MOREE INTEGRATED
TRANSPORT & INTERMODAL PROGRAM

Melbourne to Brisbane Inland Rail
Narrabri to North Star

JONES AVENUE OVERPASS RELOCATION

ASSESSMENT OF IMPACTS ON EMERGENCY RESPONDERS

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Introduction

The purpose of this report is to assess the impact of the proposed Overpass location associated with the infrastructure suite of the Moree Integrated Transport and Intermodal Program (**Moree IT&IP**) required for the implementation of the Melbourne to Brisbane Inland Rail network. The proposed Jones Avenue Overpass was intended to address three issues. These issues are outlined below:

1. To provide an alternative path, particularly for emergency vehicles, at times when the Alice Street and Bullus Drive level crossings were closed due to train movements
2. To provide a pedestrian and cycle access path that facilitated movements along a current informal movement path
3. To cater for a situation where a crash at one of the current level crossings blocks both crossings for a significant period.

It is now proposed that the Overpass be relocated to south of Moree along the Newell Highway preceding the Hall's Creek Bridge. The location of the initial proposal and current proposal are shown in Figure 1 below.

This report addresses the impacts on emergency vehicle access times associated with the Overpass moving to the now preferred location further south. The assessment included the review of emergency response times in relation to increased length and frequency of trains in addition to addressing the situation where both level crossings may be rendered unusable by a crash. Further detail regarding the emergency response scenarios are outlined throughout the body of the report.

Figure 1 – Overpass Locations

Impact of longer trains

The Melbourne to Brisbane Inland Rail Project (**Inland Rail**) would have negligible impact on closure times associated with the Alice Street level crossing due to the current traffic light cycle with the Newell Highway. Closure times on Bullus Drive would increase due to the longer trains involved and frequency of closure would increase with the ARTC service offer being up to 40 trains per day. This is based on the assumption trains are 1,800m in length and travelling 80km/hr plus 20 seconds before and 5 seconds after each train, noting the total "closed" time per train would be approximately 1 minute and 50 seconds.

This is not a significant increase on the light-cycle time at the intersection of the Gwydir and Newell Highways. Modern train management systems mean that actual train times would be available to emergency services, which would allow the optimum crossing point to be selected based on train timing.

Impact of simultaneous closure

An Emergency Response Timeframes spreadsheet model (Appendix A) was constructed including all relevant road links to determine existing response times from the key emergency services including Police, Fire and Rescue and Ambulance. Response times were to the centroid of the East Moree area which was considered to be a representative destination for the purposes of the modelling. The model includes the response times by the proposed Halls Creek Overpass instead of the proposed Jones Avenue Overpass including time allowances for intersections and level crossing closures. Data has been verified by actual driving times and use of Google Maps.

Reasonable calibration was achieved through test runs, with the spreadsheet being conservative in times as compared to actual timing runs. Similarly, a review against Google Maps indicated that the response times are conservative. Given the time of day of the runs, being mid- afternoon, these represent a "busy" period on the road network.

Typical response times for other regional towns were assessed from the location of the Fire and Rescue facility in that town to the edge of the urban area. This is similar to the situation being tested in Moree. Times were assessed using Google Maps and the results for Armidale, Narrabri and Tamworth are presented in Appendix B.

As indicated in those tests, typical response time from origin to destination (not including time to crew vehicles) is 10 minutes. This time is longer than the times for Moree based on additional length of level crossing closure time associated with the Inland Rail. This indicates that even with Inland Rail operating at its defined service offer, response times are still within acceptable limits.

Risk assessment of closure of both crossings simultaneously

A risk assessment (probability study) has been undertaken to determine the likelihood of both level crossings being blocked simultaneously based on the ARTC service model of 40 trains per day at 1,800m in length. It is noted that the distance between the two level crossings is approximately 1,500m. Potential blocking of both level crossings could only occur if a northbound train has a crash at the Gwydir Highway (Alice Street) level crossing or, alternatively, a southbound train has a crash at the Bullus Drive level crossing.

ARTC is not expected to achieve the service model train frequency and length for approximately 7 to 10 years. However, trains longer than the current typical 600m to700m are expected following the construction of the Moree IT&IP infrastructure suite. The Moree IT&IP infrastructure will not affect the Alice Street crossing.

Furthermore, both Alice Street and Bullus Drive crossings are protected by boom gates and have a significantly lower risk in terms of crashes than uncontrolled level crossings which make up the majority of crossings in the region and nationally. Based on existing records, there has only been one incident involving a level crossing in the Moree area in the past 8 years that involved a collision with a road vehicle, and that was at a crossing unprotected by boom gates[1]. In addition, the Alice Street crossing is coordinated with the Newell Highway/Alice Street traffic lights, which will significantly reduce crash likelihood.

Statistical analysis of general crash risk data[2] indicates heavy vehicles are over-represented in crashes at level crossings. The proposed southern overpass would substantially reduce heavy vehicle usage of existing level crossings, most particularly during harvest periods, thus reducing risk as compared to the Jones Avenue overpass which was not intended to cater for heavy vehicles.

Approximately 25% of crashes involve boom gated crossings, noting that this type of crossing has the lowest crash occurrence for heavy vehicles. There are up to 800 boom gate crossings in Australia[3] with boom gate crashes occurring at the rate of approximately 1.1 crashes per 1,000,000 trains.

When assessing the Moree probability, using national average vehicle volumes for boom gated crossing (noting this also includes a high number of high volume urban crossings), this translates into 1 crash every 68.5 years. Adjusted for traffic volumes in Moree, the rate drops to a much lower level due to the very high volumes in urban areas (typically between 30,000 and 100,000 vehicles per day)[4] therefore, the estimated real probability is one crash per 120 years or lower.

Conclusion

The assessment of emergency response timeframes for the preferred Overpass location has indicated minimal impact. Investigation has identified that the likelihood of a double blockage situation occurring is minimal as outlined in the Emergency Response Timeframes spreadsheet model.

When comparing Moree transit times to the periphery of urban areas in Armidale, Narrabri and Tamworth, times are still acceptable. However, regard should be held for Fire and Rescue response times from the East Moree base given it is a requirement to return to base prior to attending another incident. Should the preferred southern overpass be endorsed, overall response times are considered acceptable noting that journey times would still be comparable with other regional towns.

[1] ARTC data

[2] Transport Safety Bulletin – Issue 2 – Level Crossing Accidents in Australia 2012

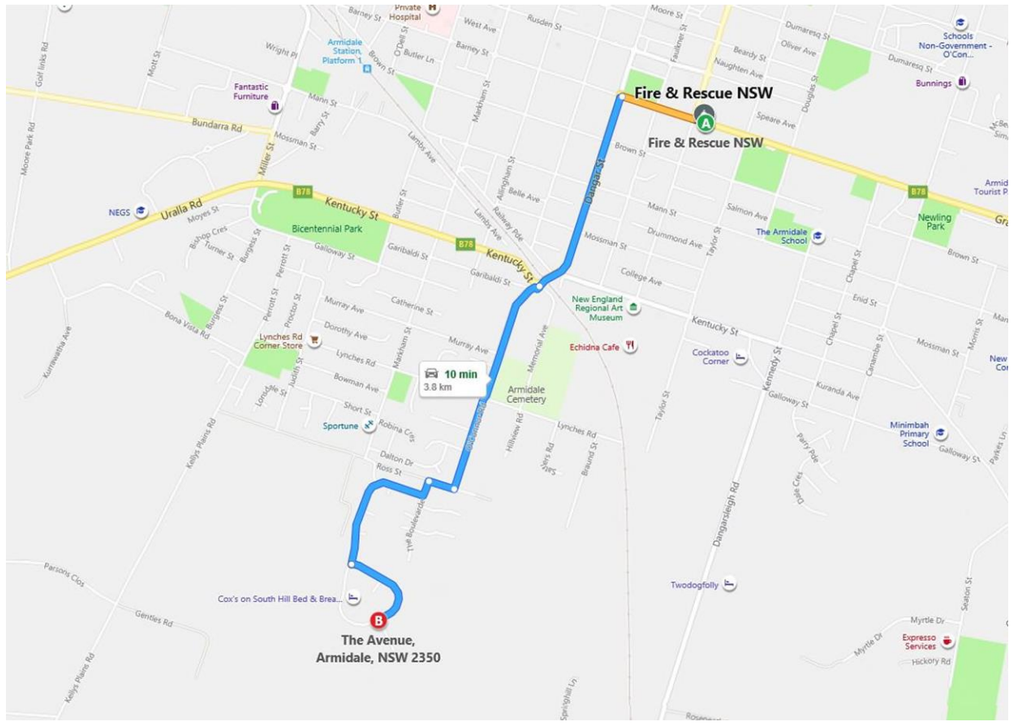
[3] Meiers, Guo and Levasseur, 2012, Crossing, vehicle and environmental characteristics influence on crash likelihood in Australia and New Zealand

[4] Report – Red Light Infringements at Level Crossings MRWA 2006

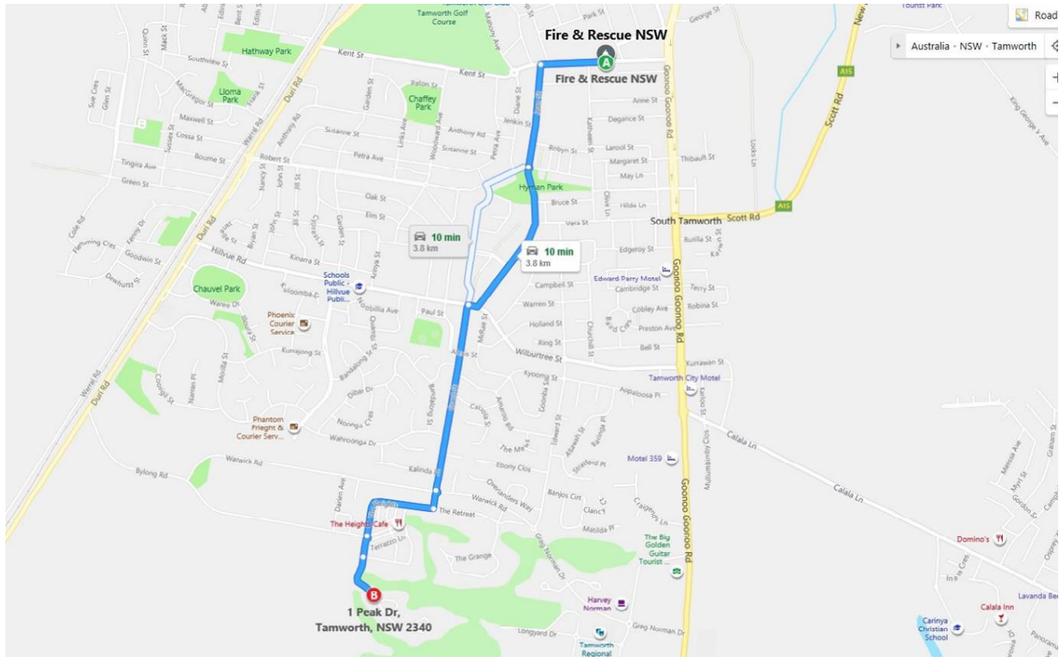
APPENDIX A – Emergency Response Timeframes - Spreadsheet Model

Run Description	Total Link times (from bottom Sheet 1)	Intersection Delays	Light Green	Light Red	No of speed limit changes	Time per speed limit change	Total Link Time Green Light (Secs)	Total Link Time Red Light (Secs)	Total Link time Green Light (M:S)	Total Link time Red Light (M:S)	Differ-ence	Test run times	Google Map times
Fire Brigade to E Moree - via existing shortest	204.41	46	15	90	0	5	265.41	340.41	04:25	05:40	01:15		
Fire Brigade to E Moree - via Jones Ave Bridge	251.98	70	0	0	0	5	321.98	321.98					
Fire Brigade to E Moree - via southern bridge	625.50	120	0	0	5	5	770.50	770.50					
Ambulance to E Moree - via existing shortest	124.84	34	15	90	0	5	173.84	248.84	02:54	04:09	01:15		
Ambulance to E Moree - via Jones Ave Bridge	216.58	53	0	0	0	5	269.58	269.58					
Ambulance to E Moree - via southern bridge	590.10	98	0	0	5	5	713.10	713.10					
Police to E Moree - via existing shortest	215.00	53	15	90	0	5	283.00	358.00	04:43	05:58	01:15		
Police to E Moree - via Jones Ave Bridge	244.57	77	0	90	0	5	321.57	411.57					
Police to E Moree - via southern bridge	640.07	113	0	90	5	5	778.07	868.07					
Test 1 - Amb to E Moree	161.62	34	15	90	0	5	210.62	285.62	03:31	04:46	01:15	03:40	4:00
Test 2 Police to Bullus/Newell via Tycannah	231.39	66	15	90	0	5	312.39	387.39	05:12	06:27	01:15	04:51	6:00
Test 3 Fire to Procon	260.80	39	0	0	2	5	309.80	309.80	05:10	05:10	00:00	05:04	6:00
Test 5 Police to Halls Ck Bridge via Newell	353.59	54	0	0	3	5	422.59	422.59	07:03	07:03	00:00	06:07	7:00

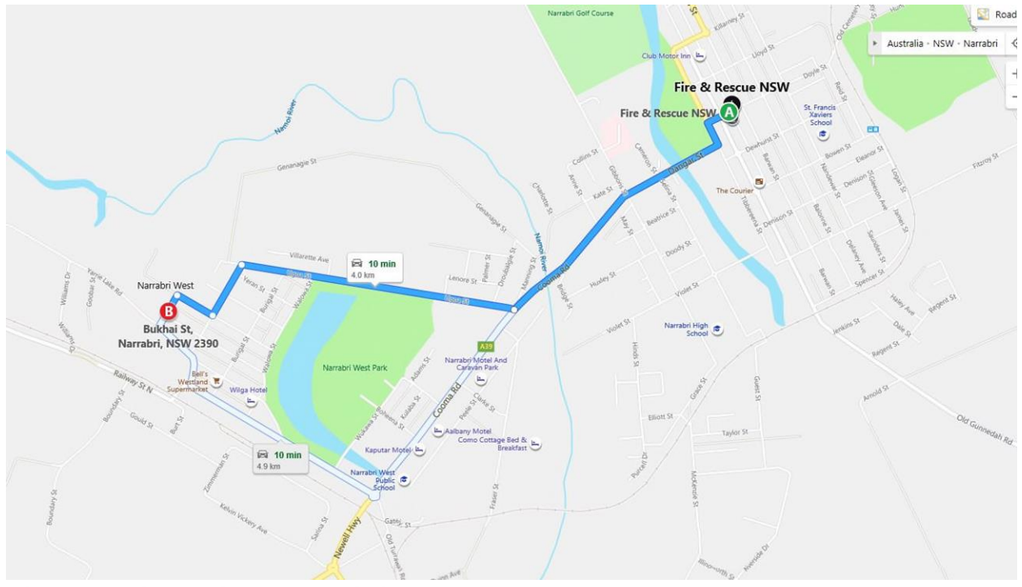
APPENDIX B – Link Times – Comparison Towns



Time to urban edge – Armidale



Time to Urban Edge Tamworth



Time to Urban Edge - Narrabri