

Addendum Report

REPORTS THROUGH THE GENERAL MANAGER

REPORTS FROM THE DIRECTOR ENGINEERING

a26 [E-CM] Bridge Replacement on Mistral Road over Dunbible Creek -
Anthonys Bridge

SUBMITTED BY: Infrastructure Delivery

Valid



Supporting Community Life

LINKAGE TO INTEGRATED PLANNING AND REPORTING FRAMEWORK:

2	Supporting Community Life
2.4	An integrated transport system that services local and regional needs
2.4.3	Ensure local streets, footpaths and cycleways are provided, interconnected and maintained

SUMMARY OF REPORT:

At its meeting of Thursday 15 May 2014, Council resolved to defer the replacement of Anthonys Bridge by 12 months to allow time to properly investigate and resolve flood issues, plus allow time to undertake community consultation regarding the two options for managing vehicular traffic during construction.

Design problems have now been resolved and community consultation has been completed. This report provides discussion surrounding the major issues for the replacement of Anthonys Bridge.

RECOMMENDATION:

That Council:

- 1. Temporarily closes Mistral Road during the replacement of Anthonys Bridge.**
- 2. Includes a cycleway on the downstream side of the new Anthonys Bridge at a cost of \$150,000 in the 2015/16 budget.**
- 3. Undertakes pavement rehabilitation on 5 sections of Stokers Road and 1 Section of Bakers Road before the Anthonys Bridge replacement commences and funds the \$1,586,000 required to complete these works by adjusting the current roads programs in the December 2014 budget review.**

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4. **Officers initiate the process of formally naming the bridge in accordance with Council policy.**
5. **ATTACHMENT 2 is CONFIDENTIAL in accordance with Section 10A(2) of the Local Government Act 1993, because it contains:-**
 - (a) **personnel matters concerning particular individuals (other than councillors).**

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REPORT:

Background

Anthony's Bridge on Mistral Road over Dunbible Creek is listed as the top priority on the bridge replacement program. It has been listed for replacement as item CP2.4.3.53 of Council's Delivery Program 2013/2017 and total funding of \$1,552,000 has been proposed for the project. The funding is equally split between 2014/15 and 2015/16 with all available bridge replacement funding allocated to this project for both years.

At its meeting of Thursday 15 May 2014, Council resolved to defer the replacement of Anthony's Bridge by 12 months. This was to allow time to properly investigate and resolve flood issues, plus allow time to undertake community consultation regarding the two options for managing vehicular traffic during construction:

- Construct a side track and temporary detour to keep the road open during construction; or
- Close Mistral Road at the Stokers Road intersection and redirect traffic to an alternative route.

Council indicated its preferred option was to temporarily close Mistral Road as this results in less damage to public roads, less environmental damage, less wet weather risk and less cost to the community.

The Anthony's Bridge Replacement Communications Report (December 2014) is attached to this report and individual responses are included in a separate confidential attachment.

Matters arising from the community consultation are discussed below.

Condition of Stokers Road

The current condition of Stokers Road as an alternative route was raised as a concern by some residents. Council has already allocated funding of \$686,000 in the current budget to rehabilitate 3 sections of Stokers Road:

- Segment 20 - 440m near Tweed Valley Way Intersection.
- Segment 110 - 140m between Concrete Causeway and Dunbible Creek Bridge.
- Segment 130 - 280m between Richards Bridge and Richards Deviation.

Approvals for segments 20 and 130 have been obtained and work is scheduled to commence in February 2015. Approvals for segment 110 are currently outstanding, but they are expected shortly and work on this section is proposed to continue on after the other sections.

Council has proposed further funding of \$700,000 in the 2015/2016 budget to rehabilitate another 2 sections of Stokers Road, being segments 80 and 90, a total of 1000m south of the concrete causeway. Approvals for these sections have been received and work could start on short notice. In order to complete these works before the commencement of Anthony's Bridge, it is possible to bring these works forward into the current budget by making adjustments to the roads programs and delaying other works.

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Condition of Bakers Road

The current condition of Bakers Road as an alternative route was raised as a concern by some residents. There is a 480m section at the Byangum end of the road where the road pavement has failed. It would cost approximately \$200,000 to rehabilitate the pavement in this section of road. No funding is currently available or proposed in future budgets to carry out this work, however it is expected that the impending road network condition survey and associated program review will bring this segment of the road into the forward program with high priority. Approvals have been received to undertake this work and it is possible to bring these works forward into the current budget by making adjustments to the roads programs and rescheduling other works. Work could commence immediately following the works on Stokers Road.

The tight alignment of Bakers Road was also raised by a number of residents. Traffic volumes do not warrant the widening and straightening of Bakers Road. Apart from the high cost involved, approvals and land acquisitions could not be completed in the available timeframes.

Footpath / Cycleway

It is obvious from the community feedback that there is a strong desire for a pedestrian footway to be included on the bridge. The existing bridge is approximately 6.5m wide between kerbs and carries 2 lanes of traffic at 3.25m each lane.

The proposed bridge is 8.2m wide between kerbs, which is 1.7m wider than the existing bridge. This additional width provides 2 traffic lanes at 3.2m each plus a road shoulder on either side of 0.9m. This configuration is deemed suitable for the location and purpose of the bridge.

A drawing of the cross section of the existing and proposed bridges comparing the available trafficable areas is provided as an attachment to this report.

Mistral Road east of Stokers Road carries approximately 1,000 vehicles per day. Pavement width is approximately 7 to 7.5 metres with limited linemarking and road shoulder provision. Pedestrians should not be encouraged to walk adjacent to or on this road given the vehicle speeds, traffic volume and limited sight distance availability. There are no plans long term or short term plans to provide pedestrian facilities on Mistral Road between Stokers Road and the Art Gallery. Providing a pedestrian compliant bridge would create a pedestrian facility in isolation. The proposed bridge is approximately 1m wider than the roads on either side of the bridge.

Although there is no need to provide a pedestrian facility in this location, preliminary investigations were undertaken to determine the best method of providing a dedicated footpath across Dunbible Creek. The Australian Standard for bridge design specifies the requirements for pedestrian and cycleway hand rails. These are higher than standard traffic barriers. Therefore, as soon as pedestrians or cyclists are catered for, higher bridge rails are needed and these increase the debris load on the bridge during a flood event.

Due to the difficult founding conditions and site considerations, any additional lateral load on the bridge will require additional piles to be installed. This considerably increases the cost of the bridge. The most economical way to cater for pedestrians is to attach the walkway or cycleway to the downstream side of the new bridge.

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Discussions have been held with the bridge designer and it is thought that a 2.5m cycleway can be added to the design within the required timeframes. Preliminary cost estimates show that the cycleway would add an additional \$150,000 to the cost of the vehicular bridge. The cost difference between providing a 1.2m wide footpath or a 2.5m wide cycleway is approximately \$15,000.

Catering for pedestrians on the bridge could be seen as encouraging pedestrians to walk on the road either side of the bridge and this could become a catalyst for providing a full footpath beside the road. This needs to be balanced against the argument that the bridge is designed to last 100 years and if footpaths are installed beside this road in the future, retrofitting a footpath to the bridge is more expensive than providing one from the start.

Also for consideration is the benefit that pedestrians would receive from this facility compared to the benefit that could be provided to pedestrians in other parts of the shire for the same cost. A cost benefit analysis has not been undertaken.

Adding a cycleway or footpath to the bridge structure will increase the construction time by approximately 4 weeks. The vehicular bridge would need to remain closed for this period due to the effects that vibrations from traffic have on the durability of the fresh concrete at the attachment points.

Cheaper Alternatives and Shorter Construction Timeframes

At the pop up information stall, some residents raised the issue about how long the bridge will take to construct and why it is costing so much, citing various other bridge types as examples. The bridge solution proposed for this site is a balance between high up front capital costs and low long term maintenance costs to provide the lowest whole of life costs. Time, quality and scope are all interrelated to cost and one cannot change without impacting the others.

The proposed solution is prestressed precast planks with transverse tensioning bars with the road surface applied directly to the planks.

Other material types or construction techniques could be adopted to reduce the construction timeframe down to less than half of that proposed, but these come at a cost. To reduce construction time without compromising quality requires more upfront capital or a reduction in scope. To reduce construction time without changing the scope or upfront cost requires a compromise in quality which decreases the design life and increases maintenance costs.

For example, a full precast concrete deck could be utilised on the bridge. This would reduce the construction timeframe by approximately 4 weeks. However, it requires an extra 400T of precast concrete elements to be transported from Brisbane, but it only reduces the locally supplied cast-in-situ concrete by 150T. The additional upfront cost of this method is \$140,000 plus it requires yearly maintenance of the post tensioning bars that hold the precast elements together with full replacement of the stress bars at least once during the life of the bridge.

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Funding

In August 2014, a grant for the replacement of Anthonys Bridge was applied for under the Australian Government's Bridges Renewal Programme (BRP) Round One. No advice has been received to date regarding the outcome of this grant application. The total application was for \$1,900,000 based on a 50:50 funding split. If successful it would provide \$950,000 in additional funding on the strict condition that the funds must be expended before 30 June 2015. Any delay to the proposed starting date would make Council ineligible for the grant.

Kingscliff Bridge over Cudgen Creek is second on Council's bridge replacement priority list. Based on the current deterioration trend of Kingscliff Bridge, within the next 3 years costs in the order of \$100,000 will be incurred to re-deck the bridge, replace girders and repair concrete cancer. Maintenance of this type was last carried out towards the end of 2008 at a cost \$160,000 and it requires the full closure of Kingscliff Bridge. Due to the disruption and cost involved, it would be better to replace Kingscliff Bridge before this maintenance is required, alternatively, if the maintenance is undertaken the replacement should be delayed another 7-10 years.

Based on current budget allocation forecasts, Council will have enough funds available in 2018/19 to commence construction of the replacement Kingscliff Bridge. This timeframe is marginal and may not avoid the need for costly maintenance works. If the grant for Anthony's Bridge is successful, then funds currently allocated for Anthonys Bridge could be reallocated towards Kingscliff Bridge. This would bring the proposed replacement forward by 12 months and meet the required timeframe for replacement. Any additional costs incurred on Anthonys Bridge for a footpath/cycleway or temporary bridge could delay the replacement of Kingscliff Bridge by 12 months and significant maintenance of the existing structure will be required unless additional budget is allocated or the grant application is successful.

Side Track and Temporary Bridge during construction

The option of constructing a temporary bridge and side track during construction was discussed with the adjacent land owners. The affected owners are willing for Council to temporarily occupy the private property needed for the temporary bridge on the condition that it is built upstream of the existing bridge. The land owners advised that they would not allow a temporary bridge to be constructed on their properties downstream of the existing bridge under any circumstances.

Council's environmental scientist was consulted about the proposed location of the temporary bridge as it would substantially increase the proposed project disturbance footprint, approximately doubling the size from 500m² to 1000m². This creates increased adverse environmental impacts due to the development of road approaches which would increase vegetation clearing, and with relatively high creek banks, would potentially destabilise the soil in these areas and facilitate creek bank erosion. The laying of rock enclosed within geotextile fabric across Dunbible Creek for vehicular access would cause temporary constriction of the creek and create a fish passage barrier (listed as a key threatening process under the *Fisheries Management Act 1994*), resulting in decreased stream connectivity and affect the hydrological and ecological processes. The placement of this rock and subsequent removal at completion of the new bridge would result in unnecessary habitat disturbance and increase the risk of sedimentation of the receiving waterways. Dunbible Creek has been mapped as key fish habitat by the NSW Department of Primary Industries, Fisheries and Aquaculture, and feeds the Tweed estuary, a highly

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productive marine habitat supporting the commercial fishing industry and recreational fishing opportunities prevalent within Tweed's estuaries.

The proposed method of rock filling Dunbible Creek and placing a short span temporary bridge remains the most economical alternative of providing a side track to keep Mistral Road open during construction. Multiple span temporary bridges avoid the constriction in the creek but they are more costly and still have the same impact on the creek banks.

An additional consideration is the decommissioned cattle dip site located upstream of the existing bridge on the eastern side of Dunbible Creek. Although the actual cattle dip site would not be disturbed by the temporary bridge and side track, these would pass through the location of the old holding yards. The potential exists that contaminated land could be disturbed, if contamination was found, this would add significant cost to the side track and could delay the replacement of the bridge.

School Bus

Discussions have been held with the school bus operator that services Stokers Road and Bakers Road. Multiple buses per day use Anthonys Bridge travelling in both directions, morning and afternoon. The temporary closure of Anthonys Bridge would cause significant inconvenience to this service but the bus operator is confident that the services could continue with new routes and timetables being implemented for the duration of the project. The bus operator requested that school bus signage be installed on Bakers Road to alleviate some of the safety concerns with using Bakers Road.

Australia Post

Discussions were held with Australia Post about disruption to the mail delivery if Anthonys Bridge was temporarily closed. Initially Australia Post thought that mail delivery to the Dallis Park estate would not be possible if Mistral Road was closed. Australia Post has a policy that excluded 'postie bikes' from travelling on roads with speed zones in excess of 80km/hr, which means that they cannot use the alternative routes of Bakers Road or Stokers Road. After further consideration, Australia Post contacted Council and advised that mail delivery to the residents would not be interrupted if a road closure was implemented, as an alternative delivery method had been identified.

Emergency Services

Some residents raised concerns about the response times of emergency services if Mistral Road was temporarily closed. NSW Ambulance service was contacted by Council staff regarding this concern. The areas affected by the proposed closure have not created a high workload for the paramedics in the past. However, the nature of emergencies is such that history is no indication of the future and the workload during the possible closure cannot be predicted. It was thought that closing Mistral Road would add an extra 10 minutes response time to the most affected residents.

Road Realignment

A proposal to build the new bridge adjacent to the existing bridge and realign Mistral Road at the completion of the project was presented as an alternative method of keeping Mistral Road open during construction. This proposal would also require intersection adjustments at Stokers Road and Bakers Road. Investigations were undertaken at a concept level only. It was found that the road realignment would cost \$295,000 before land acquisitions and

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intersection treatments were even considered. Investigations ceased as the temporary bridge option provides a safer long term road alignment for similar costs.

Construction Start Date

The current proposal is to start construction of Anthonys Bridge in 2015 at the end of the wet season (typically April or May). As well as minimising construction and environmental risks, this timeframe also suits the funding model split between 2 financial years. If the grant application is successful then this start date becomes critical and cannot be delayed for any reason. To meet this construction start date, the design needs to be finalised by early January 2015 and tenders for material procurement and specialised services need to be called no later than the end of January.

All design issues have been resolved by the bridge designer for the 8.3m wide bridge. Final design and drafting is currently on hold pending resolution of the footpath and the temporary bridge issues. The designer is confident that he can amend the design models as necessary and complete the design in the required timeframe if provided with final direction by mid December 2014. Approval documentation is currently being prepared and will be lodged by the end of December after decisions have been made regarding the temporary bridge and footpath.

The existing timber bridge is deteriorating rapidly and the life of the existing structure has been extended as long as economically feasible. If the replacement bridge is delayed beyond the proposed start date, then Council will need to consider placing a weight restriction on the existing bridge. The existing bridge is currently vulnerable to complete loss during a large flood event.

Condong Sugar Mill

The issue was raised about how 2,500 tonne of sugar cane would be transported to Condong Sugar Mill if Mistral Road was temporarily closed. The timeframe for harvesting this cane conflicts with timeframes for replacing the bridge and neither can be rescheduled without increased cost and risk. Discussions were held with the Condong Sugar Mill regarding this issue. The Mill is investigating two potential problems before advising Council further.

The first issue is the height of the cane trucks using Stokers Road as a detour. Before the cane trucks can use this road, the Mill would need to obtain approval to use Stokers Road as a 4.6m high vehicle route. Council's low loader uses Stokers Road regularly with loads of 4.6m and occasionally with loads of 5.0m, so there is no overhead infrastructure that needs adjusting before the cane trucks can operate on this road.

The second issue is the additional length of the proposed detour as it increases the travel time. To haul the cane to the Mill in the same time period as normal, an additional 2 trucks are needed. The Mill has not yet advised if these additional trucks would be available.

Bridge Naming

The bridge is known informally as Anthonys Bridge but has never gone through a formal naming process. During the construction of the bridge it is proposed to undertake the process of advertising and selecting a suitable name in accordance with the Policy.

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OPTIONS:

1. Replace Anthonys Bridge with the proposed 8.3m wide structure and temporarily close Mistral Road during construction with no additional funding.
2. Replace Anthonys Bridge with the proposed 8.3m wide structure and temporarily close Mistral Road during construction, and provide additional funding of \$900,000 to rehabilitate Stokers Road and Bakers Road.
3. Replace Anthonys Bridge with the proposed 8.3m wide structure and provide a temporary bridge and sidetrack to keep Mistral Road open during construction, and provide additional funding of \$310,000.
4. Replace Anthonys Bridge with the proposed 8.3m wide structure, include a cycleway in the design and temporarily close Mistral Road during construction, and provide additional funding of \$150,000.
5. Replace Anthonys Bridge with the proposed 8.3m wide structure, include a cycleway in the design and temporarily close Mistral Road during construction, and provide additional funding of \$150,000 for the cycleway and funding of \$900,000 to rehabilitate Stokers Road and Bakers Road.
6. Replace Anthonys Bridge with the proposed 8.3m wide structure, include a cycleway in the design and provide a temporary bridge and sidetrack to keep Mistral Road open during construction, and provide additional funding of \$460,000.

CONCLUSION:

Funding is not available to meet all of the communities' expectations during the replacement of Anthonys Bridge. The feedback provided by the community should therefore be taken into consideration and balanced against the needs of the wider community to produce the greatest benefits for the whole shire while minimising the impact on the local community.

Providing long term benefits to the community such as high quality bridges, pavement rehabilitations and footpaths are considered more important than temporary work to avoid short term inconveniences.

It is therefore concluded that Council should bring forward the rehabilitation of 2 sections on Stokers Road into the current budget, allocate funding in the current budget to rehabilitate 1 section of Bakers Road, allocate funding in the 2015/16 budget for the provision of a cycleway on Anthonys Bridge, and temporarily close Mistral Road for the duration of the bridge replacement.

COUNCIL IMPLICATIONS:

a. Policy:

Community Engagement Strategy v1.1.

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b. Budget/Long Term Financial Plan:

Funding of \$1,552,000 is already proposed in the budget, equally split between 2014/15 and 2015/16 financial years to replace Anthony's Bridge.

Additional funding of \$150,000 is required in the 2015/2016 budget to fund the cycleway component of the bridge if this option is selected.

Further funding of \$310,000 is required to provide a temporary bridge and side track during construction if this option is selected.

Funding of \$686,000 is included in the 2014/15 budget to rehabilitate 3 sections of Stokers Road. Further funding of \$700,000 is proposed in the 2015/2016 budget to rehabilitate another 2 sections of Stokers Road. The current road program could be adjusted in the December budget review to bring this funding forward and reschedule other road projects.

Further funding of \$200,000 is required in the 2014/15 budget to rehabilitate 1 section of Bakers Road if this option is selected. The current road program could be adjusted in the December budget review to include Bakers Road and reschedule other road projects.

c. Legal:

Not Applicable.

d. Communication/Engagement:

Consult-We will listen to you, consider your ideas and concerns and keep you informed.

UNDER SEPARATE COVER/FURTHER INFORMATION:

Attachment 1. Bridge Replacement on Mistral Road over Dunbible Creek - Anthony's Bridge Communications Report December 2014 (ECM 3536905).

(Confidential) Attachment 2. Bridge Replacement on Mistral Road over Dunbible Creek - Anthony's Bridge Community Consultation Submissions (ECM 3536969).

Attachment 3. Bridge Replacement on Mistral Road over Dunbible Creek - Anthony's Bridge Drawing comparing the trafficable areas of the existing and proposed bridges (ECM 3537522).
