



Intersection of Spences Road and Numurkah Road, Katunga, Victoria

Existing Conditions Road Safety Audit

Client:

Moira Shire Council

Project No. 180686

Final Report – 28/05/2019

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INTRODUCTION

Trafficworks has been engaged by Moira Shire Council (Council) to undertake an existing conditions road safety audit of the intersection of Spences Road and Numurkah Road, Katunga. The request by Council for the road safety audit is in response to the recommendation of a Coroner's Report into a fatal crash that occurred at the intersection on Wednesday 27 June 2018.

The audit was conducted by:

Stuart Redman [BEng (Civil)(Hons)]

Senior Road Safety Auditor

and

Bob Citroën [Dip Civil Eng, Grad Dip Road Safety]

Senior Road Safety Auditor

Reviewed by:

Paul Mihailidis [BEng (Civil), GradCert Mgt]

Senior Road Safety Auditor

The audit included an inspection of the site by Stuart Redman and Bob Citroën during the afternoon and evening of Thursday 28 March 2019. The conditions during the day inspection were fine and sunny, and at night, the conditions were clear and calm.

Description of the Site

Existing Conditions

Numurkah Road

Numurkah Road is a link road managed by Council, oriented in a north-south direction, providing a connecting route between Numurkah, to the south and Strathmerton to the north.

Near the intersection, Numurkah Road is configured as a two-lane two-way carriageway with a 7.5 m wide seal (2 x 3.75 m traffic lanes) bounded by 1.5 m wide unsealed shoulders. The road is located centrally within a 20 m wide road reservation, with a major irrigation channel located to the west of the road, south from Spences Road. A syphon for a water supply point to the farming property northeast of the intersection crosses Numurkah Road immediately north of the intersection, with syphon infrastructure located in the road reserve shielded by guard fencing.

The speed limit along the road near the intersection is the default rural 100km/h. The clear zone adopted for this audit is 6.5 m¹ based on a design speed of 100km/h and the two-way traffic volume of 888 vehicles per day².

¹ Clear zone determined in accordance with the Austroads Guide to Road Design, Part 6 – Roadside Design, Safety & Barriers – Table 4.1 for cut batters 6:1 to flat

² Traffic Volume Data provided by Moira Shire Council (Collected 18 April to 2 May 2019)

Spences Road

Spences Road is a rural access road managed by Council, oriented in an east-west direction, providing a connecting route between the Goulburn Valley Highway to the west and Labuan Road to the east.

Spences Road is configured as a sealed carriageway bounded by unsealed shoulders, with a:

- 5.2 m wide seal (providing two narrow lanes) west of Numurkah Road
- 4.3 m wide seal (providing a single lane) east of Numurkah Road.

The road is located centrally within a 20 m wide road reservation, with a major irrigation channel located to the north of the road, west from Numurkah Road. This channel crosses Spences Road immediately west of the intersection with Numurkah Road with the syphon extending for the full distance between fence lines.


The speed limit along the road near the intersection is the default rural 100km/h. The clear zone adopted for this audit is 5.0 m¹ based on a design speed of 100km/h and the two-way traffic volume of 140 vehicles per day².


The intersection and the surrounding road network are shown in Figure 1.

Figure 1 - Site Location (reproduced under licence from Nearmap)




FINDINGS AND RECOMMENDATIONS


No	Audit Findings	Audit Recommendations	Risk Rating	Client Response	
				Accept: Yes / No	Reasons / Comments
1	SITE ISSUES				
1.1	Road alignment and cross-section				
1.1.1	<p>When approaching the intersection from both approaches on Spences Road the location of Numurkah Road is hard to see due to a lack of identifying features and visual cues at the intersection. This may result in the approaching driver seeing through/past the intersection.</p> <p>This could result in a vehicle on Spences Road misjudging and overshooting the intersection, potentially colliding with a through vehicle on Numurkah Road.</p> 	<p>Consider installing transverse rumble strips and associated warning signs on both Spences Road approaches.</p> <p>It is likely that the rumble strips will need to be installed for the full width of the road due to the narrow seal widths on both approaches.</p>	<p>Likelihood: Occasional</p> <p>Severity: Serious</p> <p>Risk Rating: HIGH</p>	Yes	


No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.2	Intersections				
1.2.1	<p>There is vegetation around the irrigation farm channel (and associated infrastructure) on the northeast quadrant of the intersection behind the guard fence. This restricts visibility to oncoming vehicles of some looking to the north on Numurkah Road.</p>  <p>This could obscure a vehicle on the Numurkah Road northern approach from the view of a vehicle waiting to enter the intersection from the Spences Road eastern approach and could result in a collision between the two vehicles at the intersection.</p> <p>It should be noted that sightlines are in excess of 300 m looking north from the eastern approach at 5.0 m set back from the edge of seal on Numurkah Road.</p>	Trim/remove the vegetation in the northeast quadrant of the intersection to ensure sightlines are maintained.	NOTE ONLY	Yes	Only for vegetation within the road reserve. Vegetation within the channel reserve is the responsibility of Goulburn Murray Water (GMW)



No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.2.1 Cont.	<p>This is the desirable location from which to assess Safe Intersection Sight Distance (SISD) as specified in Figure 3.2 of AGRD4A.</p> <p>It is concluded that minimum SISD criterion is satisfied.</p> <p>However, to further ameliorate the risk of collisions at the intersection, some vegetation clearing is recommended.</p>	Refer above	Refer above		
1.2.2	<p>There is a line of trees with low-hanging limbs that may restrict the vision of drivers on the eastern approach when looking south along Numurkah Road.</p> <p>This could obscure a vehicle on the Numurkah Road southern approach from the view of a vehicle waiting to enter the intersection from the Spences Road eastern approach and could result in a collision between the two vehicles at the intersection.</p>	Trim/remove tree limbs on the eastern side of Numurkah Road (south of Spences Road) to ensure sightlines are maintained.	NOTE ONLY	Yes	





No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.2.2 Cont.	<p>It should be noted that sightlines are in excess of 300 m looking north from the eastern approach at 5.0 m set back from the edge of seal on Numurkah Road.</p> <p>This is the desirable location from which to assess Safe Intersection Sight Distance (SISD) as specified in Figure 3.2 of AGRD4A.</p> <p>It is concluded that the minimum SISD criterion is satisfied.</p> <p>However, to further ameliorate the risk of collisions at the intersection, some vegetation clearing is recommended.</p>	Refer above	Refer above		
1.2.3	<p>Running parallel with Spences Road, on the north side of the road reserve is a 20 m to 25 m wide irrigation supply channel (including earth embankments).</p>  <p>This restricts the vision of drivers on the western approach when looking to the north along Numurkah Road.</p>	No action required	NOTE ONLY		



No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.2.3 Cont.	<p>However, it should be noted that sightlines are in excess of 300 m looking north from the western approach at 5.0 m set back from the edge of seal on Numurkah Road.</p> <p>This is the desirable location from which to assess Safe Intersection Sight Distance (SISD) as specified in Figure 3.2 of AGRD4A.</p>  <p>It is concluded that the minimum SISD criterion is satisfied</p>	Refer above	Refer above		
1.2.4	<p>There is a power pole on the south west corner of the intersection, however this does not impact the vision of drivers on the eastern approach when looking south along Numurkah Road.</p> <p>It should be noted that sightlines are in excess of 300 m looking south from the western approach at 5.0 m set back from the edge of seal on Numurkah Road.</p>	No action required	NOTE ONLY		


No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.2.4 Cont.	 <p>It is concluded that the minimum SISD criterion is satisfied</p>	Refer above	Refer above		
1.2.5	<p>The Spences Road western approach to Numurkah Road is STOP sign controlled.</p> <p>For a posted speed limit on the major road (Numurkah Road) of 100km/h the sight distance threshold along the major road (at 3.0m from the edge of the through lane) is 95m, below which a Stop sign should be used.</p> <p>The sightlines for Numurkah Road are more than 300m in both directions for the western approach indicating Give Way to be the appropriate control.</p> <p>The sight distance is greater than that shown in Figure 2.2 and therefore, a STOP sign is not required.</p>	Review the appropriateness of the STOP sign on the Spences Road west approach with a view to replacing it with a GIVE WAY sign, and markings.	NOTE ONLY	Yes	The review will be conducted with results tabled at the Council's Local Traffic Committee for its consideration. Next Committee meeting is scheduled for September 2019.



No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.2.5 Cont.	<p>Spences Road looking south (western approach).</p>  <p>Spences Road looking north (western approach).</p>  <p>It should be noted that the use of STOP signs where poor sight distance is not a factor can lead to driver non-compliance, and a lack of credibility of STOP signs where they are appropriate.</p>	Refer above	Refer above		


No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.2.6	<p>The STATCON line marking at the intersection is faded and does not delineate the intersection. This makes it hard to see when approaching the intersection from both approaches on Spences Road.</p> <p>This could result in a vehicle on Spences Road misjudging the intersection and overshooting, potentially colliding with through traffic on Numurkah Road.</p> 	Refresh all the STATCON linemarking at the intersection following the review noted in item 1.2.4.	<p>Likelihood: Improbable</p> <p>Severity: Serious</p> <p>Risk Rating: MEDIUM</p>	Yes	


No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.3	Signs and Lighting				
1.3.1	<p>There is no street lighting present at the intersection.</p> <p>The provision of street lighting (a "Flag" light) on otherwise unlit roads of an intersection may be warranted to alert approaching motorists to the presence of the intersection from a safe distance.</p> <p>Without the flag light, a vehicle may have to brake suddenly and could result in a loss of control.</p>	<p>"Flag" lighting should be considered to indicate the presence and location of the intersection.</p>	<p>Likelihood: Improbable</p> <p>Severity: Minor</p> <p>Risk Rating: LOW</p>	Yes	<p>Council will consider the lighting installation subject to Council being successful in obtaining Federal Blackspot Funding grants or other similar funding grants.</p>
1.3.2	<p>Advance warning signs on both minor approaches are faded and are in poor condition.</p> <p>This could make it difficult for an approaching driver to clearly read and comprehend the message the sign is displaying.</p> <p>This may result in the driver misjudging the intersection and overshooting, potentially colliding with through traffic on Numurkah Road.</p> 	<p>Replace the signs and consider installing a duplicate on the opposite side of Spences Road.</p>	<p>Likelihood: Improbable</p> <p>Severity: Serious</p> <p>Risk Rating: MEDIUM</p>	Yes	


No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.3.3	<p>Crossroad warning signs are present on both major approaches and are in good condition.</p> <p>Northern Approach</p>  <p>Southern Approach</p>  <p>No further action required.</p>	No action required	NOTE ONLY		


No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.4	Markings and Delineation				
1.4.1	<p>Numurkah Road only has a centreline marked in the vicinity of the Spencer Road intersection. At the intersection this centre line is faded.</p>  <p>Edgelines delineate the edge of the road and can discourage traffic from travelling on shoulders. No edgelines are present along Numurkah Road.</p>	Refresh the centre line along Numurkah Road through the intersection and consider the installation of edgelines.	Likelihood: Improbable Severity: Minor Risk Rating: LOW	Yes	
1.4.2	<p>The narrow seal of Spences Road precludes the installation of longitudinal line markings, apart from the single continuous dividing line at the approach to the STATCON markings at each yield point.</p> <p>The single continuous dividing line marking at the intersection is faded, reducing visibility of the intersection, particularly in dark and inclement weather conditions on the western approach.</p>	Refresh the single continuous dividing line to the STATCON markings on the western minor approach.	Likelihood: Improbable Severity: Serious Risk Rating: MEDIUM	Yes	

No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.4.2 Cont.	<p>This could result in a vehicle on Spences Road misjudging the intersection and overshooting, potentially colliding with through traffic on Numurkah Road.</p> 	Refer above	Refer above		
1.4.3	<p>Near the intersection along both Spencer Road and Numurkah Road, guideposts are only installed to mark cross culverts and other roadside structures.</p>  <p>Guide posts are used to mark the edge of the road formation in the absence of other features, such as edgelines, guard fence or bridge rail.</p>	Consider installing additional guideposts on the approaches to the Spencer Road/Numurkah Road intersection to enhance delineation of the intersection.	Likelihood: Improbable Severity: Minor Risk Rating: LOW	Yes	

No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.4.3 Cont.	Guideposts delineate the road edge and assist the road user by indicating the alignment of the road ahead and under some circumstances, by providing a gauge with which to assess available sight distance.	Refer above	Refer above		
1.5	Crash Barrier and Clear Zones				
1.5.1	<p>Located near the Stop sign on the western approach to Numurkah Road is an obsolete (old style) guidepost. This is not considered frangible and present a hazard to an errant vehicle on the western approach to the intersection.</p> 	Remove the obsolete guidepost and replace it with a frangible guidepost as required.	<p>Likelihood: Improbable</p> <p>Severity: Minor</p> <p>Risk Rating: LOW</p>	Yes	

No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.5.2	<p>Type-B Guard Fence exists on the north east quadrant of the intersection shielding the farm channel infrastructure.</p> <p>A redundant fence post is located behind the southern barrier terminal.</p>  <p>The existing barrier does not protect the fence post at the location as it is located behind the gating terminal, which provides an inadequate length (of need) for the safety barrier.</p> <p>Should an errant vehicle run-off the road at this location, the barrier will not shield this hazard as intended.</p> <p>The safety barrier installation does not conform to current guidelines.</p>	<p>Consider the following course of action (in order of priority):</p> <ol style="list-style-type: none"> 1. remove the hazard (post) 2. mitigate the residual risk (i.e. shield remaining roadside hazards with a compliant safety barrier system as required, replacing the existing non-conforming system). 	<p>Likelihood: Improbable</p> <p>Severity: Serious</p> <p>Risk Rating: MEDIUM</p>	<p>Yes for guideposts</p>	<p>Action item 2 is subject to further budget considerations</p>

No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.5.3	<p>There is a power pole located on the south west quadrant of the intersection, at a 2.2 m offset from the edge of seal.</p>  <p>This is considered a hazard should an errant vehicle run-off the road at this location.</p>	<p>Consider the following course of action (in order of priority):</p> <ol style="list-style-type: none"> remove / relocate the power pole mitigate the residual risk by shielding the pole 	<p>Likelihood: Occasional Severity: Serious Risk Rating: HIGH</p>	<p>No to relocation of guidepost. Yes to providing barrier railing to shield the post subject to future budget availability</p>	<p>The relocation of the power pole is considered too high for Council to fund as it carries power lines in both directions. Council's preference is for the pole to be replaced by Powercor at time of renewal.</p>

No	Audit Findings	Audit Recommendations	Risk Rating	Accept: Yes / No	Client Response Reasons / Comments
1.6	<p>Pavement</p> <p>It appears the pavement is failing on the western approach to the intersection at the location of the channel crossing/syphon under Spencer Road.</p> <p>This has resulted in a depression occurring in the road formation within the braking zone at the approach to the intersection.</p>  <p>This may cause an approaching eastbound vehicle to lose control, or impede the braking ability, resulting in a collision with a road side hazard or another vehicle at the intersection.</p> <p>It should be noted that there was evidence of maintenance spray paint reference markings on the road pavement at the depression, potentially indicating an intention to address this pavement depression.</p>	<p>Repair the road pavement.</p>	<p>Likelihood: Occasional</p> <p>Severity: Serious</p> <p>Risk Rating: HIGH</p>	<p>Yes</p>	

No	Audit Findings	Audit Recommendations	Risk Rating	Client Response	
				Accept: Yes / No	Reasons / Comments
2.1	NIGHT ISSUES				
2.1.1	The advance warning signs on the east and west approaches to the intersection are faded, impacting reflectivity. This may result in the driver misjudging the intersection and overshooting, potentially colliding with through traffic on Numurkah Road.	Replace the signs and consider installing a duplicate on the opposite side of Spences Road to enhance the visibility of the signs.	Likelihood: Improbable Severity: Serious Risk Rating: MEDIUM	Yes	
2.1.2	Raised Reflective Pavement Markers (RRPMs) are not present on Numurkah Road. These should be included to improve delineation of the pavement markings in inclement weather or night time conditions.	Install RRPM's along the centre line on Numurkah Road to improve delineation.	Likelihood: Improbable Severity: Serious Risk Rating: MEDIUM	Yes	At the intersection only

Client response completed by:

Name: Graham Henderson

Signed: 

Date: 25th July 2019