

11.2 – Mundijong Road – King Road intersection remedial works (SJ1299)

Responsible Officer:	Manager Engineering Services
Senior Officer:	Director Infrastructure Services
Disclosure of Officer's Interest:	No Officer involved in the preparation of this report has an interest to declare in accordance with the provisions of the <i>Local Government Act 1995</i> .

Authority / Discretion

Executive	The substantial direction setting and oversight role of the Council such as adopting plans and reports, accepting tenders, directing operations and setting and amending budgets.
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Report Purpose

The purpose of this report is to provide Council with an update on the current state of the recently completed Mundijong Road / King Road Intersection project and seek approval for a budget variation to the contract to undertake essential remedial works.

Relevant Previous Decisions of Council

Ordinary Council Meeting – 11 December 2023 – OCM294/12/23 - COUNCIL RESOLUTION / Officer Recommendation

That Council:

- 1. AWARDS Tender RFT 11/2023 Mundijong - King Road - Intersection Upgrade to WCP Civil Group Pty Ltd to the value of \$596,054.21, excluding GST as contained within CONFIDENTIAL attachment 1.*
- 2. AUTHORISES the Chief Executive Officer to sign a contract on behalf of the Shire of Serpentine Jarrahdale for Tender RFT 11/2023 Mundijong - King Road - Intersection Upgrade.*

Background

The Mundijong Road / King Road project was approved as part of the Metropolitan Regional Road Group (MRRG) Improvement Program and is jointly funded by MRRG (2/3) and the Shire (1/3).

Delivery of the project was staged over two years, with Stage 1 being the detailed design phase and land acquisition completed in 2022/23 financial year) and Stage 2 being the construction phase completed in 2024/25 financial year. The MRRG grant funding in Year 1 was \$66,667 and the Shire's contribution was \$33,333.

Contact Us

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The MRRG grant funding for Stage 2 is \$599,724 and the Shire's contribution is \$299,862. The total project budget over the 2 stages is \$999,586.

The current road intersection is a basic T-intersection with a posted speed of 100km/hr for both King Road and Mundijong Road. The intersection configuration, prior to upgrade, consisted of a narrow informal left turn lane into King Road from Mundijong Road and a widened unmarked right turn / straight through west bound from Mundijong Road into King Road. It is anticipated that there will be significant traffic increase along Mundijong Road following completion of the Tonkin Highway extension in the near future, which has been considered as part of the intersection design.

The scope of works for this project included construction of a 185m long auxiliary left lane along Mundijong Road into King Road and a 213m channelised right turn pocket into King Road from Mundijong Road as per Austroads Guideline Part 4A. The proposed intersection upgrade will accommodate 27.5m long RAV 4 vehicles and improve the safety at this intersection. Other works to the intersection upgrade include road widening, drainage upgrade, removing roadside hazards including vegetation within the clear zone, installation of a new traffic island, edge line marking and delineation including chevron pavement marking and guideposts.

The location of works for the intersection upgrade is shown in the below aerial image (Figure 1).



Figure 1

Following the completion of the project in early 2024, the road widening area was opened to traffic. As the newly built sections of road widening was subjected to traffic loading, it soon became evident that the pavement was settling and deforming in several localised sections. Following further progression of pavement deformations, Shire Officers implemented traffic management plans in the affected section of the road with reduced speed from 100km/hr to 60km/hr which continues to be in place to date to ensure road safety.

Shire Officers engaged with the contractor who completed the works to determine the cause of the settlement and pavement failure. The contractor undertook a preliminary investigation and pavement testing up to 1.1m below the road surface and found that the existing road subgrade layer was extremely wet. They concluded that the pavement failure was primarily due to the natural soft clayey subgrade becoming unstable due to water ingress from the adjacent open drain, saturating the subgrade and making it unstable.

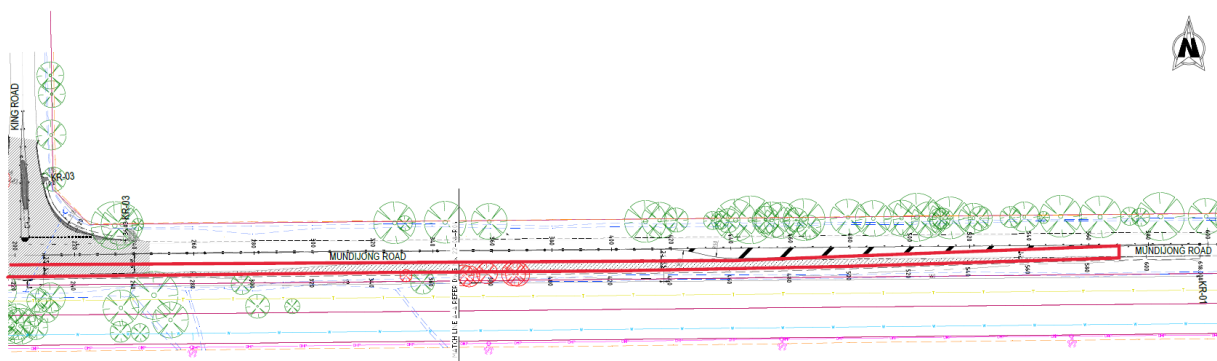
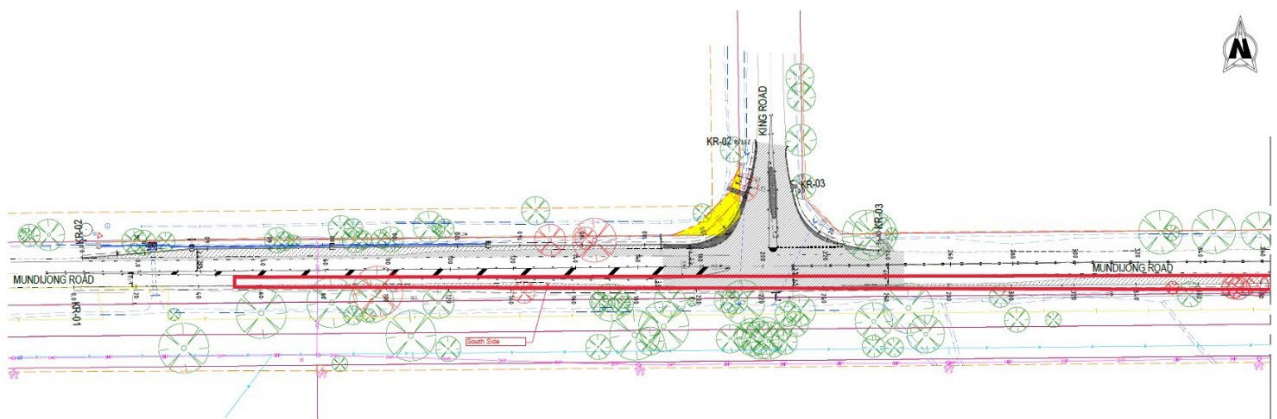
To investigate the matter further, the Shire engaged an external consultant to conduct a thorough investigation into the issue. The consultant's investigation has confirmed that the failure of the



road pavement and surface is primarily caused by the weak natural clayey subgrade material which is unsuitable to withstand the traffic loading.

In addition, the existing open drain located adjacent to the road widening was found to be dysfunctional due flat gradient and accumulation of organic debris which resulted in excessive water ponding in the drain over a long period of time causing water ingress into the subgrade layer, exacerbating the pavement deformation. The consultant's investigation found that settlement of the road pavement and deformation was still continuing at the time of testing and investigation in September and October 2024. This investigation recommended that the entire length of the widened section of the road needed to be treated to improve the pavement strength. Given the road had been opened to traffic for over 6 months, further pavement testing was undertaken in November 2024 to determine if the bearing capacity of the subgrade layer had improved due to traffic loading. This testing (FWD -Falling Weight Deflectometer) was undertaken to the decision making in selecting the appropriate and most cost effective treatment required to strengthen the pavement and repair the deformation.

The below image indicates the intersection upgrade design, with the widening area of pavement failure outlined in red.





Community / Stakeholder Consultation

Nil.

Statutory Environment

Section 3.57(1) of the *Local Government Act 1995* requires a local government to invite tenders before it enters into a contract of a prescribed kind under which another person is to supply the goods or service.

In addition to prescribing the kinds of contracts that must be publicly invited, the *Local Government (Functions and General) Regulations 1996 (Functions and General Regulations)* also provide for varying a contract for the supply of goods of services:

21A. Varying a contract for the supply of goods or services

If a local government has entered into a contract for the supply of goods or services with a successful tenderer, the contract must not be varied unless —

- (a) the variation is necessary in order for the goods or services to be supplied and does not change the scope of the contract; or*
- (b) the variation is a renewal or extension of the term of the contract as described in regulation 11(2)(j), (ja) or (jb).*

Advice was sought on undertaking the rectification works through a contract variation under regulation 21A of the *Local Government (Functions and General) Regulations 1996 (Functions and General Regulations)*, refer **CONFIDENTIAL attachment 1**.

Comment

The scope of this project was developed for funding application in 2020 based on a typical 300mm thick pavement rehabilitation using the geotechnical information available at the time, which was limited to the 300mm design pavement layer. This treatment and design is generally an adequate and industry standard approach for similar road widening projects. As such, the scope as approved within the grant funding application was used to develop the detailed design where no need was identified for additional geotechnical investigation into the subgrade layer, up to 1.1m below road surface level.

With the information available at the time of design, it would have been unusual to undertake such an extensive and costly geotechnical investigation, considering the size and scope of the project. It should be noted that one of the main contributing factors into the pavement failure is the ponding of water in the open drain located adjacent to the road widening which has caused water ingress into the subgrade layer. The ponding of water was caused due to lack of proactive maintenance of the drain, being partially blocked by debris, and flat gradient of the drain. As the drain was outside the scope of works for this project, it would be reasonable to expect that this potential risk to pavement stability was not considered as part of the design.

However, learning from this experience, more extensive geotechnical investigation will need to be considered in similar projects in future to better inform the pavement design details to ensure design is fit for local ground conditions, on a case by case basis. Similarly, more drainage investigations will need to be considered as part of the design process where there is evidence of poor drainage or where there are open drains at close proximity of projects.



Following the initial testing and investigation by the consultant in October, the consultant's recommended treatment option to repair the road deformation included removal of the newly built road pavement plus part of the clay subgrade to a total depth of 750 mm, to be replaced with suitable imported basecourse material and asphalt wearing course. The cost of this option was estimated to be \$420,000. Due to the high cost of this option, Shire Officers requested the consultant to undertake further FWD testing. This testing was to determine if the bearing capacity of the subgrade layer had improved due to traffic loading, given the road had been under traffic for over 6 months and it would be reasonable to expect that the majority of the potential pavement deformations had already occurred and the bearing capacity of the subgrade layer had improved. It was intended that the results of this testing would be used in selecting the most cost effective pavement improvement treatment. The test results obtained in December indicated that the bearing capacity of the subgrade layer had improved and a revised pavement design was developed using the FWD test results. The new pavement design required replacement of a 100mm thick layer of the existing pavement with asphalt at a cost of \$180,000 which is the recommended option in this report.

Following the analysis of the FWD testing results, the scope of works to remediate the road widening area was determined to include:

- Box out, remove and dispose the top 100mm of the widened West bound passing lane
- Compact the exposed pavement layer
- Install 100mm thick layer of asphalt in two layers, 60mm thick as base and 40mm thick layer as wearing course
- Clean the existing open drains along Mundijong Road to enable free water flow

If the remedial works are undertaken as a variation to the original contract, these works will be able to be completed expediently. The approval of the variation to the original contract will allow for a more streamlined approach, enabling the contractor to mobilise resources immediately and proceed without delay. This would enable the works to be completed within a reasonable timeframe and also significantly reduce the risk associated with extended procurement and construction timelines potentially resulting in further deterioration of the road. This will also remove complexities of work liabilities between different contractors working on the same project, if a different contractor was engaged to complete the works.

In the event that the variation is not approved, the alternative option would be to undertake a new procurement process to engage a contractor to complete the works. This process is likely to delay the completion of the works well beyond the summer season into winter, which is not the recommended time to undertake works of this nature due to wet weather. If this option was chosen as the preferred option moving forward then the works are likely to be completed during the next summer season in late 2025. It is likely that there will be further deformation of the road pavement between now and next summer. Although continuing temporary traffic management with reduced speed will mitigate some of the road safety risk resulting from uneven road surface during this time, however, delaying the works until next summer will increase this safety risk level. In addition, further extended delays in repairing the road will cause reputation damage to the Shire.

Therefore, approving the variation would be a critical decision to ensure that the project is completed safely and within an appropriate timeframe.

The remedial works have been costed at \$180,000 excluding GST, inclusive of traffic management, internal project management and line marking reinstatement costs. The total budget variation required to complete the works is therefore \$180,000.

**Options**Option 1

That Council:

1. APPROVES the budget allocation of \$180,000 for a variation to the RFT 11/2023 Mundijong Road - King Road Intersection Upgrade to WCP Civil Group Pty Ltd;

Account Number	Type	Account Description	Debit \$	Credit \$
6400-80409-6600-0000	Increase Expenditure	Mundijong Road - King Road - Intersection Upgrade works – Capital Expenditure	180,000	
6400-80409-5033-0000	Increase Transfer from Reserve	Mundijong Road - King Road - Intersection Upgrade works – Transfer from Reserve – Road and Bridge Asset Reserve		180,000

Reason:

Funds required for the remediation works at Mundijong and King Road Intersection

2. AUTHORISES the Chief Executive Officer to sign a variation on behalf of the Shire of Serpentine Jarrahdale to the Tender RFT 11/2023 Mundijong Road - King Road Intersection Upgrade.

Option 2

That Council

1. APPROVES the budget adjustment of \$180,000 for Mundijong Road - King Road - Intersection:

Account Number	Type	Account Description	Debit \$	Credit \$
6400-80409-6600-0000	Increase Expenditure	Mundijong Road - King Road - Intersection Upgrade works – Capital Expenditure	180,000	
6400-80409-5033-0000	Increase Transfer from Reserve	Mundijong Road - King Road - Intersection Upgrade works – Transfer from Reserve – Road and Bridge Asset Reserve		180,000

Reason:

Funds required for the remediation works at Mundijong and King Road Intersection

2. REQUESTS the Chief Executive Officer undertake a new procurement process for the rectification works.

Option 3

That Council DOES NOT APPROVE the budget variation, and resolve to leave the road as is, managed under temporary traffic management with reduced speed.

Option 1 is recommended.

Conclusion

The contractor has completed the project in accordance with the Shire's detailed design and specification. The pavement in the widened section of the road has experienced significant deformation due to weak subgrade containing soft clay material located outside the scope of works. The remedial works are required to be undertaken to strengthen the pavement preventing further deterioration of the road and ensuring road safety. On the basis of the legal advice being that issuing a variation to the original contractor complies with r21A of the *Local Government (Functions and General) Regulations 1996 (WA)*, the option of engaging the original contractor to complete the works over the current summer period is the most viable option available as recommended by Officers.

**Attachments (available under separate cover)**

- **11.2 – CONFIDENTIAL attachment 1** – Civic Legal advice on proposed variation of contract – Mundijong Road - King Road intersection upgrade (IN24/27991)

Alignment with our Council Plan 2023-2033

Thriving	
1.	Plan for the sustainable growth of the Shire of Serpentine Jarrahdale
2.	Advocate and attract businesses to grow and thrive, increasing opportunities for local employment
3.	Strengthen and grow the local tourism industry
Liveable	
1.	Advocate for public transport and focus on connectivity within communities
2.	Improve maintenance and investment in roads and paths
5.	Increase our capacity to reduce, recover and recycle waste to improve sustainability and reduce impacts on the environment
Connected	
2.	Contribute to a well-connected, accessible and health community

Financial Implications

Officers request that \$180,000 be drawn from the Road and Bridge Asset Management reserve for this project.

The proposed course of action will require a formal budget variation. Accordingly, approval is sought for the following budget adjustments for the reasons specified:

Account Number	Type	Account Description	Debit \$	Credit \$
6400-80409-6600-0000	Increase Expenditure	Mundijong Road - King Road - Intersection Upgrade works – Capital Expenditure	180,000	
6400-80409-5033-0000	Increase Transfer from Reserve	Mundijong Road - King Road - Intersection Upgrade works – Transfer from Reserve – Road and Bridge Asset Reserve		180,000
Reason:				
Funds required for the remediation works at Mundijong and King Road Intersection				



Risk Implications

Risk has been assessed on the Officer Options:

Officer Option	Risk Description	Controls	Principal Consequence Category	Risk Assessment			Risk Mitigation Strategies (to further lower the risk rating if required)
				Likelihood	Consequence	Risk Rating	
1	Not approving the proposal for budget adjustment to progress with the variation for the road works by the original contractor. Not authorising the variation to the contractor, liability issues by conflicting responsibilities between different contractors.	Report to OCM, Procurement Policy,	Financial	Almost Certain	Moderate	HIGH	Accept the Officer Recommendation
1	Not approving the budget and road works do not occur, can result major property damage and human injuries	Speed reduction signs (temporary)	Physical or Psychological	Possible	Major	HIGH	Accept the Officer Recommendation
2	Not approving the proposal for budget adjustment and progress with Annual contractors or Tendering process	Report to OCM, Procurement Policy,	Organisational Performance	Likely	Moderate	SIGNIFICANT	Accept the Officer Recommendation
2	Road works do not occur, can result major property damage and human injuries	Speed reduction signs (temporary)	Physical or Psychological	Possible	Major	HIGH	Accept the Officer Recommendation
3	Road works do not occur, can result major property damage and human injuries	Speed reduction signs (temporary)	Physical or Psychological	Possible	Major	HIGH	Accept the Officer Recommendation



3	Road works do not occur	Speed reduction signs (temporary)	Reputation	Likely	Moderate	SIGNIFICANT	Accept the Officer Recommendation
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Voting Requirements: Absolute Majority

Officer Recommendation

That Council:

- APPROVES** the budget allocation of \$180,000 for a variation to the RFT 11/2023 Mundijong Road - King Road Intersection Upgrade to WCP Civil Group Pty Ltd;

Account Number	Type	Account Description	Debit \$	Credit \$
6400-80409-6600-0000	Increase Expenditure	Mundijong Road - King Road - Intersection Upgrade works - Capital Expenditure	180,000	
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Reason:

Funds required for the remediation works at Mundijong and King Road Intersection

- AUTHORISES** the Chief Executive Officer to sign a variation on behalf of the Shire of Serpentine Jarrahdale to the Tender RFT 11/2023 Mundijong Road - King Road Intersection Upgrade.