

# Appendix 8

Ardmore Park Quarry – Modification 3

## Post Construction Phase Road Safety Audit of the Product Delivery Route

prepared by

Transport & Urban Planning Pty Ltd

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September 2018

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## ROAD SAFETY AUDIT OF EXISTING ROAD

### AUDIT OF

### EXISTING TRANSPORT ROUTE FOR

### ARDMORE PARK QUARRY

### BUNGONIA



Ref. 17126 RSA Existing Road

24 September, 2018

Prepared By



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## **CONTENTS**

<b>1.0 PROJECT INFORMATION</b>	<b>2</b>
1.1 Audit Aim and Objectives	2
1.2 Background	2
1.3 Current Development Application and Submissions	2
1.4 Scope of the Audit	3
<b>2.0 AUDIT DETAILS</b>	<b>5</b>
2.1 Audit Methodology	5
2.2 Audit Administration	5
2.3 References & Documentation	5
2.4 Audit Process	6
2.5 Responding to the Audit Report	7
<b>3.0 AUDIT FINDINGS</b>	<b>8</b>
3.1 Issues Raised by Goulburn Mulwaree Council	8
3.2 Risk Ranking	9
3.3 Audit Findings	9
3.3 Audit Summary	19
<b>4.0 FORMAL STATEMENT</b>	<b>20</b>

### **APPENDIX A**

Existing Transport Route and Audit Location

### **APPENDIX B**

Photographs - Audit Findings

## **1.0 PROJECT INFORMATION**

### **1.1 Audit Aim and Objectives**

Transport and Urban Planning Pty Ltd has been engaged by Multiquip Quarries to undertake a road safety audit on the existing approved Transport Route for Ardmore Park Quarry, Bungonia.

The existing road audit was requested by the Department of Planning and Environment as part of the Ardmore Park Quarry Modification 3 Development Application assessment process.

The objective of this road safety audit is to identify potential safety problems for road users and to ensure that measures to eliminate or reduce these likely problems are fully considered.

The Roads and Maritime Services Guidelines for Road Safety Audit Practice and the Austroads Guide to Road Safety provide detailed guidance on the conduct of road safety audits, the procedure and the detailed issues to be examined and this audit has been carried out in accordance with these manuals.

### **1.2 Background**

The Ardmore Park Quarry Project was approved by the Department of Planning in September 2009, which included the provision of a Transport Route approximately 20km in length between the Quarry Entrance on Oallen Ford Road and the Hume Highway, east of Goulburn.

Consent Conditions for the Ardmore Park Quarry required upgrading works to Jerrara Road, Mountain Ash Road and Oallen Ford Road and construction of a by-pass around the township of Bungonia due to the increased vehicle volumes and sizes.

Upgrading works required extension of the existing road pavement on both sides to provide 2 x 3.5m wide lanes with a 1m wide shoulder (0.5m sealed/0.5m unsealed). Upgrading of all Water Course Crossings along the transport route to 8m wide (2 x 3.5m wide lanes with 0.5m wide sealed shoulders) was also required. Ancillary works included reconstruction of existing piped low points and headwalls, roadside table drains, clearing of roadside vegetation and the provision of guardrail as required for protection from roadside hazards.

Design standards adopted for the upgrade works were in accordance with Goulburn Mulwaree Councils Development Control Plan 2009 and Standards for Engineering Works - typical cross sections for rural roads - drawing number SD-R01A.

After approval, the upgrade works to the Transport Route were carried out in 3 stages. All 3 stages of the upgrade works have been inspected regularly and completed to Goulburn Mulwaree Council's satisfaction.

### **1.3 Current Development Application and Submissions**

Multiquip Quarries have lodged an application, known as The Ardmore Park Quarry Modification 3, which proposes increased annual materials production without any increase to total truck movements. This is proposed to be achieved through the following modifications to current operations;

- Use of High Mass Limit Trucks approved under the Performance Based Scheme of the National Heavy Vehicle Regulator. The length and capacity of truck and dog vehicles used would be increased from those currently in use. Vehicle length would increase from 19m to 25.8m and vehicle load capacity would increase from 30 tonne to 50.3 tonne.

- Current total truck movements will be maintained as a daily average and calculated each month with additional controls i.e: maximum daily movements applied and limiting movements within nominated hours of operation. Higher dispatch days would be evened out with less productive days.
- Increased hours of operation for product loading and transportation.

Exhibition of Ardmore Park Quarry Modification 3 concluded on 26 February, 2018. Submissions were received from Government agencies, special interest groups and community members. Multiquip have been requested by the Department of Planning and Environment to prepare and submit a Response to Submissions (RTS). In addition to this, the DPE have requested a Road Safety Audit be included in the RTS.

Goulburn Mulwaree Councils submission dated 22 February 2018 raised no objection to the Ardmore Park Quarry Modification 3 application, but provided comment for consideration during assessment of the application.

The following recommendations were made by Goulburn Mulwaree Council with regard to road conditions of the transport route;

#### Road Cross Section

- Road shoulder be increased to 1.5m with 0.5 of this shoulder being sealed. Reference Austroads Guide to Road Design Part 3: Geometric Design - Rural Road Widths Section 4.2.6, Table 4.5 (Single Carriageway Rural Road Widths) Note 3.
- Culvert/bridge widths (barrier to barrier) be increased to 9m. Reference Austroads Guide to Road Design Part 3: Geometric Design - Bridge Considerations, Section 10.

#### Road Geometry

- Assessment of vehicle turn paths at intersections due to increased vehicle length

#### Road Side Safety

- Clear zones be provided in accordance with Austroads Guide to Road Design Part 6: Roadside Design, Safety and Barriers - Section 4, Table 4.1 (Clear zone distances from edge of through travelled way)
- Road side safety barrier analysis be carried out and barriers installed as appropriate. Reference Austroads Guide to Road Design Part 6: Roadside Design, Safety and Barriers, Section 6 (Road Safety Barriers)

### **1.4 Scope of the Audit**

The existing approved Transport Route between the Hume Highway and the Ardmore Park Quarry Entrance is assessed under this audit in consideration of the Ardmore Park Quarry Modification 3 Development Application and Council's comments concerning possible upgrading works.

The Transport Route runs from the elevated interchange on the Hume Highway to the south along Jerrara Road for a length of approximately 14.7km to the T-intersection with Mountain Ash Road. The route then heads west along a short section of Mountain Ash Road for approximately 130m.

**MULTIQUIP QUARRIES**

Ardmore Park Quarry  
Appendix 8

**RESPONSE TO SUBMISSIONS**

PA 07\_0155 MOD3  
Report No. 625/25

The route then heads south along a private road to bypass the township of Bungonia and provide a link between Mountain Ash Road and Oallen Ford Road. *This section of private road known as the Bungonia Bypass is not included in this audit.*

The route then runs along Oallen Ford Road for a length of approximately 4km to the Ardmore Park Quarry Entrance. The entrance is opposite the T-intersection of Oallen Ford Road and Lumley Road and offset approximately 20m to the north.

Civil works plans for the previous upgrade were reviewed as part of the audit for the sections of;

- Jerrara Road and Mountain Ash Road from Hume Hwy to Private Entrance (Bungonia Bypass)
- Oallen Ford Road from Private Entrance (Bungonia Bypass) to Ardmore Park Quarry Entrance

The audit findings are provided for the above sections of the Transport Route.

Appendix A shows the road sections audited.



## 2.0 AUDIT DETAILS

### 2.1 Audit Methodology

The audit has been carried out following the procedures set out in the Roads and Maritime Services Guidelines for Road Safety Audit Practices Part 1: Road Safety Audit. The audit examines the features of the existing Transport Route which may affect road user safety and it has sought to identify potential safety hazards.

However, the auditors point out that no guarantee is made that every deficiency has been identified. Further, if all the recommendations in this report were to be followed, this would not confirm that the proposed design is 'safe'; rather, adoption of the recommendations should improve the level of safety of the existing Transport Route.

### 2.2 Audit Administration

Road Safety Audit Team:

**Lisa Tulau** Design Manager  
Accredited Level 3 Road Safety Auditor (Audit Leader)  
Auditor ID: RSA-02-0443

**Geoff Morris** Traffic, Transport & Road Safety Consultant  
Accredited Level 3 Road Safety Auditor  
Auditor ID: RSA-02-0876

### 2.3 References & Documentation

The following references and documents were reviewed as part of the Audit.

#### References

- Austroads Guide to Road Safety: Part 1: Road Safety Overview and Part 6: Road Safety Audit
- Roads and Maritime Services - Guidelines for Road Safety Audit Practice Part 1: Road Safety Audit
- Austroads - Guide to Road Design
- RMS - Supplements to Austroads Guide to Road Design
- RMS Delineation Manual
- Goulburn Mulwaree Development Control Plan

#### Documentation

- Civil works for Proposed upgrade of Oallen Ford Road from private entrance to Ardmore Park, Bungonia - Drawing No. 21184 (Sheets 1-32)
- Civil works for Proposed upgrade of Jerrara Road from Hume Highway to Mountain Ash Road, Bungonia - Drawing No. 21185 (Sheets 1-120)
- Ardmore Park Quarry Project Road Works Summary
- Project Approval - Section 75J of the Environmental Planning and Assessment Act 1979
- Approval under s138 Roads Act - Application No. s138/0080/1213

## 2.4 Audit Process

The Road Safety Audit included the following tasks:

- Commencement briefing and collection of all relevant information to conduct the audit.
- Review of the design plans showing the previous upgrades to the Transport Route.
- Examination of Austroad standard as compared to Council DCP standards, evaluation of the benefits of applying the higher standard as it relates to road safety and potential road safety issues and consideration of background information provided for the project.
- Site Inspection and on-site auditing of existing Transport Route.
- Identification on non-conformances and road safety considerations
- Preparation of Road Safety Audit Report.

The commencement briefing involved email correspondence with the Project Manager and the EIS consultant to ensure all relevant information was available to the audit team. This commenced in mid July 2018 and relevant information was collected and reviewed over a three week period.

The Transport Route was inspected and audited on 17 August and examined relative to applied and recommended design standards for both day and night traffic conditions in terms of:

- Road alignment and cross section
- Auxiliary Lanes
- Intersections
- Signs and Lighting
- Markings and Delineation
- Crash Barriers and Clear Zones
- Pedestrians and Cyclists
- Bridges and Culverts
- Pavement
- Provision for Heavy Vehicles
- Miscellaneous Issues

The audit report was prepared following the on-site audit.

## **2.5 Responding to the Audit Report**

As set out in the road safety audit guidelines, responsibility for the road design always rests with the designer/project manager and not with the auditor. A project manager is under no obligation to accept any or all the audit recommendations. Also, it is not the role of the auditor to agree to or approve of the project manager's response to the audit. Rather, the audit provides the opportunity to highlight potential problems and have them formally considered by the project manager, in conjunction with all other project considerations.

To assist with this, a table contained within Audit Findings provides a column for any response.

## 3.0 AUDIT FINDINGS

### 3.1 Issues Raised by Goulburn Mulwaree Council

Design standards adopted for the approved and recently completed upgrade works on the Transport Route were in accordance with Goulburn Mulwaree Councils Development Control Plan 2009 and Standards for Engineering Works - typical cross sections for rural roads (drawing number SD-R01A). The adopted design vehicle was a 19m truck and dog. The upgrade works have been inspected and completed to Goulburn Mulwaree Council's satisfaction.

Ardmore Park Quarry Modification 3 proposes use of a 25.8m truck and dog on the Transport Route.

Goulburn Mulwaree Council's submission on the application has suggested/recommended the adoption of Austroads Standards for the road. Whilst this may be considered a higher standard of design, the Austroad Standard will not necessarily result in a safer road environment than currently provided.

Adoption of the Austroad Standard for Single Carriageway Rural Road Widths, as recommended, would require the existing road shoulder on both sides to be increased by 0.5m unsealed. From inspection, most shoulder widths for the length of the transport route exceed the minimum requirement of 0.5m unsealed. It is not considered that this minor increase in shoulder width in some locations would improve safety for increased length vehicles.

Council has recommended Water Course Crossings widths be provided at 9m between barriers, which is in accordance GM Council's DCP. Council recommends Austroads standards be adopted, which specifies that traffic lane and shoulder widths provided on the culvert should not be less than the widths provided on the approach. Existing Water Course Crossings are generally located on near straight road alignments with good lengths of guardrail and edgelines on all approaches. The existing crossing width of 8m is considered adequate given the uniform treatment on approach to the crossing and that there is no change in the vehicle swept path. It is not considered that an increase of 0.5m in the shoulder width would improve safety through the crossing for increased length vehicles.

Council has recommended clear zones be provided in accordance with Austroads Standards. Recent upgrade works on the Transport Route provide clear zones of 4m, which is consistent with Austroads clear zone distances for ADT less than 750 vehicles. Modification 3 proposes to maintain total truck movements as noted in Section 1.3 of this report. It is therefore considered that existing clear zones are adequate, apart from some minor potential roadside hazards which have been identified as potential safety issues. (See Tables 3.1 and 3.2).

Council has recommended analysis of the installed roadside barriers. Roadside safety barriers were inspected as part of the audit and appear to have been installed as required to provide protection from roadside hazards and to manufacturers specifications with appropriate end treatments. Some minor issues with the length of installed guardrail have been identified as potential safety issues and these are listed in Tables 3.1 and 3.2.

Council has also recommended the assessment of turn paths at intersections due to increased vehicle length. Swept paths will be prepared independently of this audit.

### 3.2 Risk Ranking

Where risks and potential safety issues have been identified, these have been ranked using Austroads Ranking method, based on frequency, severity, overall level of risk and treatment approach presented in Tables 4.1 to 4.4 in Guide to Road Safety Part 6: Road Safety Audit. The risk rankings and Austroads suggested treatment approach are defined as follows:

- Intolerable      Must be corrected
- High              Should be corrected or the risk significantly reduced, even if the treatment cost is high
- Medium          Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high
- Low                Should be corrected or the risk reduced, if the treatment cost is low

### 3.3 Audit Findings

Audit findings for each section of the existing Transport Route are provided below and potential safety issues summarised in Table 3.1 and 3.2.

#### **Transport Route - Jerrara Road and Mountain Ash Road from Hume Hwy to Private Entrance (Bungonia Bypass)**

Jerrara Road is accessed via an elevated interchange and roundabout on the eastern side of the Hume Highway. The road then runs south through undulating rural terrain for approximately 14.7km and forms a T-intersection with Mountain Ash Road. The route then heads west along a short section of Mountain Ash Road (approximately 130m) to the T-intersection with Bungonia Bypass.

The audit site inspections found that;

#### Road Alignment and Cross Section

- The vertical and horizontal alignments on Jerrara Road are generally consistent with the undulating terrain with areas of cut and fill up to 4m in some locations.
- The sealed carriageway is generally 7.0m wide, consisting of 2 x 3.5m wide lanes.
- Shoulders are a minimum of 1m wide (0.5m sealed and 0.5m unsealed)
- The sealed shoulder in a few locations is slightly less than 0.5m and it appears that adjustment of the adjacent edgeline will provide the minimum lane and sealed shoulder width.

#### Auxiliary Lanes

- Left turn auxiliary lanes have been provided on Mountain Ash Road at the intersection with Jerrara Road and at the intersection with Bungonia Bypass to assist vehicular movements at and between the intersections.

### Intersections

- The intersection of Jerrara Road and Mountain Ash Road was recently upgraded as part of the transport route works. The Jerrara Road southbound approach to the intersection is on a downhill grade with reverse bends.
- The intersection of Bungonia Bypass and Mountain Ash Road was constructed as part of the transport route works.

### Signs and Lighting

- Jerrara Road is currently speed limited to 80km/hr with signage placed at regular intervals.
- Curve warning signs are generally provided as required. Supplementary Advisory Speed warning signs below the curve warning signs were observed to be turned in some locations and not visible to approaching vehicles. This may be done by roadwork contractors during reduced speed limits for roadworks, but it was also observed in non-work areas.
- Chevron alignment markers are provided on some bends without guardrail or on bends to supplement the guardrail. It was observed that some bends require additional markers to extend further around the curve. It was also observed that the downhill approach to Mountain Ash Road should be provided with chevron alignment markers.
- The intersection of Jerrara Road and Mountain Ash Road is under Give Way control.
- The intersection of Bungonia Bypass and Mountain Ash Road is under Stop Control.
- There is no street lighting on the transport route.

### Markings and Delineation

- Centreline markings are provided along the full length of the carriageway. A combination of BB, BS and S1 lines are provided.
- It was observed that redundant centerline markings were painted over with black paint rather than being removed completely. Centreline markings are confusing in some locations, particularly from reflection due to sunlight.
- Edgelines are provided on both sides of the carriageway for the full length of Jerrara Road. The edgeline was observed to be missing on one side of one water course crossing.
- Give Way (TB) and Stop line (TF) markings at the intersections are worn.
- Reflectorised guide posts are provided at consistent spacings and locations. A number of posts were observed to be flattened or damaged.
- Piped low points and property accesses are located along the length of road and associated headwalls are provided with reflectorised guideposts.

### Crash Barriers and Clear Zones

- Roadside embankments are located along the length of the road due to the undulating terrain. Steep embankments along the length of the road and on the outside edge of curves in the road alignment are provided with guardrail. Appropriate end treatments have been used on all lengths of guardrail.
- Guardrail has been used in 3 locations to protect roadside poles in the clear zone. The length of guardrail provided is less than the minimum length required to provide effective protection from the roadside hazard.
- Road side vegetation varies from open grasses to dense growth in some locations. The existing vegetation has been cleared for approximately 4m from the edge of new pavement for the full length of the road as part of the upgrade works to improve sight distance and visibility, particularly on bends. Tree trunk diameters vary from approximately 100mm to 300mm. Some larger diameter trees located within 2m of the edge of pavement have been removed since the previous audit.
- The extension of existing pipes, the provision of new headwalls and the reconstruction of roadside drainage channels has been carried out in various locations to accommodate the carriageway widening. Piped low points with headwalls are located within the clear zone, but are consistent with a rural road environment with table drains. One location on Jerrara Road requires additional treatments.
- A number of property accesses are located along Jerrara Road. Where required, the roadside drainage channel is piped for the width of the driveway with small headwalls either side. The headwalls are located within the clear zone, but are consistent with a rural road environment with table drains.

### Pedestrians, Cyclists and Public Transport

- No pedestrians or cyclists were observed during audit and there are no special provisions on the transport route.
- Jerrara Road/Mountain Ash Road is a School Bus Route, with an existing stop located on the southern side of Mountain Ash Road.

### Bridges and Culverts

- A number of Water Course Crossings are located along the length of the road. Crossings are a minimum width of 8m consisting of 2 x 3.5m wide lanes and 0.5m wide sealed shoulder both sides. These are generally provided with consistent guardrail and edgelines on the approach and departure sides of the road carriageway and through the crossing.

### Pavement

- Pavement extension works have recently been carried out on both sides of the road carriageway. Existing pavement cross fall and super-elevation has been adopted to provide a smooth transition between old and new pavement.

Provision for Heavy Vehicles

- The recent upgrade works have provided a road environment suitable for heavy vehicles.
- The roadside environment is generally unable to accommodate broken down vehicles. Wider standing areas are provided at intermittent locations along the road to accommodate heavy vehicles.

Miscellaneous

- Existing services within the road reserve are overhead electricity and Telstra.
- Road kill was evident with carcasses of larger native animals (kangaroos and wombats) by the side of the road.
- A number of property accesses are located along the length of the road, with the roadside drainage channel piped for the width of driveway. Headwalls are generally provided with guideposts.



**RESPONSE TO SUBMISSIONS**

PA 07\_0155 MOD3

Report 625/25

**MULTIQUIP QUARRIES**

Ardmore Park Quarry

Appendix 8

**TABLE 3.1 TRANSPORT ROUTE - JERRARA ROAD AND MOUNTAIN ASH ROAD FROM HUME HWY TO PRIVATE ENTRANCE (BUNGONIA BYPASS)**

Item	Location on road	Issue	Risk Ranking	Response by Audit Manager
1	CH.1500	Steep unprotected batter and headwall on southbound approach to driveway (Gate 157/159) Combination of drop off around culvert and driveway approach increases risk with vehicles pulling towards the shoulder on approach to the driveway, particularly in night conditions.	Medium	
2	CH.3980, CH.4140 and CH.4250	Sections of guardrail protecting electrical poles in the clear zone (southbound) are approximately 8-12m in length, which is below the minimum standard length. The guardrail will not provide adequate protection in the event of a run-off road accident.	Medium	
3	CH.4710 to CH.4830	Chevron alignment markers are located on southbound approach to the curve (northern side of the driveway Gate 481) Markers should be extended further past the driveway to complete the curve.	Low	
4	CH.10550	Chevron alignment markers are located on northbound approach to the curve. Markers should be extended further to complete the curve.	Low	
5	CH.13660	Edgeline missing on southbound carriageway of Water Course Crossing	Low	
6	CH.14200 to CH.14640	Vehicle skid marks were observed on the southbound approach of Jerrara Road at the intersection with Mountain Ash Road. The approach is on a downhill grade with reverse curves. a. T-intersection warning signage (W2-3) is provided approximately 250m before the intersection at CH.14370. Consider replacing existing W2-3 signage with W2-12 (Reduce Speed, T-intersection 250m Ahead) b. Consider providing chevron alignment markers on curve in road alignment approximate CH.14460 to CH.14520.	Medium	

**MULTIQUIP QUARRIES**

Ardmore Park Quarry

Appendix 8

**RESPONSE TO SUBMISSIONS**

PA 07\_0155 MOD3

Report No. 625/25

<b>Item</b>	<b>Location on road</b>	<b>Issue</b>	<b>Risk Ranking</b>	<b>Response by Audit Manager</b>
7	Full length of Transport Route	The provision of Raised Retro-reflective Pavement Markers is recommended to supplement pavement markings for increased effectiveness. Consider provision of Bi-directional RRPM's on centerline markings and mono-directional RRPM's on edgeline markings.	Medium	
8	Various locations	Blacking out of redundant centerline markings is not effective and creates confusion, particularly from sunlight reflection during the day and headlight reflection in night time conditions. Redundant centerline markings should be removed.	Medium	
9	Various locations	A number of reflectorised guideposts were observed to be damaged or flattened. Ensure regular maintenance program is in place to replace damaged posts in future.	Low	
10	All Intersections	Give Way (TB) and Stop Line (TF) markings at intersections are worn. Ensure regular maintenance program is in place to replace worn linemarking.	Low	

**Transport Route - Oallen Ford Road from Private Entrance (Bungonia Bypass) to Ardmore Park Quarry Entrance**

Oallen Ford Road is accessed at the southern end of the Bungonia Bypass via a T-intersection. The transport route runs south from the intersection through undulating rural terrain for approximately 4km to the Ardmore Park Quarry Entrance. The entrance is opposite the T-intersection of Oallen Ford Road and Lumley Road and offset approximately 20m to the north.

Our site inspections found that;

Road Alignment and Cross Section

- The vertical and horizontal alignments on Oallen Ford Road are generally consistent with the undulating terrain with minimal areas of cut and fill.
- The sealed carriageway is generally 7.0m wide, consisting of 2 x 3.5m wide lanes.
- Shoulders are a minimum of 1m wide (0.5m sealed and 0.5m unsealed)

Auxiliary Lanes

- A left turn auxiliary lane has been provided on Oallen Ford Road at the intersection with the Ardmore Park Quarry Entrance to assist vehicular movements into the entrance.

Intersections

- The intersection of the private entrance (Bungonia Bypass) and Oallen Ford Road was recently constructed as part of the transport route works.
- The intersection of Oallen Ford Road was upgraded as part of the transport route works.

Signs and Lighting

- Oallen Ford Road is currently speed limited to 80km/hr with signage placed at regular intervals.
- Curve warning signs are generally provided as required. Supplementary Advisory Speed warning signs below the curve warning signs were observed to be turned in some locations and not visible to approaching vehicles. This may be done by roadwork contractors during reduced speed limits for roadworks, but it was also observed in non-work areas.
- Chevron alignment markers are provided on some bends without guardrail.
- The intersection of Bungonia Bypass and Oallen Ford Road is under Stop Control.
- The intersection of Oallen Ford Road and the Quarry Entrance is under Give Way Control.
- The intersection of Oallen Ford Road and Lumley Road is under Give Way control.
- There is no street lighting on the transport route.

### Markings and Delineation

- Centreline markings are provided along the full length of the carriageway. A combination of BB, BS and S1 lines are provided.
- It was observed that redundant centerline markings were painted over with black paint rather than being removed completely. Centreline markings are confusing in some locations, particularly from reflection due to sunlight.
- Edgelines are provided on both sides of the carriageway for the full length of Oallen Ford Road. The edgeline was observed to be missing on one side of some water course crossings. Edgelines have not been replaced in areas of pavement reconstruction.
- Give Way (TB) and Stop line (TF) markings at the intersections are worn.
- Reflectorised guide posts are provided at consistent spacings and locations. A number of posts were observed to be flattened or damaged.
- Piped low points and property accesses are located along the length of road and associated headwalls are provided with reflectorised guideposts.
- Edgelines were observed to be missing in areas of pavement restoration works.

### Crash Barriers and Clear Zones

- Roadside embankments are located along the length of the road due to the undulating terrain. Steep embankments along the length of the road and on the outside edge of curves in the road alignment are provided with guardrail. Appropriate end treatments have been used on all lengths of guardrail.
- Road side vegetation is mostly open grasses and scrub. The existing vegetation has been cleared for approximately 4m from the edge of new pavement for the full length of the road as part of the upgrade works to improve sight distance and visibility, particularly on bends.
- The extension of existing pipes, the provision of new headwalls and the reconstruction of roadside drainage channels has been carried out in various locations to accommodate the carriageway widening. Piped low points with headwalls are located within the clear zone, but are consistent with a rural road environment with table drains.
- A number of property accesses are located along Oallen Ford Road. Where required, the roadside drainage channel is piped for the width of the driveway with small headwalls either side. The headwalls are located within the clear zone, but are consistent with a rural road environment with table drains.

### Pedestrians, Cyclists and Public Transport

- No pedestrians or cyclists were observed during audit and there are no special provisions on the transport route.
- Oallen Ford Road is a School Bus Route.

### Bridges and Culverts

- A number of Water Course Crossings are located along the length of the road. Crossings are a minimum width of 8m consisting of 2 x 3.5m wide lanes and 0.5m wide sealed shoulder both sides. These are generally provided with consistent guardrail and edgelines on the approach and departure sides of the road carriageway and through the crossing.

### Pavement

- Pavement extension works have recently been carried out on both sides of the road carriageway. Existing pavement cross fall and super-elevation has been adopted to provide a smooth transition between old and new pavement.
- Sections of failed pavement have been repaired under the transport route works.

### Provision for Heavy Vehicles

- The recent upgrade works have provided a road environment suitable for heavy vehicles.
- The roadside environment is generally unable to accommodate broken down vehicles. Wider standing areas are provided at intermittent locations along the road to accommodate heavy vehicles.

### Miscellaneous

- Existing services within the road reserve are overhead electricity and Telstra.
- Road kill was evident with carcasses of larger native animals (kangaroos and wombats) by the side of the road.

**MULTIQUIP QUARRIES**

Ardmore Park Quarry

Appendix 8

**TABLE 3.2****RESPONSE TO SUBMISSIONS**

PA 07\_0155 MOD3

Report No. 625/25

**TRANSPORT ROUTE - OALLEN FORD ROAD FROM PRIVATE ENTRANCE (BUNGONIA BYPASS) TO QUARRY ENTRANCE**

<b>Item</b>	<b>Location on road</b>	<b>Issue</b>	<b>Risk Ranking</b>	<b>Response by Audit Manager</b>
1	CH.2100	Edgeline missing on southbound carriageway of Water Course Crossing	Low	
2	CH.2500	Edgeline missing on southbound carriageway of Water Course Crossing	Low	
3	Various	Edgeline missing following pavement restorations	Low	
4	Full length of Transport Route	The provision of Raised Retro-reflective Pavement Markers is recommended to supplement pavement markings for increased effectiveness. Consider provision of Bi-directional RRPM's on centerline markings and mono-directional RRPM's on edgeline markings.	Medium	
5	Various locations	Blacking out of redundant centerline markings is not effective and creates confusion, particularly from sunlight reflection during the day and headlight reflection in night time conditions. Redundant centerline markings should be removed.	Medium	
6	Various locations	A number of reflectorised guideposts were observed to be damaged or flattened. Ensure regular maintenance program is in place to replace damaged posts in future.	Low	
7	Various locations	Supplementary Speed Advisory signs below warning signs have been twisted and are not visible to approaching vehicles	Low	
8	Intersections	Give Way (TB) and Stop Line (TF) markings at intersections are worn. Ensure regular maintenance program is in place to replace worn linemarking.	Low	

### **3.3 Audit Summary**

Existing lane and shoulder widths, signage, pavement markings and protection of roadside hazards along the Transport Route are generally considered adequate and consistent with a rural road environment. Potential safety issues with low to medium risk rankings have been identified to enable these items to be addressed and appropriate treatments put in place.

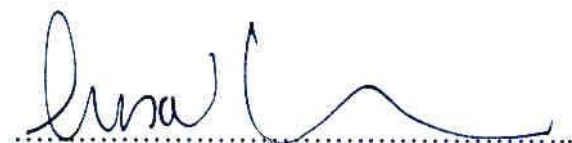
The Transport Route was inspected and observed to function effectively and safely for the current intended purpose and combination of vehicle types. The existing road environment is considered suitable for use by the proposed longer vehicle and is not considered to present an increased safety risk.

## **4.0 FORMAL STATEMENT**

We have examined and audited the Transport Route detailed in Section 2.4 and we have inspected the existing Transport Route in accordance with the procedures set out in the RMS's Guidelines for Road Safety Audit Practices.

The audit has been carried out for the sole purpose of identifying any features of the existing Transport Route that could be altered or reconsidered to improve safety. The identified issues have been noted in this report in Table 3.1 and 3.2.

Section 3.1 provides an evaluation and the auditor comments on those matters raised by Goulburn Mulwaree Council in its submission to the Department of Planning.



Lisa Tulau - Audit Leader  
Transport & Urban Planning

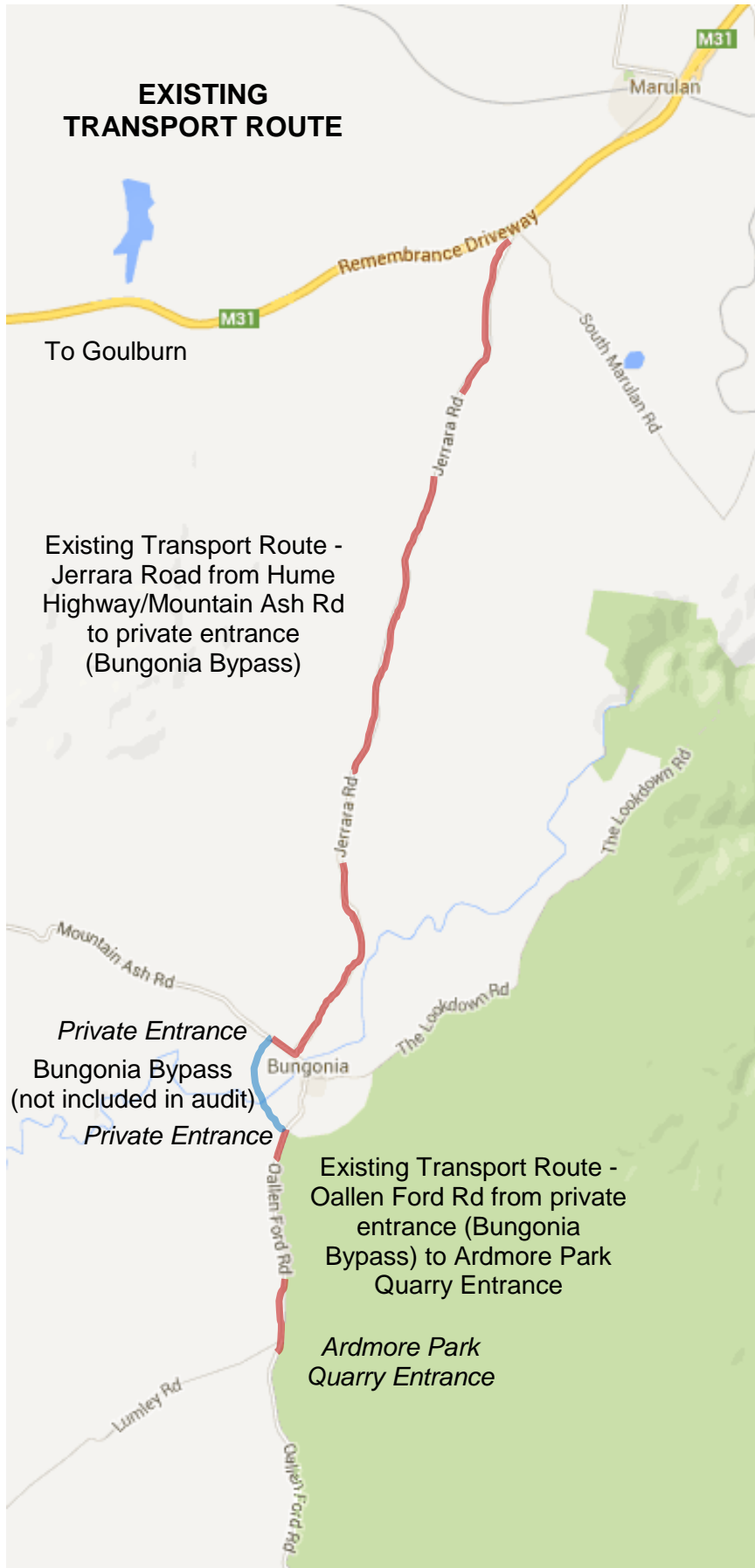


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Geoff Morris - Audit Team  
Transport & Urban Planning

24 September, 2018



## APPENDIX A



## APPENDIX B

TABLE 3.1

Transport Route - Jerrara Road and Mountain Ash Road from Hume Hwy to Private Entrance (Bungonia Bypass)

Item 1

Steep unprotected batter/headwall on southbound approach to driveway (Gate 157/159)





Item 2

Sections of guardrail protecting electrical poles in the clear zone





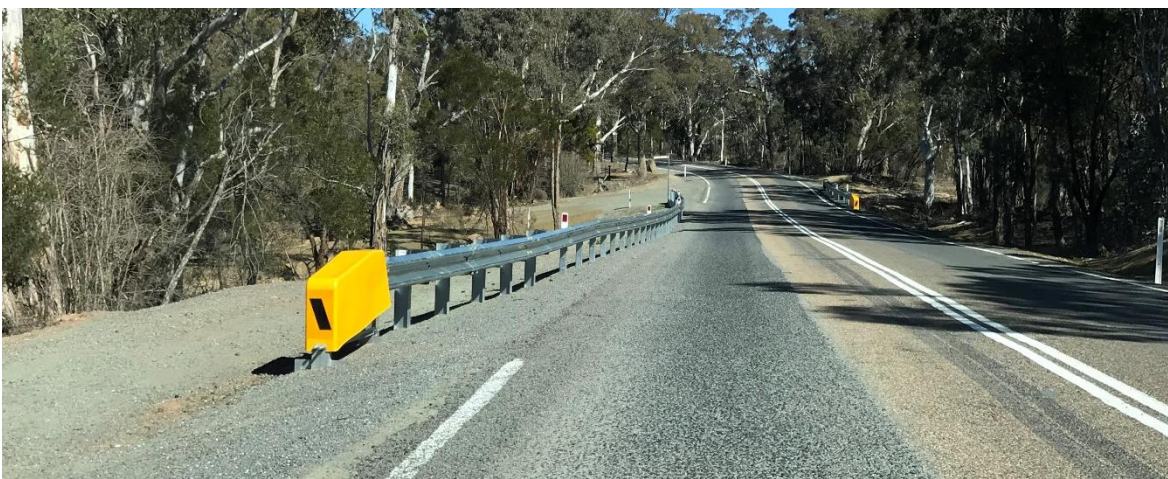
Items 3 and 4

Chevron alignment markers should be extended further to complete the curve.



Item 5

Edgeline missing on southbound carriageway of Water Course Crossing





**Item 6**

Vehicle skid marks were observed on the southbound approach of the intersection



Consider providing chevron alignment markers on curve in road alignment and replacing existing warning signage





**Item 8**

Blacking out of redundant centerline markings is not effective and confusing when crossing over new centerline markings



Blacking out of redundant centerline markings is not effective with sunlight reflection





**Item 9**

Water Course Crossings are generally located on near straight road alignments with good lengths of guardrail and edgelines on all approaches.





**Item 10**

A number of reflectorised guideposts were observed to be damaged or flattened





**TABLE 3.2**

**Transport Route - Oallen Ford Road from Private Entrance (Bungonia Bypass) to Quarry Entrance**

Item 1 and 2

Edgeline missing on southbound carriageway of Water Course Crossings



Item 8

Supplementary Speed Advisory signs below warning signs have been twisted and are not visible to approaching vehicles



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