zone. The detailed design phase would consider the need for, and functional requirements of, a stock movement route. Future stock route planning would be in consultation with the NSW Livestock Health and Pest Authority.

2.8 Noise and vibration

Submission numbers

8, 22, 26, 40.

Issue description

In summary, the respondents raised the following issues:

- The preferred option results in acceptable noise impacts on residential areas around the Wamba Wamba community property and permits future development of the community.
- The noise impacts of Option 4B at Wamba Wamba could be mitigated through screening and landscaping.

Response

The proposal has been designed to meet traffic noise target levels for residential receivers in accordance with NSW EPA and Roads and Maritime operational noise guidelines. As outlined in Section 5.6.3 of the environmental investigation, the proposal would likely result in noise levels exceeding the operational noise goal at the Cornerstone community property. However, Cornerstone community representatives have indicated that they intend to relocate to more suitable premises in Swan Hill. The preferred option generally results in acceptable operational noise impacts at residential receivers. Should the proposal proceed, further operational noise impact assessment would be carried out in accordance with the *NSW Road Noise Policy* (DECCW, 2011) to identify operational noise impacts and mitigation measures required.

As identified in Section 2.3.3 of the environmental investigation, Option 4B was not preferred, in part due to potential amenity and noise impacts on the Wamba Wamba community property in NSW. While it is noted that screening may mitigate some of the visual impacts of Option 4B on the Wamba Wamba community property, it is unlikely that screening would address potential operational noise impacts for these residents. Adverse operational noise impacts on residential receivers would not meet the project objectives and would not be possible under NSW EPA and Roads and Maritime noise guidelines. As outlined in Section 2.2.5, the preferred option was selected as a result of rigorous options assessment. When compared with all other options, the preferred option is the only option considered to collectively meet the objectives well, with other options only collectively meeting the objectives moderately or poorly.

2.9 Socio-economic

Submission numbers

18, 39.

Issue description

In summary, the respondents raised the following issues:

- The proposal would discourage large and historic vessels travelling to Swan Hill and hamper tourism development.
- The proposal would not allow the continued use of walking tracks.

Response

As outlined in Section 2.2.2 and Section 2.2.3 the proposed intermediate level bridge will provide sufficient clearance for the passage of double deck house boats during normal summer river flows. The proposed opening span bridge would allow for the passage of paddle boats, expected to be about four times a year during high river flows. The proposed lift span would be able to be opened and closed in about five minutes. The current opening and closing time is up to one hour for the existing bridge. Note that maintenance of the existing lift span to reduce this timeframe has recently been completed.

In accordance with the project objectives the proposal will maintain existing navigation clearances for boats and will not impede the passage of tourist vessels. Through the improvement of lift span opening times on both the proposed and existing bridges, the effective passage of river vessels will be facilitated.

As outlined in Section 2.6, the bridge abutment would be designed to integrate into the surrounding landscape and to minimise the impacts on land use along the riverbank. There would be temporary restrictions to access along the banks of the Murray River during construction. Once operational, the proposal would not restrict pedestrian access along either side of the Murray River.

2.10 Ecology

Submission numbers

8, 14, Panel Report.

Issue description

In summary, the respondents raised the following issues:

- The proposal will minimise impacts on flora and fauna.
- The design should minimise the loss of native vegetation.
- Impacts to flora and fauna should be mitigated. The loss of vegetation should be compensated for.

Response

The preferred option minimizes impacts on flora and fauna. As outlined in Section 5.1.3 of the environmental investigation, the proposal would result in removal of 0.3 hectares of River Red Gum forest within the riparian zone of the Murray River, fragmentation of the riparian corridor and a loss of habitat connectivity. River Red Gum forest is not listed under the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* as a threatened ecological community.

Should the proposal proceed towards construction, environmental assessment of the

NSW part of the proposal would be carried out in accordance with the NSW *Environmental Planning and Assessment Act 1979*. Impacts to native vegetation and fauna would be assessed with reference to relevant State and Commonwealth legislation, including the NSW *Threatened Species Conservation Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Through future assessment and detailed design the impacts on flora and fauna will be minimised. As outlined in Section 5.1.5 of the environmental investigation these measures would include:

- Detailed design would minimise the width of clearing through the riparian corridor as far as practical.
- A rehabilitation plan would be developed with the aim of improving and maintaining the extent and quality of existing native vegetation at the site. The rehabilitation plan would use River Red Gum of local provenance combined with local understorey and native grass species.
- Any loss of hollow-bearing trees would be offset by the installation of nest boxes, at a ratio of one nest box for each hollow removed.
- Planting of River Red Gum trees to offset the loss of vegetation and rehabilitate the study area would be undertaken using a ratio of 2:1 (planted:removed). Plantings would be done in accordance with a rehabilitation plan.

2.11 General

2.11.1 Support for the preferred option

Submission numbers

8, 17, 28, 31, 40, 43, 44, 48.

Issue description

Respondents were generally in support of the preferred option, satisfied that the proposal results in the best environmental outcomes.

Response

Noted.

2.11.2 Legislative requirements

Submission number

37.

Issue description

A full environmental impact assessment is required to fully assess all impacts.

Response

The environmental investigation was prepared to consider the environmental constraints and potential impacts of the preferred option. It was prepared to inform strategic land use planning around the NSW component of a future crossing.

Where details of the design or construction methodology of the proposal were unresolved, Section 6.1 of the environmental investigation identified areas for further investigation and assessment in any future environmental impact assessment for the proposal.

Should the proposal proceed towards construction, environmental assessment of the proposal would be carried out in accordance with the NSW *Environmental Planning and Assessment Act 1979*.

3 Changes to the proposal

There are no changes to the preferred option proposed in NSW as a result of the submissions received during public display of the environmental investigation. A number of measures have been included for consideration during the detailed design of the proposal.

The Panel Report recommended that the VicRoads Planning Scheme Amendment C41 delete the northern connection from the bridge access road to Monash Drive. While this recommendation does not have a direct impact on the NSW design of the preferred option, there are indirect impacts on the function of and maintenance requirements for the existing bridge.

The additional measures have been provided in Section 4 below.

4 Environmental management

Section 6.1 of the environmental investigation includes a summary of recommendations relating to future investigations and assessments. This would further characterise and evaluate the potential impacts of the proposal when more information on design and construction is available.

Section 6.2 of the environmental investigation includes a summary of recommendations to address the known potential impacts of the proposal and to further investigate the constraints identified for future assessment.

In response to the submissions received during public display of the environmental investigation and consideration of the recommendations of the Panel Report, the following additional measures would be considered during the detailed design of the proposal:

- Design the bridge abutment to be set back from the river frontage as far as possible (refer Section 2.6).
- Design the abutment, batter and retaining walls of the bridge approach to integrate into the adjoining parkland and use sloping terraces rather than earthen embankments (refer Section 2.6).
- The future use of the existing bridge would be determined should the proposal move towards construction. Any future assessment would consider the need to meet heritage-specific legislative requirements, permits or approvals relating to any proposed change of use of the existing bridge.

Should the proposal proceed towards construction, environmental assessment of the proposal would be carried out in accordance with the NSW *Environmental Planning and Assessment Act 1979*. These recommendations would be considered and adopted where appropriate in any future environmental impact assessment for the proposal.

5 Conclusion

This submissions report addresses the submissions raised following the public display of the environmental investigation and planning assessment report in June and July 2011. This report also considers the recommendations of the Panel Report (Independent Panel, 2011) where relevant to the component of the preferred option in NSW. It identifies actions that would be required as part of the future detailed design, planning, and approval process.

There are no changes to the preferred option proposed as a result of the submissions. The proposal has been confirmed as the preferred option. Roads and Maritime will inform Wakool Shire Council of the preferred option. Roads and Maritime will also request that the road corridor be shown on the Wakool Local Environment Plan, and that Wakool Shire Council advise any prospective developers of Roads and Maritime' proposed realignment of the Swan Hill-Moulamein Road.

When funding is approved for construction of the replacement Murray River bridge crossing at Swan Hill additional community consultation will occur. Through that future consultation process Roads and Maritime would again consider the community position on the design, benefits and impacts of the replacement Murray River bridge crossing.

6 References

Cardno Lawson Treloar 2009, *Detailed hydrology study for the Swan Hill Bridge Planning Study*, March 2009.

Cardno Lawson Treloar 2011, *Swan Hill Bridge Flood Study Detailed Hydraulic Study*, Addendum Report, May 2011.

Independent Panel 2011, *Swan Hill Planning Scheme Amendment C41 Replacement Murray River Bridge Panel Report*, November 2011.

Roads and Maritime Services 2011a, *Replacement Murray River bridge crossing at Swan Hill, Environmental Investigation*, prepared by GHD .

Roads and Maritime Services 2011b, *Procedure for Aboriginal Cultural Heritage Consultation and Investigation*, November 2011.

Roads and Maritime Services 2011c, *Timber truss road bridges, A strategic approach to conservation*, July 2011.

Roads and Traffic Authority 2001, *Environmental Noise Management Manual*.

VicRoads 2007, *Traffic Modelling Report*, VicRoads Network and Asset Planning.

VicRoads 2011, *Planning Assessment Report*, June 2011.