Final LATM Plan

Bacchus Marsh Local Area Traffic Management Study – Area 1

V190895

Prepared for

Moorabool Shire Council

7 February 2020

Cardno

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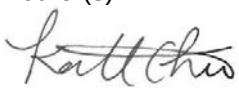

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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
F01	30/01/20	Draft Report	Kaitlin Chuo	Matthew Ballard
F02	07/02/20	Final Report – First Submission	Kaitlin Chuo	Matthew Ballard

Executive Summary

Cardno was engaged by Moorabool Shire Council in July 2019 to develop a Local Area Traffic Management (LATM) plan for Stage 3 of the Bacchus Marsh study area in Darley (Area 1) between Albert Street and Western Freeway.

An LATM study is a formal way of addressing community concerns within the study area including, traffic, pedestrian and cyclist related issues within the local streets, whilst reflecting the requirements and expectations of the local community.

The initial consultation process involved the utilisation of an online interactive survey tool, namely Social Pinpoint, in September 2019, where local residents were invited to pinpoint key issues within the area. A total of 186 responses were received.

Community feedback received from the initial questionnaire survey was analysed together with a detailed existing conditions assessment to develop a Draft LATM plan proposal.

The draft plan was prepared and presented to the residents and businesses for initial consultation via Social Pinpoint. The public was also invited to attend community consultation sessions in person and provide additional feedback to the project team. The key traffic and transport issues the draft plan aimed to address included:

> **Speeding**: Particularly on Grey Street and Albert Street;

> **Pedestrian Safety:** there is a general lack of footpath facilities throughout the area. Residents were also concerned about the lack of crossing facilities around the shopping area at the southwestern corner of Grey Street and Gisborne Road;

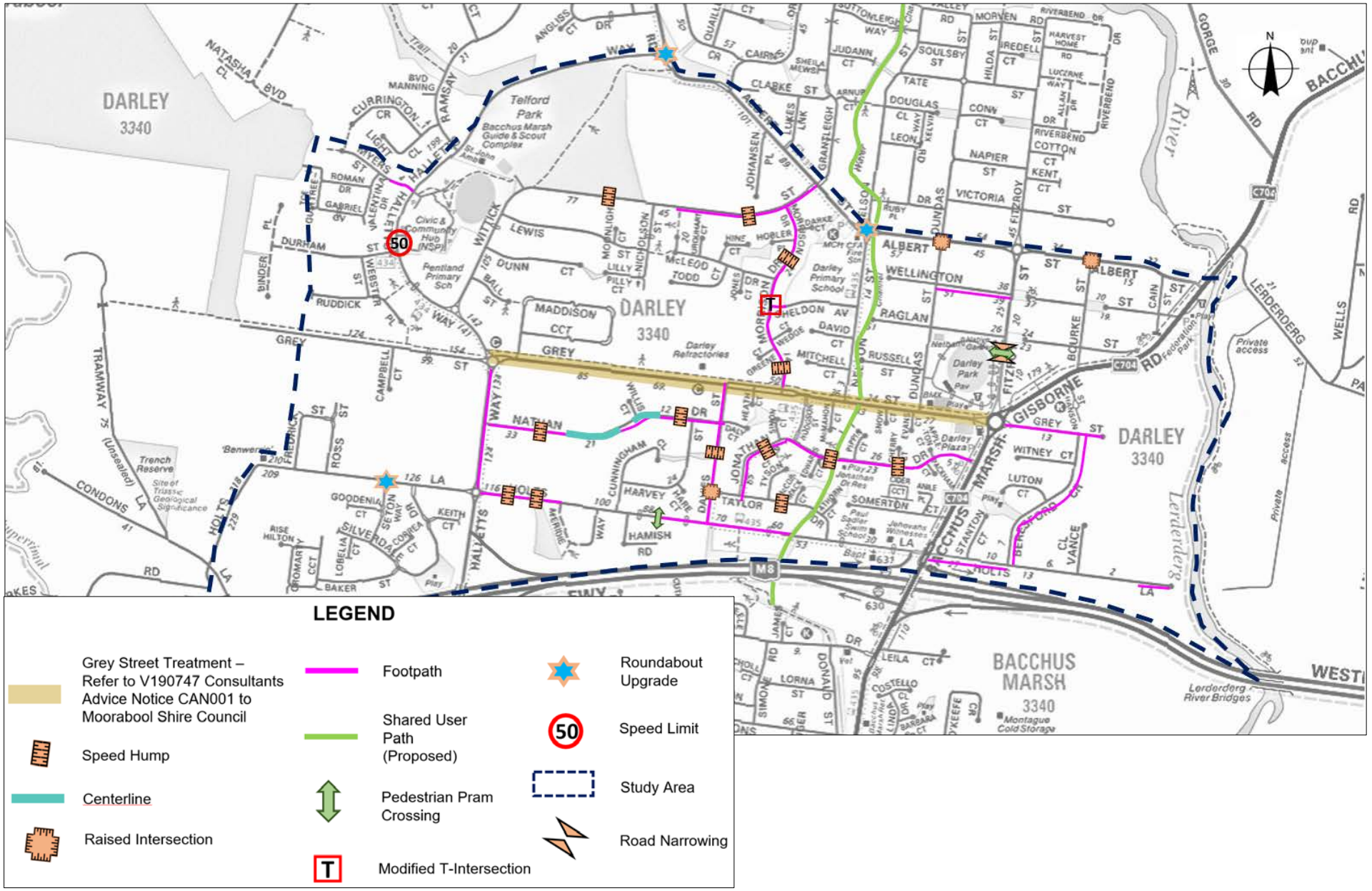
> **Congestion**: the congestion on Gisborne Road is impairing the access to the local streets that are connected to Gisborne Road; and

> **Heavy Vehicles:** Particularly on Albert Street.

Community feedback was an important component of the study, and provided valuable insight to the importance of each treatment for the local area, as well as the benefit each treatment provided. A number of additional measures were subsequently included to address other concerns raised by the community.

Following further investigation, and having regard to the community consultations and feedback conducted during the study, a Final Local Area Traffic Management Plan was prepared as shown on the following page, and Appendix B, along with a priority ranking and associated cost estimate for each nominated measure. The treatments outlined within the final plan are to be funded as part of Council's Capital Works Program, when funding becomes available.

Final LATM Plan



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1 Introduction

Cardno has been engaged by Moorabool Shire Council to undertake a Local Area Traffic Management (LATM) study for the Bacchus Marsh Area. 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.

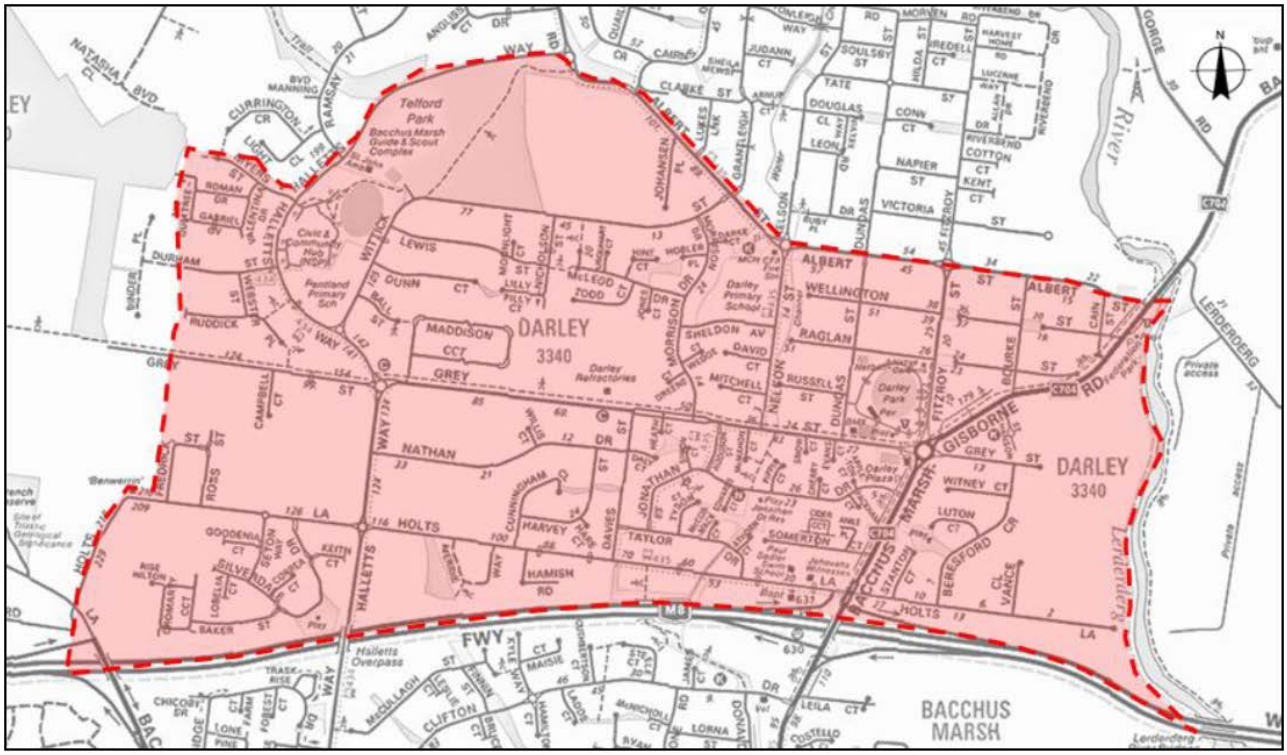
The following report provides a Final LATM Plan to respond to feedback from the community consultation sessions on the Draft LATM Plan. This report should be read in conjunction with the Existing Conditions Assessment (Document Reference V190895REP001D01) and the Draft LATM Plan (Document Reference V190895REP002F01).

In the course of preparing the Final LATM Plan, Cardno has consulted with Moorabool Shire Council to inform the measures proposed.

1.1 Study Area

The study area is bound by Albert Street / Halletts Way to the north, the Western Freeway to the south, Holts Lane to the west, and Lerderderg River to the east. The extent of the study area is generally shown in Figure 1-1.

Figure 1-1 Bacchus Marsh LATM Study Area Map



1.2 Existing LATM Measures

The existing traffic management devices currently implemented in the local area by Council are shown in Figure 1-2.

1.3 Proposed LATM Measures

A series of proposed LATM measures was prepared by Cardno to address the main traffic issues identified from the traffic data and community consultation data, in consultation with Council officers. These proposals were previously presented in the Draft LATM Plan, which was central to the community consultation process and crucial to the development of the Final LATM Plan.

The proposed Draft LATM Plan measures are shown in Figure 1-3 while the final LATM plan is shown in Figure 1-4.

Figure 1-2 Existing Traffic Management Measures

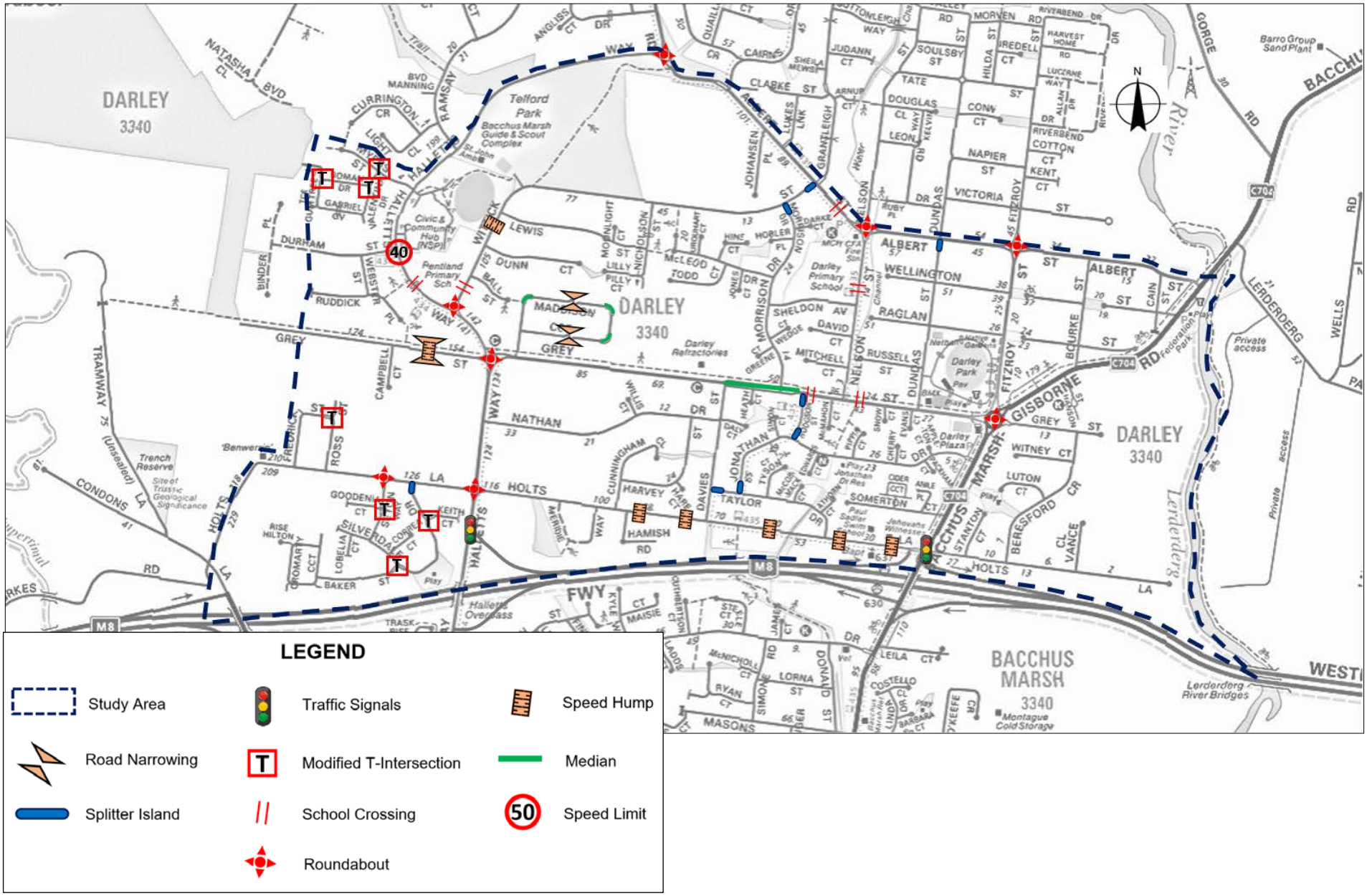


Figure 1-3 Proposed Draft LATM Measures

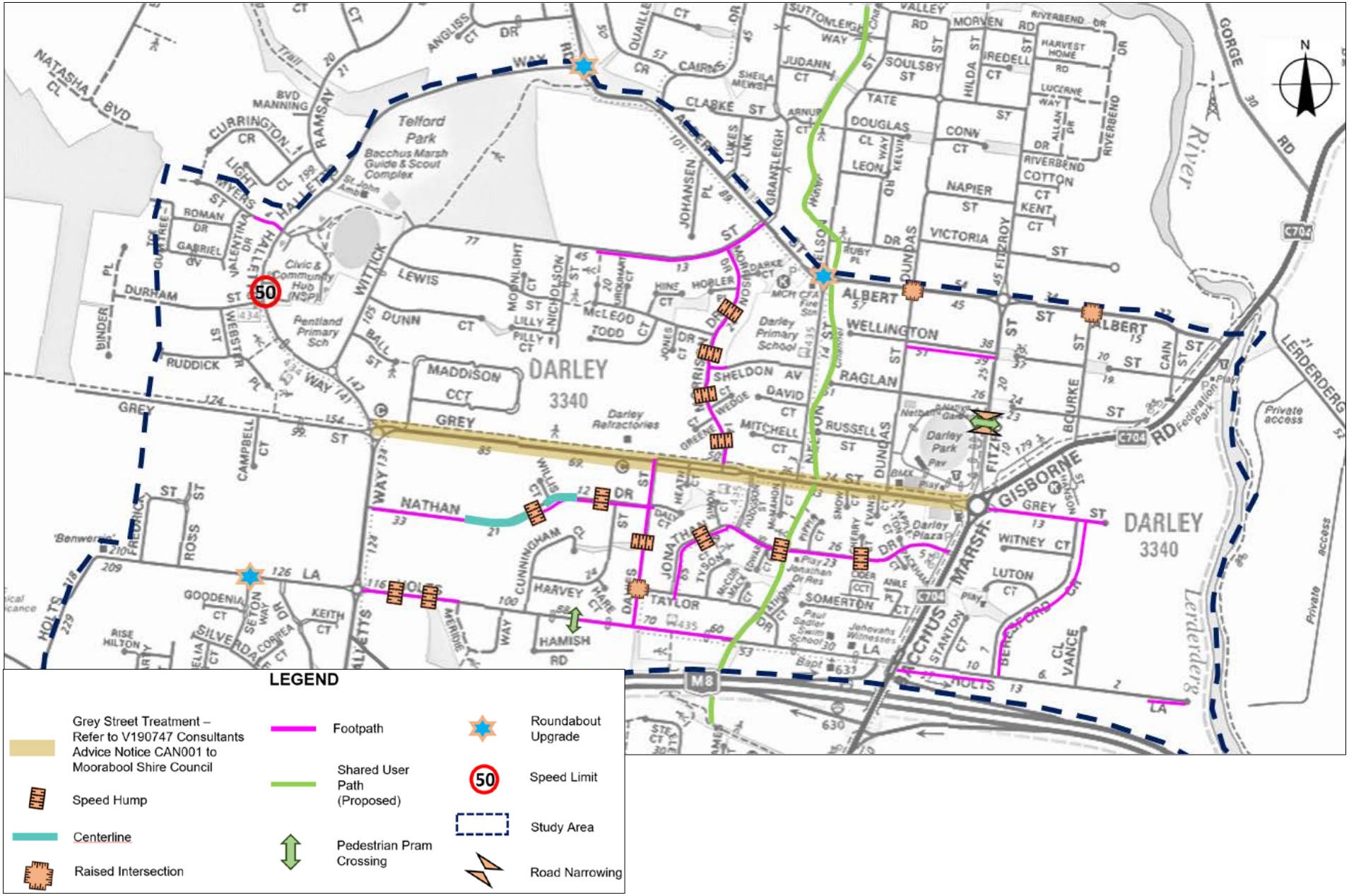
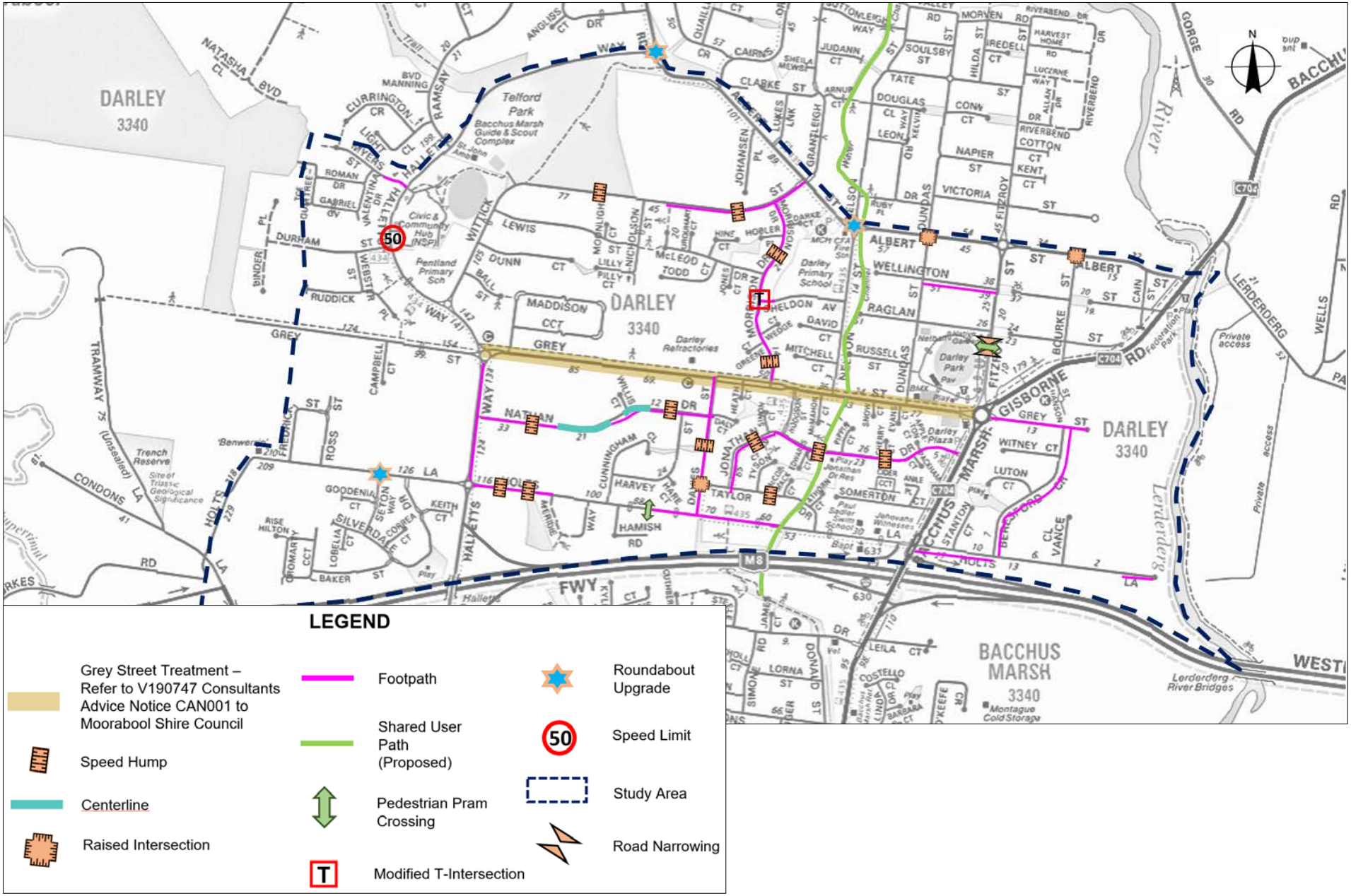


Figure 1-4 Final LATM Measures



2 Scope of This Report

2.1 Overview

The Final Local Area Traffic Management (LATM) Plan outlined in the following sections has been informed by Cardno's understanding of the study area as contained within the Existing Conditions Assessment (V190895REP001D01), the Draft LATM Plan (V190895REP002F01), and the findings of the Community Consultation.

The Final LATM Plan provides an overview of the community consultation process for the Draft LATM Plan, and the subsequent revisions to the plan in response to the community feedback.

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

Within the study area there is only one DoT operated road, which is Gisborne Road, operating in a north-south direction, located on the east part of the study area.

2.2 Complementary Projects

Cardno understands that a number of studies and projects are currently being undertaken by DoT, 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 Gisborne Road/Grant Street (C704), as well as address concerns regarding heavy vehicle movements through the wider township. There is also a Grey Street Traffic Improvements study where Council seeks to better utilise the use of existing pavement and provide better pedestrian and cycling links.

Accordingly, it is noted here that this LATM study does not address community concerns relating to heavy vehicle movements and traffic congestion along Bacchus Marsh-Gisborne Road. Rather, this LATM study complements the broader studies being undertaken, whilst addressing concerns from the community regarding congestion and road safety within the local street network.

3 Community Consultation

3.1 Overview

Correspondence was sent to all properties within the study area on Thursday 5 December 2019, encouraging residents to visit haveyoursay.moorabool.vic.gov.au to view the draft plan and provide feedback on the proposed treatments via an interactive map or survey. The draft plan was also advertised in the local paper and on Councils social media advising that all residents are welcome to contribute.

Two drop-in community consultation sessions were held on Thursday 12th and Tuesday 17th December 2019 which allowed residents to view the plan in person, ask questions and have conversations around the recommendations.

At the drop-in sessions, Council and Cardno representatives provided background information about the LATM Study, the findings and observations, explained the proposed treatments, and sought the community's opinions on whether they supported the proposed plan, and if not, which elements of the proposed plan were they not supportive of. During the sessions, community members were asked to provide feedback on the Draft LATM plan, to allow for clarification, refinement, and identification of amendments to be incorporated into the Final LATM plan.

The interactive map provided descriptions of the proposed treatment at each location and the community's opinions were collected by asking whether they supported, partly supported, or do not support the treatment and/or its location. Additionally, interactive map users were prompted to indicate the priority ranking of the treatment on a five-point scale, with one being 'not urgent' to five being 'should be installed immediately'.

Responses to the proposed LATM plan were collated in electronic format through the interactive map until Friday 31st January 2020.

Copies of the letter and relevant consultation content are attached in Appendix A.

3.2 Drop in Session Response

Across the two community drop-in sessions, approximately 15 members of the community attended to provide detailed discussion and feedback about the Bacchus Marsh LATM Study. During these sessions, community members were invited to submit individual survey responses and place dots on maps of the Draft LATM Plan.

A total of 8 individual survey responses were received. A summary of the conclusions from key discussion points during the consultation and the individual survey responses are presented below:

- Truck activities have increased throughout the area in the past decade;
- Speeding issues throughout the study area;
- There is need for LATM measures on Nathan Drive between No 25 and 37; and
- Footpath installation on Wittick Street might interfere with property boundaries.

3.3 Online Interactive Map Response

The online interactive map recorded a total of 89 responses across 22 individual users.

A summary of the community's responses to the proposed LATM treatments is presented in Table 3-1.

Table 3-1 Online Interactive Map Responses

Treatment Type	Location	Responses					Average Priority Ranking
		Support	Partly Support	Don't Support	Total	% Support	
Speed Limit Change	Halletts Way	2	0	0	2	100%	4.5
Centerline	Nathan Drive	4	0	0	4	100%	3.25
Footpath	Davies Street	1	0	0	1	100%	4
	Holts Lane	3	1	0	4	100%	4
	Jonathan Drive	8	0	0	8	100%	4.63
	Morrison Street	3	1	0	4	100%	4.5
	Nathan Drive	1	0	2	3	33%	1.67
	Wittick Street	1	4	0	5	100%	2.6
Pram Crossing	Fitzroy Street	1	0	0	1	100%	3
	Holts Lane	0	0	1	1	0%	1
Raised Intersection	Albert Street	1	0	3	4	25%	2
	Davies Street	3	1	2	6	67%	4.3
Speed Hump	Davies Street	2	0	1	3	67%	3.67
	Holts Lane	1	0	1	2	50%	3
	Jonathan Drive	11	1	2	14	86%	3.4
	Nathan Drive	1	2	3	6	50%	2.83
	Morrison Drive	2	2	11	15	27%	2
Roundabout Upgrades	Albert St/Halletts Way	1	1	0	2	100%	3
	Albert St/Nelson St	1	1	0	2	100%	2.5
	Holts Lane/Seton Way	1	0	0	1	100%	4
	Total	**48**	**14**	**26**	**127**	**75%**	**3.2**

As indicated in the above table, most of the proposed treatments received favourable responses with 16 of the 20 treatments receiving over 50% support. One notable observation regarding proposed speed hump on Morrison Drive is that the eleven "don't support" comments were made by two residents, whereas the four "support" and "partly support" comments were from four different residents.

The priority rankings for the proposed treatments were varied, with 7 of 20 treatments receiving a priority ranking of four or above (the treatment is considered urgent).

Six (6) treatments receiving a ranking of between three and four (the treatment is considered moderately urgent), with seven (7) treatments proposed receiving a ranking of less than three (the treatment is not considered urgent).

3.4 Other Non-LATM Comments

In addition to the comments relating to the LATM measures within the study area, several comments were received that are considered to be worthy of further investigation for other safety and operation related projects:

> There is a visibility issue at the Halletts Way and Holts Lane roundabout for drivers;

> The residents along the water channel parallel to Nelson Street have raised the concern that the proposed shared use path would be almost on the same level as the top of their house fences, thus allowing an obstructed view to their private backyard. The residents have requested design alternatives to provide more privacy; and

> The roundabout of Links Road and Hallets Way needs to provide better crossing facilities for safer shared use path connection across the intersection.

3.5 Review of Community Responses

The responses from the community for each of the proposed LATM treatments that were considered a high priority, a low priority, were notably supported, or notably not supported, are detailed further in Table 3-2. This information is based on the responses to the community consultation sessions, the online interactive map, and other related correspondence.

Table 3-2 Detailed Community Feedback Summary

Treatment	Level of Support	Priority	Community Comments	Comments/Recommendation
Proposed 50 km/hr Speed Limit Change on Halletts Way	100%	4.5	None	-
Proposed Centerline on Nathan Drive	100%	3.25	"I understand that the center line would be for the full length of Nathan Drive and not just the section that has curb and channel."	Centreline is proposed only at the curves to guide vehicles to pass each other from opposite directions safely. Centerline on straight alignments would not be necessary.
Proposed Footpath on Davies Street	100%	4	None	-
Proposed Footpath on Holts Lane	100%	4	"Support all the way to Gisborne Road, for what reason would you partially lay footpath, pram crossing only to have a footpath end and people then walking on the road" "Footpaths all the way, down to traffic lights, don't understand why you would stop in sections" "consultation would be appreciated but fair enough re the footpath"	Footpaths are proposed to connect gaps between the existing footpaths.
Proposed Footpath on Jonathan Drive	100%	4.62	"Don't take out the corner indentation on Taylor and Davies as my visitors need to drive up that to avoid holding up local buses."	Concept design of the proposed LATM will be further consulted with affected residents prior to construction.
Proposed Footpath on Morrison Street	100%	4.5	None	-
Proposed Footpath on Nathan Drive	33%	1.7	"we have an acre block footpaths would take our country feel away not needed at all" "I don't consider there is a need. Children and others walking along Nathan Drive do not have nature strip obstructions that restrict walking. It is a problem if the people walking along Nathan Drive walk on the road because of the speed that cars travel along this road"	To improve travelling comfort and safety a paved footpath that is separate from the traffic lane is important, especially for more vulnerable road users such as children, baby prams, wheelchairs, etc. It can also assist to create a more "urban", slow-speed environment where motorists would be more cautious towards the other road users and decrease the severity and likelihood of crashes.

Treatment	Level of Support	Priority	Community Comments	Comments/Recommendation
Proposed Footpath on Wittick Street	100%	2.6	"As a resident of one of the houses it would be great to have some consultation of what that would entail, where the path would cut into the current garden etc." "I support a footpath but as a resident who is affected, I would like consultation before trees and plants are uprooted to know exactly where it is going. I would like to transport what plants I can, trim what needs to be trimmed and move what we can. Landscaping of our area is affected. This land has been used and developed by the owner for some time and I feel we have cared for council land well, we deserve consultation before it is disrupted." "It all depends as where the footpath will be located and nobody can tell us! We went to the information day yesterday. All our properties have either retaining walls, gardens and trees that might have to be removed if the footpath is placed right next to our fence line. The retaining walls are there for a good reason as our blocks are extremely sloped and they keep the earth from spilling onto our driveways. The more viable and cost-effective option for the footpath would be on the opposite side to our houses, along the grassy strip. That way there is no disturbance to residents or services like NBN lines, electricity or water. Also, no removal of trees from residents' gardens, some who have nurtured their gardens to improve the streetscape for over 20 years. There is also a fire hydrant abutting our fence line so that should not be removed. If the footpath had to be placed on the houses side of the street, it should be placed at road level, in line with the gutters as council have done further down in Albert Street, that way no disturbance to residents' gardens or retaining walls. Where our house is located, the street dramatically slopes down to Albert Street and any footpath could become a water fall during heavy rainfall. As it is now, some houses have been flooded at the bottom of the street due to heavy rain as the water cascades down the street. The area in Albert Street where the footpaths have been placed alongside the road is close to the Darley Fish & Chip shop for your reference. Please consider the residents objections to having their gardens torn up, retaining walls demolished and damage to their property if a footpath is placed millimetres from our fence lines."	It is a valid concern that the installation of a footpath on Wittick Street between No 47 to Albert Street would require further investigation to avoid interfering with private property boundary line. Further consultation will be carried out with all the affected residents if the project progresses and detailed plans are prepared.

Treatment	Level of Support	Priority	Community Comments	Comments/Recommendation
Proposed Pram Crossing on Fitzroy Street	100%	3	None	-
Proposed Pram Crossing on Holts Lane	0%	1	“Footpaths both sides of Holts Lane are more important than a pram crossing, I live at 92 Holts Lane and have women and children walking down hill on the road getting to the bus stop”	This does not detract from the proposal to provide a pram crossing.
Proposed Raised Intersections on Albert Street	25%	2	“I observe no traffic congestion here” “Main thoroughfare for emergency vehicles leaving Darley”	The purpose of raised intersection treatment is to slow down approaching speed from all directions to create a safer environment for all road users, rather than addressing traffic congestion. Emergency services will be included in the consultation process.
Proposed Raised Intersection on Davies Street and Taylor Drive	50%	4.3	“Speed hump needed in Taylor Drive because cars speed in Taylor to avoid Holts speed humps!” “if there's a traffic island further up Davies Street this is NOT necessary BUT a traffic island in Taylor street IS necessary as kids often play on the road, also there is a bend on the east end of the road that affects visibility, hence needs slower driving” “Think of the busses current is too small needs widening not raising” “Dangerous for BUSES Maybe think of flattening and enlarging the Taylor/Davies Street intersection” “But not a speed hump as well. Not necessary to do both”	One speed hump has been added to the final LATM plan. According to Austroads standards, speed calming devices need to be 75m-100m apart in order to be effective. The distance between the proposed raised intersection and proposed speed hump is roughly 100m. The raised intersection will be installed to cater for bus operation.
Proposed Speed Humps on Davies Street	67%	3.7	“A speed hump in Taylor Street more relevant.”	One speed hump has been added to the final LATM plan.
Proposed Speed Humps on Holts Lane	50%	3	“Footpaths in both sides of the road, Pram crossings and still be walking on the road as there is no footpaths”	Footpath has been proposed on Holts Lane where there is no footpath on either side.

Treatment	Level of Support	Priority	Community Comments	Comments/Recommendation
Proposed Speed Humps on Jonathan Drive	86%	3.4	“Due to the fact that Jonathan Drive has a lot of idiot drivers that speed and don’t stop cars are likely to end up in houses. Yes something needs to be done but it’s the Intersection of Jonathan Drive and Gisborne Road.” “Speed Humps damage vehicle and unnecessarily restrict traffic flow.”	The intersection of Jonathan Drive and Gisborne Road is under DoT jurisdiction and not part of this project. Due to the limitation of road width on Jonathan Drive there is no more effective LATM measure appropriate in this environment.
Proposed Speed Humps on Nathan Drive	50%	2.83	"1. A Speed Hump needs to be placed between Hallets Way and the Centre Line to slow driver speed prior to the S-bend in the road and the start of the downward grade. drivers tend to accelerate from Hallets Way and if they hit the hump on the down grade it could result in an accident. 2. There is a break in the proposed footpath...is this intentional (if so why?) or is it just not completed? 3. These improvements will assist in safety for motorists and residents, but please give further thought to the placement of the Street Humps. Thank you. Happy festive season." “Need to have at least one of the speed humps up near 40 Nathan as cars accelerate significantly when entering from Hallets Way at this point and there are young children living in this area.” “This section of the road is very steep. The road, in conjunction with the speed humps, desperately need widening to provide increased safety.” “Speed Humps damage vehicle and unnecessarily restrict traffic flow.”	A speed hump has been added to the final LATM plan outside of No. 31 on Nathan Drive. Footpaths are proposed to connect gaps between the existing footpaths. Widening road width would not likely result in better road safety, but rather encourage higher operating speed. Similar to Jonathan Drive, Nathan Drive also has limited options for LATM measures due to its narrow road width.
Proposed Speed Humps on Morrison Drive	27%	2	“Too many speed humps for the length of the street” “Not quite sure why so many speed humps necessary” “Speed Humps damage vehicle and unnecessarily restrict traffic flow” “No data in the study to support this” “Living in Hine Court, Morrison Drive is my only path home. I do not believe there is any problem with traffic on Morrison Drive.”	The four proposed speed humps have been reduced to two, with a modified T-intersection treatment proposed at the intersection of Morrison Drive and Sheldon Avenue. Morrison Drive is in close proximity to Darley Primary School, thus it is paramount that a slower speed environment is provided where children can be expected to frequently access.

Treatment	Level of Support	Priority	Community Comments	Comments/Recommendation
Existing Roundabout Upgrade on Albert Street and Nelson Street	100%	2.5	“Must cater for emergency vehicles leaving adjacent station”	Emergency services will be included in the consultation
Existing Roundabout Upgrade on Halletts Way and Links Road	100%	3	“can't quite see what needs to change for the Halletts way/albert street one:	This roundabout has poor deflection for the left-turning vehicles from Albert Street turning into Halletts Way, thus creating a speeding risk.
Existing Roundabout Upgrade on Holts Lane and Seton Way	100%	4	None	-

4 Recommended Final Local Area Traffic Management Plan

4.1 Detailed of the Final LATM Plan

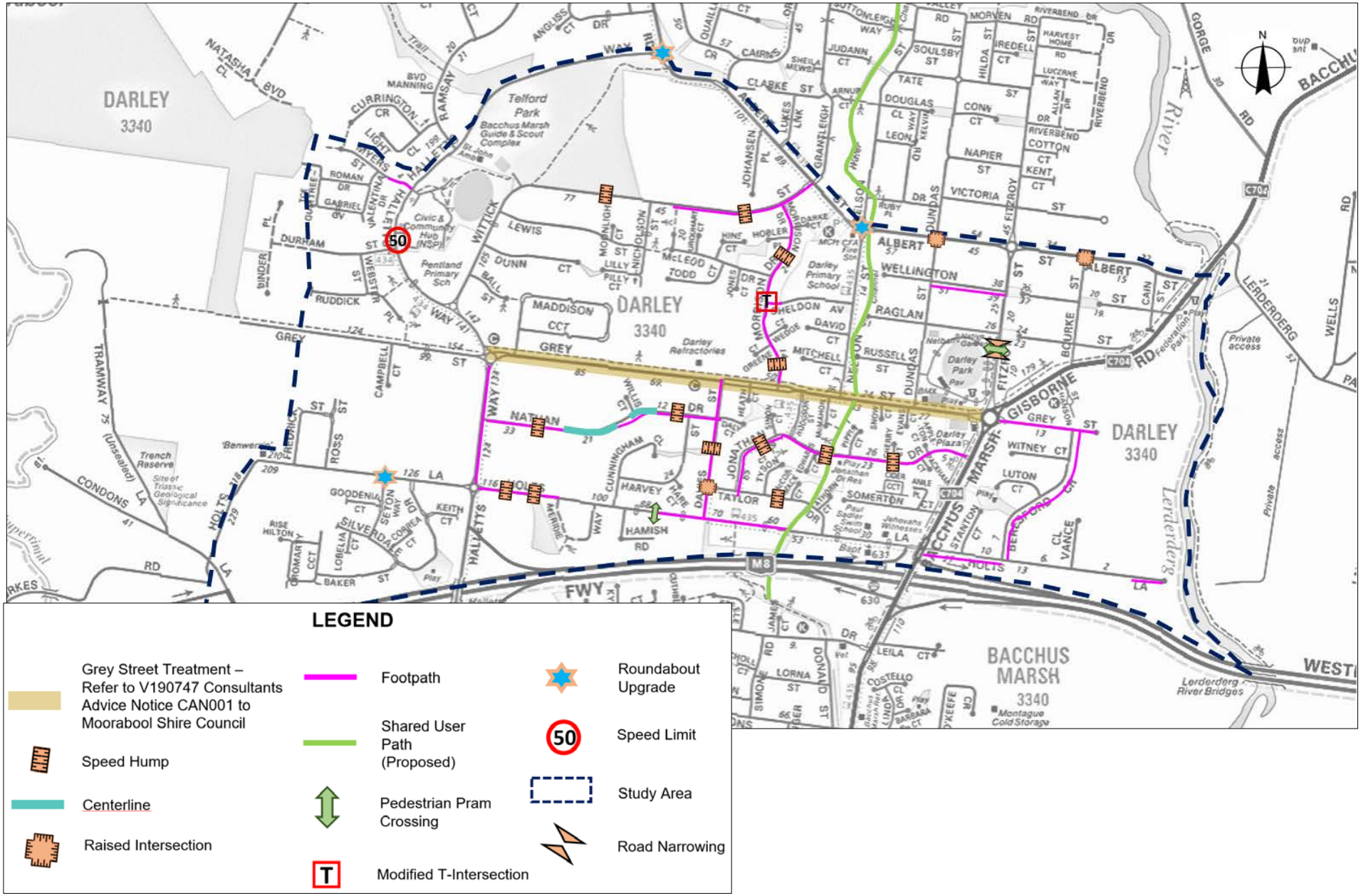
Based on the community consultation process, recommendations of Council and further investigations undertaken, the following adjustments to the LATM Plan have been made:

- Add a speed hump outside of 19 Taylor Drive;
- Add two speed humps on Wittick Street, outside of No 27 and No 75;
- Remove two speed humps on Morrison Drive, and add a modified T-intersection treatment at the Sheldon Avenue and Morrison Drive intersection; and
- Add a speed hump outside of 29 Nathan Drive.

4.2 Final LATM Plan

The recommended plan is shown in Figure 4-1. A detailed version can be seen in Appendix B.

Figure 4-1 Final Local Area Traffic Management Plan



4.3 Overview of Treatments

The following section represents an overview of the more complex treatments and provides example images for these treatments.

4.3.1 Centre Blister

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 4-2 provides an example of a centre blister LATM treatment.

Figure 4-2 Centre Blister

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.

4.3.2 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 4-3 shows an example of a modified T-intersection treatment.

Figure 4-3 Modified T Intersection (Burbidge Dr / Lone Pine Sq, Bacchus Marsh)

Courtesy of Nearmap

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.

4.3.3 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 4-4 presents an example of a typical speed hump treatment.

Figure 4-4 Speed Hump

Advantages of road 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 road 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.

4.3.4 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 4-5 presents an example of a raised intersection treatment.

Figure 4-5 Raised Intersection

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.

4.3.5 Surface Treatment / Threshold 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 4-6 presents an example of a threshold treatment.

Figure 4-6 Threshold Treatment (Clifton Dr / Cuthbertson Ct, Bacchus Marsh)

Courtesy of Nearmap

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.

4.3.6 Road Narrowing / Kerb Outstands

Road narrowing treatments involve narrowing the width of a road in a specific location to reduce vehicle speeds, improve delineation of road areas and minimise pedestrian crossing distances. Road narrowing is typically achieved by extending the kerb into the roadway via the use of kerb outstands, which can be used for landscaping. Figure 4-7 shows an example of a road narrowing treatment.

Figure 4-7 Road Narrowing Treatment (Graham St / Pilmer St, Bacchus Marsh)

Courtesy of Nearmap

Advantages of Road Narrowing Treatments

> Reduce vehicle speeds;
> Relatively low cost;
> Opportunities for landscaping;
> Relatively minimal impact for emergency vehicles; and
> Significantly less disruptive than alternative LATM treatments.

Disadvantages of Threshold Treatments

> Reduce parking supply;
> Difficult to accommodate bicycle lanes;
> Introduce squeeze points for cyclists; and
> May increase congestion on high volume streets.

4.4 Cost Estimates & Treatment Priority List

Table 4-1 outlines the indicative treatment cost and priority of the Final LATM Plan. The estimated costs are indicative only, and have been prepared to assist in developing an implementation plan. The installation costs of traffic management can vary considerably and largely depend on the extent and design of devices. The main components that typically influence construction costs are the materials used, need for kerb reconstruction, impact on existing drainage, telecommunications pits, and discovery of other underground services e.g. gas, water, possible relocation of power poles, and degree and type of landscaping.

In the case of these works, while staging the construction of works is generally necessary due to funding constraints, the staging of works needs careful consideration to minimise the interim impact of treatments on surrounding streets.

In staging the works, Council should have regard to the following considerations:

> The benefits should be immediate and obvious to residents. The staging should appear logical to residents to ensure acceptance of plan;

> Locations where crash problems have been identified should be given a priority;

> Maximum effort should be made to avoid transferring traffic impacts, regardless of their duration;

> Installation should be delayed for treatments which may not be required or may need to be modified depending on the effects of earlier stages; and

> Possible cost savings from grouping devices into a single stage or focusing on one location should be considered, where possible.

The priority of each treatment has been derived using a number of factors to create a priority ranking tool. Factors were allocated a score between 0 and 2, resulting in a priority score for each treatment out of 10 (with 10 representing the highest priority). This was combined with the second community consultation regarding the timing of the treatment, to determine a recommended time of implementation for each treatment where:

> **High** – Should be actioned in the short term (1 – 2 years)

> **Medium** – Should be actioned in a medium-term (2 – 5 years)

> **Low** – Should be actioned in the long-term (5+ years)

The key factors and its ranking criteria are outlined below:

1. Cost – The cost of each treatment has been approximated based on the cost of construction / implementation only, and thus provides a general assessment of the cost comparison between each treatment. Given the approximated costs the treatments were given a cost score as follows:
   > A score of 0 was given for any treatment costing more than $200,000;
   > A score of 0.5 was given for any treatment costing between $50,000 and $200,000;
   > A score of 1.0 was given for any treatment costing between $20,000 and $50,000;
   > A score of 1.5 was given for any treatment costing between $10,000 and $20,000; and
   > A score of 2.0 was given for any treatment costing less than $10,000.
2. Importance – The importance of each treatment was based on the community's priority ranking received via the online interactive map.
3. Volume – The score for volume was assessed similarly to cost. For locations where traffic volumes were unknown, volumes were projected from known nearby traffic volumes. The volume score was determined as follows:
   > A score of 0.5 was given at locations with volumes less than 5,000 vpd;
   > A score of 1.0 was given at locations with volumes between 5,000 and 10,000 vpd;
   > A score of 1.5 was given at locations with volumes between 10,000 and 20,000 vpd; and
   > A score of 2.0 was given at locations with volumes greater than 20,000 vpd.
4. Speed / Safety – The score for speed / safety aspects of each treatment was assessed based on the existing speed and safety issues at the location of each treatment. As such, locations where safety was flagged as a serious issue in combination with high speeds were given a high score, and locations where

speed and/or safety were not a major concern were given a lower score. All scores were assessed with consideration to the impact the proposed treatment would have in addressing speed and/or safety concerns.

5. Overall community feedback – The score for community feedback was assessed based on the overall community discussions and survey results regarding each treatment and issue that had been collated through the entire LATM study. The score was weighted towards the level of support received in the community workshops and online interactive map responses. At locations where a small number of responses were received, additional consideration was given to written feedback.

Table 4-1 Treatment Priority and Cost Summary Table

Treatment ID	Treatment	Location	Cost (Estimate Only)	Total Score (10)	Priority	Timeframe
T016	Speed Hump	Wittick Street	$8,000	8.5	High	1 - 2 years
T026	speed limit change	Halletts Way	$1,000	8.3	High	1 - 2 years
T010	Footpath	Halletts Way	$34,000	8.0	High	1 - 2 years
T021	roundabout upgrades	Holts Lane	$20,000	8.0	High	1 - 2 years
T019	roundabout upgrades	Albert Street	$20,000	7.8	High	1 - 2 years
T020	roundabout upgrades	Halletts Way	$20,000	7.5	High	1 - 2 years
T013	Speed Hump	Jonathan Drive	$12,000	7.4	High	1 - 2 years
T004	Footpath	Jonathan Drive	$72,250	7.3	High	1 - 2 years
T011	Speed Hump	Davies Street	$4,000	7.2	High	1 - 2 years
T025	Centerline	Nathan Drive	$2,000	7.1	High	1 - 2 years
T002	Footpath	Davies Street	$34,000	7.0	Medium	2 - 5 years
T003	Footpath	Holts Lane	$93,500	7.0	Medium	2 - 5 years
T006	Footpath	Myers Street	$7,000	7.0	Medium	2 - 5 years
T012	Speed Hump	Holts Lane	$8,000	7.0	Medium	2 - 5 years
T018	raised intersection	Davies Street	$18,000	7.0	Medium	2 - 5 years
T009	Footpath	Wittick Street	$42,500	6.8	Medium	2 - 5 years
T005	Footpath	Morrison Drive	$51,000	6.8	Medium	2 - 5 years
T024	Modified T-Intersection	Morrison Drive	$15,000	6.8	Medium	2 - 5 years
T008	Footpath	Wellington Street	$21,250	6.0	Medium	2 - 5 years
T022	Pedestrian Crossing with Road Narrowing	Fitzroy Street	$40,000	6.0	Medium	2 - 5 years
T015	Speed Hump	Nathan Drive	$8,000	5.9	Medium	2 - 5 years
T014	Speed Hump	Morrison Drive	$8,000	5.5	Medium	2 - 5 years
T017	raised intersection	Albert Street	$36,000	5.5	Medium	2 - 5 years
T007	Footpath	Nathan Drive	$63,750	4.8	Medium	2 - 5 years
T023	Pedestrian Crossing	Holts Lane	$20,000	4.7	Medium	2 - 5 years
T001	Footpath	Beresford Crescent	$42,500	4.8	Low	5+ years
			$701,750.00			

**Cost estimates do not include costs associated with replacing existing drainage infrastructure.*

Please refer to Appendix C for additional information regarding the priority ranking and cost estimates of these treatments.

5 Summary and Conclusions

The objective of this study was to prepare a Local Area Traffic Management (LATM) plan for the Bacchus Marsh Darley area, which addresses the main traffic issues in the area and reflects the requirements and expectations of the local community.

The LATM Study involved extensive consultation with the local community to identify local traffic issues and possible improvements, in conjunction with engineering investigations. Other components of the study have included the collection of traffic volume and speed information, as well as investigation of publicly available crash data.

The community consultation component of the study included an online interactive map and two community workshops, in order to understand the community's thoughts regarding necessary areas for improvement, as well as the suitability of proposed treatments.

The key issues identified in the study generally related to traffic concerns such as heavy vehicle volumes, pedestrian and cyclist safety, traffic speed, and irresponsible driving.

Based on the preceding assessment undertaken by Cardno and community feedback on the proposed Local Area Traffic Management Plan, the next steps area as follows:

> The traffic treatments programs are to be listed in the Capital Work's Program to obtain funding from the Council;

> Council will distribute a letter to the local community advising of the outcomes of the study and including the adopted Final Local Area Traffic Management Plan;

> The implementation of traffic management measures will commence in the next 1-2 years. The order of implementation will be based off available funding, resource availability and the priority order outlined within this Final LATM Plan;

> Where necessary, Council will consult with property owners abutting the device locations at the design stage regarding exact locations and design; and

> Following installation, Council will continue to monitor safety and performance, to ensure that any effects caused by the imposed LATM measures are discovered and mitigated against.

0BBacchus Marsh Local Area Traffic Management Study – Area 1

APPENDIX A

COMMUNITY CONSULTATION MATERIALS

To the Resident
«Address»
«Suburb» VIC «Post_Code»

<<DATE>>
Ref: JM:jy
RN: 16/03/005

Local Area Traffic Management Study (Stage 3) Darley – Community Consultation

As you would be aware, Moorabool Shire Council is undertaking a Local Area Traffic Management (LATM) study within a precinct of Darley, to improve traffic management and road safety within your area.

Council recently asked residents for their input, to assist in identifying the key traffic issues being experienced within the study area, as well as validating some of the issues previously raised. From the extensive feedback received, a draft LATM plan has been prepared and has been endorsed by Council for a further phase of community consultation.

A copy of the draft plan is available to view at haveyoursay.moorabool.vic.gov.au where residents are encouraged to provide comments on the proposed treatments via the link to the interactive map until **5.00pm Sunday 5 January 2020**.

In addition to this, two drop-in sessions will be held to allow residents to view the plan, ask questions and have conversations around the recommendations. Bookings are not required and residents can attend at any time during the sessions.

Session 1: Thursday 12 December 2019
4.30pm – 7.00pm
Darley Civic and Community Hub - Pavilion

Session 2: Tuesday 17 December 2019
4.30pm – 7.00pm
Darley Civic and Community Hub - Pavilion

We encourage residents to enter the Darley Civic and Community Hub via Wittick Street entrance and use the carpark closest to the Pavilion.

We look forward to receiving your feedback on the draft plan. Should you have any queries in relation to the above, please contact Matthew Ballard (Cardno) on 8415 7777.

Yours sincerely,

John Miller
Manager Assets

COMMUNITY CONSULTATION

BACCHUS MARSH LOCAL AREA TRAFFIC MANAGEMENT STUDY – Stage 3 (Darley)

Community Consultation (Phase 2); The Draft LATM Plan

Council recently asked residents for their input, to assist in identifying the key traffic issues being experienced within the study area, as well as validating some of the issues previously raised. Over 323 responses were received from the community, along with multiple other engagements, as part of this initial phase of consultation.

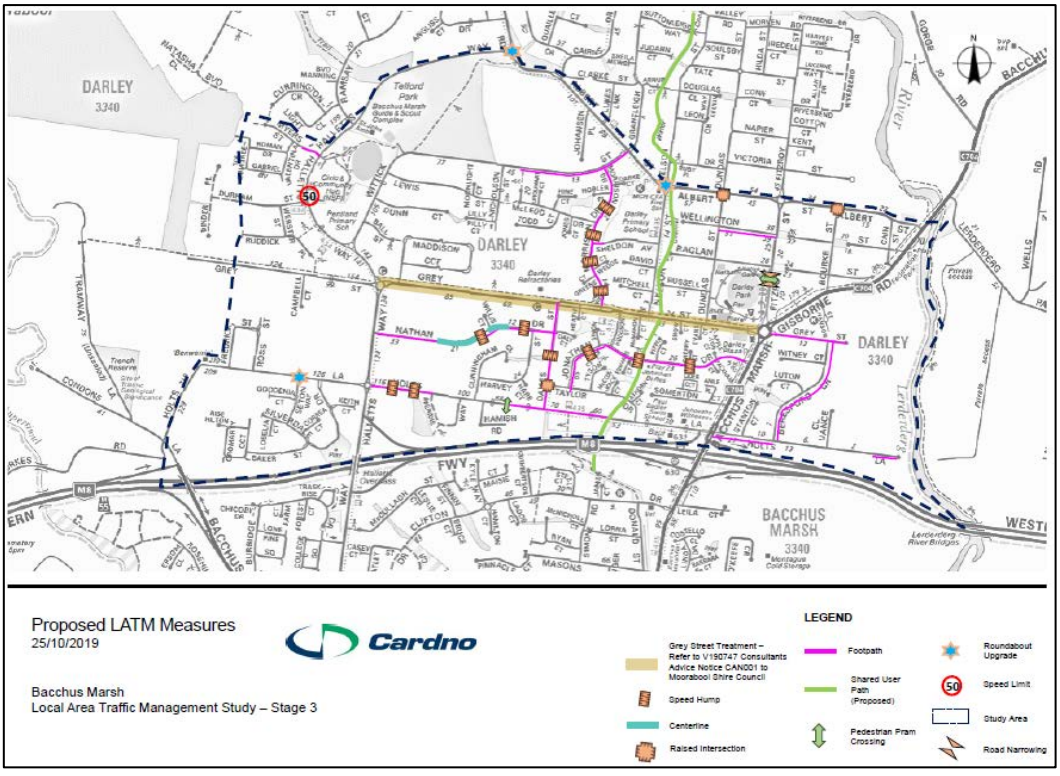
This feedback, along with traffic data collected, has been translated into a series of proposed treatments that aim to address the key traffic issues raised. The draft LATM plan has been endorsed by Council for Phase 2 of the consultation process and we now invite the community to provide further feedback on the plan **until 5.00pm, Sunday 5 January 2020**.

Visit haveyoursay.moorabool.vic.gov.au to view the draft documentation and provide feedback on the proposed treatments, or drop in to one of our information sessions to find out more:

Drop in Session 1	Drop in Session 2
Thursday 12 December 2019 4.30pm – 7.00pm Darley Civic and Community Hub - Pavilion	Tuesday 17 December 2019 4.30pm – 7.00pm Darley Civic and Community Hub - Pavilion

Bookings for the sessions are not required and residents can attend at any time during the sessions. We encourage residents to enter the Darley Civic and Community Hub via Wittick Street entrance and use the carpark closest to the Pavilion.

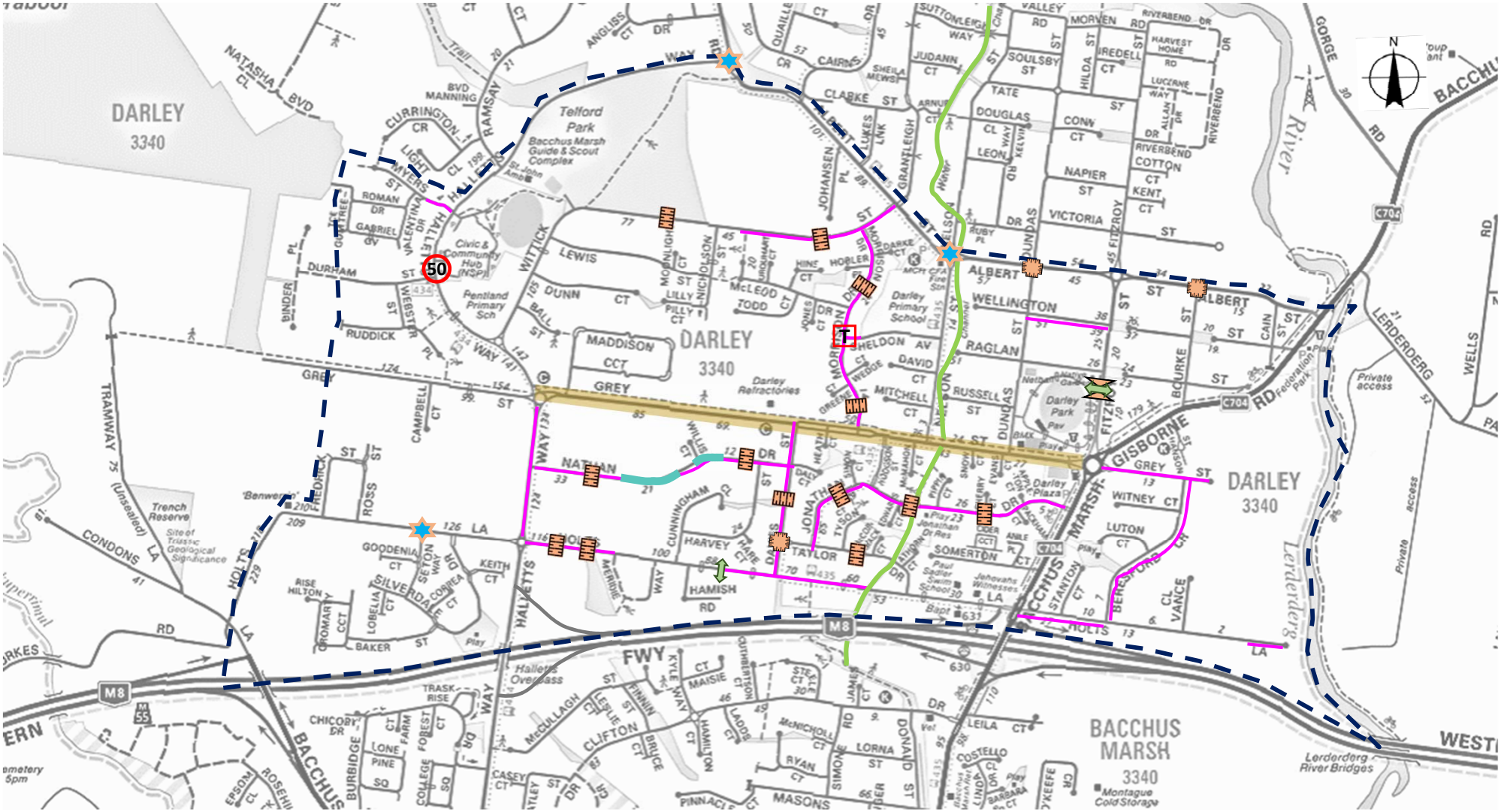
If you have any queries or require any further information, please contact Matthew Ballard (Cardno) on 8415 7777 or Council on 5366 7100.



0BBacchus Marsh Local Area Traffic Management Study – Area 1

APPENDIX B

FINAL LATM PLAN



Finalised Proposed
LATM Measures
07/02/2020

Cardno

Bacchus Marsh
Local Area Traffic Management Study – Stage 3

LEGEND

- Grey Street Treatment – Refer to V190747 Consultants Advice Notice CAN001 to Moorabool Shire Council
- Speed Hump
- Centerline
- Raised Intersection
- Footpath
- Shared User Path (Proposed)
- Pedestrian Pram Crossing
- T — Modified T-Intersection
- Roundabout Upgrade
- 50 — Speed Limit
- Study Area
- Road Narrowing

0BBacchus Marsh Local Area Traffic Management Study – Area 1

APPENDIX C

COST ESTIMATES AND PRIORITY RANKING

Appendix C: Cost Estimates & Priority Ranking

Treatment ID	Treatment	Location	Cost (Estimate Only)	Importance	Volume (vpd)	Speed / Safety	Community Feedback (% of support)	Cost Score (2)	Importance Score (2)	Volume Score (2)	Speed / Safety Score (2)	Community Feedback Score (2)	Total Score (10)	Priority	Responsibility
T001	Footpath	Beresford Crescent	$ 42,500	4.0	300	2.0	33%	1.0	1.6	0.5	1.0	0.7	4.8	Low	Council
T002	Footpath	Davies Street	$ 34,000	4.0	400	3.0	100.00%	1.0	2.0	0.5	1.5	2.0	7.0	Medium	Council
T003	Footpath	Holts Lane	$ 93,500	4.0	1000	4.0	100.00%	0.5	2.0	0.5	2.0	2.0	7.0	Medium	Council
T004	Footpath	Jonathan Drive	$ 72,250	4.6	500	4.0	100.00%	0.5	2.3	0.5	2.0	2.0	7.3	High	Council
T005	Footpath	Morrison Drive	$ 51,000	4.5	1200	3.0	100.00%	0.5	2.3	0.5	1.5	2.0	6.8	Medium	Council
T006	Footpath	Myers Street	$ 7,000	4.0	100	1.0	100.00%	2.0	2.0	0.5	0.5	2.0	7.0	Medium	Council
T007	Footpath	Nathan Drive	$ 63,750	1.7	500	2.0	100.00%	0.5	0.8	0.5	1.0	2.0	4.8	Medium	Council
T008	Footpath	Wellington Street	$ 21,250	4.0	200	1.0	100.00%	1.0	2.0	0.5	0.5	2.0	6.0	Medium	Council
T009	Footpath	Wittick Street	$ 42,500	2.6	800	4.0	100.00%	1.0	1.3	0.5	2.0	2.0	6.8	Medium	Council
T010	Footpath	Halletts Way	$ 34,000	4	9000	4.0	100.00%	1.0	2.0	1.0	2.0	2.0	8.0	High	Council
T011	Speed Hump	Davies Street	$ 4,000.00	3.7	400	3.0	67.00%	2.0	1.9	0.5	1.5	1.3	7.2	High	Council
T012	Speed Hump	Holts Lane	$ 8,000.00	3	1000	4.0	50.00%	2.0	1.5	0.5	2.0	1.0	7.0	Medium	Council
T013	Speed Hump	Jonathan Drive	$ 12,000.00	3.4	500	4.0	86.00%	1.5	1.7	0.5	2.0	1.7	7.4	High	Council
T014	Speed Hump	Morrison Drive	$ 8,000.00	2	1200	3.0	27.00%	2.0	1.0	0.5	1.5	0.5	5.5	Medium	Council
T015	Speed Hump	Nathan Drive	$ 8,000.00	2.83	500	2.0	50.00%	2.0	1.4	0.5	1.0	1.0	5.9	Medium	Council
T016	Speed Hump	Wittick Street	$ 8,000.00	4	800	4.0	100.00%	2.0	2.0	0.5	2.0	2.0	8.5	High	Council
T017	raised intersection	Albert Street	$ 36,000.00	2	5600	4.0	25.00%	1.0	1.0	1.0	2.0	0.5	5.5	Medium	Council
T018	raised intersection	Davies Street	$ 18,000.00	4.3	400	3.0	67.00%	1.5	2.2	0.5	1.5	1.3	7.0	Medium	Council
T019	roundabout upgrades	Albert Street	$ 20,000.00	2.5	5600	4.0	100.00%	1.5	1.3	1.0	2.0	2.0	7.8	High	Council
T020	roundabout upgrades	Halletts Way	$ 20,000.00	3	4000	4.0	100.00%	1.5	1.5	0.5	2.0	2.0	7.5	High	Council
T021	roundabout upgrades	Holts Lane	$ 20,000.00	4	1000	4.0	100.00%	1.5	2.0	0.5	2.0	2.0	8.0	High	Council
T022	Pedestrian Crossing with Road Narrowing	Fitzroy Street	$ 40,000.00	3	5000	2.0	100.00%	1.0	1.5	0.5	1.0	2.0	6.0	Medium	Council
T023	Pedestrian Crossing	Holts Lane	$ 20,000.00	1	1000	4.0	10.00%	1.5	0.5	0.5	2.0	0.2	4.7	Medium	Council
T024	Modified T-Intersection	Morrison Drive	$ 15,000.00	4.5	1200	3.0	50.00%	1.5	2.3	0.5	1.5	1.0	6.8	Medium	Council
T025	Centerline	Nathan Drive	$ 2,000.00	3.25	500	2.0	100.00%	2.0	1.6	0.5	1.0	2.0	7.1	High	Council
T026	speed limit change	Halletts Way	$ 1,000.00	4.5	4000	3.0	100.00%	2.0	2.3	0.5	1.5	2.0	8.3	High	Council
			$ 701,750.00												

ASSUMPTIONS

That each item is completed separately or with only a few other items. If many of these are bulked together, a discout would be expected on a lot of these estimates

Shared paths are 3m wide and standard footpaths are 1.5m. These are 175mm thick concrete footpath with 75mm crushed rock base.

- We have assumed the centre blisters will be landscaped with either grass or small plants, not concrete island infill. We estimate this would increase costs by around 50-60%
- Threshold treatments are assumed to be standard Council 3m wide raised pavements including line marking and signage.