



# LOCAL AREA TRAFFIC MANAGEMENT

CLARENDON LOCAL AREA TRAFFIC MANAGEMENT STUDY

CLARENDON PRECINCT, THORNBURY

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## CLARENDON PRECINCT, THORNBURY

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## 1 INTRODUCTION

O'Brien Traffic has been engaged by Darebin City Council to undertake a Local Area Traffic Management study of the area bound by Dundas Street, High Street, Darebin Road and Station Street in Thornbury.

In the course of preparing this report:

- The subject area has been inspected;
- Traffic volume and speed data has been reviewed and analysed;
- Crash data has been analysed;
- Community issues and suggestions have been considered;
- Issues and opportunities have been identified; and
- A Local Area Traffic Management Strategy has been developed.

## 2 STUDY AREA

The study area is bound by Dundas Street, High Street, Darebin Road and Station Street in Thornbury, as shown in **Figure 1**.

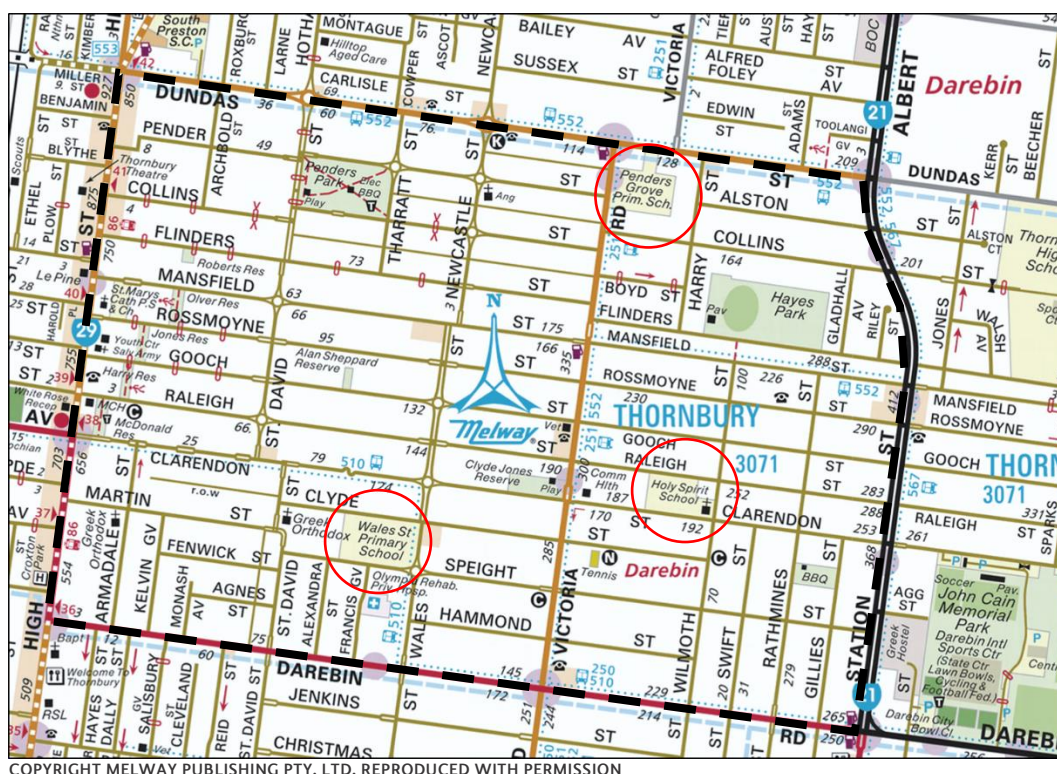


FIGURE 1: STUDY AREA



The study area is predominantly residential. Other land uses include:

- Three primary schools - Wales Street Primary School, Holy Spirit Primary School and Penders Grove Primary School (highlighted in **Figure 1**);
- Three reserves including Penders Park, Hayes Park and a pocket park on Rathmines Street; and
- Commercial/retails premises, including the strip located along High Street on the western boundary of the subject site.

Bus routes operate within the study area, on Dundas Street, Station Street, Mansfield Street, Victoria Road, Clarendon Street, Wales Street and Darebin Street.

### 3 EXISTING CONDITIONS

#### 3.1 STREET NETWORK

##### 3.1.1 Arterial roads

The study area is bounded by the arterial roads of Darebin Road, Station Street and High Street (south of Clarendon Street) to the south, east and west respectively.

Arterial roads are under the control and management of VicRoads.

**Station Street** is a Primary Arterial Road between Dundas Street and Darebin Street. It provides two traffic lanes and one bicycle lane in each direction, separated by a median island. Pedestrian operated signals are provided south of Clarendon Street, south of Mansfield Street and north of Collins Street.

**Darebin Road** is a Secondary Arterial Road and provides one traffic lane, one bicycle lane and one parking lane in each direction. Pedestrian operated signals are provided west of Wales Street.

**High Street** is a Secondary Arterial Road south of Clarendon Street. It provides one traffic lane in each direction with kerbside parking provided in marked parallel spaces and centre of the road tram tracks.

##### 3.1.2 Major Council Roads

Dundas Street and High Street (north of Clarendon Street), on the northern and western boundaries of the study area, are Major Council Roads. Victoria Road, which runs in a north-south orientation through the area is also a Major Council Road.

**Dundas Street** provides one traffic lane, a bicycle lane and a parking lane in each direction.

**High Street** provides one traffic lane in each direction with kerbside parking provided in marked parallel space and centre of the road tram tracks. Traffic signals are provided at the Clarendon Street intersection and pedestrian operated signals are provided south of Mansfield Street.

**Victoria Road** provides one traffic lane, a bicycle lane and a parking lane in each direction. Victoria Road intersects with Dundas Street and Darebin Road at traffic signals. Pedestrian operated signals are located north of Clarendon Street and south of Dundas Street (adjacent to Pender's Grove Primary School).

### 3.1.3 Local streets

All other streets in the study area are local streets. These are typically orientated approximately east-west or north-south and provide for two-way traffic movements (with the exception of two one-way streets – see below).

Many of the local streets have existing traffic management treatments, as shown in Error! Reference source not found..

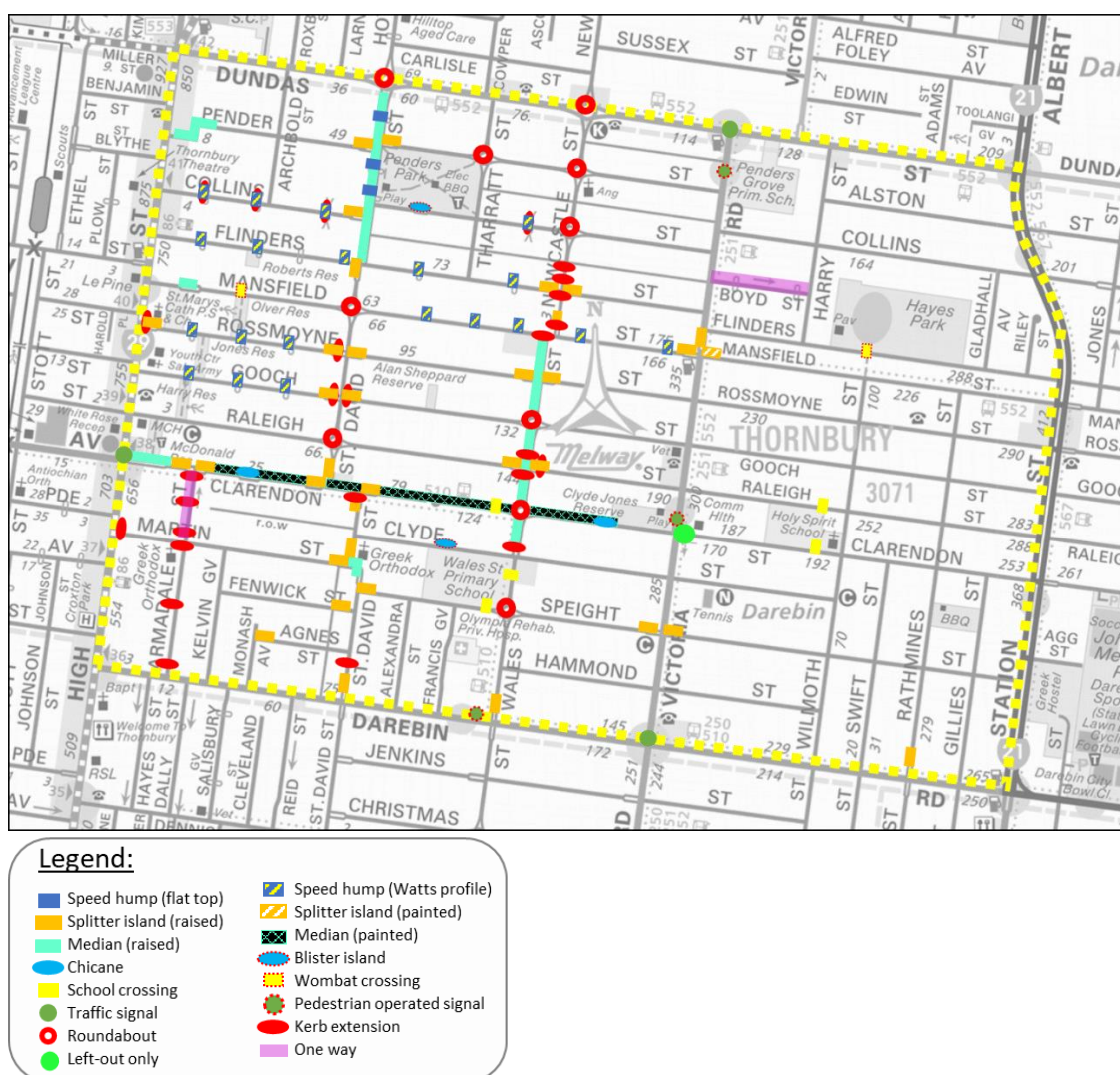


FIGURE 2: EXISTING TRAFFIC MANAGEMENT TREATMENTS

Existing traffic management treatments include:

- Speed humps
  - Gooch Street (High Street – St David Street);
  - Rossmoyne Street (High Street – St David Street);

- Mansfield Street (St David Street – Victoria Road);
- Flinders Street (High Street - Wales Street);
- Collins Street (High Street – Victoria Road); and
- St David Street (Flinders Street – Dundas Street).
- Roundabouts
  - Wales Street at Speight Street, Clarendon Street and Gooch Street
  - St David Street at Raleigh Street, Mansfield Street and Dundas Street;
  - Newcastle Street at Collins Street, Pender Street and Dundas Street; and
  - Pender Street at Tharratt Street.
- One-way streets - Boyd Street and Armadale Street (northern section).
- Left out only treatment on Clarendon Street (east) at Victoria Road.
- Median treatments
  - Wales Street (Clyde Street – Mansfield Street);
  - St David Street (Flinders Street – Dundas Street); and
  - Clarendon (High Street – Victoria Road).
- Chicanes - Clarendon Street (High Street – Victoria Road).

Kerbside parking is typically permitted in most streets.

### 3.1.4 Speed Zones

The 50 km/h default urban speed limit currently applies to the study area (including Dundas Street), with the exception of:

- A 40 km/h zone on Wales Street, Clyde Street and Speight Street in the vicinity of the Wales Street Primary School;
- A 40 km/h zone on Clarendon Street in the vicinity of Holy Spirit Primary School;
- A 40 km/h zone on Raleigh Street in the vicinity of Holy Spirit Primary School;
- A 40km/h School Speed Zone on Victoria Road in the vicinity of Penders Grove Primary School; and
- High Street (40 km/h, 8am-midnight), Darebin Road (60 km/h), and Station Street (60 km/h).

The existing speed zones in the study area are shown in **Figure 3**.

However, Council will apply to have the speed limit for the area reduced to 40 km/h as part of implementation of the LATM Scheme.





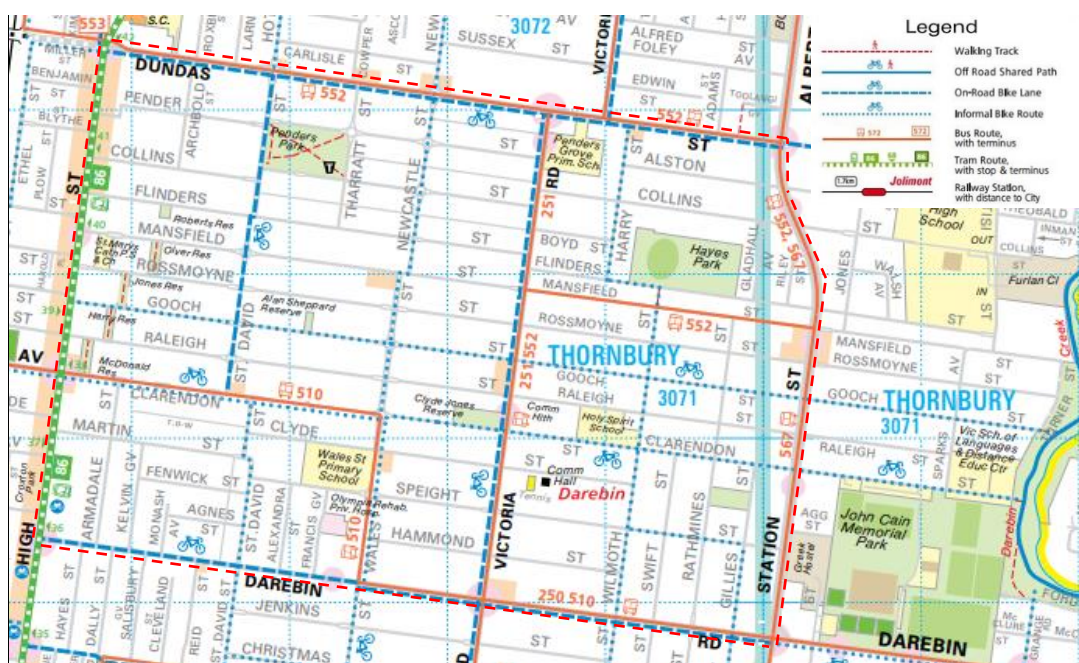
Bus routes operate along Dundas Street, Station Street, Darebin Road, Victoria Road, Clarendon Street, Wales Street (south of Clarendon Street), and Mansfield Street (east of Victoria Road).

High Street is a tram route.

Thornbury and Croxton Stations are located approximately 200m west of the study area.

### 3.3 BICYCLE ROUTES

Bicycle routes are shown in Figure 5.



SOURCE: YARRA TRAVELSMART MAP

FIGURE 5: BICYCLE ROUTES

Bicycle lanes are provided on Darebin Road, Dundas Street, Victoria Road and St David Street (north of Clarendon Street).

Clarendon Street, Gooch Street, St David Street (south of Clarendon Street), Newcastle Street - Wales Street, Harry Street - Flinders Street - Wilmoth Street, Speight Street (Wilmoth Street to Gilles Street) and Gillies Street (south of Speight Street) are informal bicycle routes.

### 3.4 TRAFFIC VOLUMES AND SPEED DATA

Traffic volume and speed data was provided by Council and is presented diagrammatically in **Appendix A**. This includes:

- Average weekday traffic volumes;
- Average weekday AM and PM peak hour volumes; and
- 85<sup>th</sup> percentile speed<sup>1</sup> data.

<sup>1</sup> The speed at which 85% of all vehicles travel under.



### 3.4.1 Traffic volumes

Most local streets within the study area have traffic volumes less than 1,000 vpd. The streets with traffic volumes greater than 2,000 vpd are:

- Clarendon Street (High Street – St David Street) - 6,549 vpd;
- Clarendon Street (St David Street – Victoria Road) - 3,578 vpd;
- St David Street (south of Clarendon Street) – 3,132 vpd; and
- Wales Street – 2,442 vpd.

### 3.4.2 Vehicle speeds

When analysing speed data, it is the industry norm to consider 85<sup>th</sup> percentile speeds – that is, the speed at which 85% of all vehicles travel at or under. The premise is that the 85<sup>th</sup> percentile speed reflects the speed environment of the road, as this the speed that most drivers choose to travel at or below, regardless of the speed limit.

An overview of 85<sup>th</sup> percentile speeds in the study area is shown in **Figure 6**.

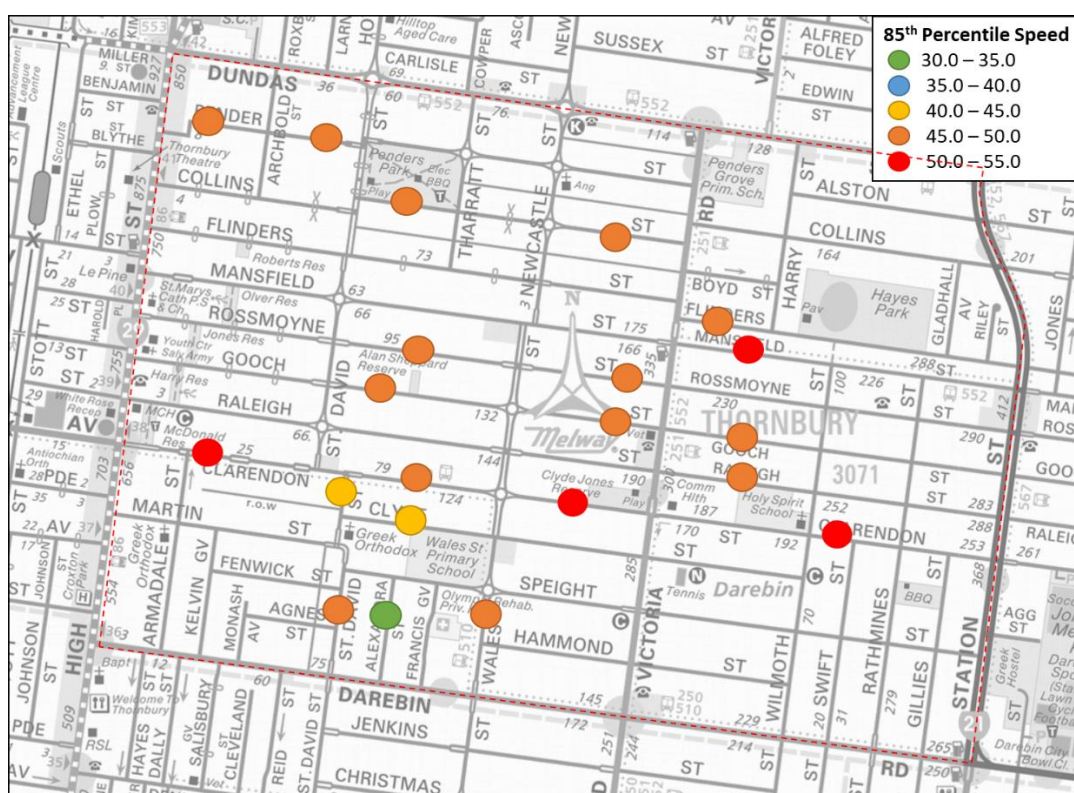


FIGURE 6: 85<sup>TH</sup> PERCENTILE SPEED DATA

As shown in **Figure 6**, most of the local streets with current traffic data have 85<sup>th</sup> percentile speeds less than 50 km/h, with the exception of:

- Clarendon Street (85<sup>th</sup> percentile speed of 49-52.4 km/h; and
- Mansfield Street (east of Victoria Road) (85<sup>th</sup> percentile speed of 54.1 km/h).



### 3.5.3 Cross intersection crashes

Eleven casualty crashes occurred at cross intersections controlled by Stop/Give Way signs and involved vehicles from adjacent directions.

Three of the above 11 crashes occurred at the Victoria Road/Clarendon Street intersection.

## 4 CONSULTATION

A Community Engagement Workshop was held on 28<sup>th</sup> March 2018 at the Darebin Bowls Club Function Room in Thornbury. The Workshop sought to obtain the views and concerns of local residents and identify 'problem' locations.

Participants were invited to write down their concerns and suggestions on post-it notes and stick them onto A1 size maps located around the room. O'Brien Traffic and Council staff were available to answer questions and contribute to discussions.

Areas of concern identified from the Workshop included:

- Clarendon Street – traffic volumes and speed;
- Clarendon Street/Victoria Road intersection – cars do not obey left out only from Clarendon Street east approach;
- Clarendon Street/St David Street intersection – concerns with safety;
- Victoria Road – safety concerns with cars turning right to/from side streets;
- Wales Street – rat running and safety concerns near school;
- Cyclist safety at roundabouts;
- Safety at cross intersections.

Concerns relating to rat-running and/or speeding were identified in numerous streets including St David Street, Newcastle Street, Rossmoyne Street, Gillies Street, Raleigh Street, Rathmines Street, Wilmouth Street and Mansfield Street. Note speed humps have been installed in Mansfield Street since the Community Workshop.

A summary of the community's concerns and suggestions are provided in **Appendix C**.

Following on from the Community Engagement Workshop, a Reference Group was established. The Reference Group met on the 5<sup>th</sup> September 2018 to discuss and agree on a draft LATM scheme.

## 5 POTENTIAL TREATMENTS

### 5.1 TRAFFIC CALMING TREATMENTS

#### 5.1.1 Clarendon Street

Clarendon Street, between High Street and Victoria Road, carries a high volume of traffic for a local street – it's function is more akin to a collector street. Vehicle speeds are also higher than desirable with 85<sup>th</sup> percentile speeds higher than the 50 km/h speed limit.

Clarendon Street is a bus route therefore any traffic calming treatments would need to be bus friendly. It is understood that the bus operator is not supportive of the existing chicane treatments and would prefer a different type of treatment. Speed cushions would be appropriate, with speed humps provided east of Wales Street (i.e. where it is not a bus route).

The existing median between St David Street and Wales Street is more effective than the painted median elsewhere, which is faded and has limited visual impact. The painted median could be upgraded (similar to the section between St David Street and Wales Street) with centre-of-the road tree planting opportunities.

#### 5.1.2 St David Street

A left in/left out treatment is proposed at St David Street north and south of Clarendon Street to stop the north-south through movement. It is anticipated that this would reduce traffic volumes on St David Street.

The left in/left out treatments would also address safety concerns raised by the community (although it is noted that there were no casualty crashes at the intersection during the period analysed).

#### 5.1.3 Raleigh Street

Other than Clarendon Street, Raleigh Street is the only continuous east-west street between High Street and Victoria Road that has not been treated with speed humps.

With implementation of any traffic calming treatments in Clarendon Street, Raleigh Street would desirably be treated with speed humps also.

#### 5.1.4 Martin Street

Consideration could be given to provision of speed humps or speed cushions in Martin Street, along with centre of the road tree planting, to discourage through traffic via St David Street.

#### 5.1.5 Threshold treatments

Raised threshold treatments could be provided at the side streets along Station Street and Darebin Road as an entry treatment and to the residential area.

## 5.2 INTERSECTION SAFETY TREATMENTS

### 5.2.1 Victoria Road / Clarendon Street

The current layout restricts motorists exiting Clarendon Street east to left out only, and motorists exiting Clarendon Street west to right out or left out only (i.e. no straight through movements).

However, during the Community Engagement Workshop, concerns were expressed about motorists ignoring the left out only from Clarendon Street (east) to Victoria Road. It appears the current design does not adequately discourage the through movement.

Redesign of the intersection to physically prevent the through movement from Clarendon Street east would discourage rat-running and improve safety at the intersection.

Council recently commissioned a design for the intersection and has received TAC funding to deliver the project in 2019. The design is reproduced in **Figure 8**.

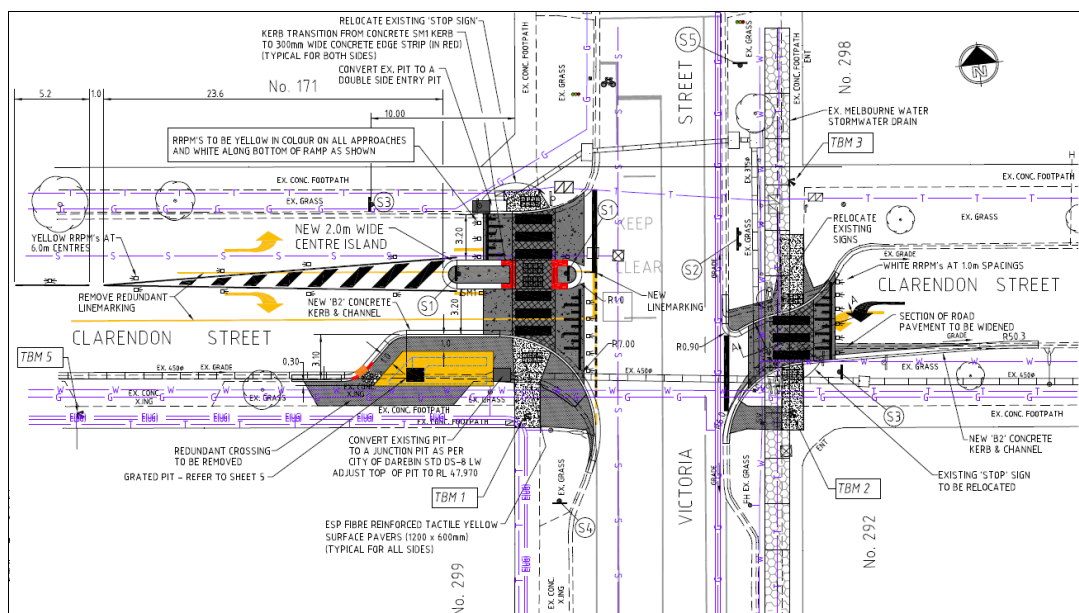


FIGURE 3: VICTORIA ROAD/CLARENDON STREET PROPOSED INTERSECTION REDESIGN

### 5.2.2 Victoria Road intersections

On the western side of Victoria Road, several side streets are very wide. This encourages cars to turn in from Victoria Road at higher speeds. Pedestrians crossing the side streets also have a greater crossing distance to negotiate.

Provision of splitter islands on the side streets would assist pedestrians crossing and reduce the speed of cars turning into the streets.

Splitter islands are proposed at the following locations:

- Flinders Street, west of Victoria Road;



- Rossmyme Street, west of Victoria Road;
- Gooch Street, west of Victoria Road; and
- Raleigh Street, west of Victoria Road.

### 5.2.3 Cross intersections

The study area has a high number of cross intersections that are controlled by Stop/Give Way signs. The crash data analysis indicated a significant number of crashes have occurred at cross intersections. Furthermore, the community identified safety as a concern at many of these intersections.

It is proposed that a mass action treatment be applied to untreated cross intersections in the study area, that is, provision of speed cushions on the priority approaches to cross intersections. Speed cushions would reduce the speed of vehicles on the priority route in the vicinity of the intersection. This would improve safety twofold. Firstly, drivers having to give-way when entering the intersection would have more time to observe oncoming traffic (as they would be travelling at a lower speed). Secondly, if a crash does occur, the severity would be reduced as a result of lower speeds.

In addition to the above, it is proposed to change the priority at the Rathmines Street/Gooch Street intersection so that traffic on Rathmines Street gives way. This would alternate priority at the intersections along Rathmines Street.

In addition to improving safety at the intersections, provision of speed cushions would reduce vehicle speeds and discourage through traffic along the treated streets, in particular St David Street, Wales Street, Newcastle Street, Wilmouth Street, Rathmines Street, Speight Street and Clarendon Street (east of Victoria Road).

Council has been successful in its grant submission to the TAC and has received funding for the installation of speed cushions.

### 5.2.4 St David Street/Martin Street

The bend on St David Street at Martin Street could be improved with linemarking, specifically an edgeline on the eastern side and a painted kerb outstand on the south western corner, to better define the path of travel while maintaining kerbside parking. The stop line on Martin Street would also be repositioned.

## 5.3 PEDESTRIAN TREATMENTS

### 5.3.1 St David Street

Speed humps are provided on St David Street at the pedestrian crossing points adjacent to Penders Park, as shown in **Figure 9**. This can give pedestrians the wrong impression that they have right-of-way at the crossing, as evidenced by the provision of a “Pedestrians Give Way to Vehicles” sign (also shown in **Figure 9**).



FIGURE 4: SPEED HUMP AND PEDESTRIAN CROSSING POINT ON ST DAVID STREET ADJACENT TO PENDERS PARK

It is recommended that either:

- the pedestrian crossing points be upgraded to zebra crossings *subject to meeting the warrants for provision of zebra crossings*; or
- the speed humps be removed and replaced with speed cushions to the south of the northern crossing point, and to the north of the southern crossing point, to remove any confusion to pedestrians whilst continuing to reduce vehicles speeds.

Pedestrian and vehicle counts should be conducted to determine if zebra crossings are warranted.

### 5.3.2 Collins Street

To improve safety for pedestrians in the vicinity of Penders Park, a raised threshold treatment is proposed at St David Street.

### 5.3.3 Wales Street

The community raised some concerns about safety of the school crossing. Consideration could be given to converting the crossing to a raised school crossing.

### 5.3.4 Mansfield Street

At the southern end of the pedestrian link between Hayes Park and Mansfield Street, there is a kerb ramp to cross Mansfield Street. However, the kerb ramp leads into the middle of the Mansfield Street/Wilmouth Street intersection, as shown in **Figure 10**. Desirably the kerb ramp would be relocated to align with the kerb ramp on the southern side of Mansfield Street. Speed cushions could also be provided near the pedestrian crossing point to reduce vehicle speeds.

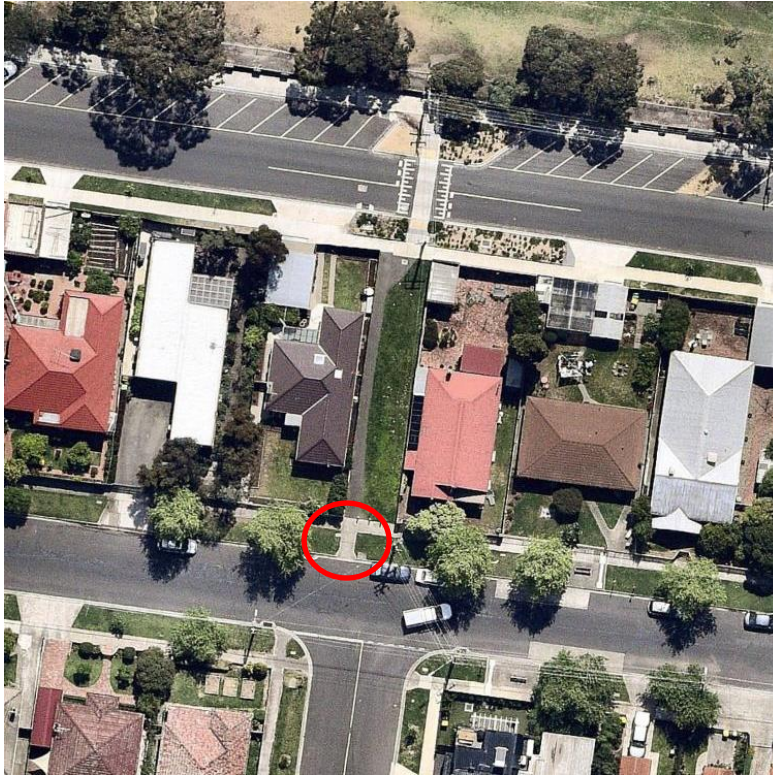


FIGURE 5: KERB RAMP AT SOUTHERN END OF PEDESTRIAN LINK BETWEEN HAYES PARK AND MANSFIELD STREET

## 5.4 BICYCLE TREATMENTS

### 5.4.1 Dundas Street/St David Street

Four bicycle casualty crashes occurred at the Dundas Street/St David Street roundabout during the 5.5 year crash analysis period. Bicycle lanes on Dundas Street terminate on the approaches to the roundabout and there is no provision for cyclists. Bicycle sharrows could be provided at the roundabout to indicate that cyclists share the lane with vehicular traffic through the roundabout. The provision of sharrows also reminds motorists to look for cyclists.

It is noted that sharrows were implemented at the Dundas Street/Newcastle Street roundabout in early 2013 as shown in **Figure 11**. Bicycle casualty crashes at this roundabout were half the number of crashes at the St David Street roundabout during the analysis period.



FIGURE 6: BICYCLE SHARROWS AT THE DUNDAS STREET/NEWCASTLE STREET ROUNDABOUT

#### 5.4.2 St David Street at Mansfield Street and Raleigh Street

St David Street has on-road bicycle lanes between Dundas Street and Clarendon Street. Sharrows could be provided at the Mansfield Street and Raleigh Street roundabouts to improve cyclist safety.

## 6 DRAFT LATM SCHEME

A draft LATM Scheme was developed based on input from the community (i.e. at the Community Engagement Workshop in March 2018), data analyses and site inspections.

The draft LATM Scheme was presented to a meeting of the Reference Group on 5<sup>th</sup> September 2018 for discussion and agreement. The Reference Group endorsed the proposed treatments, and provided suggestions for additional/improved treatments.

Dyson Bus was also consulted regarding the existing/proposed traffic management treatments along Clarendon Street.

Following input from the Reference Group and Dyson Bus, the draft LATM scheme was refined.

The refined draft LATM Scheme is shown diagrammatically in **Figure 12**.

Concept plans for the proposed treatments in the scheme are provided in **Appendix D**.



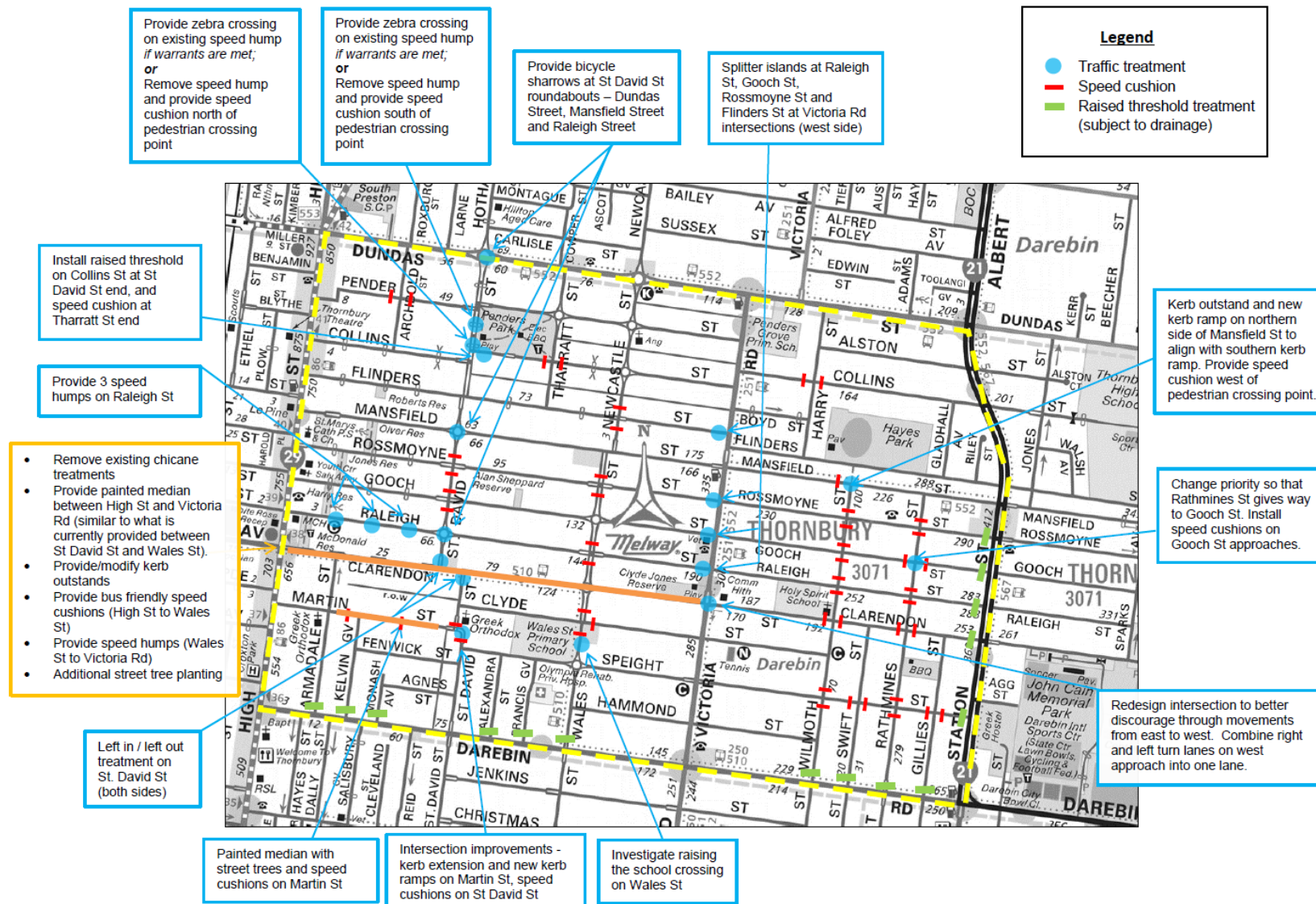


FIGURE 7: CLARENDON PRECINCT LATM SCHEME



## 7 STREET LIGHTING ASSESSMENTS

An assessment of street lighting at each location is provided in **Table 1**.

LOCATION		PROPOSED TREATMENT	STREET LIGHTING ASSESSMENT
<i>Traffic calming treatments</i>			
1	Clarendon Street, High Street to St David Street	<p>Remove chicane treatment at Armadale Street and alter kerb outstands</p> <p>Remove chicane and alter kerb outstand at 48/49 Clarendon Street</p> <p>Painted median treatment with centre of the road street trees</p> <p>Speed cushions at 2 locations (8) plus new median islands</p>	<p>Existing street lighting on SE and SW corners</p> <p>Upgrade street light outside 50 Clarendon Street</p> <p>Existing street lighting ok</p> <p>Located at existing street lights on south side</p>
2	Clarendon Street, St David Street to Wales Street	Speed cushions at 2 locations (7)	Located at existing street lights on south side
3	Clarendon Street, Wales Street to Victoria Road	<p>Median treatment</p> <p>Speed humps at 2 locations with centre of the road tree plantings</p>	<p>Existing street lighting</p> <p>Located at existing street lights on south side</p>
4	St David Street (north)/Clarendon Street	Left in/left out treatment	Upgrade existing street light on Clarendon Street
5	St David Street (south)/Clarendon Street	Left in/left out treatment	Upgrade existing street light on Clarendon Street
6	Raleigh Street	Speed humps at 3 locations	<p>Located at existing street lights on north side</p> <p>Upgrade light and/or extend bracket adjacent to Harry Reserve</p>
7	Martin Street	<p>Painted median and centre-of-the road street trees</p> <p>Speed cushions at 2 locations</p>	<p>Existing street lighting</p> <p>Located at existing street lights</p>
8	Armadale Road at Darebin Road	Raised threshold treatment	New street light required on Armadale Road
9	Kelvin Grove at Darebin Road	Raised threshold treatment	New street light required on Kelvin Grove

LOCATION		PROPOSED TREATMENT	STREET LIGHTING ASSESSMENT
10	Monash Avenue at Darebin Road	Raised threshold treatment	New street light required on Monash Avenue
11	Alexandra Street at Darebin Road	Raised threshold treatment	Existing street light on NW corner
12	Francis Grove at Darebin Road	Raised threshold treatment	Existing street light on NW corner
13	Wales Street at Darebin Road	Raised threshold treatment	New street light required on Wales Street
14	Wilmouth Street at Darebin Road	Raised threshold treatment	New street light required on Wilmouth Street
15	Swift Street at Darebin Road	Raised threshold treatment	New street light required on Swift Street
16	Rathmines Street at Darebin Road	Raised threshold treatment	Existing street light on NE corner
17	Gillies Street at Darebin Road	Raised threshold treatment	New street light required on Gillies Street
18	Speight Street at Station Street	Raised threshold treatment	New street light required on Speight Street
19	Clarendon Street at Station Street	Raised threshold treatment	Existing street light on SW corner
20	Raleigh Street at Station Street	Raised threshold treatment	New street light required on Raleigh Street
21	Gooch Street at Station Street	Raised threshold treatment	New street light required on Gooch Street
22	Rossmoyne Street at Station Street	Raised threshold treatment	Upgrade street light on SW corner
<b>Intersection safety treatments</b>			
23	Victoria Road/Clarendon Street	Intersection redesign	Existing street lighting adequate
24	St David Street/Martin Street	Kerb outstand, painted kerb outstand, new kerb ramps on Martin St  Linemarking and speed cushions on St David St	Upgrade existing street lighting
25	Flinders Street west of Victoria Road	Splitter island	Existing street light on north side of Flinders Street

LOCATION		PROPOSED TREATMENT	STREET LIGHTING ASSESSMENT
26	Rossmoyne Street west of Victoria Road	Splitter island	New street light required
27	Gooch Street, west of Victoria Road	Splitter island	Upgrade street light on SW corner
28	Raleigh Street, west of Victoria Road	Splitter island	Upgrade street light on NW corner
29	Gooch Street/Rathmines Street	Change intersection priority	Existing street lighting adequate
30	Pender Street, east and west of Archibold Street	Speed cushions	Provide new street light on Pender St east of intersection or investigate mast arm/upgrade to existing light on SW corner
31	Collins Street, east and west of Tharratt Street	Speed cushions	Provide new street light on Collins St east of intersection or investigate mast arm/upgrade to existing light on NW corner
32	St David Street, north and south of Rossmoyne Street	Speed cushions	Upgrade street light on SW corner New street light required on N side of intersection
33	St David Street, north and south of Gooch Street	Speed cushions	Upgrade street light on NW corner New street light required on S side of intersection
34	Newcastle Street, north and south of Flinders Street	Speed cushions	New street light(s) required on Newcastle St north and/or south of intersection
35	Wales street, north and south of Rossmoyne Street	Speed cushions	Existing street light on SW corner Provide mast arm on street light on NW side of intersection
36	Wales street, north and south of Raleigh Street	Speed cushions	Existing street light on NW corner New street light required on SW corner
37	Wales street, north and south of Clyde Street Clyde Street, east of Wales Street	Speed cushions	Existing street light on SW corner New street lights required on N and E sides of intersection
38	Harry Street, east and west of Collins Street	Speed cushions	Upgrade street light on NE corner New street light may be required on west side of intersection

LOCATION		PROPOSED TREATMENT	STREET LIGHTING ASSESSMENT
39	Wilmouth Street, north and south of Rossmoyne Street	Speed cushions	Existing street light on SW corner New street light may be required on north side of intersection
40	Wilmouth Street, north and south of Gooch Street	Speed cushions	New street light required on north side of intersection or investigate mast arm/upgrade to existing street light on SW corner
41	Wilmouth Street, north and south of Raleigh Street	Speed cushions	New street light may be required on south side of intersection or investigate mast arm/upgrade to street light on NW corner
42	Wilmouth Street, north and south of Speight Street	Speed cushions	New street light may be required on south side of intersection or investigate mast arm/upgrade to street light on NW corner
43	Clarendon Street, east and west of Wilmouth Street	Speed cushions	New street light required on north side of intersection or investigate mast arm/upgrade to existing street light on SW corner
44	Clarendon Street, east and west of Rathmines Street	Speed cushions	New street light required on west side of intersection or investigate mast arm/upgrade to existing street light on SW corner
45	Rathmines Street, north and south of Rossmoyne Street	Speed cushions	New street light required on north side of intersection or investigate mast arm/upgrade to existing street light on SW corner
46	Gooch Street, east and west of Rathmines Street	Speed cushions	New street light required on north side of intersection or investigate mast arm/upgrade to existing street light on SW corner
47	Rathmines Street, north and south of Raleigh Street	Speed cushions	New street light required on south side of intersection or investigate mast arm/upgrade to existing street light on NE corner
48	Rathmines Street, north and south of Speight Street	Speed cushions	New street light required on south side of intersection or investigate mast arm/upgrade to existing street light on NE corner

LOCATION		PROPOSED TREATMENT	STREET LIGHTING ASSESSMENT
49	Speight Street, east and west of Swift Street	Speed cushions	New street light may be required on west side of intersection or investigate mast arm/upgrade to existing street light on NW corner
50	Speight Street, east and west of Gillies Street	Speed cushions	New street light may be required on east side of intersection or investigate mast arm/upgrade to existing street light on NW corner
<b><i>Pedestrian treatments</i></b>			
51	St David Street adjacent to Penders Park	Remove two speed humps, provide speed cushions	Upgrade existing street lights
52	Collins Street at St Davids Street	Raised threshold treatment	Existing street light on NE corner
53	Wales Street	Convert school crossing to raised school crossing	Existing street light
54	Mansfield Street opposite Wilmouth Street	Kerb outstand, relocate kerb ramp Speed cushions (2)	Existing street light
<b><i>Bicycle treatments</i></b>			
55	Dundas Street/St David Street	Install sharrows at roundabout	Upgrade existing street lighting
56	St David Street/Mansfield Street	Install sharrows at roundabout	Upgrade existing street light on SW corner
57	St David Street/Raleigh Street	Install sharrows at roundabout	Existing street light on NW corner

TABLE 1: STREET LIGHTING ASSESSMENT



## 8 PROPOSED TREATMENT PRIORITIES

Proposed treatment priorities are provided in **Table 2**.

LOCATION		PROPOSED TREATMENT	PRIORITY
<i>Traffic calming treatments</i>			
1	Clarendon Street, High Street to St David Street	Remove chicane treatment at Armadale Street and alter kerb outstands  Remove chicane and alter kerb outstand at 48/49 Clarendon Street  Painted median treatment with centre of the road street trees  Speed cushions at 2 locations (8) plus new median islands	Medium  Medium  Medium  Medium
2	Clarendon Street, St David Street to Wales Street	Speed cushions at 2 locations (7)	Medium
3	Clarendon Street, Wales Street to Victoria Road	Median treatment  Speed humps at 2 locations with centre of the road tree plantings	Medium  Medium
4	St David Street (north)/Clarendon Street	Left in/left out treatment	Medium
5	St David Street (south)/Clarendon Street	Left in/left out treatment	Medium
6	Raleigh Street	Speed humps at 3 locations	Low
7	Martin Street	Painted median and centre-of-the road street trees  Speed cushions (8)	Low  Low
8	Armadale Road at Darebin Road	Raised threshold treatment	Low
9	Kelvin Grove at Darebin Road	Raised threshold treatment	Low
10	Monash Avenue at Darebin Road	Raised threshold treatment	Low
11	Alexandra Street at Darebin Road	Raised threshold treatment	Low
12	Francis Grove at Darebin Road	Raised threshold treatment	Low
13	Wales Street at Darebin Road	Raised threshold treatment	Low
14	Wilmouth Street at Darebin Road	Raised threshold treatment	Low
15	Swift Street at Darebin Road	Raised threshold treatment	Low
16	Rathmines Street at Darebin Road	Raised threshold treatment	Low

LOCATION		PROPOSED TREATMENT	PRIORITY
17	Gillies Street at Darebin Road	Raised threshold treatment	Low
18	Speight Street at Station Street	Raised threshold treatment	Low
19	Clarendon Street at Station Street	Raised threshold treatment	Low
20	Raleigh Street at Station Street	Raised threshold treatment	Low
21	Gooch Street at Station Street	Raised threshold treatment	Low
22	Rossmoyne Street at Station Street	Raised threshold treatment	Low
<b>Intersection safety treatments</b>			
23	Victoria Road/Clarendon Street	Intersection redesign	High
24	St David Street/Martin Street	Kerb outstand, painted kerb outstand, new kerb ramps (2) on Martin Street  Linemarking and speed cushions (2) on St David St	Medium
25	Flinders Street west of Victoria Road	Splitter island	Low
26	Rossmoyne Street west of Victoria Road	Splitter island	Low
27	Gooch Street, west of Victoria Road	Splitter island	Low
28	Raleigh Street, west of Victoria Road	Splitter island	Low
29	Gooch Street/Rathmines Street	Change intersection priority	High
30	Pender Street, east and west of Archibold Street	Speed cushions (6)	High
31	Collins Street, east and west of Tharratt Street	Speed cushions (6)	High
32	St David Street, north and south of Rossmoyne Street	Speed cushions (8)	High
33	St David Street, north and south of Gooch Street	Speed cushions (8)	High
34	Newcastle Street, north and south of Flinders Street	Speed cushions (6)	High
35	Wales street, north and south of Rossmoyne Street	Speed cushions (2)	High
36	Wales street, north and south of Raleigh Street	Speed cushions (2)	High
37	Wales street, north and south of Clyde St, Clyde St east of Wales St	Speed cushions (7)	High
38	Harry Street, east and west of Collins Street	Speed cushions (6)	High

LOCATION		PROPOSED TREATMENT	PRIORITY
39	Wilmouth Street, north and south of Rossmoyne Street	Speed cushions (4)	High
40	Wilmouth Street, north and south of Gooch Street	Speed cushions (4)	High
41	Wilmouth Street, north and south of Raleigh Street	Speed cushions (4)	High
42	Wilmouth Street, north and south of Speight Street	Speed cushions (4)	High
43	Clarendon Street, east and west of Wilmouth Street	Speed cushions (4)	High
44	Clarendon Street, east and west of Rathmines Street	Speed cushions (4)	High
45	Rathmines Street, north and south of Rossmoyne Street	Speed cushions (4)	High
46	Gooch Street, east and west of Rathmines Street	Speed cushions (4)	High
47	Rathmines Street, north and south of Raleigh Street	Speed cushions (4)	High
48	Rathmines Street, north and south of Speight Street	Speed cushions (4)	High
49	Speight Street, east and west of Swift Street	Speed cushions (4)	High
50	Speight St, east and west of Gillies St	Speed cushions (4)	High
<b><i>Pedestrian treatments</i></b>			
51	St David Street adjacent to Penders Park	Remove two speed humps, provide speed cushions	Medium
52	Collins Street at St Davids Street	Raised threshold treatment	Medium
53	Wales Street	Convert school crossing to raised school crossing	Medium
54	Mansfield Street	Kerb outstand, relocate kerb ramp, speed cushions (3)	Medium
<b><i>Bicycle treatments</i></b>			
55	Dundas Street/St David Street	Install sharrows at roundabout	Low
56	St David Street/Mansfield Street	Install sharrows at roundabout	Low
57	St David Street/Raleigh Street	Install sharrows at roundabout	Low

\* Excludes drainage costs

TABLE 2: INDICATIVE COST ESTIMATES

# APPENDIX A

## TRAFFIC VOLUME AND SPEED DATA

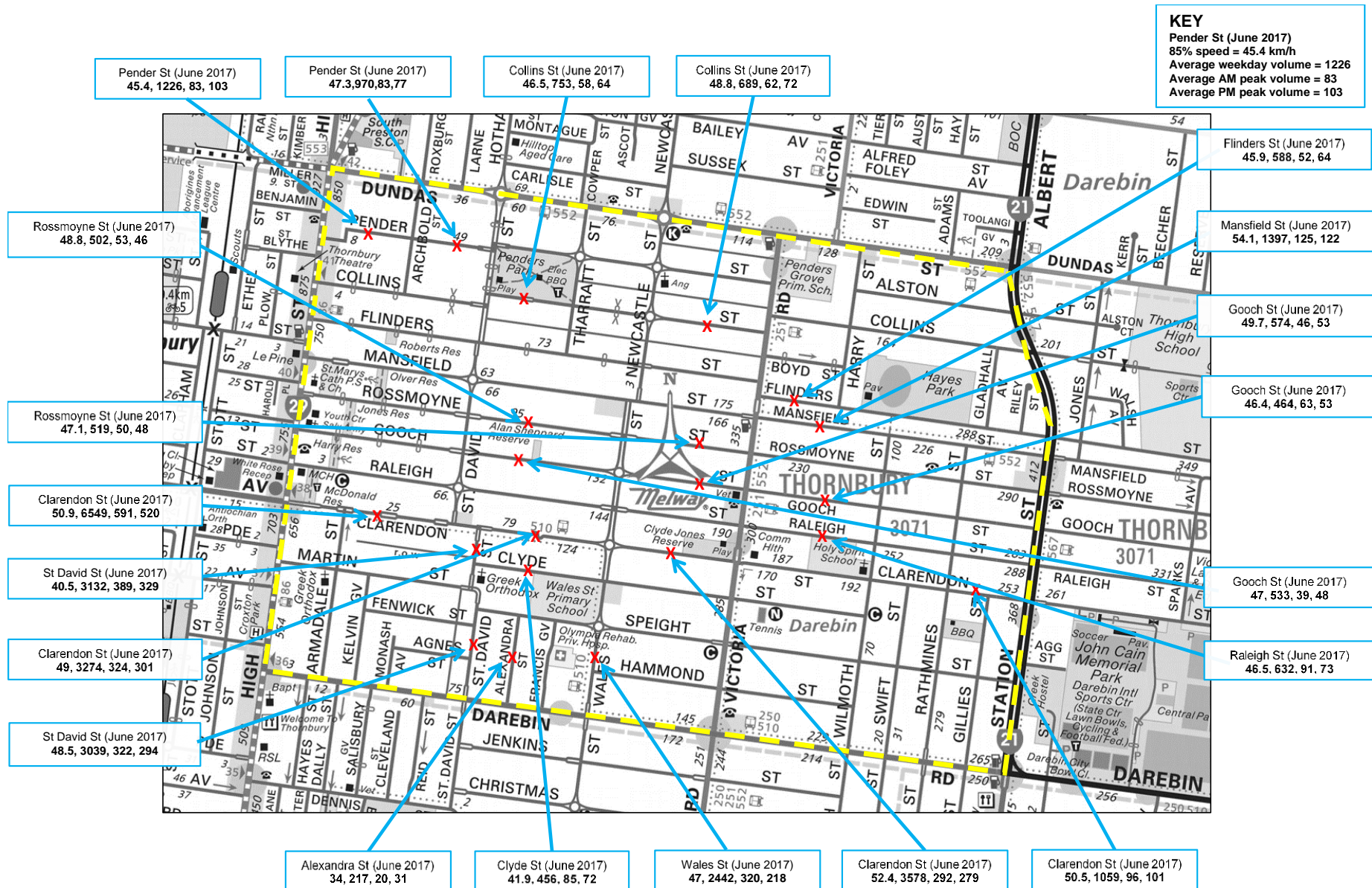


FIGURE A1: TRAFFIC VOLUME AND SPEED DATA



## APPENDIX B

### CRASH DATA

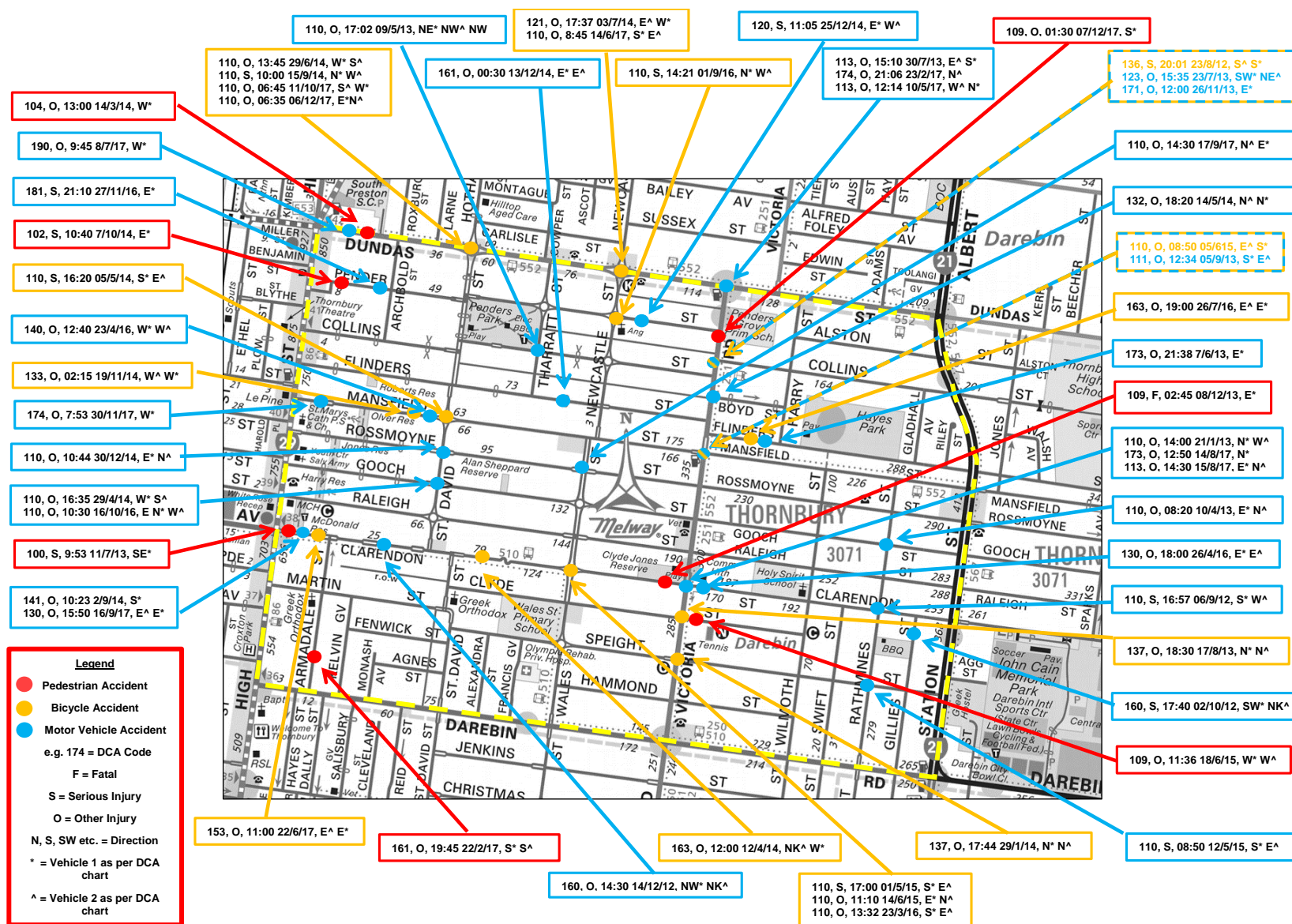


FIGURE B1: CASUALTY CRASH DATA - JULY 2012 TO JUNE 2017

**COMMUNITY ENGAGEMENT WORKSHOP:  
SUMMARY OF ISSUES AND SUGGESTIONS**

LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
Clarendon St	<p>Cars not obeying left-turn-only at Victoria Rd intersection (12)</p> <p>Traffic speeding downhill towards Wales St near school crossing (5)</p> <p>High congestion due to parked cars and buses stopping near High St intersection (3)</p> <p>Vehicles illegally parked near driveways obstruct visibility particularly on Saturdays near Psarakos market (2)</p> <p>Heavy traffic travelling from High St, St David St and Darebin Road</p> <p>Intersection with St David St is unsafe due to speeding vehicles and incline on Clarendon St</p> <p>Congestion at Victoria Rd intersection</p> <p>Difficulty turning right into Victoria Rd (south)</p> <p>Difficult to cross west side of Clarendon St at Victoria Rd intersection due to the width</p> <p>Speeding and heavy traffic volumes between Station St and Victoria Rd</p> <p>Cars turning left at Victoria Road not obeying pedestrian signals</p> <p>Poor wheelchair access near Wales St intersection</p> <p>Cars failing to give way to bikes at Victoria Rd intersection</p> <p>Cars not stopping at Rathmines Crossing</p> <p>Cars going straight at High St intersection where it is left only</p> <p>Too narrow for both bikes and cars (parked cars and no bike lane)</p> <p>Difficulty for pedestrians crossing between Psarakos Market and car park opposite</p> <p>Slow point outside 169 Clarendon St: linemarking is faded, not clear if parking is allowed or not. Confusing.</p>	<p>Reduce speed limit to 40 km/h (2)</p> <p>Redesign traffic lights at Victoria Rd intersection, including pedestrian crossing at both sides of the intersection (5)</p> <p>Program signalised crossing near Victoria Rd intersection to be activated by side road traffic</p> <p>Roundabout at Victoria Road intersection</p> <p>Treatments such as platform and more patrolled school crossings</p> <p>Provide school crossing St David St (2)</p> <p>Zebra crossing at Psarakos Market</p> <p>Speed humps or more roundabouts to slow traffic</p> <p>Repaint lines at slow point outside 169 Clarendon St and/or make parking restrictions clearer</p> <p>Signalised pedestrian crossing near St David St</p> <p>Make western leg of Clarendon St at Victoria Rd left in only</p>

LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
Victoria Rd	<p>Difficult to turn at Darebin Rd intersection, risk of accidents</p> <p>Needs resurfacing, dangerous for cyclists</p> <p>Poor visibility to turn into Victoria Rd, especially from local streets between Mansfield St and Darebin Rd (e.g. Dundas St, Gooch St and Raleigh), which causes cars to block bicycle lanes when turning (2)</p> <p>Cannot turn safely into Dundas St</p> <p>Turning is unsafe from local streets to Victoria Road, pushing traffic to side Streets</p> <p>Cars Speeding (2)</p> <p>Dangerous and potentially fatal when passing vehicles turning right</p> <p>Separation St corner too narrow after new child care centre</p> <p>Parked cars obstruct view of aquatic centre</p> <p>High volumes of traffic</p> <p>Vehicles travelling south to turn right into Clarendon St holding up southbound through traffic</p> <p>High pedestrian traffic volumes at Speight St intersection</p> <p>Signalised crossing north of Clarendon St: long wait, drivers running red light, left turners from Clarendon unaware of signals</p>	<p>Limit cars going straight at Darebin Rd intersection to reduce congestion</p> <p>Provide more pedestrian crossings</p> <p>Wider and more visible bike lanes</p> <p>Improve traffic signals at Mansfield intersection</p> <p>Modify aquatic centre access to one-way only</p> <p>Right turn lane at Clarendon St intersection</p> <p>Signalised pedestrian crossing at Speight St intersection</p> <p>East-west crossing points for cyclists across Victoria Rd</p> <p>Protected bike lanes</p>



LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
Darebin Rd	<p>Poor visibility at stop signs</p> <p>Congestion near Gilles St caused by cars merging to one lane</p> <p>Cars avoiding right turn at Station St intersection, causes congestion on local roads</p> <p>High Risk of accidents at Victoria Rd intersection, poor visibility for right turn (2)</p> <p>Cars avoiding traffic lights at Victoria Rd intersection</p> <p>Speeding (2)</p>	<p>Provide safe pedestrian crossing at Wilmoth St intersection</p> <p>Trim trees west of Wales St to improve visibility</p>
Mansfield St	<p>Speeding, especially during peak hours between St David St and Victoria Rd (3)</p> <p>Speeding between High St and St David St</p> <p>Speeding through St David St roundabout</p> <p>No parking available for residents (3)</p> <p>Congestion from traffic going to High St</p> <p>High volumes of heavy traffic during peak hours</p> <p>Dangerous intersection at Newcastle St and Wales St</p> <p>High volumes of traffic (2)</p> <p>Low visibility when exiting driveways due to parked vehicles</p> <p>Poor sightlines for vehicles turning right from Newcastle St onto Mansfield St</p>	<p>More Speed humps (2)</p> <p>Roundabout at Newcastle St intersection</p> <p>Change priority at Newcastle St intersection (Mansfield St traffic gives way to Newcastle St)</p> <p>Raised median with trees and gaps for U-turns</p>

LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
High St	<p>Pedestrian lights take too long near Mansfield St intersection (2)</p> <p>Car not obeying 40 km/h speed limit</p> <p>Parking near Gooch St intersection (2)</p> <p>Low speed limit increases rat-runs through other areas</p> <p>High risk of accidents between Darebin Rd and Clarendon St</p> <p>Potholes, bad quality of road surface and fading markings</p> <p>High volumes of traffic during peak hours to avoid St Georges Rd</p> <p>No pedestrian crossing on north side of intersection with Darebin Rd</p> <p>Difficult to cross High St in between Mansfield St and Dundas St as signals are too far apart / not practical (2)</p>	<p>Provide pedestrian crossings between Dundas St and Mansfield St intersection (3)</p> <p>Pedestrian lights between Darebin Rd and Clarendon St, high risk area for pedestrians (2)</p> <p>More protected zones at tram stops</p>
Wales St	<p>Poor visibility to turn right at Darebin Rd intersection</p> <p>Congestion during school drop-off and pickup times</p> <p>Rat-runs avoiding High St</p> <p>Aggressive behaviour towards cyclists</p> <p>Rat-running near Darebin Rd intersection</p> <p>Not enough pedestrian crossings</p> <p>Dangerous crossing for pedestrians near Wales St school (3)</p> <p>Speeding between Speight St and Rossmoyne St (2)</p> <p>Unsafe for cyclists especially at roundabouts</p> <p>Rat-running near Darebin Rd intersection</p> <p>Shrubs block sight lines near Speight St intersection</p>	<p>Reduce speed limit to 40km/h</p> <p>Provide bike lanes to schools</p> <p>Speed humps</p> <p>Roundabouts at Rossmoyne St &amp; Gooch St intersections</p>

LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
Station St	<p>Dangerous for cyclist</p> <p>Poorly maintained nature strips</p> <p>Cars unable to stop for red lights near Mansfield St intersection</p> <p>Speeding around bend</p> <p>Dangerous crossing between Rossmoyne St and Mansfield St due to heavy volumes of trucks and cars heading south</p> <p>Not enough space on footpath for children waiting at the bus stop near Collins St intersection</p>	<p>Fully controlled right turns at Dundas St intersection (2)</p> <p>Remove shrubbery along median strip near bend</p> <p>Provide signalised intersection at Flinders St to allow bikes to safely cross</p> <p>Sunken trench segment across full width of Station St</p>
Wilmoth St	<p>Congestion near childcare centre, schools and sport grounds, no side mirrors in these areas</p> <p>Cars do not slow down near Rossmoyne St, Gooch St and Raleigh St intersections (2)</p> <p>Intersection with Raleigh St not safe for cyclists during peak times</p>	<p>Provide crossing at Darebin Rd near two bus stops</p> <p>Implement speed humps to deter rat-running traffic to and from Victoria Rd</p>

LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
St. David St	<p>High volumes of traffic, dangerous for pedestrians wanting to cross St David St (2)</p> <p>Difficult to cross Darebin Rd due to high volumes (3)</p> <p>Congestion</p> <p>Rat-running (2)</p> <p>Martin St intersection unsafe during events</p> <p>Poor compliance with Stop sign at Martin Street intersection</p> <p>Difficult for school children to cross Clarendon St intersection (3)</p> <p>Unusual and confusing sight lines near Flinders St intersection (2)</p> <p>Speeding between Clarendon and Mansfield St (2)</p> <p>Risk of accidents at Gooch St intersection (3)</p> <p>Danger for cyclist at Martin St intersection due to speeding and parked cars</p>	<p>Give way sign at north side of Martin St Intersection</p> <p>Safer pedestrian crossing near Penders Park</p> <p>Traffic lights at Darebin Rd intersection</p>
Gooch St	<p>Dangerous for cyclist and pedestrians due to parked cars (2)</p> <p>Cars parked too close to Victoria Rd intersection (2)</p>	Implement Speed humps to slow traffic down coming from High St (2)
Rossmoyne St	<p>Dangerous to cross Station St</p> <p>High volumes of traffic</p>	
Kevin Gv	Cars illegally parked along Martin St obstruct visibility to turn from Kevin Gv	
Gilles St	Cars rat-running to avoid Station St during afternoon peak	

LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
Clyde St	Speeding (2)	Implement speeding cameras near school zones Existing crossing at Wales St Primary School is effective (good) Provide bike routes for Thornbury High School students and people attending sport events at Mayes reserve Reduce speed limit to 40 km/h
Raleigh St	Speeding (5) Speeding at intersection with Wales St Safety for children during school times Parents parking near school for long periods of time	Implement speeding cameras near school zones Reduce speed limit near school zones (2) Install speed humps (2) Make Raleigh St One Way during school drop-off & pickup times Make area near school a 5-minute parking zone for non-residents
Rathmines	Cars rat-running to avoid Station St during afternoon peak	
Speight St	Too narrow for cars and bicycles	
Flinders St	Cars failing to give way to bikes at St David St intersection Speeding	
Dundas St	Cars parked and bus stop too close to Victoria Rd intersection Congestion at High St intersection leads to more traffic at Raglan Street (north of study area) Too narrow road due to wide nature strips Cars speeding at right turns B-double trucks turning over roundabout at Newcastle St Insufficient lane width to turn right	Right turn arrow from Dundas St into High St



LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
Newcastle St	<p>Speeding near the northern side of Pender St intersection, dangerous for cyclists and Thornbury kindergarten children.</p> <p>Width and gradient of road creates conflict between drivers and cyclists</p> <p>Dangerous intersection for children walking to Wales St Primary School</p> <p>Speeding between Dundas St and Mansfield St</p>	
Collins St	<p>Insufficient on-street parking between Tharratt St and Newcastle St caused by overdevelopment</p> <p>Poor visibility due to cars parked too close near St David St intersection</p> <p>Dangerous to cycle as cars speed down the street</p>	Traffic calming measures
Pender St	<p>Too narrow due to cars parked on both sides, residents forced onto Collins St</p> <p>Speeding near Pender Grove Primary School</p> <p>Speeding near Penders Park</p> <p>Rat-running</p> <p>Too many people looking for parking especially at night due to no restrictions (2)</p> <p>High traffic volumes</p> <p>Speeding, especially at night</p> <p>On-street parking reduces visibility for vehicles reversing out of properties</p>	<p>Implement more speed humps and platforms (2)</p> <p>Restrict parking</p>
Wilmoth St	<p>Cars not stopping at intersections</p> <p>Parking too close near Clarendon St intersection</p> <p>Rat-runs between Darebin Rd and Mansfield (2)</p> <p>Difficult to cross Darebin Road intersection</p>	<p>Provide pedestrian crossing at Darebin Rd intersection</p> <p>Refuge island for cyclists at Wilmoth St / Darebin Rd intersection</p>

LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
Harry St	Poor visibility at Collins and Flinders St intersections (2) Café customers parking too close to Dundas St intersection	Extend No Standing area at Dundas St intersection
Boyd St	Rat-running and speeding Parked cars obstructing visibility at Harry St intersection	
Archbold St	Too narrow due to parked cars	
Miller St	Rat-running Ambiguous lane markings at High St intersection	
Hammond St	High volumes of traffic avoiding Victoria and Darebin Rd intersection	
Martin St	Cars not stopping at St David St intersection Significant delays at Martin St & High St intersection leading to rat running	Implement roundabout at St David St intersection Ban right turns from Martin St into High St
Armada St	Rat running during AM Speeding	
Francis Gr	Limited parking for residents Lack of signage indicating parking is not allowed on one side	Operate as a One-Way street
Laneways	High traffic volumes and speeding in laneway parallel to High St on eastern side (between Dundas St and Pender St) Poor sightlines between laneway above and laneway parallel to Dundas St (between Dundas St and Pender St)	Speed bumps and mirrors at junction between the two laneways

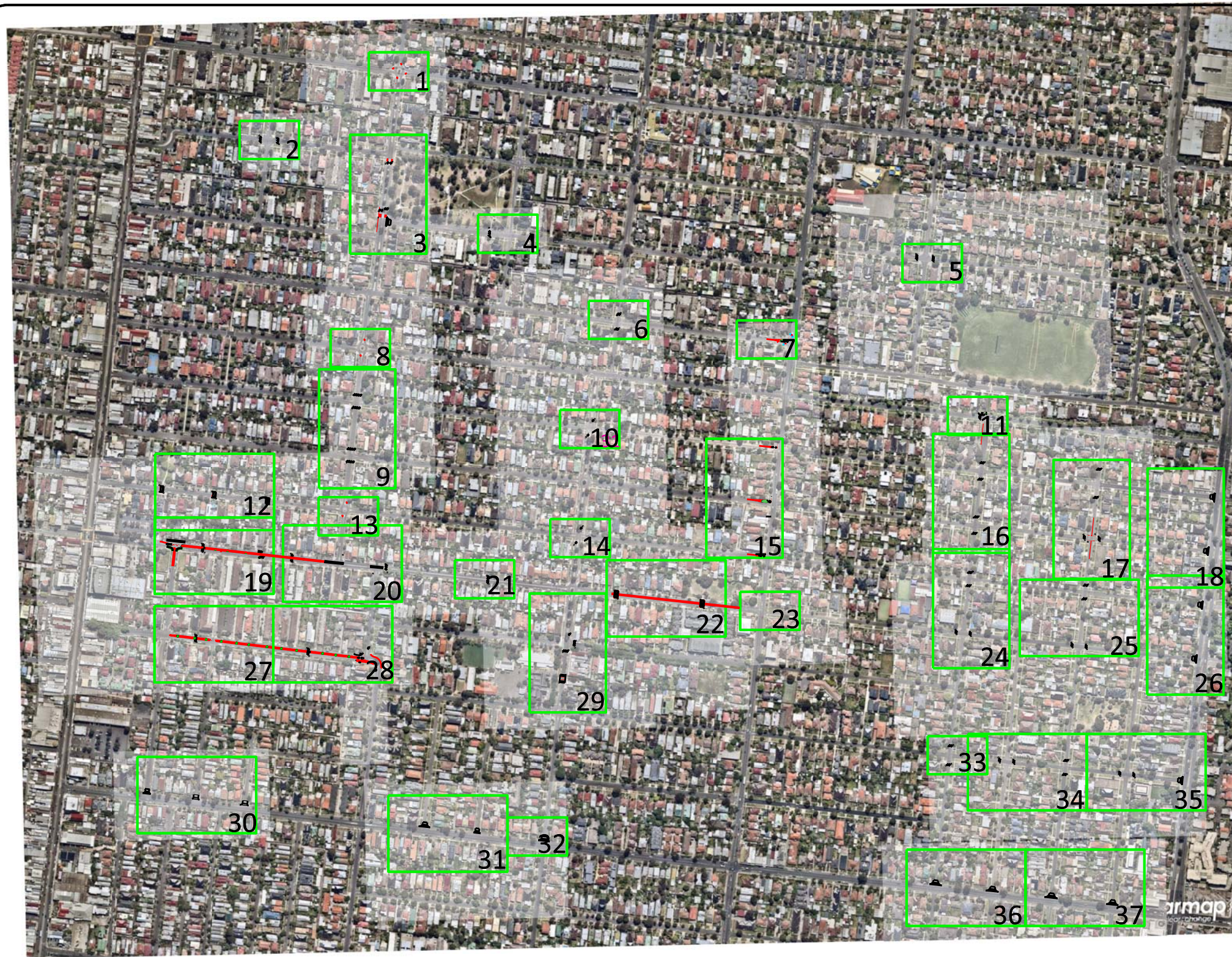
LOCATION	ISSUE (NUMBER OF TIMES)	SUGGESTION
General	<p>Shrubbery at roundabouts is too high (2)</p> <p>Congestion near low parking availability near high-rise developments (2)</p> <p>Parking near intersections and driveways, causes blockage of footpaths (4)</p> <p>Failure to give way at roundabouts</p> <p>Parking outside properties</p> <p>Narrow residential streets caused by parked vehicles (2)</p> <p>Road signage behind trees</p> <p>Dangerous entrance at Northcote aquatic centre</p> <p>Cars not obeying 40 km/h speeding limit especially along Rossmoyne, Gooch and Mansfield St</p> <p>Markings worn out at many locations</p> <p>Cars parked on driveways make it difficult for pedestrians</p> <p>Cyclists hazards: rubbish/scrap on roads, water grates not fitted correctly, divots in roads caused by poor repair work</p> <p>Conflict between cyclists and drivers</p> <p>Unsafe for pedestrians crossing to tram and bus stops</p> <p>Speeding issue between roundabouts and speed humps, unsafe for cyclists</p>	<p>More islands</p> <p>Designate safer walking routes</p> <p>Provide mirrors at laneways to improve children's safety</p> <p>Simpler and clearer road signs (2)</p> <p>No rubbish collection during peak hours</p> <p>Reduce speed limit to 40 km/h</p> <p>Educate drivers about speeding and give-way rules (2)</p> <p>Maintain road line markings</p> <p>Improve cyclists' visibility</p> <p>Replace electronic trailers with variable speed signs</p> <p>Exclude or restrict cars near Wales Street Primary School</p> <p>Education program for cyclists and drivers to improve understanding and reduce conflict</p> <p>Zebra crossings at tram and bus stops</p> <p>Synchronise traffic lights throughout Council area</p> <p>Coordinate signals so that cars behind trams also make it through intersection</p> <p>Paint 'Stop sign ahead' on roads leading to intersections</p> <p>More raised pavements</p>

TABLE 1: SUMMARY OF ISSUES AND SUGGESTIONS FROM THE COMMUNITY ENGAGEMENT WORKSHOP (INCLUDING WRITTEN SUBMISSIONS)

# APPENDIX D

## CONCEPT PLANS

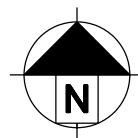




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## CLARENDON ST PRECINCT THORBURY



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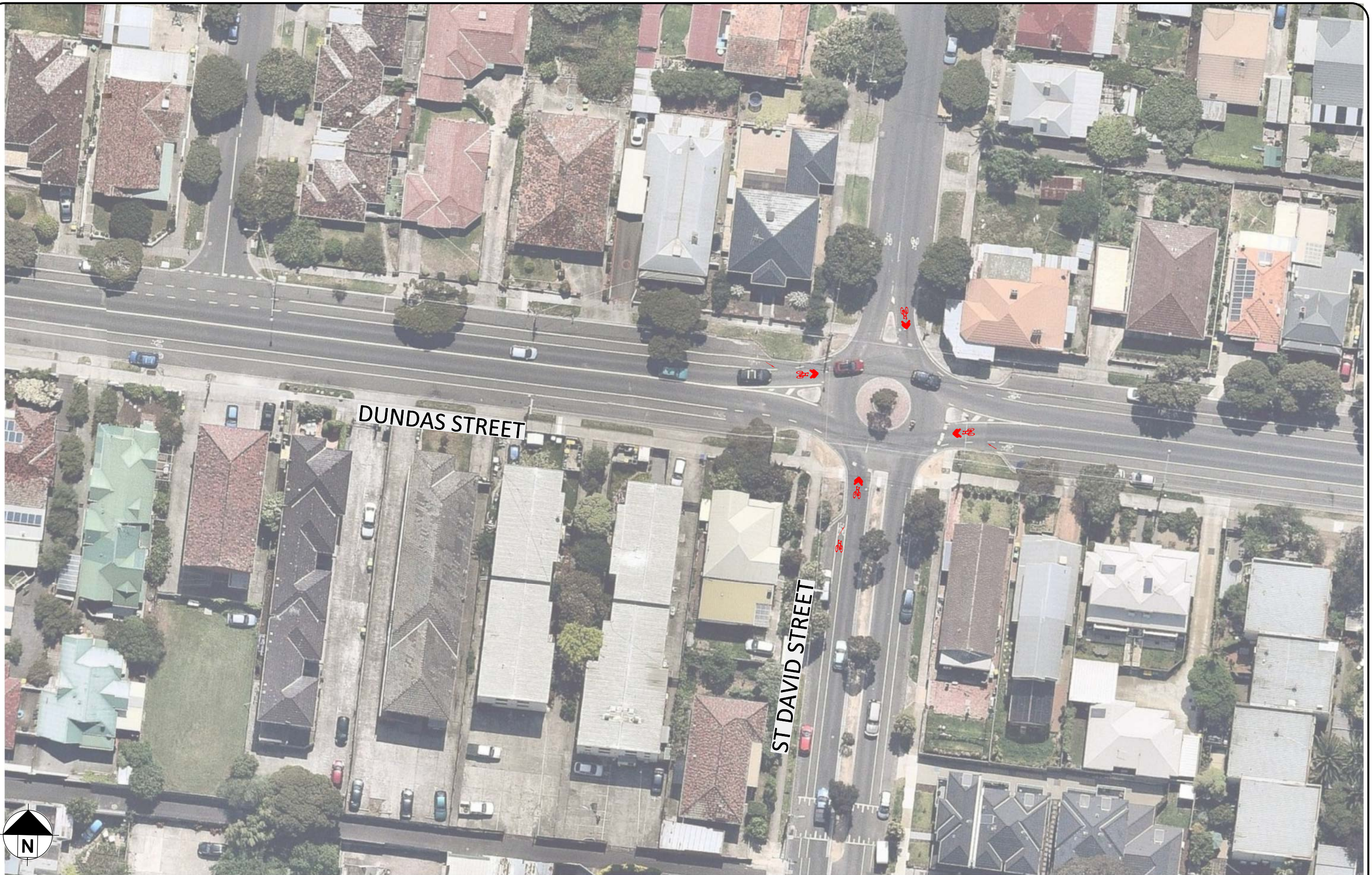
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DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver. 15000	SHEET NO: 1 OF 1
Ver. 7500	ISSUE:

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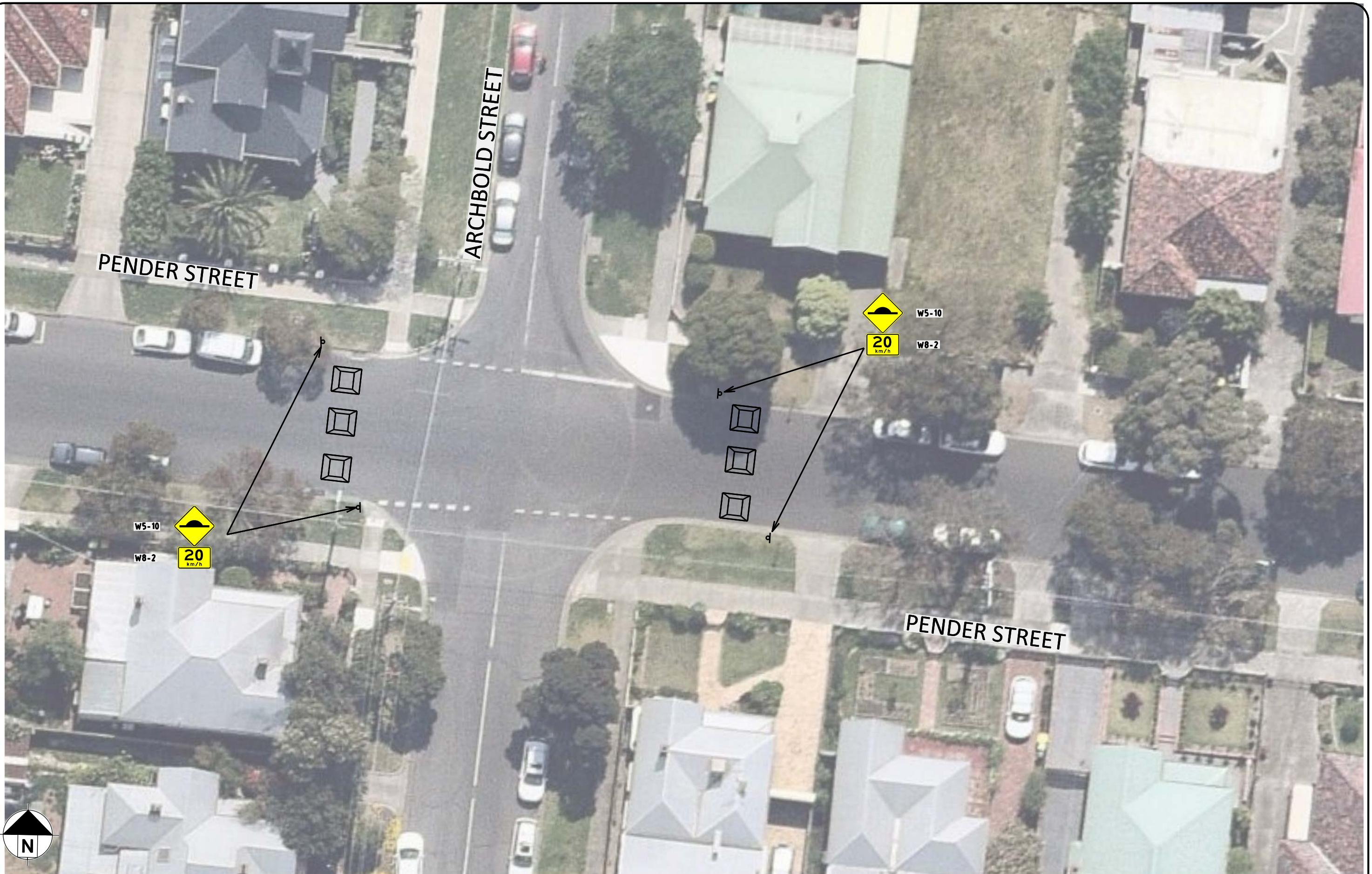


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CLARENDON PRECINCT THORNBURY  
DUNDAS STREET AND  
ST. DAVID STREET  
ROUNDAABOUT TREATMENT





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CLARENDON PRECINCT THORNBURY

PENDER STREET  
SPEED CUSHIONS





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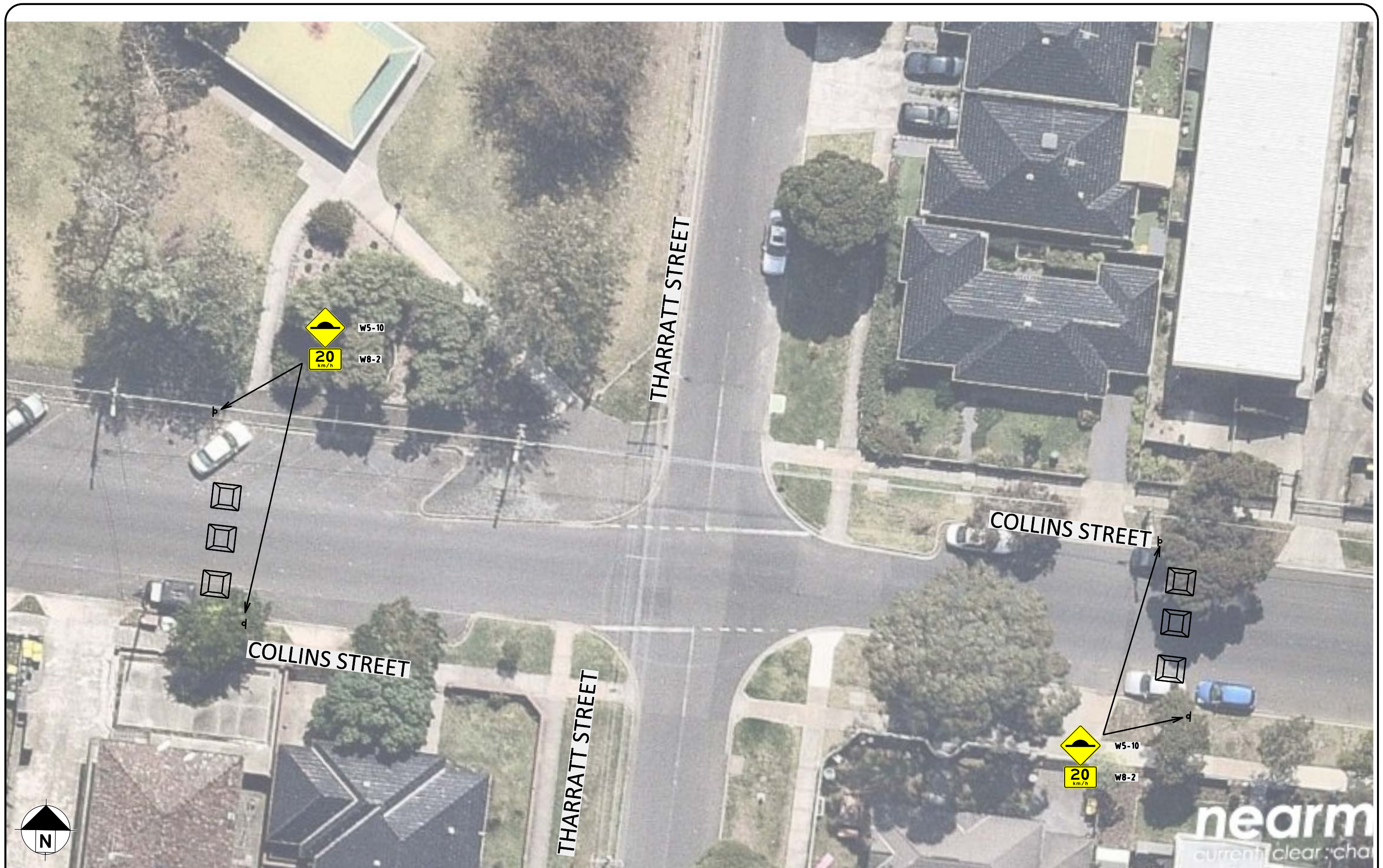


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CLARENDON PRECINCT THORNBURY  
ST DAVID STREET  
PENDERS PARK TREATMENTS





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CLARENDON PRECINCT THORNBURY

COLLINS STREET  
SPEED CUSHION TREATMENTS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	5 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY
COLLINS STREET SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	6 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY
NEWCASTLE STREET SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

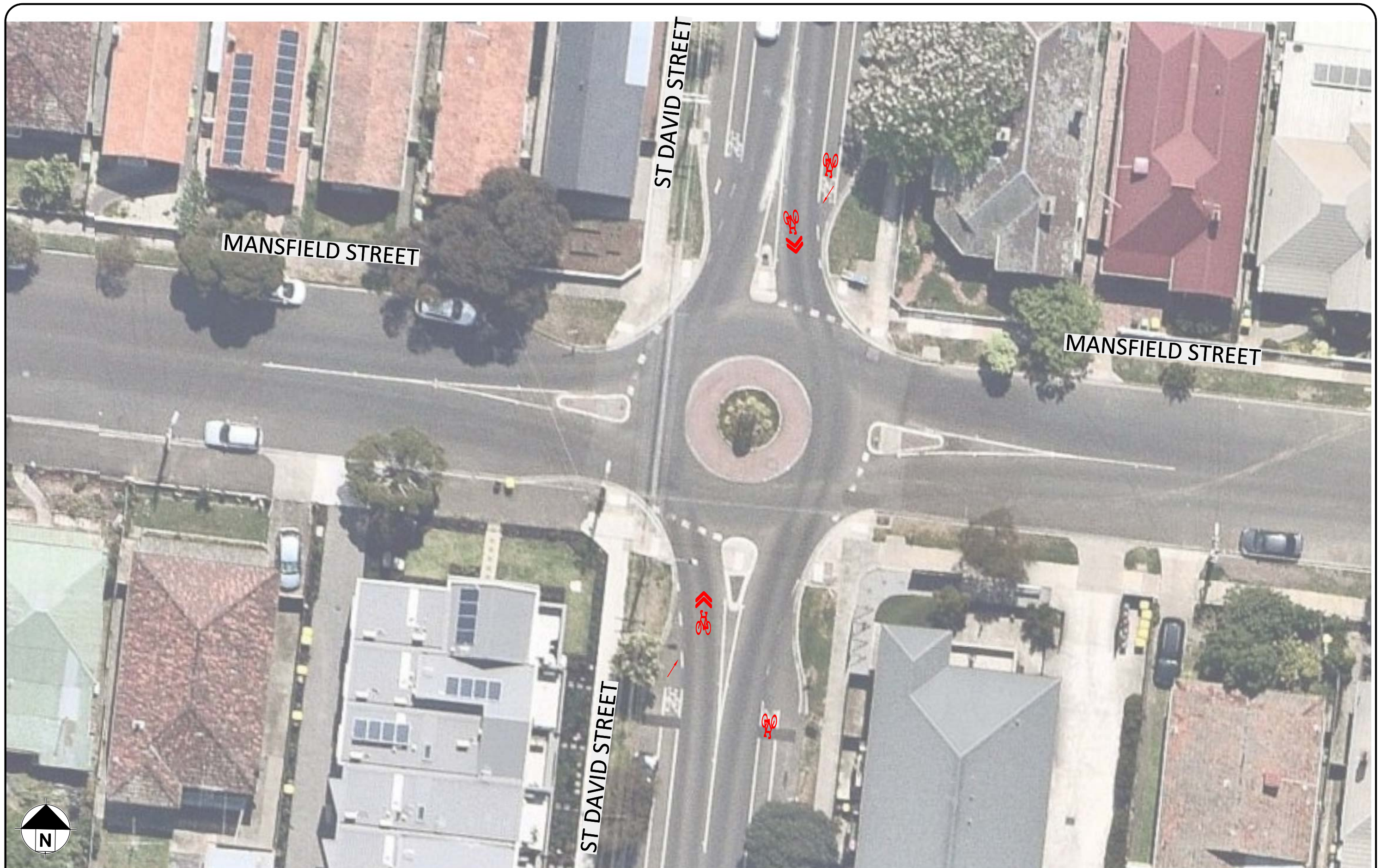


•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY	CAD FILE: 18318002.DGN
DESIGNED BY: M. FERGUSON	DRAWING NO: 18318002
SCALE: 1:250	ORIGINAL: A3
DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver. 0 2.5 5	SHEET NO: 7 OF 37
	ISSUE:

CLARENDON PRECINCT THORNBURY
FLINDERS STREET SPLITTER ISLAND TREATMENT





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY		CAD FILE: 18318002.DGN	
DESIGNED BY: M. FERGUSON		DRAWING NO: 18318002	
SCALE: 1:250	ORIGINAL: A3	DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver.	0 2.5 5	SHEET NO: 8 OF 37	ISSUE:

CLARENDON PRECINCT THORNbury

ST DAVID STREET AND  
MANSFIELD STREET  
ROUNDAbOUT TREATMENT





ISSUE	DATE	AMENDMENTS	BY	

NOT FOR CONSTRUCTION

NOTES:

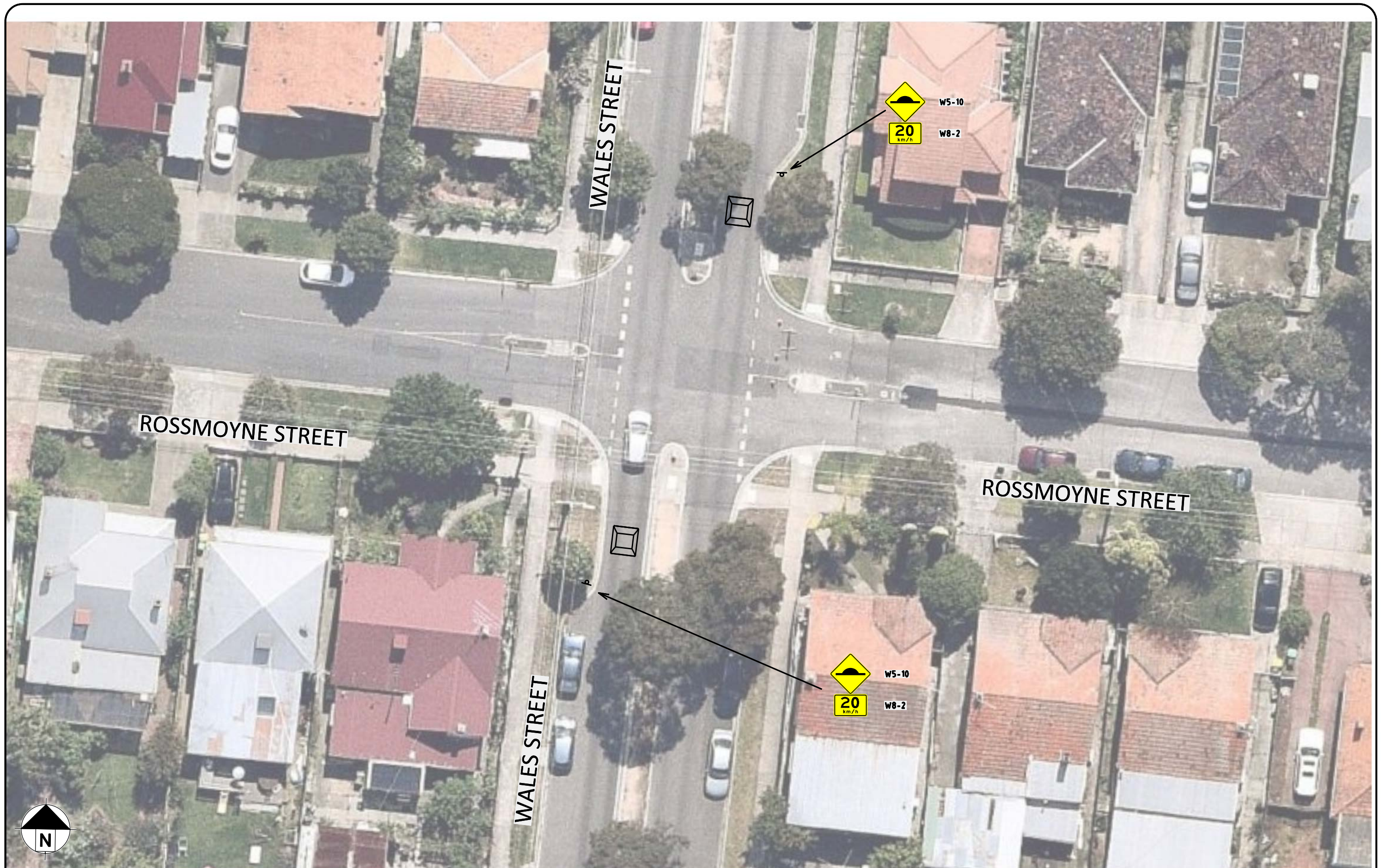


•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	9 OF 37	ISSUE:	

CLARENDON PRECINCT THORNBURY  
ST DAVID STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



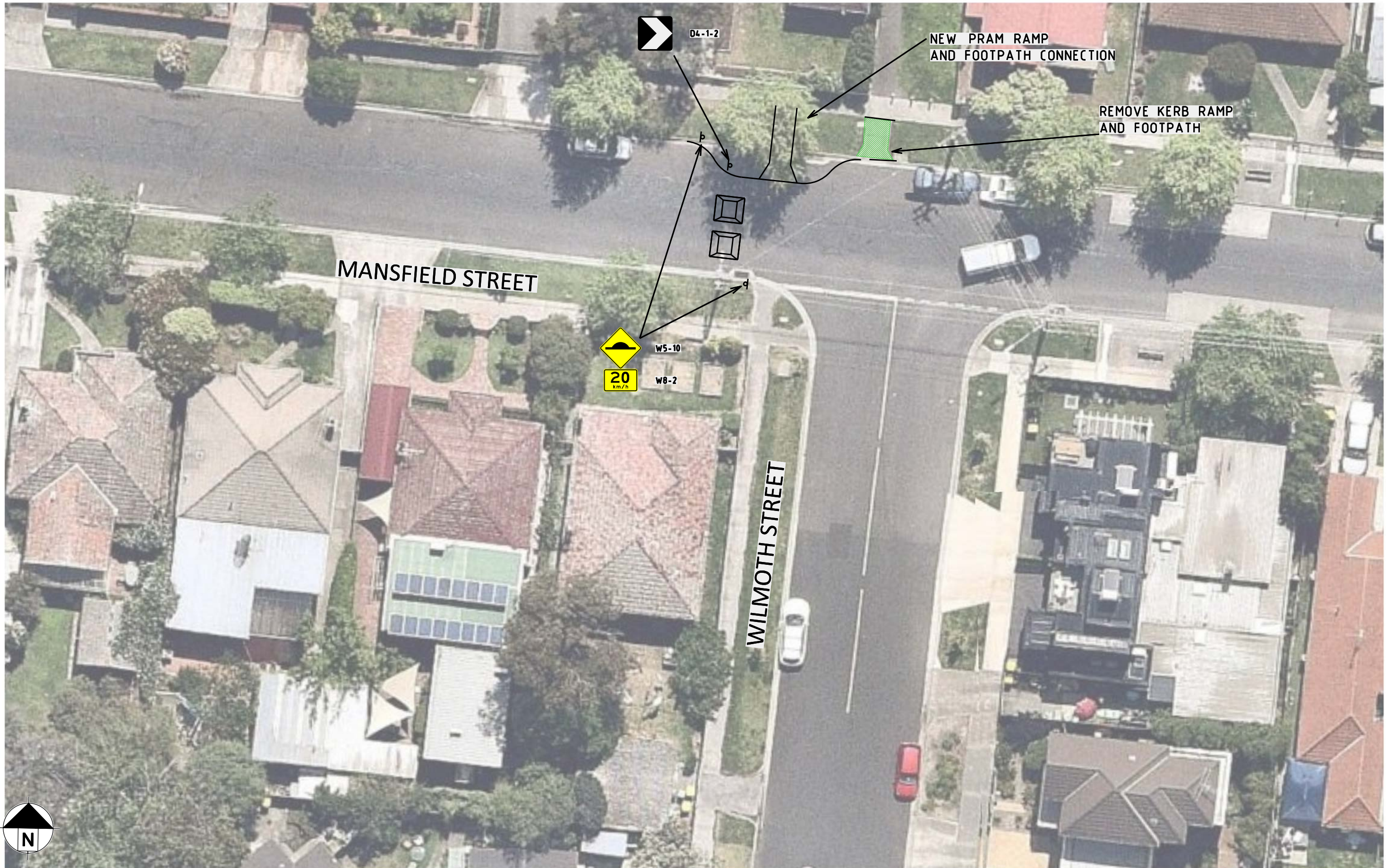
•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	10 OF 37
Ver.		ISSUE:	

### CLARENDON PRECINCT THORBURY

WALES STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
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HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	11 OF 37	ISSUE:	

CLARENDON PRECINCT THORBURY  
MANSFIELD STREET  
KERB RAMP RELOCATION  
AND SPEED CUSHION






ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

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HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY		CAD FILE: 18318002.DGN	
DESIGNED BY: M. FERGUSON		DRAWING NO: 18318002	
SCALE: 1:500	ORIGINAL: A3	DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver.	0 5 10	SHEET NO: 12 OF 37	ISSUE:

CLARENDON PRECINCT THORNbury

RALEIGH STREET  
SPEED HUMPS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety

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HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	13 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY

ST DAVID STREET AND  
RALEIGH STREET  
ROUNDAABOUT TREATMENT





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

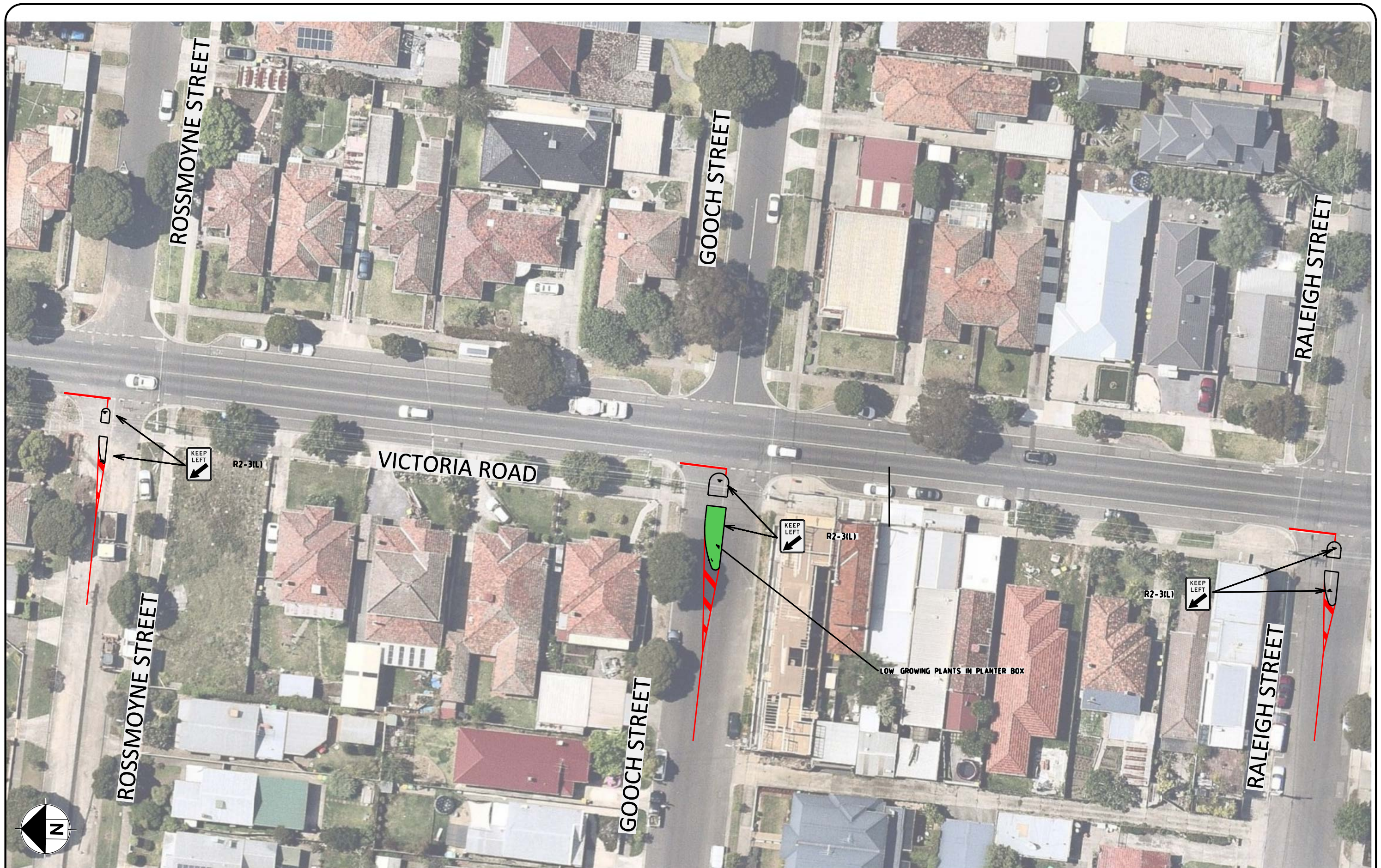


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SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	14 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORBURY  
WALES STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

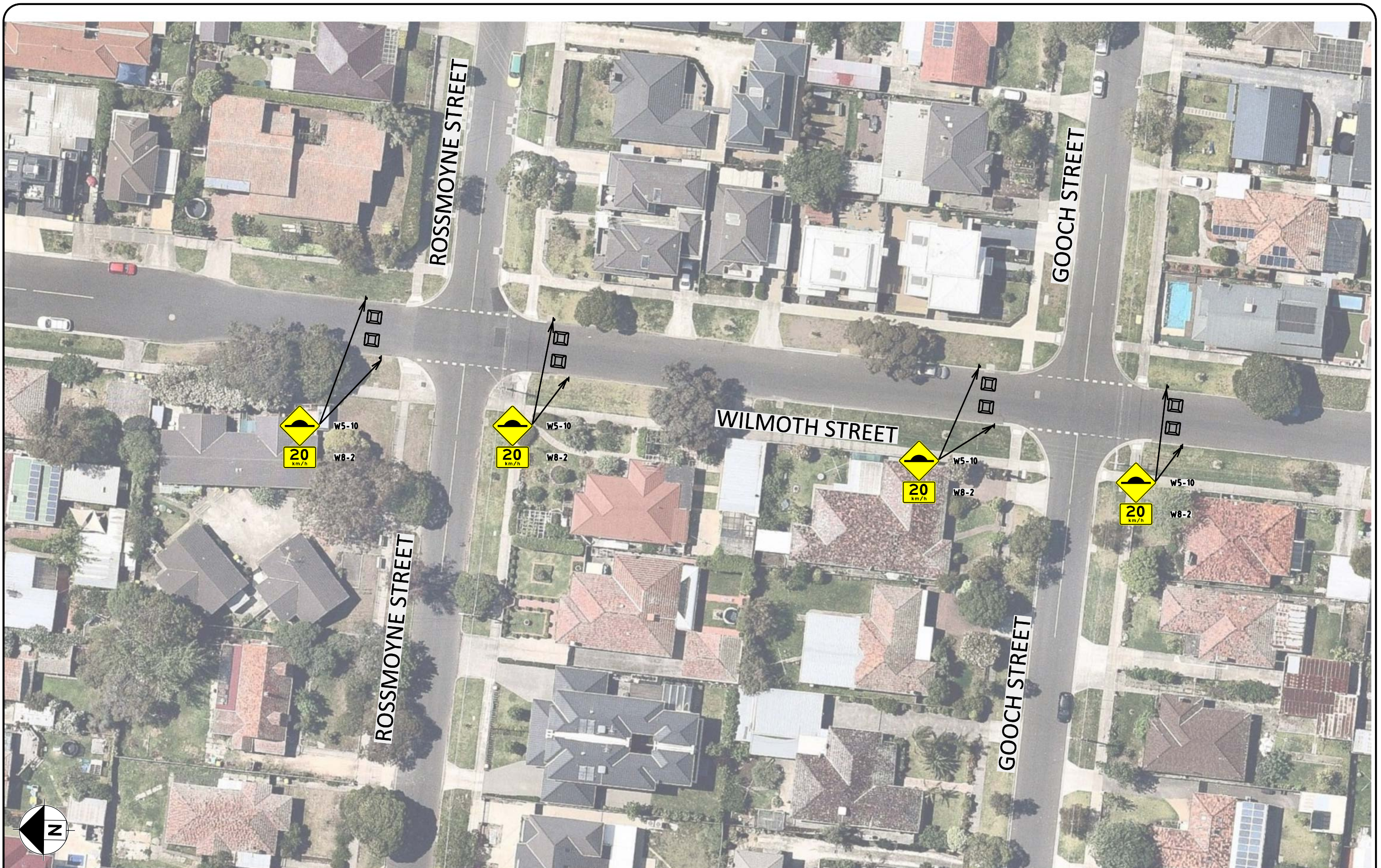


•Traffic Planning •Transport Planning  
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SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 5 10	SHEET NO:	15 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY  
ROSSMOYNE STREET  
GOOCH STREET  
RALEIGH STREET  
SPLITTER ISLANDS





ISSUE	DATE	AMENDMENTS	BY	

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale Ver.	0 5 10	SHEET NO:	16 OF 37
		ISSUE:	

CLARENDON PRECINCT THORNBURY  
WILMOTH STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

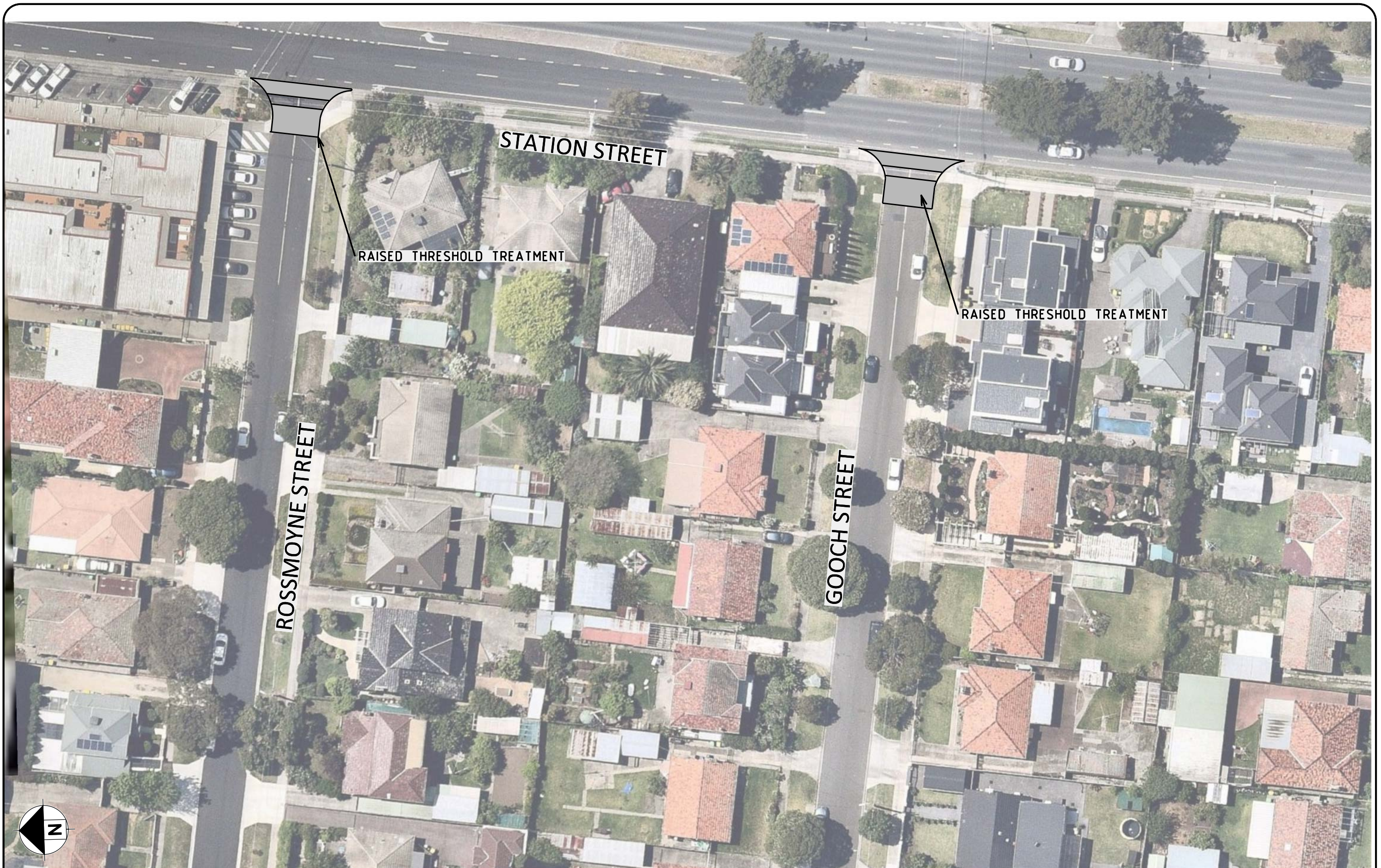


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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY	CAD FILE: 18318002.DGN
DESIGNED BY: M. FERGUSON	DRAWING NO: 18318002
SCALE: 1:500	ORIGINAL: A3
DATE: 21/05/19	JOB NO: 18318
Hor. Scale: 0 5 10	SHEET NO: 17 OF 37
Ver.:	ISSUE:

CLARENDON PRECINCT THORNBURY  
RATHMINES STREET  
GOOCH STREET  
CHANGE OF PRIORITY AND  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY		CAD FILE: 18318002.DGN	
DESIGNED BY: M. FERGUSON		DRAWING NO: 18318002	
SCALE: 1:500	ORIGINAL: A3	DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver.	0 5 10	SHEET NO: 18 OF 37	ISSUE:

CLARENDON PRECINCT THORNBURY  
ROSSMOYNE STREET  
GOOCH STREET  
RAISED THRESHOLD TREATMENT





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY		CAD FILE: 18318002.DGN	
DESIGNED BY: M. FERGUSON		DRAWING NO: 18318002	
SCALE: 1:500	ORIGINAL: A3	DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver.	0 5 10	SHEET NO: 19 OF 37	ISSUE:

CLARENDON PRECINCT THORBURY  
CLARENDON STREET  
CHICANE REMOVALS AND  
MEDIAN TREATMENT





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

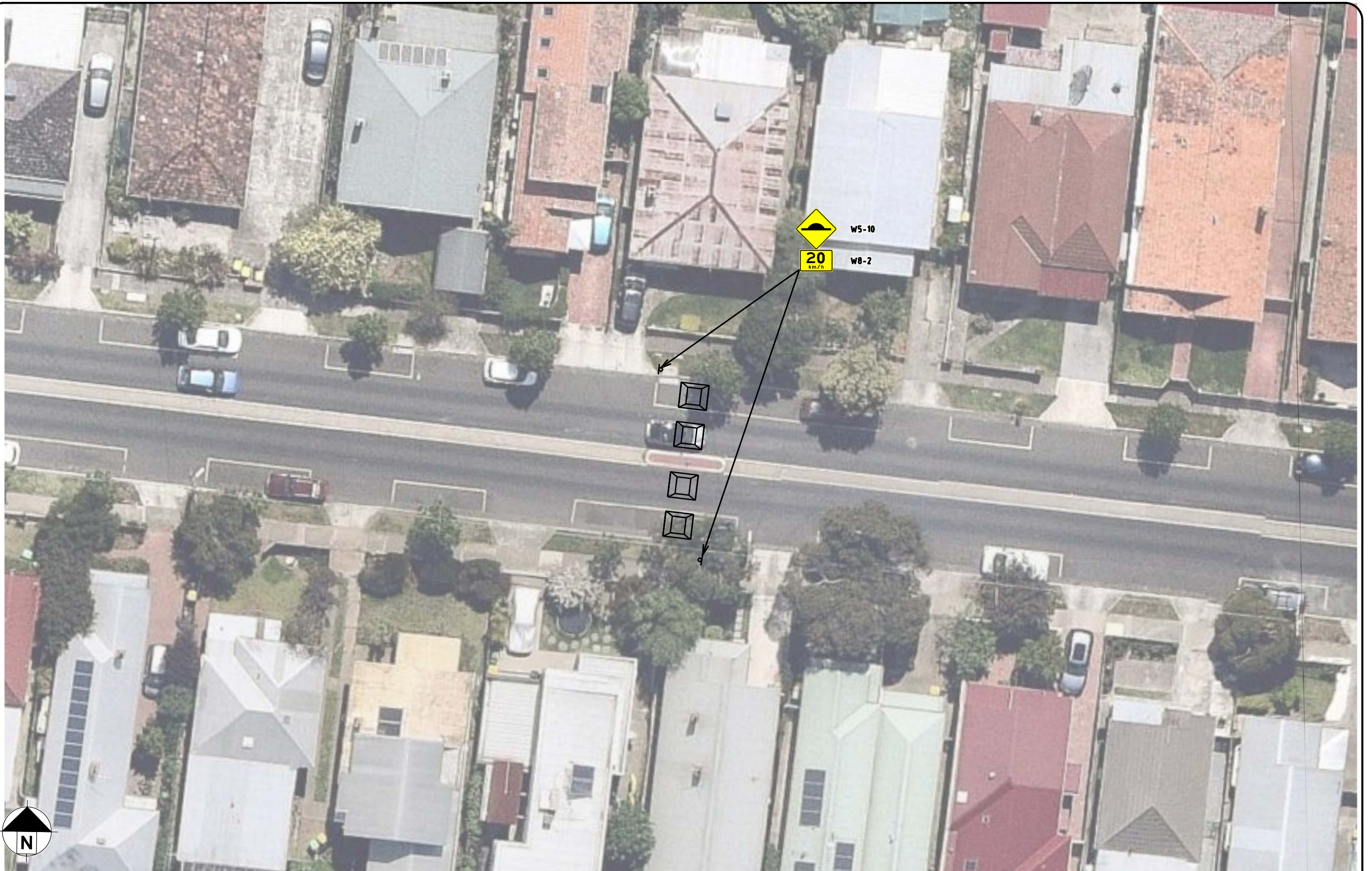


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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	20	OF	37

CLARENDON PRECINCT THORNBURY  
CLARENDON STREET  
TREATMENTS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

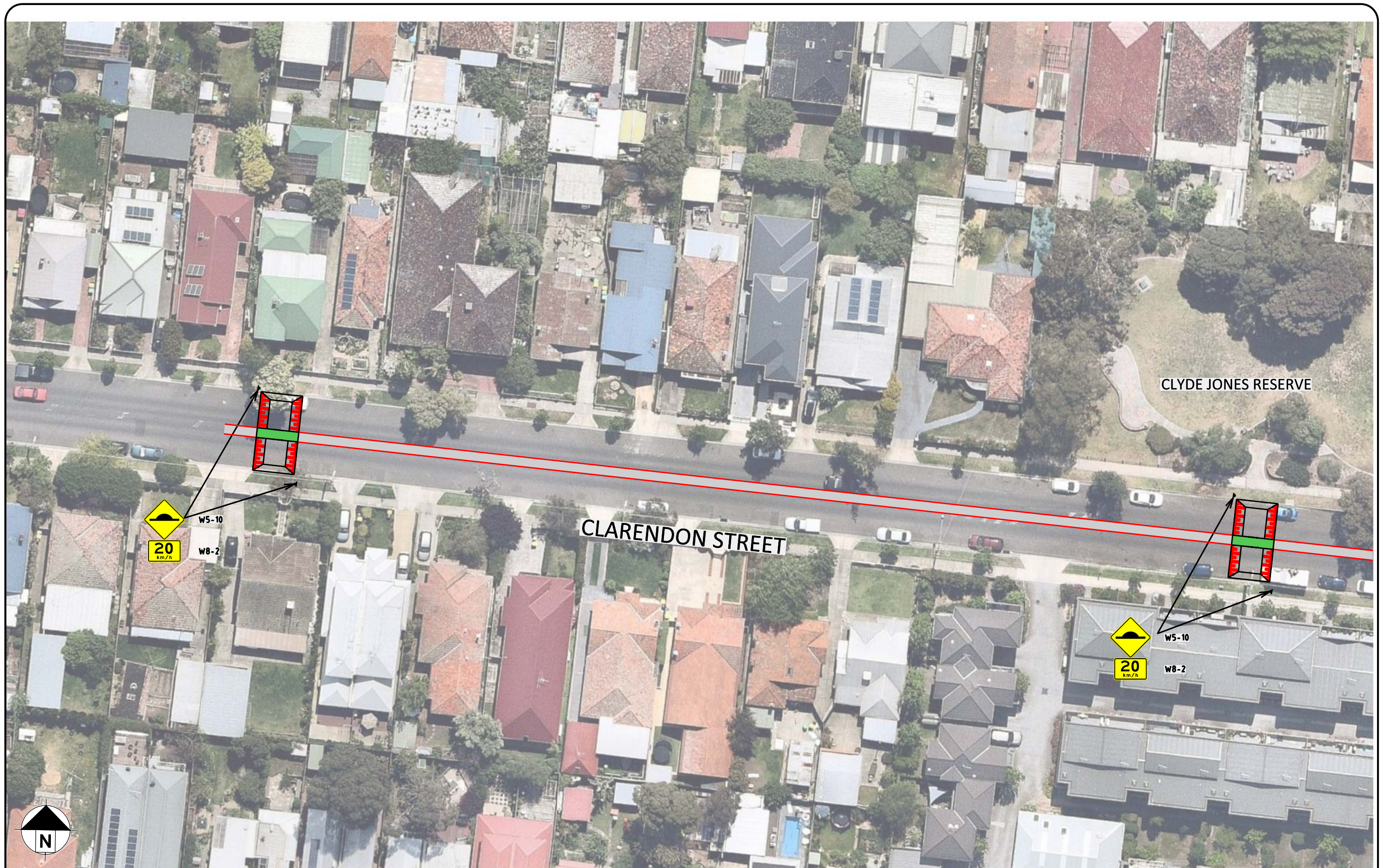


•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale:	0 2.5 5	SHEET NO:	21 OF 37
Ver.:		ISSUE:	

CLARENDON PRECINCT THORNBURY
CLARENDON STREET SPEED CUSHIONS






ISSUE	DATE	AMENDMENTS	BY

**NOT FOR CONSTRUCTION**

NOTES:



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•Traffic Engineering •Road Safety

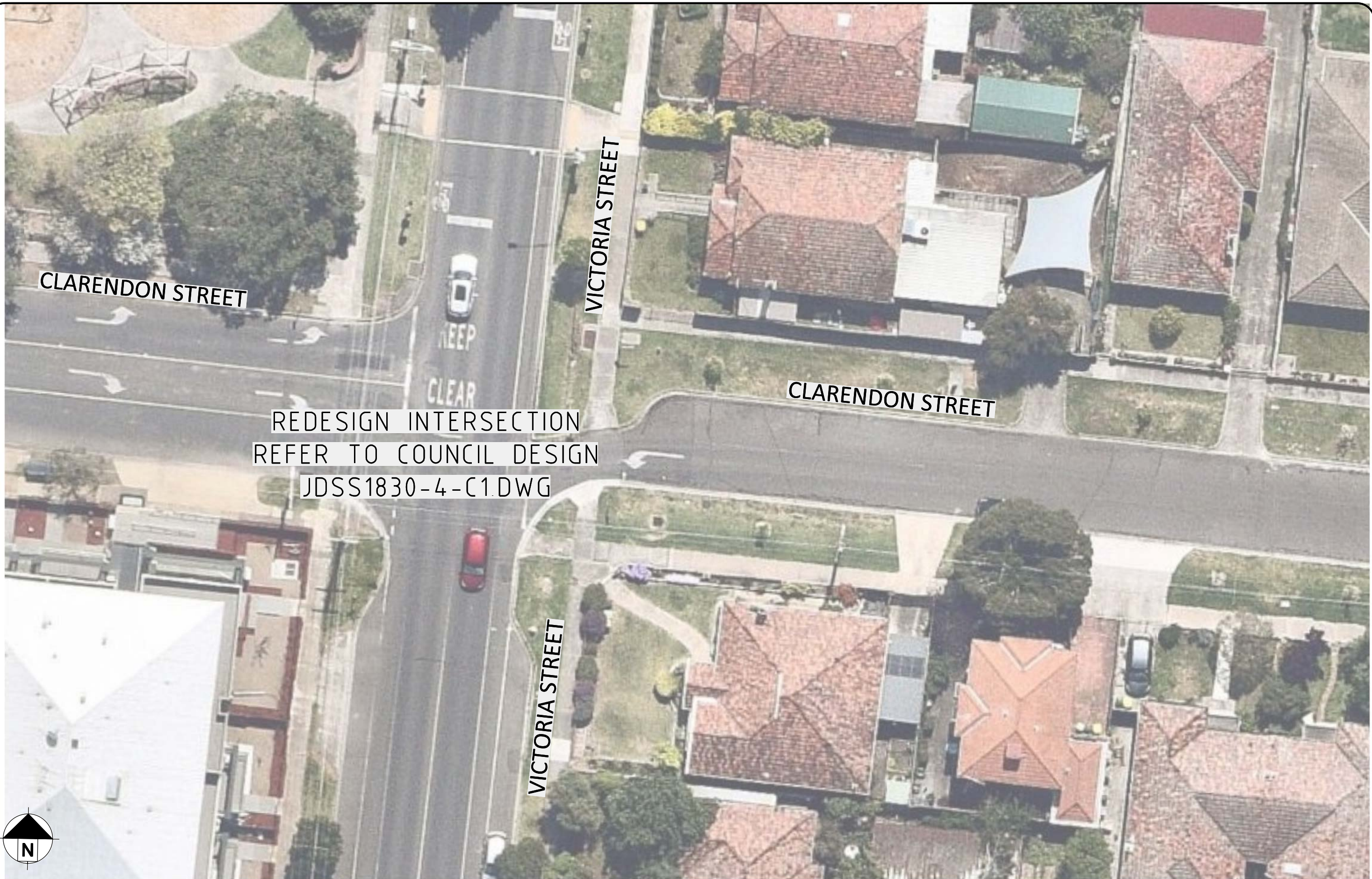
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	22 OF 37	ISSUE:	

**CLARENDON PRECINCT THORNBURY**

CLARENDON STREET  
PLANTER SPEED HUMP  
TREATMENTS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

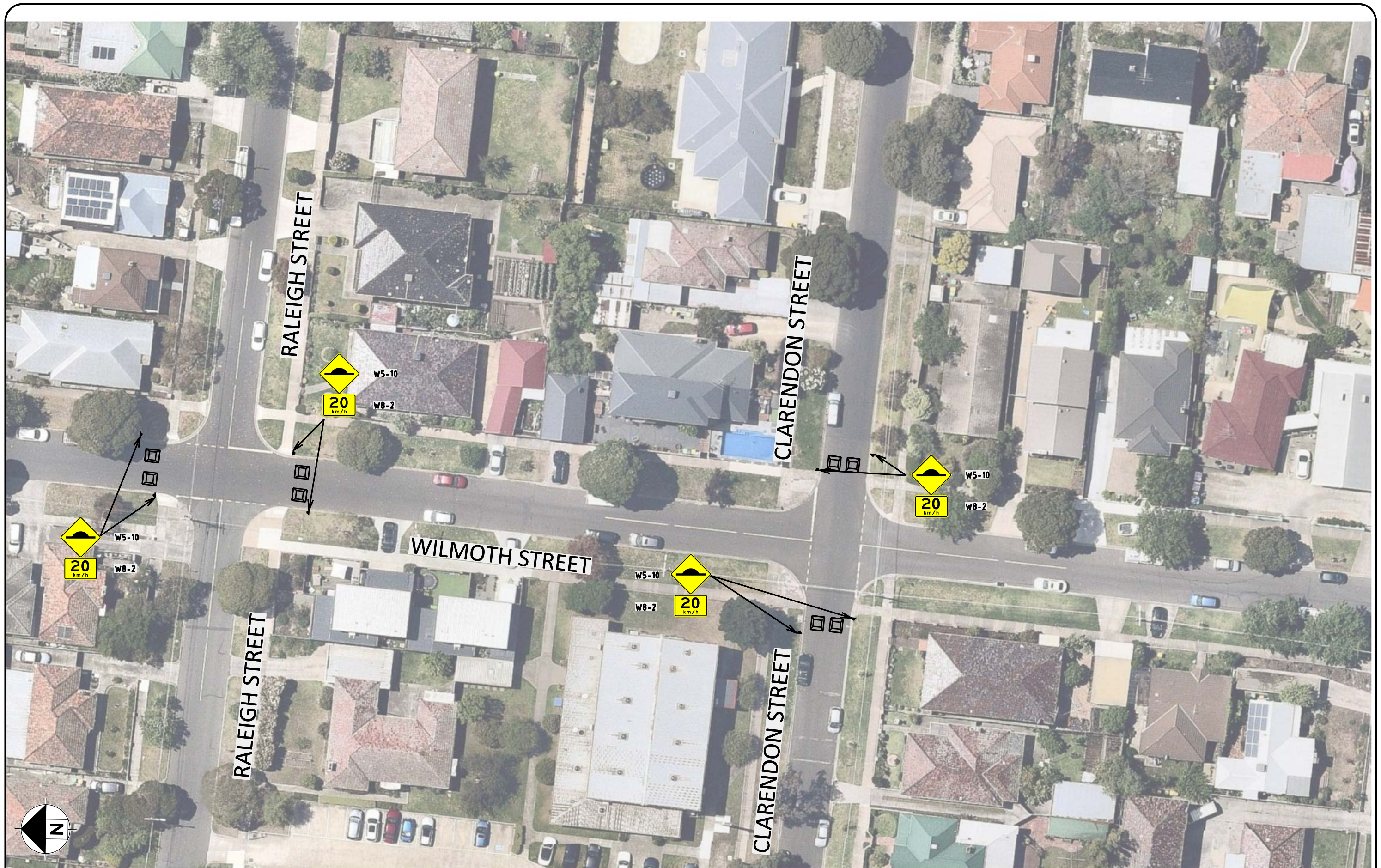


•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	23 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY  
CLARENDON STREET  
VICTORIA STREET  
INTERSECTION REDESIGN





ISSUE	DATE	AMENDMENTS	BY	

NOT FOR CONSTRUCTION

NOTES:



•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety

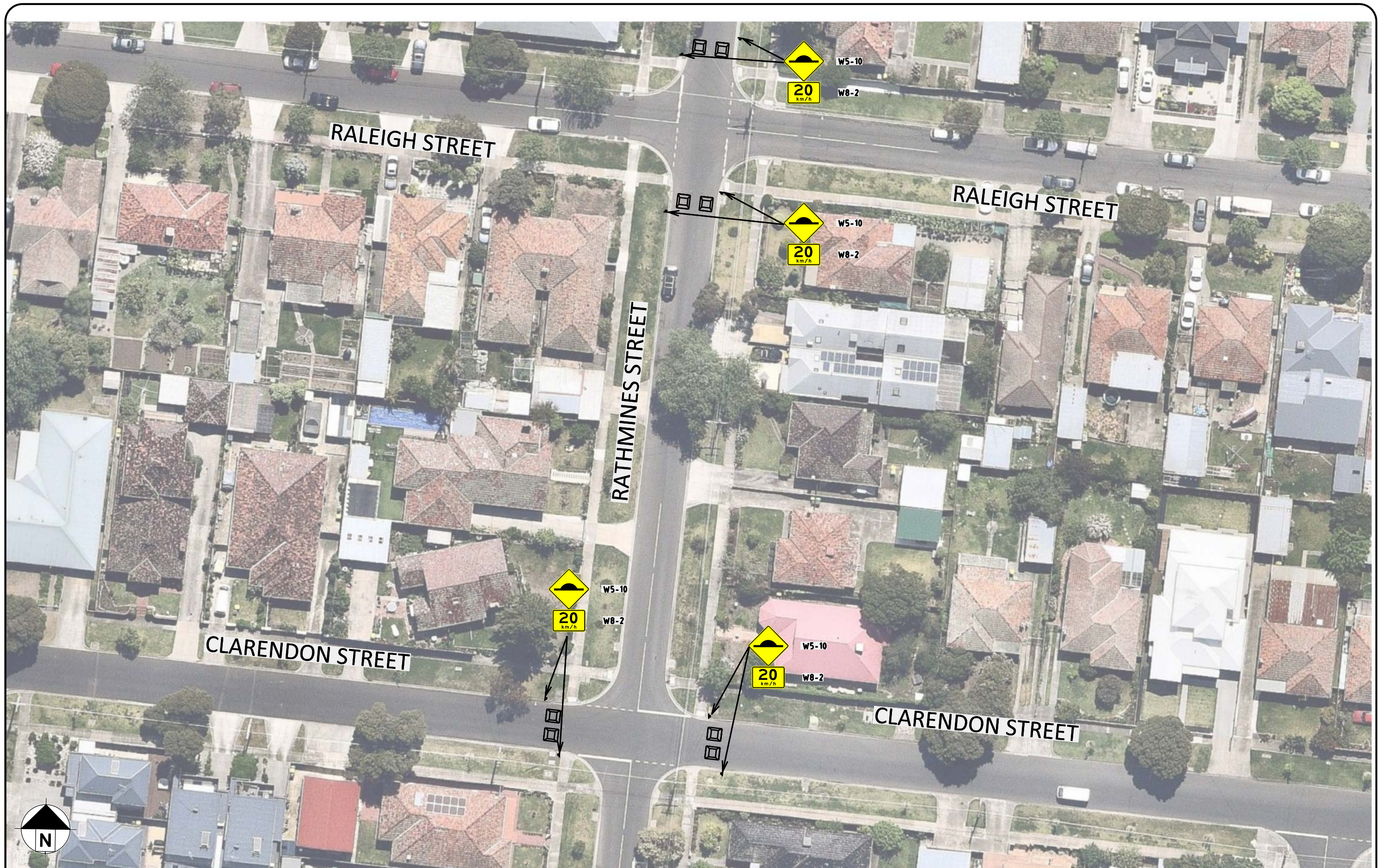
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	24 OF 37	ISSUE:	

CLARENDON PRECINCT THORNBURY

WILMOTH STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

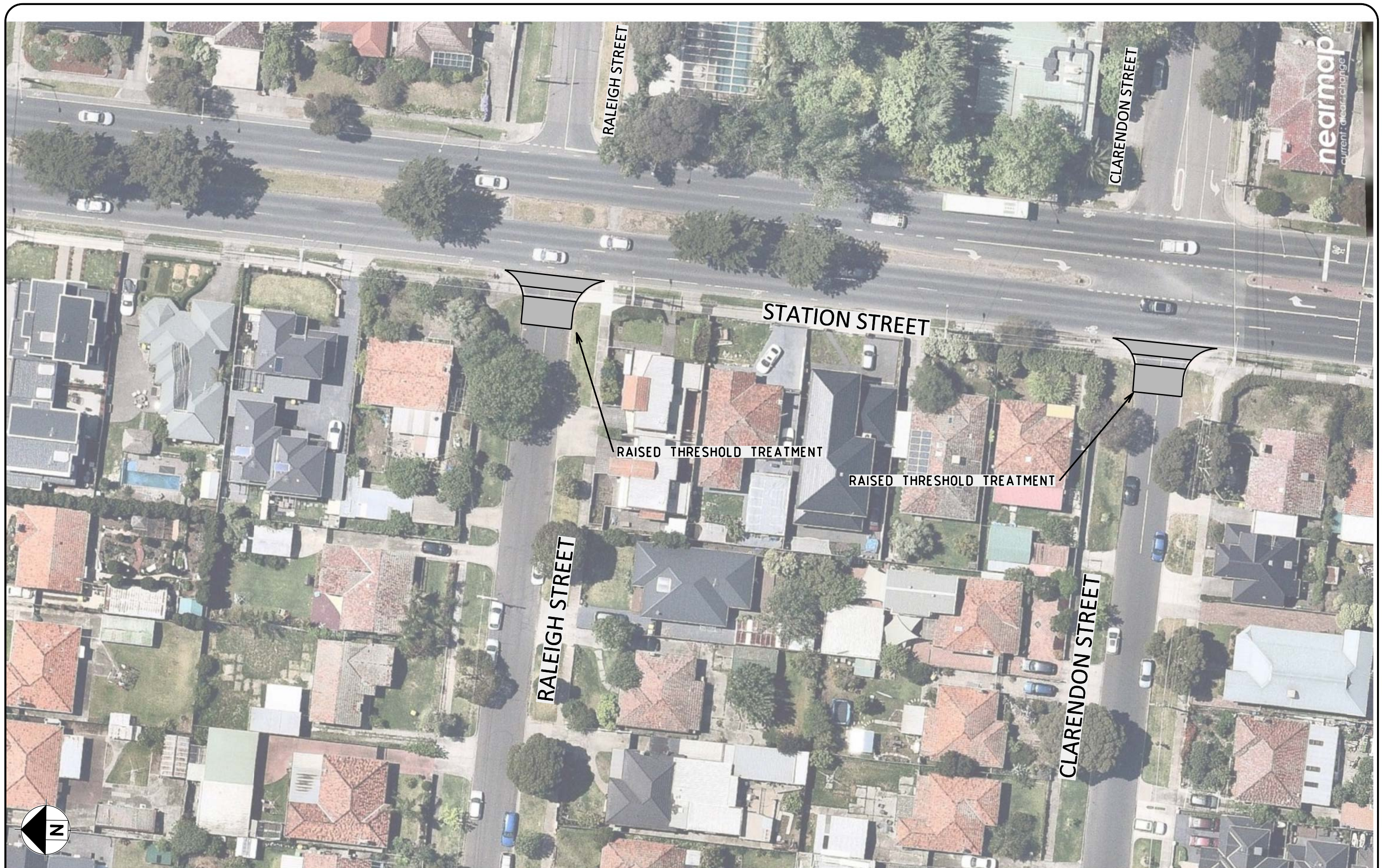


•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY	CAD FILE: 18318002.DGN
DESIGNED BY: M. FERGUSON	DRAWING NO: 18318002
SCALE: 1:500	ORIGINAL: A3
DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver. 0 5 10	SHEET NO: 25 OF 37
	ISSUE:

CLARENDON PRECINCT THORNBURY  
RATHMINES STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



•Traffic Planning •Transport Planning

•Traffic Engineering •Road Safety

SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY		CAD FILE: 18318002.DGN	
DESIGNED BY: M. FERGUSON		DRAWING NO: 18318002	
SCALE: 1:500	ORIGINAL: A3	DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver.	0 5 10	SHEET NO: 26 OF 37	ISSUE:

CLARENDON PRECINCT THORNURY

RALEIGH STREET  
CLARENDON STREET  
RAISED THRESHOLD TREATMENTS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER: J. MACAULAY		CAD FILE: 18318002.DGN	
DESIGNED BY: M. FERGUSON		DRAWING NO: 18318002	
SCALE: 1:500	ORIGINAL: A3	DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver.	0 5 10	SHEET NO: 27 OF 37	ISSUE:

CLARENDON PRECINCT THORNBUURY  
MARTIN STREET SPEED CUSHIONS  
AND MEDIAN WITH PLANTER  
BOXES





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	28 OF 37	ISSUE:	

**CLARENDON PRECINCT THORNBURY**  
MARTIN STREET SPEED CUSHIONS  
PAINTED MEDIAN WITH PLANTER  
BOXES AND LINE MARKINGS WITH  
ST DAVID STREET





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



- Traffic Planning
- Transport Planning
- Traffic Engineering
- Road Safety

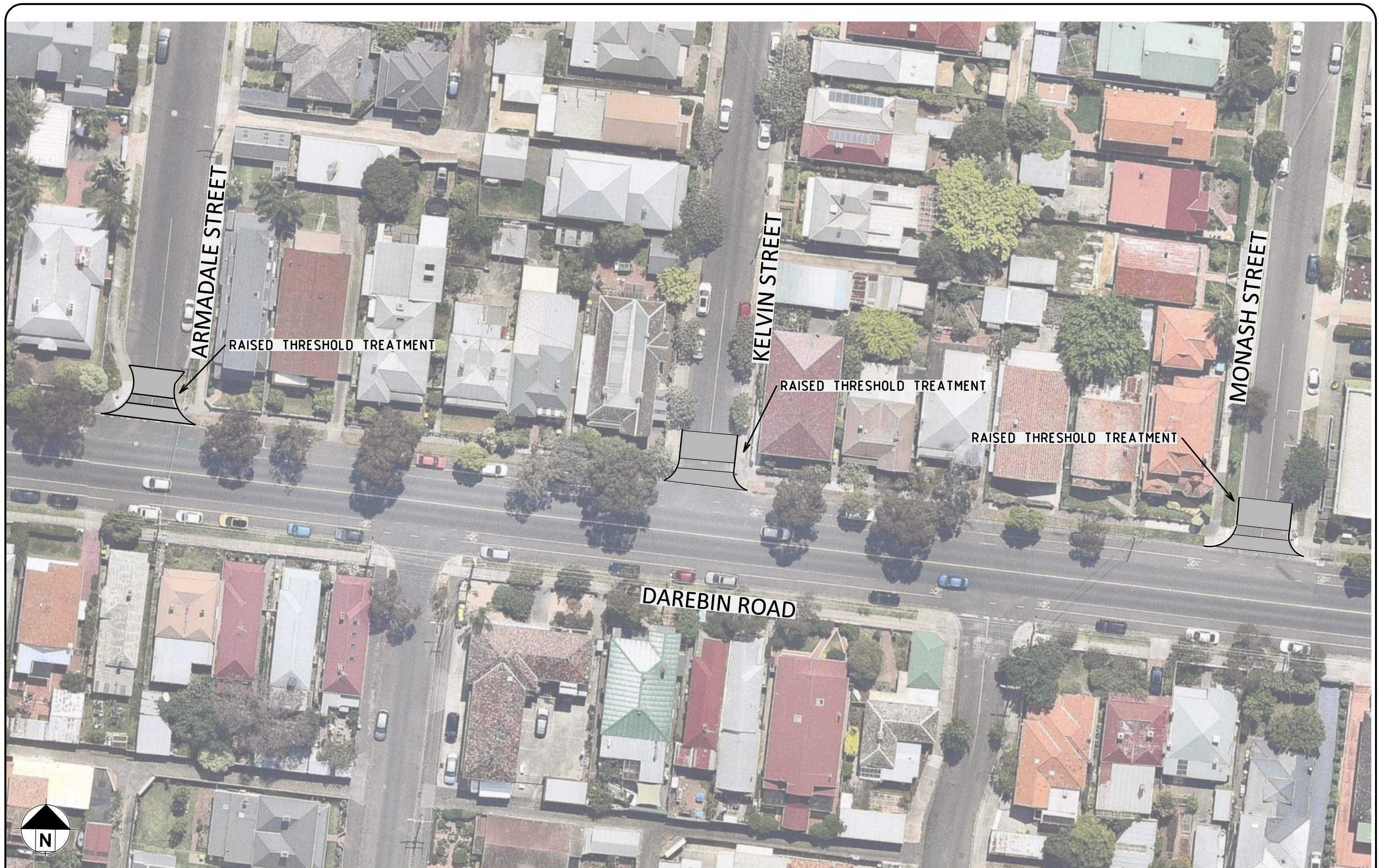
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	29 OF 37	ISSUE:	

CLARENDON PRECINCT THORNBURY

WALES STREET  
SCHOOL TREATMENTS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

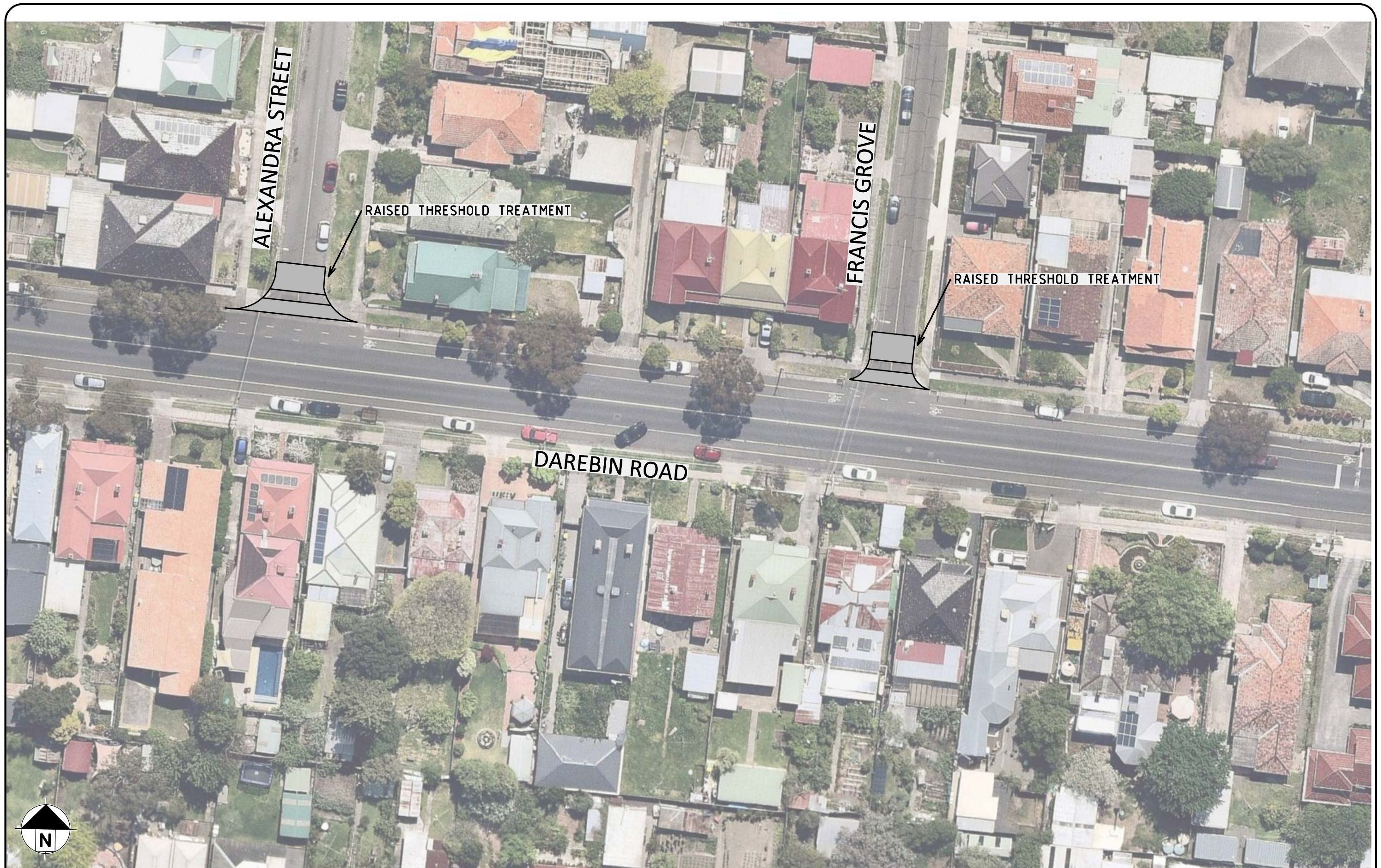


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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	ORIGINAL:	DATE:	JOB NO:
1:500	A3	21/05/19	18318
Hor. Scale	0 5 10	SHEET NO:	ISSUE:
Ver.		30 OF 37	

CLARENDON PRECINCT THORNBURY
ARMADALE STREET
KELVIN GROVE
MONASH AVENUE
RAISED THRESHOLD TREATMENTS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:

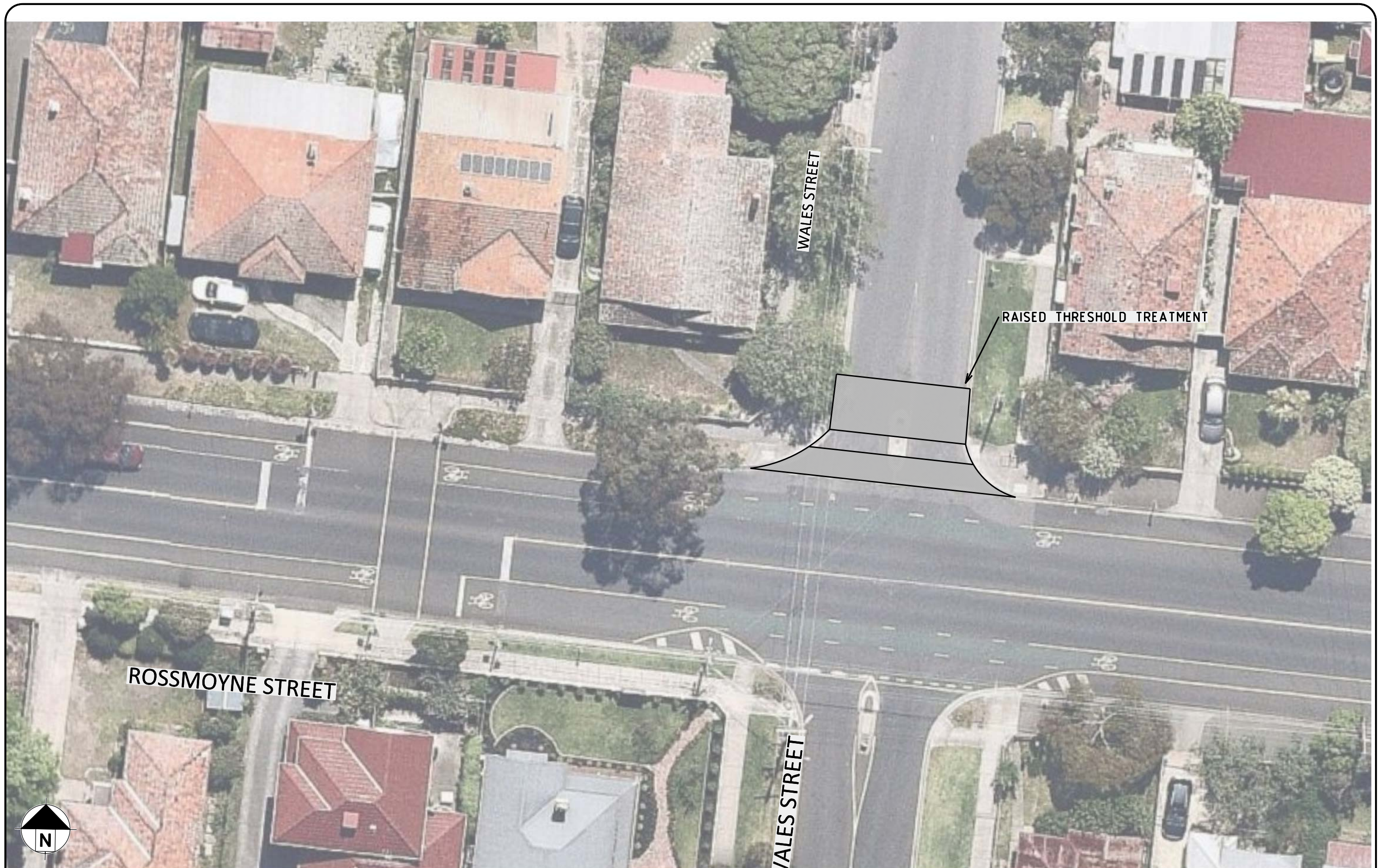


•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 5 10	SHEET NO:	31 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY
ALEXANDRA STREET FRANCIS GROVE RAISED THRESHOLD TREATMENTS





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



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•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
P: +613 9804 3610  
W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	32 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY
WALES STREET RAISED THRESHOLD TREATMENT





ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



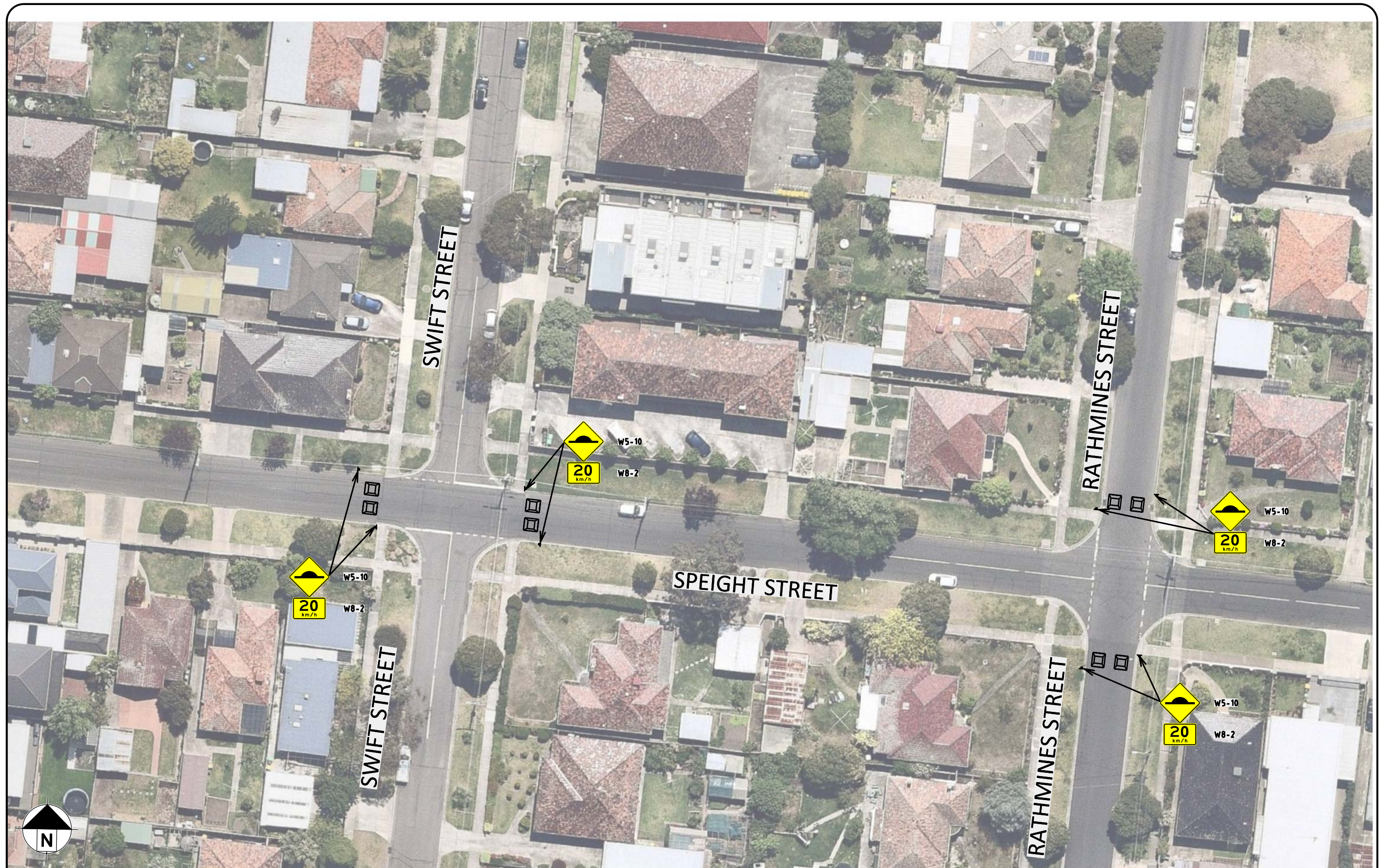
•Traffic Planning •Transport Planning  
•Traffic Engineering •Road Safety  
SUITE 2.03, 789 TOORAK ROAD  
HAWTHORN EAST, VIC, 3123  
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W: obrientraffic.com

ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:250	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale	0 2.5 5	SHEET NO:	33 OF 37
Ver.		ISSUE:	

CLARENDON PRECINCT THORNBURY

WILMOTH STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY	

NOT FOR CONSTRUCTION

NOTES:

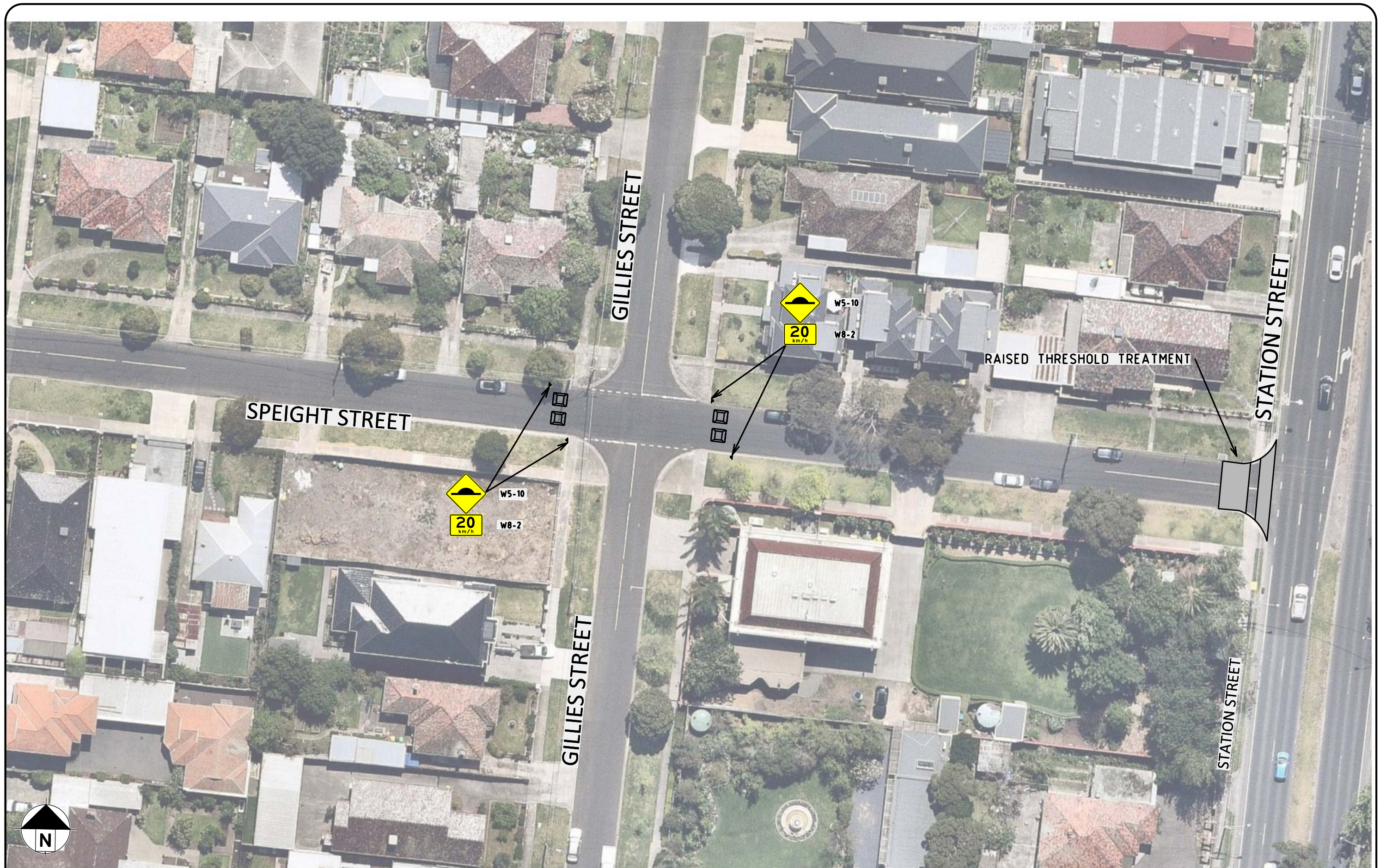


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ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
Hor. Scale Ver.	0 5 10	SHEET NO:	34 OF 37
		ISSUE:	

CLARENDON PRECINCT THORNBURY  
SPEIGHT STREET  
SPEED CUSHIONS





ISSUE	DATE	AMENDMENTS	BY

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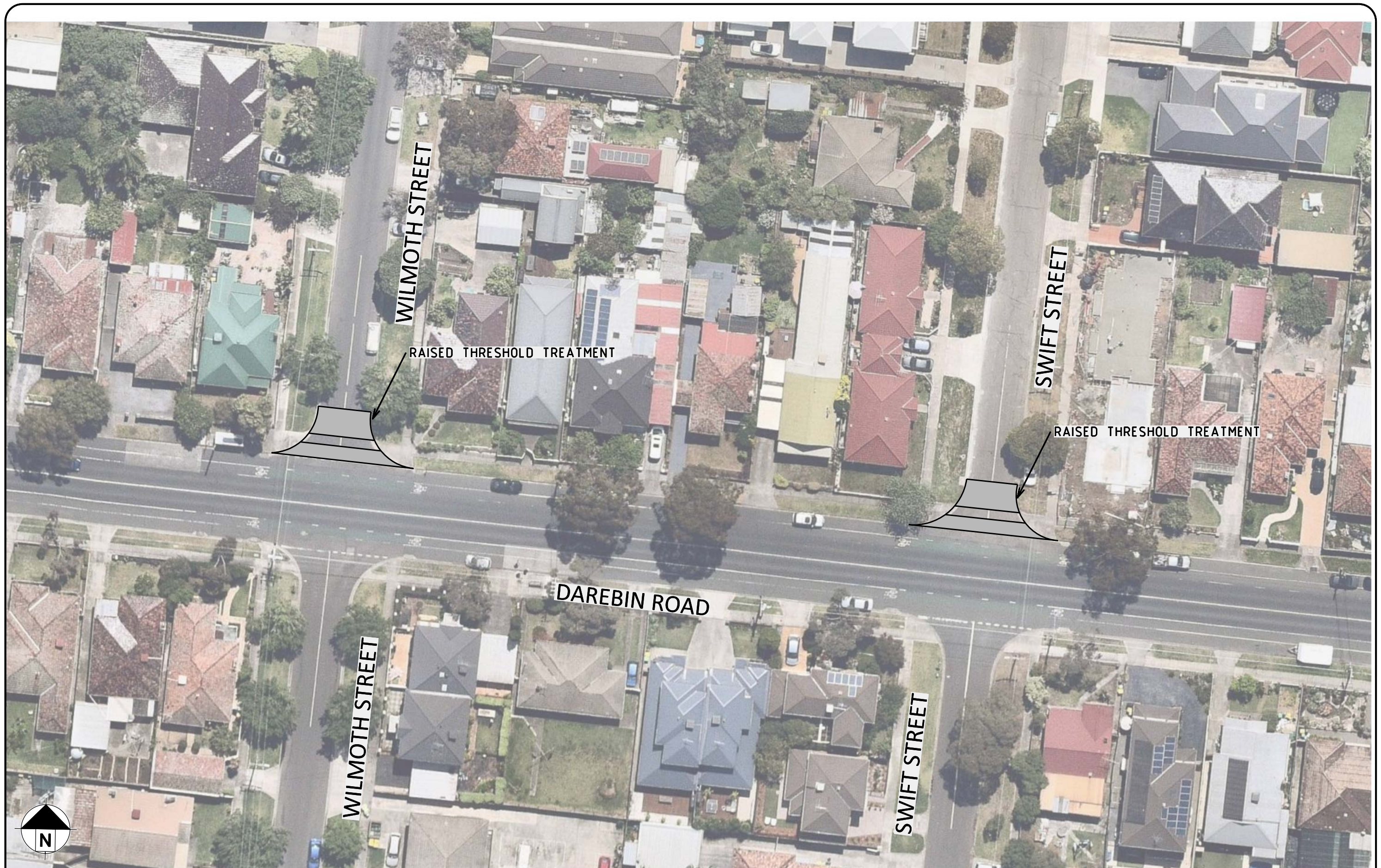
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HAWTHORN EAST, VIC, 3123  
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ENGINEER:	J. MACAULAY	CAD FILE:	18318002.DGN
DESIGNED BY:	M. FERGUSON	DRAWING NO:	18318002
SCALE:	1:500	ORIGINAL:	A3
DATE:	21/05/19	JOB NO:	18318
SHEET NO:	35 OF 37	ISSUE:	

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SPEIGHT STREET  
RAISED THRESHOLD TREATMENT  
AND SPEED CUSHIONS





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NOTES:

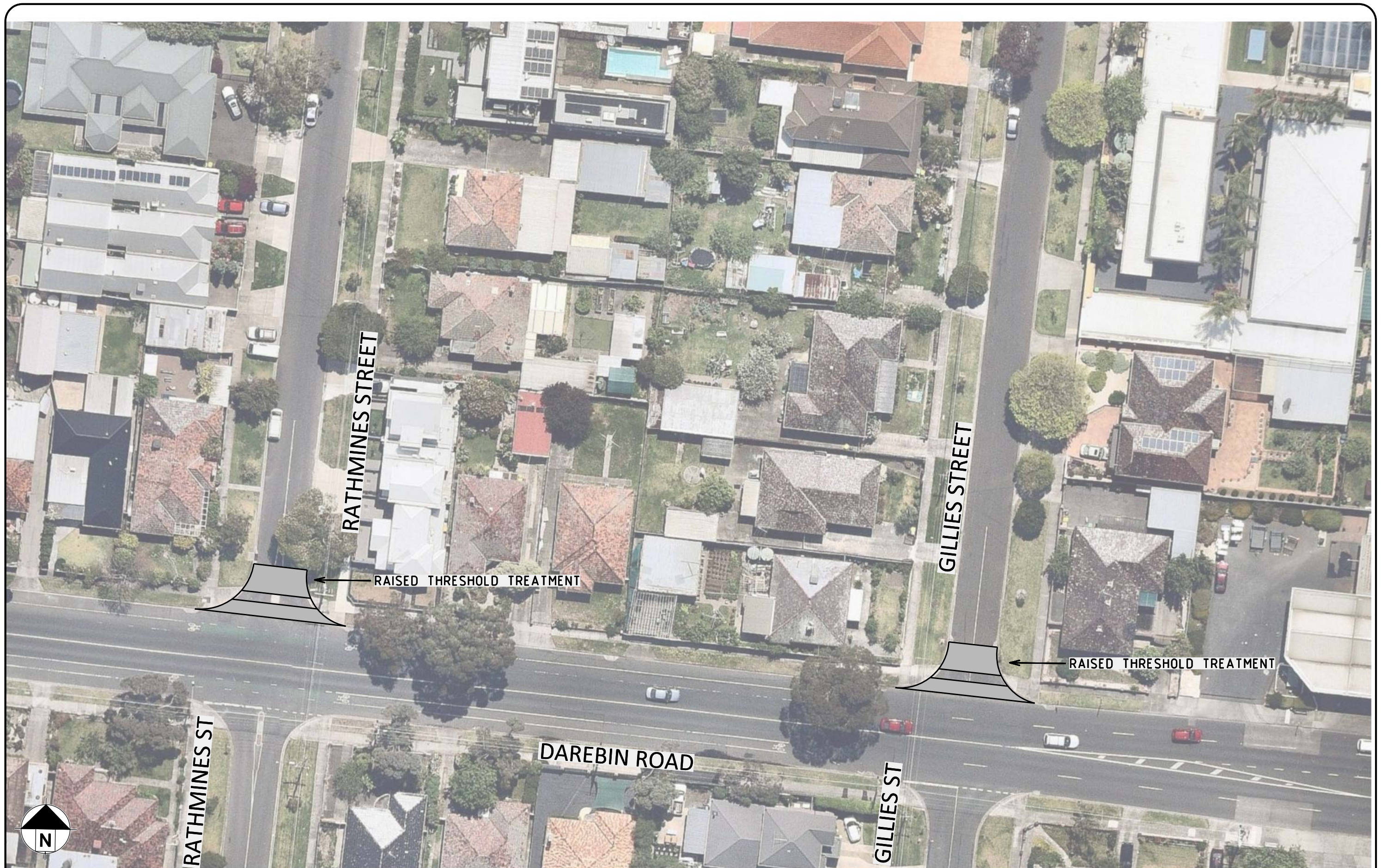


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CLARENDON PRECINCT THORNBURY
WILMOTH STREET AND SWIFT STREET RAISED THRESHOLD TREATMENT





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DATE: 21/05/19	JOB NO: 18318
Hor. Scale Ver.	SHEET NO: 37 OF 37

CLARENDON PRECINCT THORNBURY  
RATHMINES STREET AND  
GILLIES STREET  
RAISED THRESHOLD TREATMENT