

MARCH 2012

Foxground and Berry bypass – southern Berry bypass review

The third community Q&A session for the southern Berry bypass review was held on 19 March 2012 at the Berry School of Arts.

Summary – Purpose of the meeting

RMS convened a third question and answer session on the Berry bypass review to keep the community updated as work progresses. Community members asked questions and raised issues for further consideration in association with a southern Berry bypass.

The session was opened and facilitated by Lucy Cole-Edelstein of Straight Talk who introduced the following RMS speakers:

- Fiona Court, General Manager, RMS Infrastructure Communications explained updates to the website, discussed the consultation process, RMS's commitment to transparency and the importance of engaging the community in the process.
- Adam Berry, RMS Project Development Manager for the Foxground and Berry bypass, presented information about the community working groups and encouraged residents to attend.
- Steve Zhivanovich, Project Director, Foxground and Berry bypass, explained the role of the Technical Investigation Group (TIG) and advised that SMEC has been appointed as an external reviewer, with an internal review to be undertaken by RMS Project Management Office (in Parramatta).

Presentations were then made by five technical specialists:

- Henk Buys, a geotechnical engineer from AECOM described geotechnical structures and explained the current geotechnical investigations being undertaken.
- David Kennewell, a hydraulic engineer from AECOM presented a flood study map of the Berry and Shoalhaven area and explained the impacts on the southern alignment design.
- Ken O'Neill, a bridge designer from AURECON detailed the bridges on both the northern and southern alignments and described the types of bridges that were being considered for both routes.
- Peter Stewart, a construction engineer from Peter Stewart Consulting reviewed the top items in cost estimation and detailed several key considerations for constructability.
- Phil Jorgensen, an engineering estimator from Evans & Peck presented the process of cost estimating and explained the role of contingency allowance. This also included information about major cost components of the project and the scope of works.



After the presentations the technical specialists, located in separate break-out areas, were available to answer questions one-on-one with members of the community.

Approximately 125 local residents attended the meeting.

The following is a summary of the issues raised at the meeting and of RMS's response.

Question	Response
Has the appointment for an external independent reviewer (for the technical investigation group) been made and if so, what were the criteria for this appointment?	Yes, SMEC has been appointed. The brief for the independent reviewer is on the website and includes the criteria for the appointment.
Will RMS include in the southern alignment cost estimate the cost for remediation should acid sulphate soils be released into the environment?	RMS would not release acid sulphate soils into the ground. Mitigation measures for acid sulphate soils would be outlined in a management plan which would be included in the costing.
Original maps of the area showed acid sulphate soils – have these ever been found?	No, however, the geotechnical investigations are at a very preliminary stage. RMS will need to complete all testing to understand soil types along the whole route.
Is there anything that can be done at the Shellharbour catchment to prevent flooding in the Berry area?	This is an issue which will need to be taken up with Shoalhaven City Council.
Rather than having a very high road to avoid the 1 in 100 year flood, can't the existing highway be used as an alternative should the new highway flood?	The existing highway does not provide 1 in 100 year flood protection and would therefore not be accessible in a flood event as an emergency services route.
If there are two bridges on the northern alignment and six bridges on the southern alignment, how are the costings of these alignments considered comparable?	Bridge structures are longer on the southern alignment than the northern alignment, but other aspects of the southern alignment may be more cost effective and offset the costs of these bridges.
What is the length of the Berry bridge on the southern alignment and where are the start and end points?	The Berry bridge would be 1.2 kilometres long and would rise over the railway line in two locations.
Bridges at Schofields Lane and Croziers Road will be needed in the northern	The upgrade of the existing Princes Highway up to Croziers Road will be included in the costings for the northern alignment. Existing structures in this area (pipes and



alignment but not the southern alignment. Will these additional bridges be included in the costings for the northern	culverts) would need to be expanded for the northern alignment but would fulfil project requirements without the need for additional bridge structures.
alignment?	
How high would the bridge structure be over the railway at Tannery Road?	The bridge would be approximately nine metres above the existing ground level in this area measured to the underside of the bridge deck.
How much did the Kempsey bypass exceed cost and time in budgets?	This information will be provided to community member after the meeting.
Is it possible to duplicate, along the suggested southern route, the poles which are currently erected along the northern alignment?	The poles along the northern alignment demonstrate the height and location of the proposed noise mitigation along the North Street corridor. There are no poles to demonstrate the height and location of the Berry bridge.
	The bridge structures along the suggested southern route would need to be significantly higher and RMS will need to evaluate the logistics of erecting poles of this nature.

The following is a summary of issues raised in the technical break out groups and the responses of the technical specialists.

Geotechnical - Henk Buys, AECOM	
Question	Response
Has the same level of geotechnical investigation been undertaken on the northern alignment?	Yes. RMS will conduct the same level of geotechnical investigations along both the suggested southern and the preferred northern alignments.
	Although some geotechnical investigations have already been undertaken along the northern alignment, RMS will need to conduct additional testing as part of its current activities to ensure parity.
What cost comparisons are being used to compare the northern alignment with the southern alignment?	RMS will conduct a 'like for like' cost comparison between the two alignments. This is explained as follows:
	Estimates for both routes are derived from a detailed activity breakdown (called a work breakdown structure (WBS)). WBS activities are costed and the estimates built up in a comparable manner to arrive at the cost for each route. Cost estimates can then be compared on an equitable basis.
What geotechnical data is currently available?	The geotechnical investigations are at a preliminary stage with RMS currently progressing ground testing activities. Data from all sites will need to be collected and analysed before RMS can provide results to the community. Upon



	finalisation data will be posted on the project website.
How deep has RMS needed to drill before it has reached rock?	As discussed above geotechnical investigations are at preliminary stage and RMS will need to complete all testing to fully understand rock depth along the whole route. From the testing done to date and the preliminary data
	received rock depth has generally been around 10 metres.
How many boreholes have been drilled so far?	RMS has experienced delays due to the recent inclement weather. A total of nine of the 20 planned bore holes have been completed. RMS is waiting for specialised equipment from Brisbane to be delivered before it can commence the cone penetration testing. Weather permitting it is planned for the geotechnical investigations to be completed and data provided to the community in early May.
Where are the completed boreholes located?	Most of the testing to date has been conducted on the higher ground due to flooding. RMS has boreholes planned in lower lying areas but access to these sites will depend on continued weather and improving ground conditions.
Do geotechnical investigations change depending on the structures being considered?	RMS will undertake a series of tests along the whole route. The two tests being undertaken are: cone penetration tests (resistance of the ground material is measured against the drill to determine the soil type); and bore hole drilling (samples are extracted and tested).
	Results from both types of tests will be analysed and compared to determine soil and rock types / depths and type of structure required.
How will RMS decide between constructing either embankments and cuttings or bridge structures along the southern option?	A decision between the types of structures used is generally made by seeking out the most cost effective solution. This will consider constructability, the earthworks material balance which takes into account the availability of fill material, the quality of fill material and the haul distances. Other considerations include property impacts and flooding potential.
Is it more cost effective to bring in fill material rather than build a bridge?	For a project of this nature the two most costly items are earthworks and structures.
	From a geotechnical perspective ground conditions can have a major impact on the type of structure used. For example the depth of soft soils can influence the foundation treatments for embankments and therefore the overall cost.
Are the soil types similar for both the northern and southern alignments?	Both the northern and southern alignments have amongst other soil types, alluvial soils. The southern alignment will have more potentially soft alluvial soils, due to the greater length in the flood plain. However, until results are available



	RMS cannot confirm similarities between the soil types on both routes.
When will the results of the geotechnical investigations be available?	It is planned for the geotechnical investigations to be completed and data provided to the community in early May. This timing is however subject to weather conditions and RMS's ability to access testing sites.
What do the yellow dots on the presentation map represent?	Each yellow dot represents a potential test location.
Have any acid sulphate soils been found?	Geotechnical investigations are at preliminary stage and RMS will need to complete all testing to fully understand soil types along the whole route. From the testing done to date and the preliminary data received no acid sulphate soils have been recorded.
When will RMS provide a cost for the work being undertaken as part of the suggested southern alignment review?	RMS has committed to providing the community with a full breakdown of costs for the suggested southern bypass review process on completion of the work.

Hydrology – David Kennewell, AECOM		
Question	Response	
Will the bridge structure create a dam effect? How will the water get away?	Upstream or downstream flood impacts created by the bridge will be assessed during the environmental assessment process. Mitigation measures will be proposed where necessary to comply with the project objectives of minimising upstream or downstream flood impacts.	
	The bridge level will be set to provide an appropriate clearance to the 1 in 100 year flood level and the length of the bridge spans will be designed to minimise increases in upstream flood levels. This will reduce the potential for a dam effect.	
Water from Town Creek flows into culverts which are often clogged with trees and debris, causing the water to back up into town. How will this water get away, particularly when there is heavy rain?	Town Creek would pass under a southern alignment through a bridge structure that would be significantly less prone to blockage that a culvert.	
	The highway upgrade works are not located near the culverts in question and so will not improve nor worsen the current situation.	
The 2005 flood washed out the railway line as the water could not be handled by the existing culverts. The railway line and	The current flooding issues associated with the railway line as outside the scope of this project.	



embankments act as a dam, how will this be fixed?	It should be noted that consideration of flood impacts on the railway line is an important factor in the road design, to ensure that the current situation at the railway line is not made worse.
How far does the flooding come up into the farms as a result of water backing up from the Shoalhaven River?	The SMEC (2008) <i>Broughton Creek Flood Study</i> adopted a water surface level of five metres AHD (Australian Height Datum) as the tailwater condition for water backing up from the Shoalhaven River.
What about sea level rise, has that been taken into consideration in the modelling for the flooding impacts from Shoalhaven River?	Potential seal level rise due to climate change will be taken into consideration in establishing the final level of the road, and potential for reduced flood immunity in the future. RMS is currently working with Shoalhaven City Council to determine a consistent allowance for climate change based on the various flood studies that have been undertaken by Council.
Is it correct that you are looking at reducing the length of the 1.2 kilometre bridge by 500 metres with embankments?	RMS is investigating the feasibility of reducing the bridge length by using embankments.
Where will farm access be located on the embankments, will there be access points under the embankments for farmers?	The location of accesses would be determined in consultation with individual landowners. Where these structures also serve a flood mitigation objective, they will be located in sympathy with local drainage lines. The flood immunity of accesses will also need to be considered.
What suggestions from Bruce Ramsay's design have RMS included in the proposed southern bypass?	 The following suggestions from Bruce Ramsay's design have been included in RMS's current design: Redesign of the alignment and bridge structures (Bebo arch versus super tee) at Hitchcock Lane creek to minimise upstream flood impacts. Inclusion of embankment to reduce bridge length from 1.4 kilometres to 1.2 kilometres from chainage 17300 to 17500 (near the Berry sewage treatment plant). Adjustment of the embankment north of Tannery Road.
What is the minimum elevation of the embankment across the floodplain?	The current minimum elevation of the embankment across the floodplain is 7.0 metres AHD. However, the level is subject to design development and in particular further investigations into the sensitivity of the proposed road level to flooding (including potential impacts due to climate change). The level of the embankment is also governed by a range of design inputs including road geometry for safety, geotechnical input on ground conditions and the level of the road at bridge crossings (which is governed by bridge



	thickness and clearance of flood levels).
Does the proposed northern bypass offer flood-free access to Berry? How does this	Currently, Berry does not have flood free access during a 1 in 100 year ARI event.
compare with the southern route?	The north Berry bypass option would provide Berry with
If either option cuts the town off in time of flooding, this needs to be publicised.	flood free access for a 1 in 100 year ARI flood event. The suggested southern alignment does not provide this benefit. Neither proposal will have a negative impact on the current access to Berry during a flood.
Can the flood levels be shown as a horizontal line on the longitudinal drawing?	Yes. RMS will provide this as part of the final review documentation.

Bridge design– Ken O'Neil, AURECON and Adam Berry, RMS	
Question	Response
Does the height on the long section drawings include noise walls on the bridges?	No. RMS has not completed noise modelling to determine whether noise walls will be necessary on bridges for the southern alignment.
Why does the road have to dip down after it's gone over the railway? Why can't it continue at the same height?	Continuing the embankments at the same height as the railway bridges would be more expensive and have a greater visual impact to the community. It would also significantly increase the footprint of the work.
Do the bridges over the railway allow for future electrification of the line? If so, why?	Yes, allowance is made for future electrification. RailCorp specifications require RMS bridges to allow for this.
Does the proposed 1.2 kilometre bridge allow for six lanes of traffic (that is future widening to three lanes in each direction)?	Yes, the bridge will be wide enough to accommodate six lanes of traffic, but it will only be marked with four lanes until widening of the highway becomes necessary. Provision for future widening is being done now to prevent costly changes and re-work later.
The northern option bridges are not as high as the ones proposed for the southern suggestion. Why?	The heights of the bridges are determined by flood modelling and, for the southern suggestion, the railway. Our flood modelling indicates the road must be at 7.5 metres AHD for the southern suggestion. The height of the northern option bridge is about 7.5 metres (at northern end). In addition to the flooding constraints, the bridge height is also influenced by the clearance requirements over the railway line.
Are the proposed bridges as high as the	No. That bridge is much higher than anything proposed for



one over the highway at Kiama?	the southern or northern option.
What type of bridge will be built? Can they be super-tee?	The type of bridge has yet to be determined at each location. Super-tees are a cost effective option for spans up to about 32 metres so they will be considered.
Can an embankment be constructed to shorten the length of the (1.2 kilometre) bridge?	RMS is currently looking into the cost, constructability and flooding impacts of including an embankment and shortening the length of the bridge.
What is the length of the bridge across the flood plain?	1.2 kilometres.
The drawings show a 1.2 kilometre bridge, then the rest is embankment. Why doesn't it all need to be bridge?	Flood modelling shows most water during flooding flow a down Broughton Mill Creek and surrounds, thus it is not necessary to provide a bridge all the way along the southern route.
Will RMS ensure that the culverts/bridges are large enough that they won't silt up during rain events?	RMS is designing all culverts and bridges so that they can adequately cater for large rain events.
The bridges over the railways must allow for future electrification but there is not enough height between the top of the rail and the underside of the bridge?	The design currently allows 5.9 metres clearance between the underside of the bridge and the railway tracks, in accordance with RailCorps' standards. However, RMS is meeting with RailCorp to discuss their project specific requirements, including the clearance required for future electrification.
RMS has allowed only 5.5 metres between the railway and the underside of the bridge. Wasn't there a 6.5 metres allowance for the bridge over the railway on the Gerringong upgrade?	RMS will be meeting with RailCorp to discuss project specific requirements, including the height clearance allowance between the bridge and the railway.
RailCorp don't like attached wires for electrification to the underside of bridges. Will this increase the height of the bridge? And will this then increase the cost of the bridges?	RMS has assumed in the current design that infrastructure for electrification will be attached to the underside of the bridge. If this is not acceptable it would increase the height of the bridge to 6.5 metres. This would not have a significant impact of the cost of the bridge, but would increase the costs on the adjacent embankments. RMS is meeting with RailCorp to discuss this matter and other project specific requirements.
How high is the bridge above the railway near Tannery Road?	About nine metres from ground level to the underside of the bridge
Does RMS have to allow for the potential future raising of the rail line due to	RMS will be meeting with RailCorp to discuss project specific requirements, including the height clearance



climate change?		allowance between the bridge and the railway. Allowance has not been made at this stage.
Lots of attention has been given improving the bridge over Wood Mountain Road, including lower height. How can the proposed 1. kilometre bridge, which is highe longer, be considered cheaper?	to Ihill ing the .2 r and	This is what RMS is trying to determine as part of the review of the southern suggestion.
Do bridges (particularly the 1.2 bridge) have egress points for emergencies / crashes?	kilometre	No. RMS design does not allow for this, but the bridge is designed with wide shoulders so people can walk along to get off the bridge in case of an emergency.
Can RMS place poles along the s suggestion route to indicate the (similar to those in North Street northern option)?	southern height for the	RMS will look into the feasibility of this idea.
Can RMS provide cross sections southern suggestion to allow pe understand what it will look like	s of the cople to ?	RMS will provide typical cross sections at a few locations to assist the community to visual the road.
Why was the southern suggestic reconsidered when the northern was so far progressed?	on option	RMS ruled out a southern option based on a high level costing analysis (not looked at in detail) early on in the project. However, RMS received a submission suggesting a southern option. The Government asked RMS to review the costing for the southern suggestion to determine if it is a feasible option.
Has the wet weather affected the works?	e geotech	Yes, due to the wet weather the review has been delayed by two to three weeks. Costing will not be complete until early May.
What cost will be considered rea for the southern suggestion to p to the next stage and be conside option?	asonable progress ered an	There is no set figure or cost that the southern suggestion must reach to be considered feasible. Once the costing review is complete. the Government will decide if the southern suggestion represents value for money, requiring further investigation by RMS.
Are noise walls going to be inclu Berry Hospital?	uded near	RMS has not completed noise modelling to determine the number and location of noise walls. However, if noise modelling shows noise mitigation is needed near the hospital RMS will provide noise walls or other appropriate measures as required.
Does RMS have details of the propertion from the value management	eferred ent	Yes, this will be made available.



Transport Roads & Maritime Services

workshop held in 1996?

Constructability – Peter Stewart, Peter Stewart Consulting and Ron de Rooy RMS		
Question	Response	
What are the objectives of balanced earthworks and how will this affect the construction of the northern or southern alignments?	Balanced earthworks involve equal proportions of cut and fill quantities. This is also affected by whether the materials from cuts are appropriate materials for fills. The northern alignment is roughly a balanced earthworks requiring little or no importation of materials. The northern alignment would involve an average haul length for materials of 800 metres. The southern alignment is heavily unbalanced as the alignment would not provide enough materials for pavement fills and these would have to be imported, most likely from within 10 kilometres. The southern alignment would involve an average haul of approximately 2.5 kilometres. The cost to import materials is very high which is why balanced earthworks are so important	
The railway line is rarely breached by flooding. Couldn't we lower the alignment to the level of the railway line so we wouldn't need to import additional materials?	The railway line is breached more than the 1 in 100 benchmark.	
How will construction affect local farms? Will fences be set up for construction? How will access requirements for construction vehicles and workers affect properties?	We would require room for access as well as requiring room for topsoil stockpiles, sediment and erosion ponds etc. this could be 50 metres plus fenced off for construction purposes. Erosion and sediment ponds take up a lot of space so this would need to be looked at in the future should the cost comparison proceed to the next stage of review.	
Will there be restriction of movement for cattle or vehicles under bridges and structures?	If a farm is owned on either side of the road, RMS will provide access required for cattle etc.	
The southern alignment would have a severe impact on agriculture. How would farms survive the construction phase if so much of the land is fenced off?	RMS will provide an underpass and would ensure farms can still function both during and after construction.	
Will people be required to relocate during construction?	No.	



Some of the farms around the southern alignment are fairly small. How would these farms survive the construction stage of the process?	This issue would come up in the acquisition process. If a farm is no longer viable to function then RMS will acquire that property. The issue becomes more difficult when considering feeder farms and this would be looked at should the cost comparison proceed to the next stage of review.
Is anyone looking at the strategic value of the agricultural land affected by the southern alignment?	RMS is aware of impacts on the surrounding agricultural industry but this must be put on hold during the cost review. This would be considered in the next stage of review should the cost comparison proceed.
Will construction workers and vehicles be using my driveway?	They would need your permission, and this would have to be negotiated with each property owner beforehand. Construction issues can be addressed because there are restrictions such as allowable working hours. Construction can also be planned to move away from properties.
There is a large embankment planned near the southern interchange. Could this be an overpass?	Yes.

Estimating– Phil Jorgensen Evans and Peck and Jon Williamson, AECOM		
Question	Response	
There are obvious differences in costs for the southern route which looks more expensive when you see the structures and extent of embankment that would need to be built?	Yes, there are some areas that would appear to make the southern route more expensive, but there are also some areas that may be less expensive. RMS is looking at all of the structures and earthworks as well as possible indirect or less obvious cost elements for the cost estimating.	
Concerns about flooding canals, these are not only dependant on the Shoalhaven River being flooded, it's tidal also. Are you considering this?	Yes.	
Concerns about the 1 in a 100 year flood level that has been shown. Are they accurate?	Shoalhaven Council has developed a model through Cardno, its flooding technical consultants, to show these levels. Further, the area being reviewed for a southern route is outside of this data that Council have. We are obtaining information for this area through SMEC's flood modelling information obtained in 2008 for this review.	



Concerns about water in Town Creek, Bowling Club and so on, have you taken these into consideration?	Yes, these flows are being included as part of our review of flood modelling data and any cost implications are being considered.
Cost blow out could be between 30-40% which has occurred in other RMS projects, particularly those with flooding risks. Have you considered this?	Yes, we understand there is risk and are factoring this into our contingency.
What's the cost to date for the planning of the Berry bypass – since 1964?	We are not sure about the total cost, and will need to take this question on notice.
	Response as at 2/4/12: Planning for the Foxground and Berry bypass, following completion of the route selection process for the Gerringong to Bomaderry Princes Highway upgrade has cost in the order of \$2M to date.
Are we including environmental mitigation measures including noise mitigation, landscaping and urban design in our costings?	Yes we are including some environmental impact mitigation costs based on the level of detail that we currently have. These cost estimates are comparable to the sorts of mitigation measures required on the northern route and they will be listed in the final costing report.
Design improvements on the northern option were done in late 2011, that don't include a pedestrian overhead bridge near North Street, will that be costed in?	Design improvements from late 2011 will be included in the costing comparison. This does not include a pedestrian overhead bridge, or other elements that are currently being considered as part of the community workshop process.
Will items be broken down in the final costing?	Yes. A final report and will be published which will include detail costing breakdowns.
Are traffic management costs provided for in the costing?	Yes.
Some land is already owned by RMS, will this be sold?	Yes, there is a process of understanding of what is required for the project and what is not and incorporating both land acquisition costs and resale values into the cost estimates.
Does the government pass on stamp duty	We will have to take this question on notice.
from these property sales? That would have to be a significant amount.	RMS does not pay stamp duty on the purchase of property.
	However, RMS has a policy to reimburse the stamp duty for a property of equivalent value when it acquires whole properties. This cost reimbursement is included in the cost estimation of property purchases.



If there is a contingency of 40-70% at this stage, do we normally estimate a higher costing if on a flood plain?	This depends on the results from the geotechnical investigations.
How does RMS manage the accuracy of contingencies when measuring the high content of acid sulphate soft soils?	The internal review process will need this to be explained in the modelling – showing contingencies and how they are understood.
Railway bridge at Tannery Road – there are water flooding issues near the railway. How will you avoid these?	Any design we produce is required to not have any significant upstream or downstream impacts as a result of the proposal such as increasing flooding at the Tannery Road railway bridge. Any drainage measure that we need to include in the design such as embankment drainage and treatment basins so as not to have significant upstream or downstream impacts and to appropriately treat road runoff will be included in the design and reflected in the cost estimates.
There is always a flooding problem at Tannery Road – is this a council problem?	Yes, any existing problem might remain. The flood modelling assumes no adverse impacts from the proposed works.
RMS has 2-3 years to refine the northern option versus 6-8 weeks on refining the southern route. This is near impossible to compare apples with apples. It is not possible and don't agree with the process. For example, are noises walls are needed along the southern route? How do you know? Are we comparing apples with apples?	The contingencies are the same for both options. The internal review process will be rigorous to ensure it is a 'like for like' comparison and the process we are currently undertaking is focusing on reducing design unknowns such as whether or not noise walls are required so as to facilitate an apples for apples comparison.
On the northern route, urban design etc would need to be removed or clear up these unknown items to make a comparison possible, how are you addressing this?	RMS is considering such unknowns now as part of the design refinement process for the southern route.
One of the northern option benefits is that it comes with a package of urban design, landscaping, mitigation works. These are seen as value adds to the town. Is this a potential disbenefit for the southern design?	No, cost for similar urban design aspects are currently also being allowed for in the southern design costings.
Costings will be included in the northern route for urban design.	Yes, but these are not always required for the southern route as it's located in a different location with respect of the town.



Will an additional northern off ramp be costed in?	No, as this is not part of the northern option design.
Is a pedestrian crossing near North Street separate to current design at Kangaroo Valley Road, being costed in? The Berry Alliance wants this and will get it through either RMS or politically.	No, a separate pedestrian crossing is not currently being addressed and we understand that this design issue is being discussed through the working groups.

The next Q&A session is scheduled for 30 April at the Berry School of Arts at 6.30pm.