Meeting notes

APRIL 2015

Proposed Albion Park Rail bypass - flood focus group meeting

The second flood focus group meeting for the proposed Albion Park Rail bypass was held on Wednesday 1 April 2015 at the Albion Park Community Centre, Albion Park.

Meeting summary

An overview of the flooding assessment and modelling was presented to the group.

This provided the group with an overview of existing conditions, the modelling approach and the results.

Community representatives had an opportunity to ask questions and outline any concerns they had about potential flooding impacts.

The following is a summary of the comments and questions raised at the meeting and of Roads and Maritime's response.

Comment/question	*Response*
How was the flood modelling prepared? How can Roads and Maritime prepare the flood modelling for the project if Shellharbour City Council hasn't finished their flood modelling for Macquarie Rivulet floodplain?	We are using the Wollongong and Shellharbour City Council's established flood models for the Duck Creek, Macquarie Rivulet and Horsley Creek catchments. The bypass has been incorporated into the modelling to determine the changes to flood behaviour with the motorway in place. The Duck Creek and Horsley Creek flood models are both complete and validated models. We are using a final draft of the Macquarie Rivulet model as this is still being verified by Shellharbour City Council before finalisation. Once this model has been finalised, we will reassess the results to ensure there are no

	changes in impacts. This draft model is the most current and best available flooding information for this catchment and has had considerable effort invested in its development to date.
How are different storms modelled? ***How does Roads and Maritime's flood modelling take into account 1 in 100 year flood events?***	Flood models are initially established with historic rainfall data, and calibrated until results match flood levels that were observed. Once calibrated, rainfall data that has an average recurrence interval of 1 in 100 years is entered into models. A range of potential storm durations are tested (ranging from hours to days). The storm durations which produce the highest peak flow are adopted.
Does Roads and Maritime's flood modelling comply with NSW Floodplain Development Manual 2005?	Yes. The NSW Floodplain Development Manual 2005 requires that developments do not have adverse impacts on flood behaviour. It does not require that developments have no impacts (or benefits) to flooding. The policy requires that flooding be considered in conjunction with social, economic and environmental factors in assessing the merit of a development. The manual notes that: • Flood prone land is a valuable resource that should not be sterilised by unnecessarily precluding its development; and • If all proposals were assessed according to rigid and prescriptive criteria, some appropriate proposals may be unreasonably disallowed or restricted (and vice versa).
Will the Princes Highway and new roundabout beneath the Princes Motorway at Yallah be flood affected under this proposal?	We expect there to be improvements to flood immunity on the Princes Highway (in this area) after the bypass has been built.
Will culverts or bridges be used to cross over Duck Creek in the northern part of the project?	Yes. There is proposed to be: • a 45 metre span bridge (matching the existing bridge) • a total of ten 900 mm diameter pipes • There is already flooding on the railway line in this area. The bypass isn't expected to change this.
Why does Roads and Maritime's blockage	Allowances for blockage factors differ from project

policy differ from Wollongong City Council's? ***Wollongong City Council raised concern that Roads and Maritime is not using their blockage policy in the Wollongong City Council section of the bypass.***	to project depending upon local topography, vegetation, land use etc. Given that most of the project lies within the Shellharbour City Council's Local Government Area we have adopted Shellharbour City Council's blockage policy based on the Horsley Creek flood study. We have assessed flooding impacts in the Duck Creek catchment based both on Wollongong City Council's policy and Shellharbour City Council's policy and confirmed there are no adverse impacts whichever policy is adopted. We are preparing further information on the blockage policy adopted for the Flood Focus Group to be presented at the next meeting.
If Roads and Maritime used a 100% blockage of 1.2 metre culverts policy, in line with Wollongong City Council, would the bypass flood?	No. The main carriageway of the bypass would remain flood free in a 1 in 20 year storm.
Has the dam near Duck Creek been checked for structural integrity?	We will be consulting with the Dam Safety Committee to determine the operational condition of the dam and its ability to manage future increases in flows.
Is Roads and Maritime following the NSW Floodplain Development Manual 2005 which outlines that development should not have an adverse impact on flooding?	Yes. The NSW Floodplain Development Manual 2005 requires that developments do not have adverse impacts on flood behaviour. It does not require that developments have no impacts (or benefits) to flooding. The Policy requires that flooding be considered in conjunction with social, economic and environmental factors in assessing the merit of a development. It notes that: • Flood prone land is a valuable resource that should not be sterilised by unnecessarily precluding its development; and • If all proposals were assessed according to rigid and prescriptive criteria, some appropriate proposals may be unreasonably disallowed or restricted (and vice versa). We adopt the following flooding criteria on projects: - Aim to minimise flooding impacts - Consider different land uses - Up to 50mm of flooding increases in

	residential areas - Up to 100 mm of flooding increases in recreational areas - Up to 250mm of flooding increases in agricultural areas We acknowledge that building a new road in a floodplain has flood impacts. It is not economically feasible to build bridges over the entire length of the floodplain. Impacts are assessed and measures are put in place to minimise those impacts where possible.
Will the entry ramp at Tongarra Road adversely impact flooding?	All road construction within floodplains affects flooding to some degree. The design and flood modelling undertaken is intended to ensure the impacts are acceptable.
Does the bypass impact on the ponds at Macquarie Rivulet?	The ponds north of Macquarie Rivulet are old farm dams. The bypass would travel over the ponds at the Macquarie Rivulet and less than 50% of the existing ponds would be filled in.
Have all of the creeks and water courses that flow into the floodplain been considered in developing the modelling?	Yes. Every water course within each flood catchment is included in the flood models for that catchment. For simplicity, we refer to each flood model by the catchment name, e.g. Macquarie Rivulet Model, but this flood model actually encompasses every watercourse within the catchment such as Marshall Mount Creek, Frazers Creek, Hazelton Creek, Yellow Rock Creek etc.
Does the project's flood modelling take into account future development?	Yes this is taken into account. It is standard practice to test the impacts on flooding based on current flood events. We are also testing scenarios with increased rainfall intensity and sea level rise to account for potential climate change, and land use change, which includes future development. The Albion Park bypass (Tripoli Way) has not been included at this stage given Shellharbour City Council has yet to develop designs for this.
During construction will flood modelling be updated if there is a significant change in land use by that time?	Flood modelling would be reviewed again at the detailed design stage and any significant changes to land use by that time would be considered in that review.

After the bypass has been built will there still be flooding in Albion Park?	Yes. The bypass would not solve flooding in Albion Park. For minor storms we expect the existing flow patterns to remain. The focus of our work is to ensure flooding does not get worse in Albion Park as a result of the bypass.
How wide is the base of the motorway through the Macquarie Rivulet floodplain?	The width of the project at road level would be approximately 34 metres. The anticipated footprint of the motorway varies and is dependent upon the height of the embankment.
Are there any plans for Duck Creek catchment?	We don't have any plans to lengthen the existing bridge over Duck Creek as part of this project.
The bypass will put a large roadway within an existing floodplain. Previously water could spill into the floodplain. Once the bypass is built, where will the water go? ***The group highlighted from their experiences and observation that not all flood events are the same and expressed concerns on where the water flow during a flood event when the bypass is constructed.***	There are two main impacts of placing a road embankment in a floodplain, which are: • Changes to the flow (direction, velocity, constraints etc) of the floodwater • Loss of floodplain storage due to the road embankment The proposed Albion Park Rail bypass road alignment through Macquarie Rivulet would generally align with the direction of floodwater. This means Macquarie Rivulet would continue to flow north east along the northern side of the bypass and Frazers Creek would continue to flow north east along the southern side of the bypass. Large bridge and culvert structures are being designed for key locations where floodwaters currently cross this alignment, to ensure existing flood behaviour is maintained. The loss of floodplain storage caused by the placing of fill embankments in the floodplain is included in the modelling analysis. The results shown to the Flood Focus Group include the impacts of both changes to flood flow and changes to available floodplain storage.
Where does the flood water go when the bypass is constructed? Do flood levels increase?	The loss of floodplain storage caused by the placing of fill embankments in the floodplain is included in the modelling analysis. Various arrangements have been tested and the current arrangement of two horizontal to one vertical embankment slopes are the result of iterative testing of different arrangements in the floodplain. The results shown to the Flood Focus Group

	include the impacts of both changes to flood flow and changes to available flood plain storage. The loss of flood volume is reflected in the increased flood elevations shown, which are distributed across the large expanse of the floodplain.
Discussion around scouring and has it been included in the design for bridges?	Yes. Scouring is the process of an area being cleared or dug out by the force of water. Scour protection is a key part of the design of bridges. It is designed for each structure that would be built. We are currently at the concept design stage and scour will be fully addressed during the detailed design phase. Scour protection is determined through comprehensive assessment of the soil type, the flow velocity and the bedding conditions. It can range from localised rock protection around the piers, to full rock protection across the whole floodway opening. In some instances concrete scour protection is used, such as the recent scour protection works on the Tongarra Road bridge.
Will scour protection widen the project's footprint?	Generally scour protection does not widen a project's footprint; rather, it changes the appearance and texture of a surface. We will consider this in the detailed design phase.
Concerns were raised that home insurance premiums will increase due to changes to flooding caused by the bypass.	The design of the bypass is focussed on ensuring no new or unacceptable flooding impacts to properties are created. The flood modelling done is based on the flood models developed by both Shellharbour and Wollongong City councils. Insurance companies will use the results of the flood studies, developed by each of the councils, to determine future home insurance premiums.
Have the impacts of climate change been incorporated into the flood modelling?	Yes this is taken into account. It is standard practice to test the impacts on flooding based on current flood events. We are also testing scenarios with increased rainfall intensity and sea level rise to account for potential climate change, and land use change which includes future development.
How long will the bypass take to complete?	We expect the proposed bypass to be opened to

	traffic around three years after construction starts. This includes the detailed design and construction phase.
Is the current design of the bypass the cheapest option?	No. The cheapest option would not include any bridges. The current design includes 18 bridges over the entire length of the project, including four major floodway bridges. To build a continuous bridge over the full length of the floodplain would be cost prohibitive. Bridges cost around seven times more to construct than road on the ground.
Will building the bypass in the floodplain result in the need for a detention basin/retention basin?	No. The bypass is generally aligned parallel to the direction of floodwater through the Macquarie Rivulet floodplain. Bridges and culverts are proposed where flow crosses the bypass. Detention basins in a floodplain are considered not to be effective during larger storm events.
Are detention basins required to address flooding in new developments?	The scale of the project makes it very difficult to construct detention basins to manage flooding impacts. We comply with the requirements of the NSW Floodplain Development Manual to minimise flooding impacts.
Have the project flood modelling results been reviewed by Wollongong and Shellharbour City councils and the Office of Environment and Heritage?	No, not at this stage. Flooding impacts are being assessed as part of the Environmental Impact Statement. We are liaising with Wollongong City Council, Shellharbour City Council and the Office of Environment and Heritage during the preparation of the Environmental Impact Statement. We will provide a draft copy of the flood modelling to these organisations before the Environmental Impact Statement goes on display for community comment. This is in line with the Department of Planning and Environment's planning approval process. It will be available to the wider community as part of the public display.
Concerns were raised about State Emergency Service access during a flood. If Taylor Road floods how will the State Emergency Service respond?	Taylor Road is outside the scope of the project. We are assessing and managing flood impacts as a result of the bypass. We are not assessing or managing existing flooding in Albion Park.
Will median separation impact on the State Emergency Services ability to cross the bypass during flood events?	We have been meeting with Emergency Services, including the State Emergency Service, and are currently looking at cross over points on the proposed bypass to provide access to both sides

	of the motorway when required.
What flood immunity will the bypass have? It is important for access to be maintained for emergency services.	The proposed bypass is designed to be immune from a 1 in 100 year flood event. When land use and climate change are assessed the bypass will be immune from a 1 in 20 year flood event.
Does the 150 metre bridge planned for Frazers Creek have 75 metres on each side of the flooding area?	Our flood modelling has shown that the flood behaviour is not very sensitive to the specific position of this bridge, as long as a 150m opening is provided in the general vicinity of the creek crossing. We aim to optimise the position of the bridge to minimise flood impacts. This will be refined during later stages of the design process.
Suggestion from Wollongong City Council that the modelling should be looking at changes in flood risk precincts and these should be produced both pre and post development.	While this approach is not followed on our other projects, the project team is reviewing if this could be done and will advise the group.
The Flood Focus Group expressed their concern with understanding and viewing the level of detail in the flood modelling presentation.	We have noted this and are exploring options to present the information in a clearer format at the next meeting.