Draft LATM Plan

Bacchus Marsh Local Area Traffic Management Study – Stage 2

V171899

Prepared for
Moorabool Shire Council

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1 Introduction

Cardno has been engaged by Moorabool Shire Council to undertake a Local Area Traffic Management (LATM) study for Stage 2 of the Bacchus Marsh township. It is understood that the study is being undertaken in response to increased population growth and subsequent traffic congestion, and is in direct response to recommendations within the Bacchus Marsh Integrated Transport Strategy.

The following report provides a draft LATM plan to address the concerns raised during the first stage of the LATM plan, also conducted by Cardno, which consisted of an existing conditions assessment of the study area (V171899REP006F01). This assessment collated relevant background information, traffic data, community consultation surveys and an on-site investigation, and should be read in conjunction with the Draft LATM plan outlined within this report.

In the course of preparing the Draft LATM plan, Cardno has consulted with Moorabool Shire Council to discuss the measures proposed.

1.1 Study Area

The study area is bound by Main Street / Bacchus Marsh Road to the north, the Werribee River to the south, Korkuperrimul Creek to the west, and Fisken Street to the east. The extent of the study area is generally shown in Figure 1-1.

1.2 Existing LATM Measures

The existing traffic management devices previously implemented in the local area by Council are shown in Figure 1-2.
Existing Traffic Management Measures
2 Scope of Works

2.1 Overview

The Local Area Traffic Management (LATM) measures proposed in the following sections are informed by Cardno’s understanding of the study area as set out within the Existing Conditions Assessment (V171899REP006F01) and the principles of the Austroads Guide to Local Area Traffic Management.

It is imperative to understand that the scope of an LATM plan cannot directly impose measures on arterial roads managed by VicRoads, as any works associated with maintenance or improvements to these roads cannot be undertaken by Council. However, an LATM plan does consider these roads at all stages and endeavours to accommodate the needs of the local community wherever possible.

Within the study area there are two VicRoads operated roads as follows:

- Grant Street / Gisborne Road, operating in a north-south direction through the centre of the study area; and
- Bacchus Marsh Road / Main Street, generally operating in an east-northwest direction on the northern border of the study area.

Similarly, although car parking issues can be highlighted by a LATM study, directly fixing parking supply issues is not the main intent of an LATM study. However, parking access can be addressed and where possible, car parking provision improvements can sometimes be made indirectly.

2.2 Complementary Projects

Cardno understands that a number of studies and projects are currently being undertaken by VicRoads, the Victorian Planning Authority and Moorabool Shire Council that aim to address major concerns within the study area relating to traffic congestion and road safety. Significantly, it is understood that these studies and associated projects aim to address congestion along Main Street and Grant Street, as well as address concerns regarding heavy vehicle movements through Bacchus Marsh Town Centre.

Accordingly, it is noted here that this LATM study does not address community concerns relating to heavy vehicle movements and traffic congestion along Main Street and Grant Street. Rather, this LATM study complements the larger studies being undertaken, whilst addressing concerns from the community regarding congestion and road safety within the local street network.
3 Overview of Potential LATM Treatments

In order to guide decisions concerning implementation of certain measures, it is important to have thorough understanding of the potential treatments available to address issues such as those raised by the local Bacchus Marsh community, throughout the study area.

The following sections comprise descriptions of several LATM treatments that are considered appropriate for the urban context of Bacchus Marsh, and provides the respective advantages and disadvantages of each treatment.

It is noted that these treatments maybe considered individually or in combination with one other, and that on long stretches of road it is best to implement a number of treatments to maintain the same profile throughout.

3.1 Centre Blister (or similar)

A centre blister is a concrete island positioned at the centreline (median) of a street with a wide oval plan shape that narrows the lanes, diverts the angle of traffic flow into and out of the device, and can be used to provide pedestrians with a refuge. Figure 3-1 provides an example of a centre blister LATM treatment.

Advantages of Centre Blisters

> Reduce vehicle speeds;
> Prevent drivers from overtaking others;
> Provide a refuge for pedestrians and cyclists crossing the street;
> Flexibility in design allows buses and commercial traffic to be accommodated; and
> Visually enhance the street through landscaping and reduce the 'gun barrel' effect on long straight roads.

Disadvantages of Centre Blisters

> Prohibit or limit access and movement from driveways;
> Reduce on-street parking adjacent to the islands;
> Can create a squeeze point for cyclists if not appropriately catered for in the design;
> May require kerb and footpath realignment in narrow streets;
> Ineffective at reducing through traffic; and
> Relatively expensive to install and maintain.

3.2 Modified T-Intersection

Modified T-Intersections are used to affect a change in the vehicle travel path, thereby slowing traffic via deflection of traffic movements and/or reassignment of priority. Figure 3-2 shows an example of a modified T-intersection treatment.
Advantages of Modified T-Intersections

- Control traffic movements and improve traffic flow;
- Reduce vehicle speeds at the treatment point;
- Facilitate safe pedestrian crossing;
- Remove/reduce the number of vehicle conflict points;
- Can lower vehicle speeds along the length of the street when installed in a series; and
- Can accommodate buses and heavy vehicles.

Disadvantages of Modified T-Intersections

- Relatively expensive devices;
- Can create squeeze points for cyclists if not appropriately catered for in the design;
- Reduce the availability of on-street parking opportunities.

3.3 Speed Hump

A speed hump is a speed reduction device in the form of a raised curved profile extending across the roadway. Speed humps are typically 70mm to 120mm high, with a total length of three to four metres. Figure 3-3 presents an example of a typical speed hump treatment.
Advantages of speed humps
> Significantly reduce vehicle speeds in the vicinity of the device;
> Can significantly reduce road crashes;
> Relatively inexpensive to install and maintain;
> Discourage through traffic;
> Regulate speeds over the entire length of a street when used in a series; and
> Can be designed to limit discomfort to cyclists.

Disadvantages of speed humps
> Traffic noise may increase just before and after the device due to braking, acceleration and the vertical displacement of vehicles;
> Can divert traffic to nearby streets without LATM measures;
> Can be uncomfortable for vehicle passengers and cyclists; and
> May adversely affect access for buses, commercial vehicles and emergency vehicles.

3.4 Raised Treatment
A raised treatment is a raised section of roadway approximately 90mm to 100mm high, ramped up from the normal level of the street with a platform extending over more than a standard car length (at least 6 m but typically more). Raised sections of roadway can be located at mid-block locations, or they can cover an intersection between two roadways. Figure 3-4 presents an example of a raised intersection treatment.

Advantages of a Raised Treatment
> Significantly reduce vehicle speeds in the vicinity of the device;
> May discourage through traffic;
> Can be used as a form of threshold treatment;
> Can highlight the presence of an intersection; and
> Can regulate speeds over the entire length of the street when used in a series.

Disadvantages of a Raised Intersection
> Traffic noise may increase just before and after the device due to braking, acceleration and the vertical displacement of vehicles;
> Can divert traffic to nearby streets without LATM measures;
> Can be uncomfortable for vehicle passengers and cyclists; and
> May adversely affect access for buses, commercial vehicles and emergency vehicles.
> Require care that ramp markings are not confused with intersection control markings when located at an intersection.
3.5 **Left-In / Left-Out**

A left-in/left-out treatment is typically represented by a raised triangular island at an intersection, which aims to obstruct right turns and through movements to and from the intersection, street or driveway. Figure 3-5 shows an example of a Left-In / Left-Out treatment.

**Figure 3-5  Left-In / Left-Out**

![Image of a Left-In / Left-Out treatment](Image)

**Advantages of Left In / Left Out**

- Reduce the traffic volume;
- Reduce the number of conflict points;
- Provide a refuge for pedestrians and cyclists;
- Reinforce the need for drivers crossing the dividing line to give way; and
- May enhance the appearance of the street when landscaped.

**Disadvantages of Left In / Left Out**

- Restrict access to local streets and / or driveways;
- May create a squeeze point for cyclists;
- Divert traffic to other local streets without the same restriction; and
- Drivers may not comply if an appropriately designed median island is not incorporated.

3.6 **Sharrows**

Sharrows are pavement markings consisting of a bicycle symbol and two chevron markings. The intention of sharrows is to position cyclists into the centre of the traffic lane and to encourage them to mix with through traffic, to avoid conflicting with cars and other vehicles at narrow sections of road or squeeze points, such as small roundabouts. Figure 3-6 shows an example of a sharrow treatment at a roundabout.

**Figure 3-6  Sharrows**

![Image of a sharrow treatment at a roundabout](Image)
Advantages of Sharrows
> Encourage cyclists to ride in a safe road position;
> Inexpensive to implement and maintain; and
> Reinforce awareness of cyclists in local street networks.

Disadvantages of Sharrows
> No regulations or road rules supporting the use of sharrows in Victoria;
> May be confusing for drivers and cyclists; and
> Limited research into the effectiveness of sharrows.

3.7 Full Road Closure
A full road closure is the closure of a street to two-way traffic. It serves as a means of eliminating through traffic from a street or simplifying an intersection layout to reduce the possible number of conflict points and the consequent crash risk. Figure 3-7 shows an example of a full road closure.

Figure 3-7 Full Road Closure

Advantages of a Full Road Closure
> Reduce traffic volumes;
> Remove / reduce the number of conflict points when used at an intersection;
> Increase pedestrian safety;
> Remove non-local traffic;
> Can accommodate pedestrian, cyclist and/or bus access; and
> Provide landscaping opportunities.

Disadvantages of a Full Road Closure
> May restrict or reduce accessibility for local residents;
> May divert traffic to other adjacent local streets without closures, resulting in increased traffic volumes in those streets;
> May restrict access by emergency services;
> May increase travel times for some road users; and
> May reduce the availability of on-street parking.

3.8 Surface Treatment
Surface treatments or threshold treatments (when used at an intersection or a driveway) are coloured and/or textured road surface treatments that contrast with the adjacent roadway. Surface treatments aim to alert drivers that they are entering a driving environment that is different from the one they have just left by the use of visual and/or tactile clues. Figure 3-8 presents an example of a threshold treatment.
Advantages of Threshold Treatments

> Reduce approach speeds to an intersection;
> Highlight the presence of an intersection;
> Provide separation between residential areas from areas of non-residential use; and
> Alert the driver that they are entering into a local area.

Disadvantages of Threshold Treatments

> Increase maintenance requirements;
> Texturing may create stability problems for cyclists, motorcyclists and pedestrians;
> Turning traffic from and into the low speed local area may be more likely to affect traffic flow on the connecting arterial roads;
> Vehicle priority may be unclear to pedestrians in some circumstances; and
> Effectiveness is limited unless complemented by other devices in the street.

3.9 Other Treatment Options

Other treatment options available that have been utilised are more or less self-explanatory. All of the below treatments improve safety of both pedestrians, cyclists and drivers and/or define priority on sections of the roadway. These treatments are:

> Speed Limit Reductions; and
> Linemarking changes to improve clarity of communication.
4 Proposed LATM Measures and Recommendations

A number of proposed LATM measures have been recommended by Cardno to address the main traffic issues identified from the traffic data and community consultation data, in consultation with Council officers.

4.1 Key Issues

Issues have been identified through consultation via a community questionnaire survey, site observation and analysis of the existing conditions via tube count surveys and existing traffic data provided by Council. The following ‘key issues’ were identified to guide the formulation of appropriate recommendations:

> Heavy vehicles, congestion and vehicle safety on Grant Street;
> Traffic congestion on Main Street;
> Traffic speeds and irresponsible driving on Bacchus Marsh Road / Main Street, Halletts Way, Graham Street, Fiskern Street, Margaret Drive and Madden Drive;
> Traffic safety in local streets and at intersections along Bacchus Marsh Road / Main Street, Grant Street and Halletts Way;
> Pedestrian facilities on Underbank Boulevard, Closter Court and Bacchus Marsh Road Main Street in the vicinity of the Bacchus Marsh Activity Centre;
> Cycling facilities along Main Street and throughout the wider Bacchus Marsh Area; and
> On Street parking on Clarinda Street, Turner Street, Main Street and Waddell Street.

4.2 Objectives

The objectives of the proposed plan are as follows:

> Facilitate measures to reduce congestion on Main Street and Grant Street;
> Reduce the potential for conflicts with cyclists, vehicles and pedestrians along key routes and crossings;
> Maximise the benefits of available funding, with priority given to locations with high crash rates and streets with the greatest level of community concerns;
> Alleviate congestion on streets throughout the study area by providing smoother and safer connections to arterial infrastructure; and
> Maintain adequate levels of accessibility for local residents, public transport, businesses and emergency services.

4.3 Proposed LATM Treatments

The proposed LATM measures consider a range of traffic management treatments intended to address the key concerns outlined above. The proposed draft LATM is shown in Figure 4-1.
4.4 Proposed Treatments

The following sections provide a summary of all the individual treatments included in the initial traffic management plan:

4.4.1 Main Street Signalised Intersections

Proposed as part of the Stage 1 LATM study, two (2) signalised intersections at the intersections of Main Street / Gisborne Road and Main Street / Young Street are included within this stage of the LATM study.

Main Street / Gisborne Road

It is understood that a signalised intersection upgrade at Main Street / Gisborne Road is currently under consideration by VicRoads, based on the existing traffic conditions along Main Street / Gisborne Road (congestion and conflicting vehicle / pedestrian movements). Despite being an arterial road, this treatment is recommended within the LATM study given the anticipated pedestrian safety improvements.

Main Street / Young Street

The upgrade of Main Street / Young Street intersection to a signalised intersection was recommended as part of the Stage 1 Final LATM plan as a high priority treatment. Similar to the Gisborne Road intersection, it is considered that a signalised intersection at this location would provide significant pedestrian safety and amenity benefits, as well as providing controlled turns into and out of Young Street.

4.4.2 Margaret Drive & Madden Drive

Community consultation and automated tube count (ATC) data both indicated that, Margaret Drive and Madden Drive via a portion of Clarinda Street are used as a rat-run between Grant Street and Main Street, to avoid heavy traffic backing up at the Grant Street / Main Street roundabout. Specifically, 85th percentile speeds of 54.0 km/h and 57.2 km/h were recorded on Margaret Drive and Madden Drive respectively.

To address this, it is proposed to implement the following LATM treatments along this stretch of road:

- Three (3) centre blisters, comprising one (1) on Margaret Drive and two (2) on Madden Drive;
- A raised pedestrian crossing to the east of Madden Drive on Clarinda Street;
- Improvements to the existing modified T-intersection on Margaret Drive.

In combination, it is considered that this set of treatments will discourage speeding, improve safety for all transport modes and improve the existing pedestrian and visual amenity along Madden Drive and Margaret Drive.
4.4.3 Graham Street & Abutting Streets

Similarly to the rat-running issue along Margaret Drive and Madden Drive to the west of Grant Street, community consultation and ATC data indicated that Graham Street via Waddell Street, Pilmer Street and Sydney Street, is used as a rat-run for vehicles to avoid congestion backing up on Grant Street from the Main Street roundabout.

ATC data along these streets indicate that speeding is a prevalent issue along Graham Street with 85th percentile speeds of 56.9 km/hr recorded between Pilmer Street and Waddell Street.

The draft LATM plan recommends a number of measures within this area to discourage vehicles from rat running and to slow down vehicle speeds along the route. These measures include:

> Raised intersections at the intersections of:
  o Waddell Street and Standfield Street;
  o Pilmer Street and Standfield Street; and
  o Sydney Street and Standfield Street.

> Two (2) centre blister treatments on Graham Street between:
  o Waddell Street and Pilmer Street; and
  o Pilmer Street and Sydney Street.

> A modified T-intersection at the intersection of Waddell Street and Graham Street.

Figure 4-2 Graham Street facing south from Main Street

4.4.4 Lord Street

Between Main Street and McGrath Street, Lord Street stretches for almost 400 metres with a generally straight alignment and pavement width in the order of 10 metres. At its mid-point, Lord Street intersects with Simpson Street, with traffic priority provided to Lord Street. The existing intersection treatment comprises a give-way and stop sign to the eastern and western lengths of Simpson Street respectively and faded stop line marking showing right of way to Lord Street.

Under these conditions, it is considered suitable to provide a raised intersection treatment at the intersection of Simpson Street and Lord Street to warn vehicles of the presence of the intersection, improve traffic safety and reduce vehicle speeds within the area.

From the initial community consultation it is understood that Lord Street is also used by local school buses, and as such any installed treatment should consider facilitating this type of vehicle.
4.4.5 Halletts Way & Fisken Street

Halletts Way and Fisken Street are connector streets, meaning that they facilitate considerable traffic volumes travelling north-south through the study area. As such, it is not recommended to implement typical LATM treatments along these stretches of road, particularly as it is likely that this will divert more traffic to Grant Street / Gisborne Road which is already experiencing significant congestion issues.

Nonetheless, the following outlines the issues identified along these routes, and potential solutions which should not affect route choice nor increase traffic on Grant Street.

**Halletts Way**

Community consultation indicated that residents are concerned about incidences of speeding and hooning along Halletts Way, it is noted that this sentiment is shared with the community consultation responses to Stage 1 of the Bacchus Marsh LATM Study to the north of Main Street.

Unfortunately, as Halletts Way has only recently been constructed, the community comments did not indicate a specific location at which speeding and hooning behaviour was an issue.

It is noted that traffic data along the newly completed segment of Halletts Way is yet to be collected and analysed. LATM measures may be recommended for Halletts Way following subsequent data collection and the second stage of community consultation.

**Fisken Street**

Fisken Street is a long, flat and straight road with no speed controls running from Parwan Road in the south to Main Street in the north. Typically, this type of environment is conducive to speeding vehicles. Both community consultation and ATC data indicate that there is a high level of speeding along Fisken Street with 85th percentile speeds in the order of 67 km/hr, significantly above the existing speed limit of 60 km/hr.

Possible solutions to reduce speeding issues along Fisken Street may include an education / awareness campaign, speed cameras and enforcement.

It is also noted that the intersection of Fisken Street and Main Street was identified as dangerous, particularly, it appears, due to high heavy vehicle proportions turning into or out of Fisken Street.
4.4.6 Pedestrian / Cyclist Facilities

Throughout the study area a number of locations were identified as having insufficient or inadequate pedestrian and cyclist facilities. The key locations identified were:

**Underbank Boulevard**

The Draft LATM proposes to provide footpaths along the length of Underbank Boulevard. Currently no footpaths are provided and this has been raised as a point of frustration and a safety issue for residents in the area, particularly as many of the residents are elderly.

Unable to be determined from initial community consultation, it is possible that the extents of the pedestrian footpath construction could be reduced to a significantly smaller portion of Underbank Boulevard than identified in Figure 4-1. It is anticipated that, perhaps only a footpath from Main Street to the entrance of the retirement village may be required, based on responses in the second round of community consultation providing a greater understanding of the origin and destination of pedestrians in the area.

**Water Channel**

Similarly to the LATM recommendations made within Stage 1 of the Bacchus Marsh LATM study, this Draft LATM plan recommends that the land running alongside the water channel east of Madden Drive (south of Main Street) and Lidgett Street (north of Main Street) be utilised for an off-road shared path. If the shared paths to both the north and south of Main Street are implemented, it is recommended to turn the existing median on Main Street into a pedestrian refuge island, in order to form a connection between the two paths running along the water channel.

Overall, it is expected that this path would provide a convenient and safe route for pedestrians and cyclists travelling north-south through or to destinations in Bacchus Marsh (pending treatment of Main Street). It is further noted that this proposed north-south path could be further extended via a bridge over Werribee River to the south in the future.

**Halletts Way**

On the northern portion of Halletts Way, it is proposed to connect the share path constructed as part of the Halletts Way extension to Main Street, completing this north-south pedestrian and cyclist route through the study area on Halletts Way.

4.4.7 Threshold Treatments – Throughout Study Area

Threshold Treatments are recommended at a number of locations throughout the study area to provide safer and more amenable streets and intersections. It is considered that the introduction of these threshold treatments will alert drivers that they are entering a residential area and subsequently reduce speeds on associated local streets throughout the study area.

Further, by implementing threshold treatments at a large number of intersections throughout the study area, the treatment may become associated with local streets in the study area and improve the effectiveness of each individual treatment.

It is recommended to provide threshold treatments at the following locations:

- Abutting Grant Street (6);
- Abutting Halletts Way (6);
- Abutting Underbank Boulevard (6);
- Abutting Madden Drive (4);
- Abutting Clarinda Street (4);
- Abutting Fisken Street (2); and
- Abutting Main Street (1).

Figure 4-5     Existing Threshold Treatment on Dugdale Street in Bacchus Marsh
APPENDIX

A

EXISTING CONDITIONS
Existing LATM Measures
22/11/2018

Bacchus Marsh
Local Area Traffic Management Study – Stage 2

LEGEND

Study Area
Threshold Treatment
Pedestrian Operated Signals
Modified T-Intersection
Median
Road Narrowing
Pedestrian Refuge Crossing
Speed Limit
Splitter Island
Roundabout

Legend:
- Study Area
- Threshold Treatment
- Pedestrian Operated Signals
- Modified T-Intersection
- Median
- Road Narrowing
- Pedestrian Refuge Crossing
- Speed Limit
- Splitter Island
- Roundabout
APPENDIX

B

DRAFT LATM MEASURES
LEGEND

Study Area
Centre Blister (or similar)
Raised Intersection
Threshold Treatment
Modified T-Intersection
Raised Pedestrian / Bicycle Crossing
Footpath / Shared Path
Pedestrian Refuge Crossing
Signalised Intersection