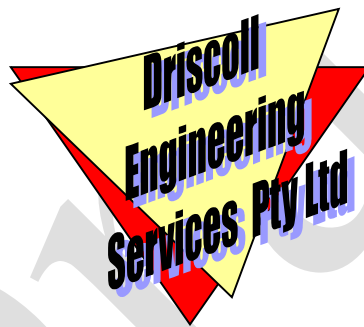


**Existing Conditions
Road Safety Assessment
Intersection of Nolan Street and Napier Street,
Maryborough**

prepared for

Central Goldfields Shire Council

prepared by



Driscoll Engineering Services P/L

*Consulting Civil, Traffic
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1. INTRODUCTION

Driscoll Engineering Services Pty Ltd has been engaged to undertake a Road Safety Assessment of the existing conditions at the intersection of Nolan Street and Napier Street in Maryborough. A locality map and an aerial photo of the intersection is included in Appendix 1.

The Road Safety Assessment has been conducted with reference to the Austroads Guide to Road Safety Part 6 - Road Safety Audit, AS 1742.3 Manual of Uniform Traffic Control and the relevant Austroads and VicRoads Supplement design and traffic engineering publications.

The Road Safety Assessment includes completion of a Safe System Assessment Matrix on the existing conditions, in accordance with VicRoads Rapid Safe System Assessment guidelines.

2. EXISTING CONDITIONS

Napier Street (Pyrenees Highway (B180)) is a two-way, two lane road with a centreline, edge lines and sealed parallel parking lanes on both sides, with kerb and channel. There are kerb outstands on the immediate approach to the intersection to reduce the crossing distance and parking has been restricted on the north side of the western approach to the intersection. The through lane widths on Napier Street are typically 3.3m wide while the parallel parking lanes width on approach to the Nolan Street intersection are typically 2.6m wide. The Napier Street speed zone is 50km/h.

Nolan Street is also a two-way, two lane road with a centreline, edge lines, sealed parallel parking lanes on both sides and kerb and channel. There are kerb outstands on the immediate approach to the intersection to reduce the crossing distance and narrow median islands at the intersection approaches. Nolan Street is controlled by a Stop sign on both approaches to the Napier Street intersection and the typical lane width on the southern approach is 3.75m, whilst the northern approach has a typical lane width of 3.4m. There are narrow raised splitter islands in Nolan Street on both approaches to Napier Street however the raised median island on the northern approach is less than 1.0m wide at the location of the pedestrian crossing point, and the southern approach island is only 0.6m in width, both of which are insufficient storage space for a pram, and there are no TGSI's present in the median splitter island. The northern approach of Nolan St is within the 40km/h precinct, whilst the southern approach has a speed zone of 50km/h. Brick paving has been used to construct low platforms in Nolan Street to delineate the intersection and reduce the speed of traffic on both approaches to Napier Street.

There is a concrete footpath on both sides of both Napier Street and Nolan Street, on all four approaches to the intersection. The footpath connections on each of the corners of the Napier Street and Nolan Street intersection include pedestrian laybacks and TGSI's, however these do not appear to be to current standards. There are no splitter islands or pedestrian crossing facilities to cross Napier Street and the splitter islands in Nolan Street are too narrow to act as a pedestrian refuge when crossing. However, midblock on Nolan Street between Napier Street and Alma Street, there is a pedestrian crossing to improve access to the library and supermarket on the north west corner of the Napier Street and Nolan Street intersection.

Traffic data provided by Council indicates that Nolan Street, north west of Napier Street has an annual average daily traffic (AADT) of 1902 vpd and south east of Napier Street and AADT of 1427 vpd. Further, traffic data provided by Department of Transport estimates Napier Street has an annual average daily traffic (AADT) of 5400 with 240 (4.4)% heavy vehicles. The posted speed limit on Napier Street is 50km/h and the northern approach of Nolan Street is within the 40km/h precinct. There is no posted limit on Nolan Street to the south and the default 50km/h is applicable, however vehicles appear to approach the intersection too quickly from the southern section of Nolan Street.

The intersection is a typical cross road intersection with a straight approach. Sight distance for vehicles approaching the intersection from Nolan Street is often restricted by vehicles parallel parked along Napier Street, particularly to the north east of the intersection.

3. CRASH HISTORY

According to the current Crash Stats database there have not been any recorded casualty crashes at the intersection of Napier Street and Nolan Street, however media reports and anecdotal evidence suggests that frequently there have been misses and collisions that resulted in property damage. According to the Maryborough Advertiser, in June and July 2021 there were two crashes at the intersection that resulted in serious injuries, however these crashes may be too recent to be included in the records. Co-incidentally there was also a crash at the intersection on the day of the site inspection which would make three crashes in just four months. At this stage the Crash Stats database has not been updated to include any of these crashes.

There is no obvious solution to address the crash history at this intersection and as a result a number of potential treatments have been considered to prevent further cross traffic collisions and collisions involving cyclists and pedestrians.

A common counter-measure to address cross traffic and right turn traffic collisions is the construction of a roundabout. Given the proximity of the intersection to significant shopping destinations and between roundabouts on Napier Street at Inkerman Street and Tuaggra Street, a roundabout at this location would assist with turning movements and speed reduction on Nolan Street. Other alternative counter-measures to address cross traffic collisions would include the banning of various movements at the intersection, i.e. left turn only out of Nolan Street which would restrict traffic movements or one-way traffic only on Nolan Street. The installation of a large raised safety platform across the entire intersection would assist in the reduction of vehicle speeds on the approaches, but will not improve sight distance or ease of traffic movements. Further, the existing similar treatment in the form of low rise paved approaches to the intersection on Nolan Street has not been effective in reducing crashes.

4. SITE OBSERVATIONS

A site assessment was conducted at the intersection between 10:30 and 11:30am on Monday 13th September. Observations from the site assessment are listed below:

- a) Although on a highway, the intersection is located on the edge of the shopping precinct in Maryborough and adjacent the intersection is a mix of businesses from the IGA Supermarket to a service station, office supplies business and a café. This leads to a large number of road users and a variety of traffic movements with a mix

of vehicles from delivery trucks to 4WD's, cars and caravans, bicycles and pedestrians.

- b) In the one-hour site inspection, 67 pedestrians were observed crossing at the intersection. The table below summarises the intersection pedestrian movements. The majority of the pedestrians were older and had mobility issues and there were a number of pedestrians using walkers, trolleys, wheel chairs and scooters. Parents with prams and young children were also observed crossing the intersection.
- c) There was a relatively high volume of traffic turning right (south bound) into Nolan Street from Napier Street, including buses. The construction of a right turn lane should be considered to improve the through lane traffic flow on Napier Street;
- d) Napier Street and Nolan Street are utilised by the bus route, with buses turning right from Napier Street into Nolan Street at this intersection. Refer to the attached bus route map.
- e) The service station on the south west corner of the intersection attracts a relatively high turn-over of vehicles and access to and from this site should be considered in any intersection works. A large number of vehicles were observed turning right into Nolan St, then immediately turning right into the service station. Upon exiting the service station, a number of vehicles turned right onto Napier Street. As the service station becomes busy, there is insufficient storage space for vehicles on the site, leading to queueing in Nolan Street, potentially blocking Nolan Street. In addition, vehicles travelling north west on Nolan Street and entering the service station tend to cut across the first parking bay.

**Pedestrians Crossing at Napier St and Nolan St Intersection
Monday 13th September: 10:30am to 11:30am**

| Across Napier St West Side | | Across Napier St East Side | | Across Nolan St North Side | | Across Nolan St South Side | | Total Pedestrians and Cyclists |
|----------------------------|-------------|----------------------------|-------------|-----------------------------|------------|----------------------------|------------|--------------------------------|
| North Bound | South Bound | North Bound | South Bound | East Bound | West Bound | East Bound | West Bound | |
| 8 | 8 | 15 | 7 | 8 (including 2 bicycles) | 10 | 4 | 7 | 67 |

Summary of Traffic Volumes 2021

| Napier St South West of Nolan St | | Napier St North East of Nolan St | | Nolan St North West of Napier St | | Nolan St South East of Napier St | |
|----------------------------------|-----|----------------------------------|-----|----------------------------------|------|----------------------------------|-----|
| AADT | %cv | AADT | %cv | AADT | %cv | AADT | %cv |
| 5400 | 4.4 | 5400 | 4.4 | 1902 | 15.5 | 1427 | 4.9 |

5. IDENTIFIED ISSUES

Site observations and a desktop review of the design of Napier Street and Nolan Street have identified the following predominant issues at this intersection:

- Congestion at the service station on the south west corner results in traffic delays on Nolan Street;
- The intersection is on the edge of the shopping and community facilities district which generates significant pedestrian movements. The café on the south east corner of the intersection encourages pedestrians to cross at this intersection.
- Pedestrians have difficulty crossing Napier Street and there is a significant number of pedestrians crossing at this intersection;
- There are high traffic volumes and turning movements at this intersection;
- There has been a high number of property damage crashes at this intersection and there were two casualty crashes at the intersection in June and July, with a third casualty crash at the nearby intersection of Napier Street and Cross Street;
- Sight lines at the Stop Statcon markings are impeded by parked vehicles on Napier Street, particularly on the east side of the intersection;

6. PROPOSED WORKS

In consideration of the physical constraints and the identified issues at the intersection, there is no obvious solution to address the crashes at this location. Therefore a number of potential treatments have been considered, each with their own benefits and difficulties. Traffic flow and traffic patterns should be considered in the broader area when considering any intersection works.

The potential treatments considered include:

- A roundabout to reduce vehicle speed and facilitate safer turning movements;
- A raised safety platform with pedestrian crossings to slow vehicles and improve pedestrian safety;
- Traffic signals;
- A central median in Napier St to provide pedestrian refuges and kerb outstands to improve sight distance;
- A central median in Napier St to limit turning movements and provide pedestrian refuges;
- A central median and Wombat pedestrian crossing; and
- A central median, pedestrian crossing and restricting traffic to one-way traffic in Nolan St;

All seven options developed look to minimise the impact on traffic using the Napier Street carriageway as it is considered important to maintain traffic flow on one of the State's main Arterial Roads.

Option 1 - Roundabout

A common counter-measure to address cross traffic and right turn traffic collisions is the construction of a roundabout. Given the proximity of the intersection to significant shopping destinations and between the roundabouts on Napier Street at Inkerman Street and Tuaggra Street, a roundabout at this location would assist with both turning movements and speed reduction on Nolan Street. However, a roundabout of similar dimensions to the

nearby roundabout at Napier Street and Inkerman Street will not fit at the Nolan Street intersection without impacting upon the verandahs on the buildings on the north west and south east corners. A smaller roundabout has been considered but would not cater for the commercial vehicles that use the Napier Street section of the Pyrenees Highway. In addition, roundabouts alone are not the best solution pedestrians and cyclists.

Option 2 – Large raised safety platform

A second concept that has been considered is the construction of one large raised safety platform across the intersection with pedestrian crossings on both Napier Street and Nolan Street to slow traffic and provide pedestrian crossing points. It is further proposed that splitter islands be constructed in Nolan Street to define the intersection and turning paths. Whilst this concept will assist with pedestrian crashes and will slow vehicles at the intersection, thereby reducing risk, it does not address congestion and turning movements at the intersection.

Option 3 – Traffic Signals

The installation of traffic signals together with central medians has been considered as another option to address crashes at this intersection. Traffic signals would improve safety for all vehicles at the intersection, improve pedestrian access and allow for controlled safe vehicle movements. However, the traffic signals would interrupt traffic flow on Napier Street, and congestion at the service station may result in the queueing of vehicles at the traffic lights. Traffic signals are a significant cost outlay for Council and without a reported crash history, there is unlikely to be Federal Blackspot funding for the intersection,

Option 4 – Minimal Kerb and Channel and Central Median Construction

A simpler low cost concept involving construction of kerb outstands and wider medians (or splitter islands) on all four approaches to the intersection in conjunction with defined pedestrian crossing points and pram crossings is another option to be considered. This concept includes the restriction of parking for a short length along both the south east side and the north east side of Napier Street to improve sight distance for vehicles crossing or turning out of Nolan Street. The presence of median islands on Napier Street may encourage vehicles to travel at a slower speed and therefore reduce risk, however this option will not address congestion at the service station.

Option 5 – Central Median, Turning Movement Restrictions, Pedestrian Crossing

Another option involves the construction of concrete central medians on Napier Street (at Nolan Street and Cross Street) together with curved splitter islands on the Nolan Street approaches that will restrict straight through and right turn movements from Nolan Street. The central median will also restrict right turn exits from the service station and right turn movements from Cross Street. In conjunction with these medians and splitter islands, a right turn lane is proposed for the entrance to the service station to allow south east bound vehicles to pass other vehicles turning into the service station. The central median in Napier Street will provide for pedestrian refuges at the crossing points and widening of the splitter islands in Nolan Street will improve pedestrian facilities at this location. Due to the proposed right and left turn lanes into the service station, it is unlikely that pedestrian crossing facilities will be able to be accommodated at the intersection in Nolan Street and therefore it is proposed that a pedestrian crossing be installed further south in Nolan Street. It is further proposed that street lighting be reviewed and upgraded as part of the intersection works. This option will have an impact on current public bus routes in Maryborough due to the restriction on straight through movements from Nolan Street.

Option 6 – Central Median and Wombat Pedestrian Crossing

Another option would involve the construction of raised safety platforms with pedestrian crossings on Napier Street to slow traffic and provide pedestrian crossing points. It is proposed that wider splitter islands be constructed in Nolan Street to provide adequate

width for pedestrian refuges when crossing Nolan Street. This concept includes the restriction of parking for a short length along both the south east side and north east side of Napier Street to improve sight distance for vehicles crossing and turning from Nolan Street. Potentially the pedestrian crossings on Napier Street could be signalised at a later date if required.

Option 7 – Central Median, One-Way Traffic in Nolan Street, Pedestrian Crossing

Another option considered involves the construction of concrete central medians on Napier Street (at Nolan Street and Cross Street) to prevent cross traffic movements together with restricting Nolan Street to a one-way street in the Northbound direction. The central median will also restrict right turn exits from the service station and right turn movements from Cross Street. Restricting Nolan Street traffic to one direction will enable a left turn lane into the service station to be constructed and allow for kerb outstands to reduce crossing distance for pedestrians on Nolan St. It is further proposed that street lighting be reviewed and upgraded as part of the intersection works. This proposal will impact the existing public bus routes and restrict access to the business and community facilities in Nolan Street. The potential impact, of one-way traffic in Nolan Street, on the remainder of the road network would need to be further assessed if this option is preferred.

Option 5 above is the recommended option that is most likely to address the cross traffic and right turn traffic collisions that have been recorded at the intersection within the last 5 years. The proposed option is the most cost effective treatment to address the identified issues and seeks to minimise the impact upon Napier Street traffic whilst not increasing the ongoing maintenance costs at the intersection.

The Central Goldfields Shire Walking and Cycling Strategy identifies Napier Street between Inkerman Street and Earl Street / Lake Road as a priority for an on-road bicycle path. The Safe System Assessment of the existing conditions and two of the proposed options identified bicycles as a risk at this intersection, therefore a further concept with separated shared user paths on Napier Street and through the intersection has been prepared for consideration.

7. RESPONDING TO THE ROAD SAFETY ASSESSMENT

Every effort has been made to identify all potential safety hazards, however the auditor expresses that no guarantee is made that every deficiency has been identified. Furthermore, if all the recommendations and suggestions made in this report are followed and/or implemented there is still no guarantee that the project is totally safe or risk free. It is considered however that the adoption and implementation of the recommendations and suggestions should improve the level of safety at the project.

Responsibility for the road works always rests with the project manager and not the auditor. The Project Manager is under no obligation to accept the audit recommendations and suggestions and furthermore it is not the role of the auditor to agree or approve of the Project Managers response to the audit.

Kim Whytcross
Driscoll Engineering Services Pty Ltd

Appendix 1 - Locality Map and Photographs

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Appendix 2 – Crash Data

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Appendix 3 – Bus Route

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Appendix 4 – Concept Drawings

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