Cheddar Road and Plenty Road Local Area Traffic Management Study

V127140
6 March 2020

Prepared for:

Executive Summary

> *It has been identified that between Cheddar Road and Boldrewood Parade many local roads are experiencing significant through traffic volumes as a result of drivers rat-running to avoid Broadway. - Darebin City Council brief*

Why?

The catalyst for this project stemmed from Council being made aware through resident reports and traffic survey data that there has been a significant increase in volumes of non local traffic using residential streets, often at high speeds, to avoid arterial roads within the study area (referenced through this report as "rat running"). GTA was engaged to investigate the claims and undertake an independent assessment of the raised issues, with the aim of treating these issues in a way that is sympathetic of the area and considers the needs of vulnerable road users.

Approach

The approach to the study was to maintain an open-mind while reviewing and evaluating the available background data to determine the needs of the area. This included a thorough desktop review, analysis of the speed and traffic volume data provided by Council and a review of the crash history over the most recent five year period. This analysis was complemented with fieldwork to review pedestrian movement patterns and desire lines.

In developing the recommendations for the study area, the approach has included:

- Establishing the real need (differentiating between perceived concerns)
- Identifying the focus areas – school zones and shopping strips
- Concentrating efforts at locations with issues supported by data
- Focussing on the needs of vulnerable road users
- Supporting a mode shift towards active and sustainable transport
- Applying a tailored, multi-faceted approach to treat the causes
- Creation of a consistent and intuitive road environment

Findings and Recommendations

Through the analysis and review of the existing conditions data (crash history, speed and volume surveys) it became apparent that there are high volumes of non-local traffic within residential streets in the study area. Another issue which is quite evident from the data is the number of casualty crashes involving pedestrians. In the last 5 years, a total of 30% of all casualty crashes across the study area involved a cyclist or pedestrian which is higher than the Victorian average of 20%.

Speeding is also a concern in 40km/h areas around schools, with the majority of these streets experiencing 85th percentile speeds of greater than the speed limit within the study area. The findings of the data analysis and on site inspections found that most of the perceived issues were supported by evidence.

Based on these outcomes, the recommendations of the study focus primarily on reducing "rat-running" and speeding in areas where there is high pedestrian activity including shopping strips and around schools.

Other factors should also be considered including the potential for any new traffic management installations to be sympathetic to buses and not push traffic onto other streets without treating them also.

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Quality Record

Issue	1. Final 23/07/2018 2. Draft 11/03/2020
Date	11/03/2020
Description	Draft Revised
Prepared By	Phoebe Hollins (Rev 1) Ben Krastins (Rev 1) Dan Mead (Rev 1) Karen Cogo (Rev 2)
Checked By	Chris Coath
Approved By	
Signed	

OVERVIEW

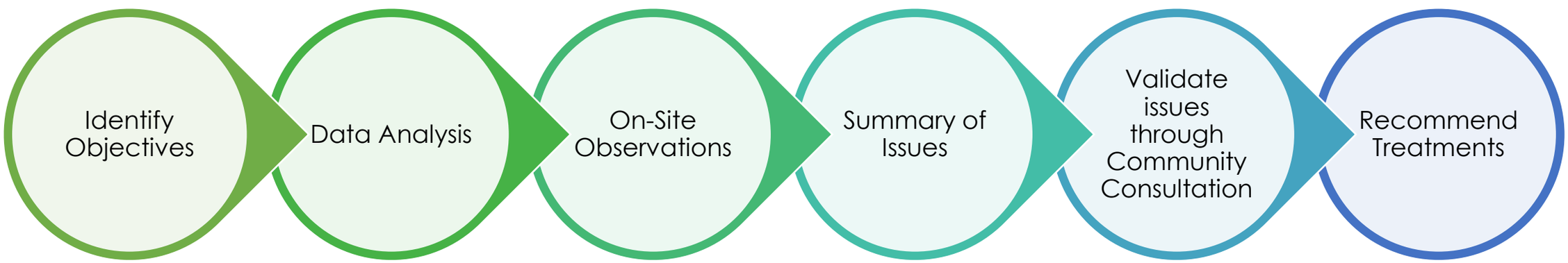
Study process

The approach for this traffic management plan has been to review the available evidence, including traffic speed data, volumes and crash history within the study area and to evaluate the issues from an evidence base. In addition to a review of the data, GTA inspected the study area on a typical weekday and participated in several community workshops to validate and better understand the issues being faced by the community.

With an understanding of the issues within the study area (from consultation and review of the evidence), the purpose of the study is to develop a tailored approach to address the established issues.

The treatments for locations which were identified as having a speeding problem will be further workshopped by the resident working group, while treatments to reduce the permeability of the road network and treat road safety problems have been recommended.

By undertaking a LATM study over such a large area, it ensures consistency and familiarity with the types of treatments and road environment. Furthermore, it ensures that the area is treated as a whole, rather than a piecemeal approach whereby locations are treated individually.



Overview

> Local area traffic management (LATM) is "*concerned with the planning and management of the usage of road space within a local traffic area, often to modify streets and street networks which were originally designed in ways that are now no longer considered appropriate to the needs of residents and users of the local area.*" (Austroads Guide to Traffic Management Part 8: Local area traffic management, 2016)

Evaluation of Data

The initial stage of the project involved the collation of all available existing data. Council provided GTA with traffic survey data at multiple locations. Based on an initial assessment of the road network layout and crash history, GTA recommended additional traffic surveys were conducted.

The data that was evaluated through out this project included: traffic volumes and speeds, crashes type and history, and land use.

An important component of the project was to spend time investigating the study area to understand the existing conditions and ensure consistency with the desktop review of the issues. The study area was inspected between 8am and 5pm on 22 November 2017.

The fieldwork enabled an improved understanding of driver behaviour, general vehicle speeds and pedestrians crossing patterns and desire lines at the beginning and end of the school day.

Review of Need

Once the existing conditions data was reviewed, an understanding was developed between the relationship this has with the issues that were raised. This included a review that sought to ascertain the real issues from those that could be perceived.

It is also included assessing the concerns raised against actual recorded (85th percentile) speeds at key locations, including the additional information that was sought to ensure data related to site-specific locations.

The review established that there was a definite need to address speeding during school hours.

Crash data was also reviewed in relation to the concerns that were raised. The only location identified as a Black Spot (under the Black Spot funding program eligibility criteria) was the intersection of St Vigeons Road and Invermay Street.

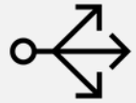
Consultation

Following the completion of the data analysis and validations based on site observations, two community engagement sessions were conducted by Council during February and March 2018.

These workshops provided further validation to the data analysis and on-site observations, as well as identifying additional concerns from the community.

The key issues and concerns which came out of the workshops were rat-running due to the permeability of the road network, speeding and hooning, and issues surrounding parking associated with increased medium density development.

The community sessions also gave the opportunity to workshop some potential traffic management solutions for these areas of greatest concern.



Options Development

The insights and feedback obtained from the data analysis, site inspections and public consultation were valuable in understanding the local community issues, geographical constraints and pedestrian movement patterns.

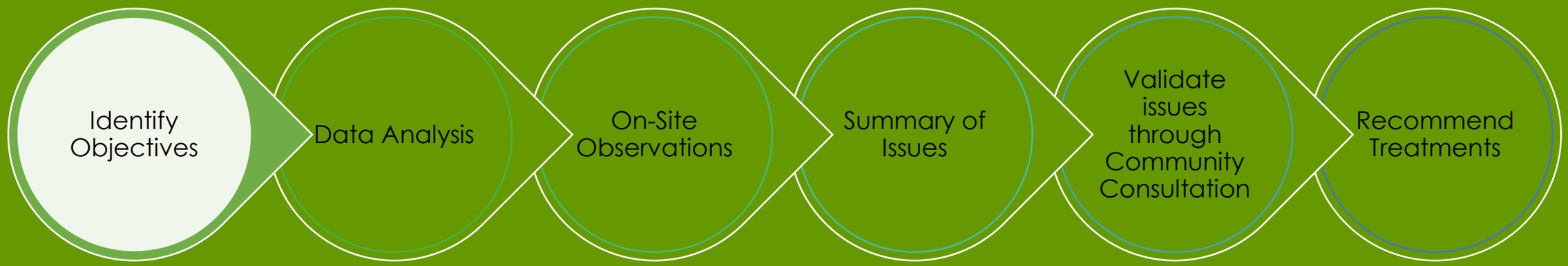
Using this collective information, along with an understanding of LATM best practice, various options investigated and considered which sought to address the primary needs while simultaneously delivering enhanced safety and amenity for the local community.

Following the completion of the preliminary traffic management plan for the area, a working group established from the community workshops will meet to further workshop the proposed treatments and treatment locations, including development of concept plans for consideration in future capital works funding submissions.

[1] Being addressed in a separate road safety improvement project by Council.

01

IDENTIFYING OBJECTIVES



Objectives

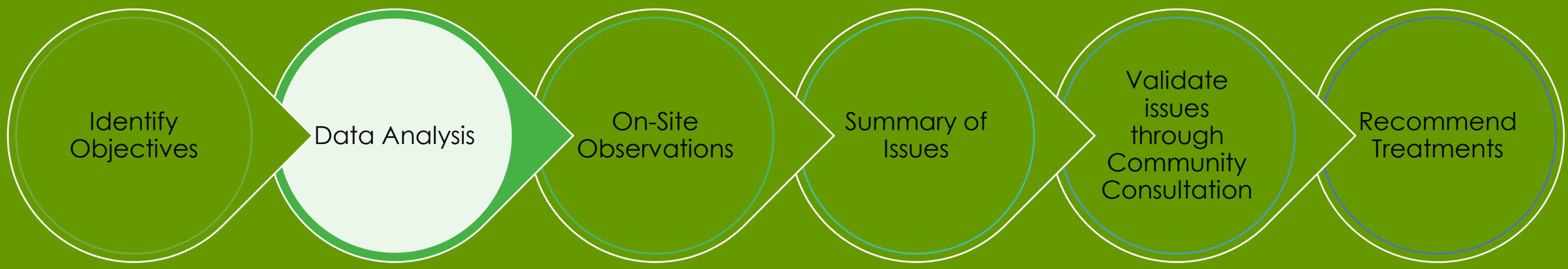
The LATM study has originated from Council being made aware through both community feedback and traffic survey data identifying the area bounded by Cheddar Road, Broadway and Plenty Road as requiring improvements to treat rat-running and road safety issues.

The key objectives of the local area traffic management plan are to:

- reduce the permeability of the road network in order to discourage non-local through traffic in local residential streets and reinforce the status of collector and arterial roads
- reduce the number and severity of crashes, especially those involving vulnerable road users
- improve the overall amenity and safety of the road environment including with regards to walkability and cycling
- support Council's wider transport objectives
- incorporate community feedback and concerns into the plan
- ensure treatment types and locations are sympathetic to public transport and do not hinder the movement of pedestrians or cyclists

02

ANALYSING THE DATA



Understanding the local context

From the evidence collected and reviewed for this study, it is clear that there are evident speeding and rat-running issue through areas of Reservoir and Kingsbury.

While Invermay Street / Marshall Drive / Burbank Drive is a designated higher order collector road, there are speeding and safety issues identified along this route.

The identified rat-run routes from Cheddar Road East to Plenty Road are not a designated higher order collector road and as such, the amount of traffic in these streets is potentially unacceptably high. However, there is existing traffic management and the streets do not allow for simultaneous 2-way traffic when vehicles are parked either side of the road, resulting in lower speeds.

Speed around schools was also identified as a problem, both in 40km/h areas directly adjoining schools and in adjacent streets. Furthermore, the number of pedestrian and cyclist related crashes throughout the study area was high, although there was no distinguishable pattern, except that these crashes were occurring mainly on Council collector roads.

Wider streets or streets with no existing traffic management, were identified as areas with higher occurrences of speeding vehicles.

Road Hierarchy

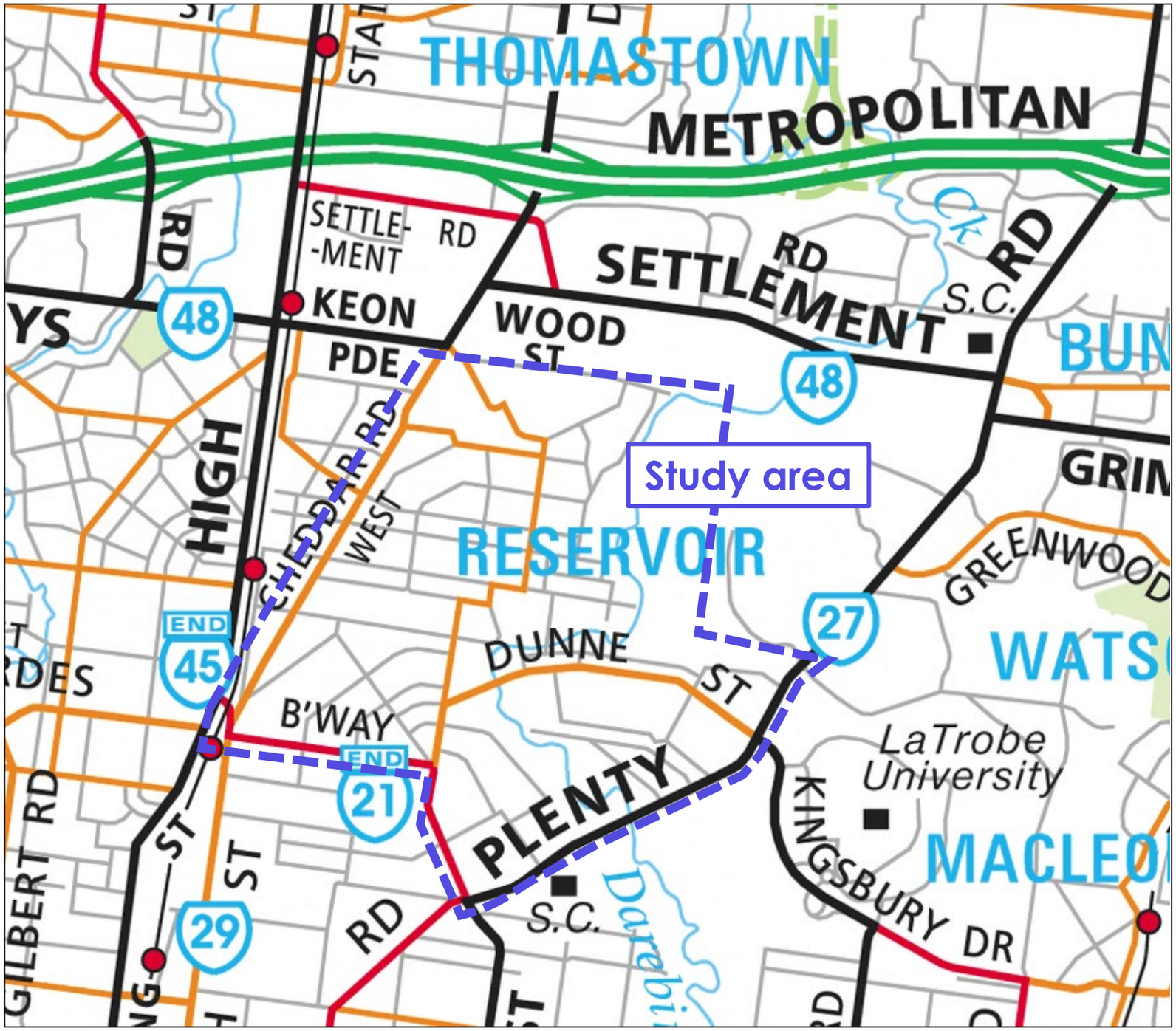
While Reservoir has good arterial road access from all directions, connectivity within the study area is poor with Dunne Street, Dole Avenue and Invermay Street providing the only collector road access to properties.

Connectivity from the Western Ring Road is only possible from Dalton Road, which is an extension of Cheddar Road. As such, vehicles are more likely to use the Council road network as opposed to High Street and Keon Pde.

Given the geographical barriers and layout of the road network, the route through Reservoir utilising residential streets is highly appealing, further compounded by the level crossing at Reservoir Station, however this is soon to be removed.

The local area traffic impacts of the level crossing should be mitigated through the level crossing removal project.

- Freeway (VicRoads)
- Primary Arterial (VicRoads)
- Secondary Arterial (VicRoads)
- Collector (Council)
- Local Access (Council)
- Railway Station



Source: Melway

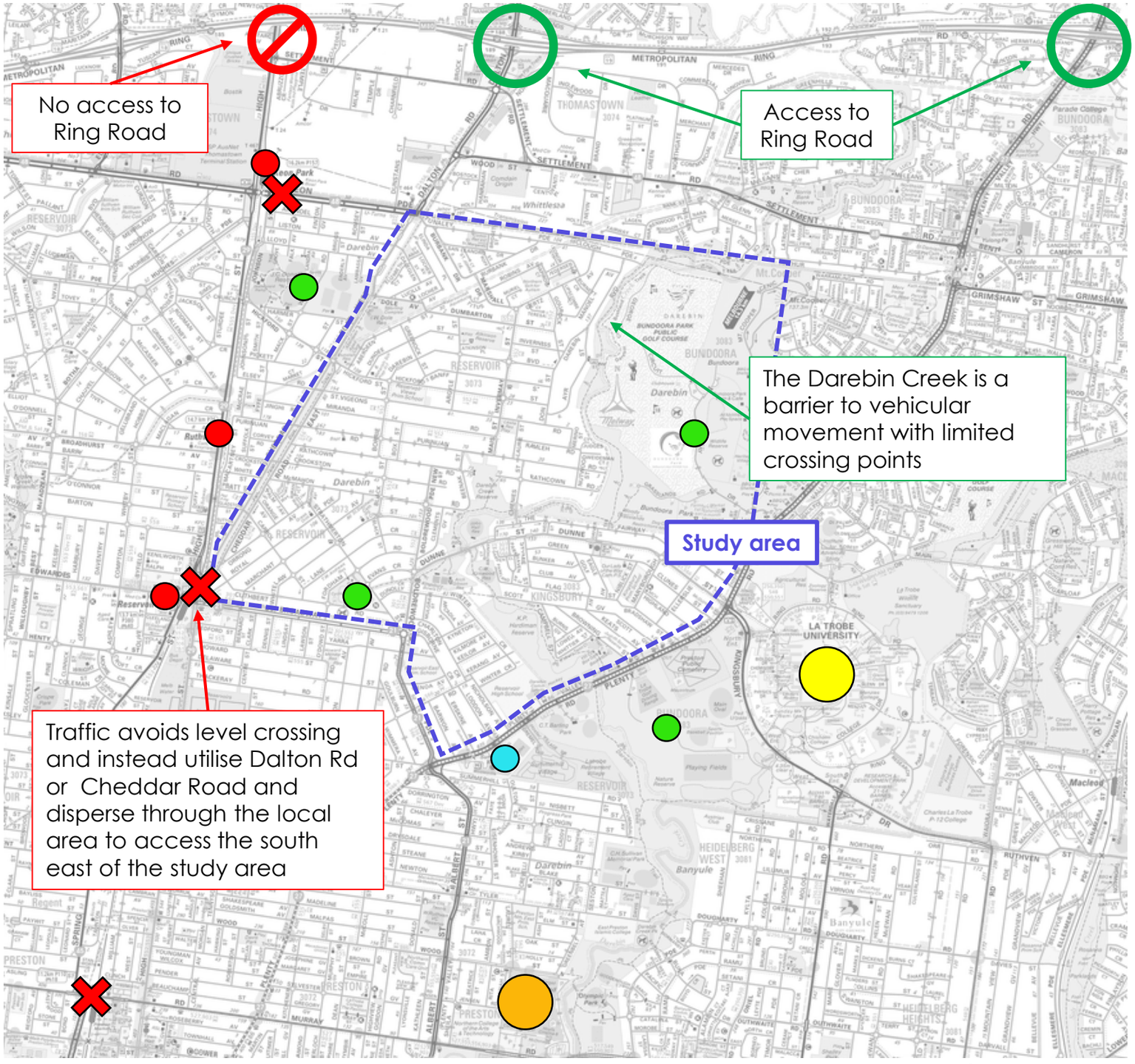
Trip Attractors / Generators

Reservoir is well served by education, retail and open space infrastructure.

Directly to the south of the study area, located off Plenty Road is Latrobe University, Summerhill Village Shopping Centre and Northland Shopping Centre, which are all major traffic generators.

Large open space reserves along the Darebin Creek, as well as Keon Park and Bundoora Park are significant open space and recreation attractors of local significance in the northern suburbs of Melbourne.

- La Trobe University
- Northland Shopping Centre
- Summerhill Village Shopping Centre
- Level Crossing
- Railway Station
- Open Space / Recreation



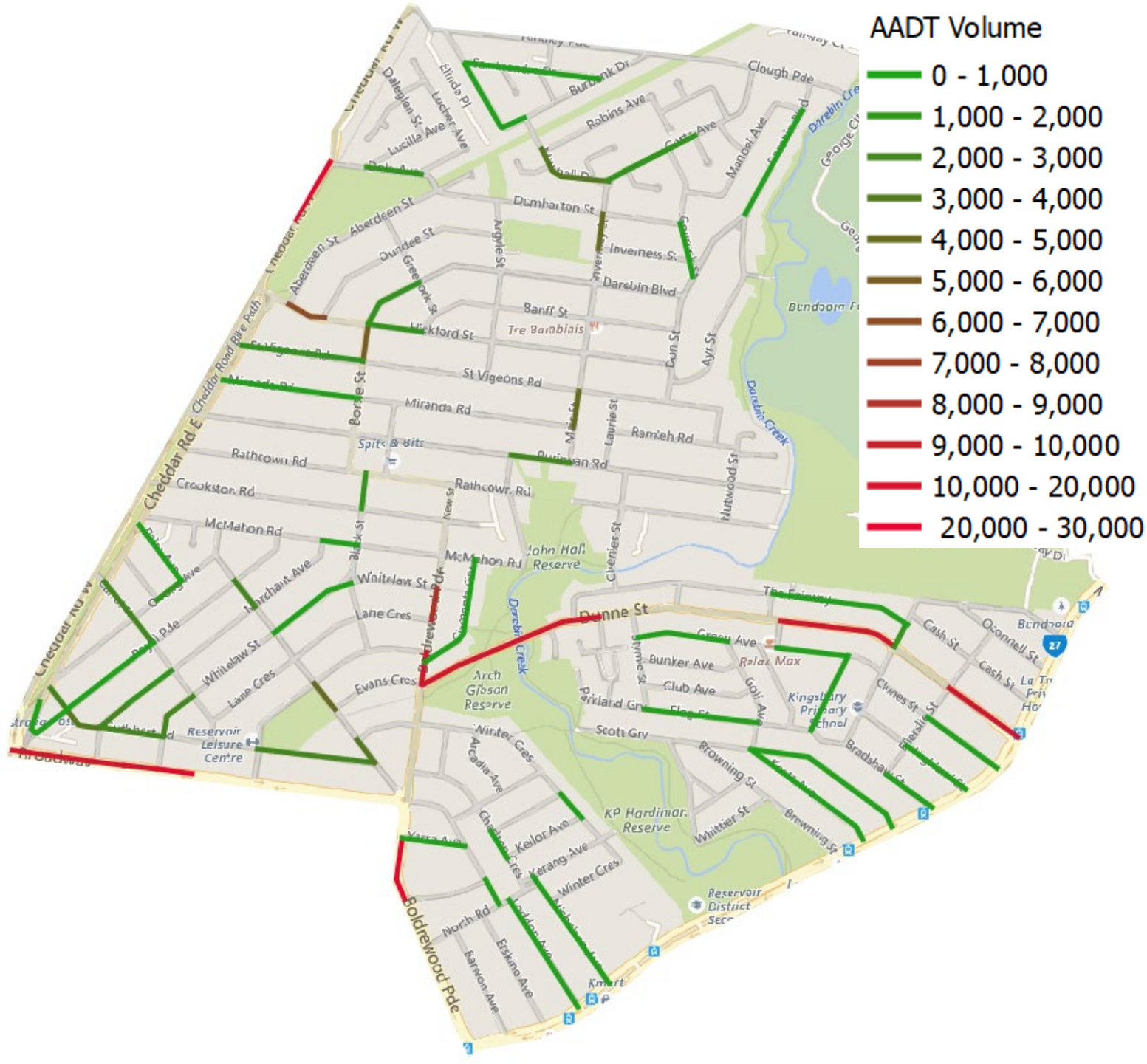
Source: Melway

Data Analysis – Traffic Volumes

While data is not available for all streets, the data shows the clear preferred traffic routes for vehicles travelling through the area.

The volumes do not exceed the expected volumes for local and collector roads in a metropolitan location however it is noted that traffic in Hickford Street / Borrie Street is high, given its local access road classification.

As shown by the vehicle speeds, streets with traffic calming generally had higher volumes however it is noted that traffic calming does not result in lower volumes. Instead, traffic calming is avoided on preferred traffic routes, to assist with traffic flow and therefore reducing rat-running through local streets.



Data Analysis – Vehicle Speeds

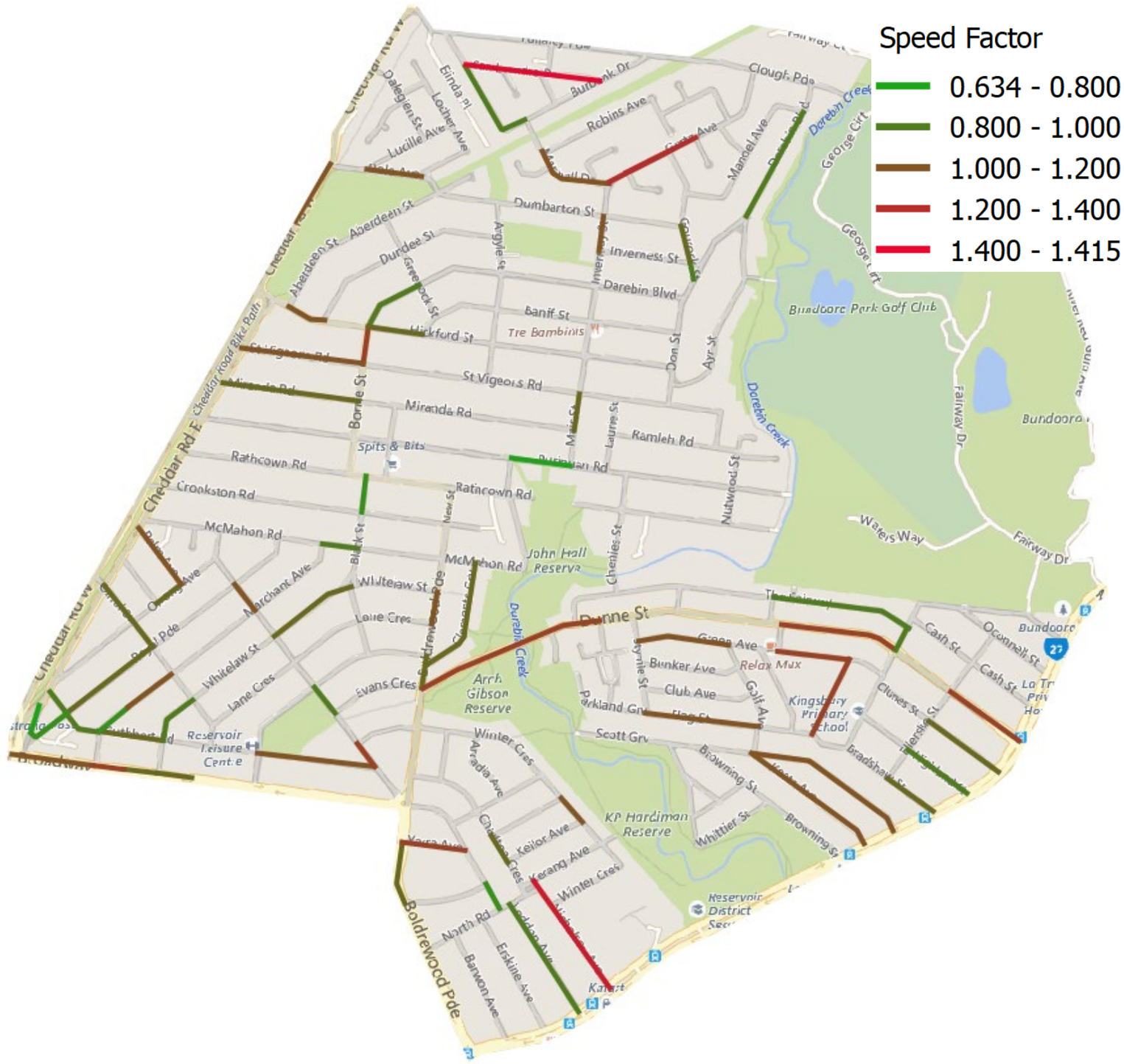
All recent traffic classifier count data in the LATM area was supplied by Council and analysed to give an understanding of the existing patterns and characteristics of traffic travelling along local streets.

The accepted standard for determining the speed profile of a particular street is 85%th percentile vehicle speed. It is the speed at which 85% of vehicles travel at or below.

Each of the colours on the map represent the measured speed profile for that street. A speed factor of 1.0 corresponds to the 85th percentile recorded speed equalling the posted speed limit in that street.

The data shows that while vehicles are generally compliant with the speed limits, there are some particular areas, including around schools, which had high recorded speeds.

Streets which had existing traffic calming, or had existing road environments which supported lower speeds, were also validated with 85th percentiles lower than the speed limit in most cases.

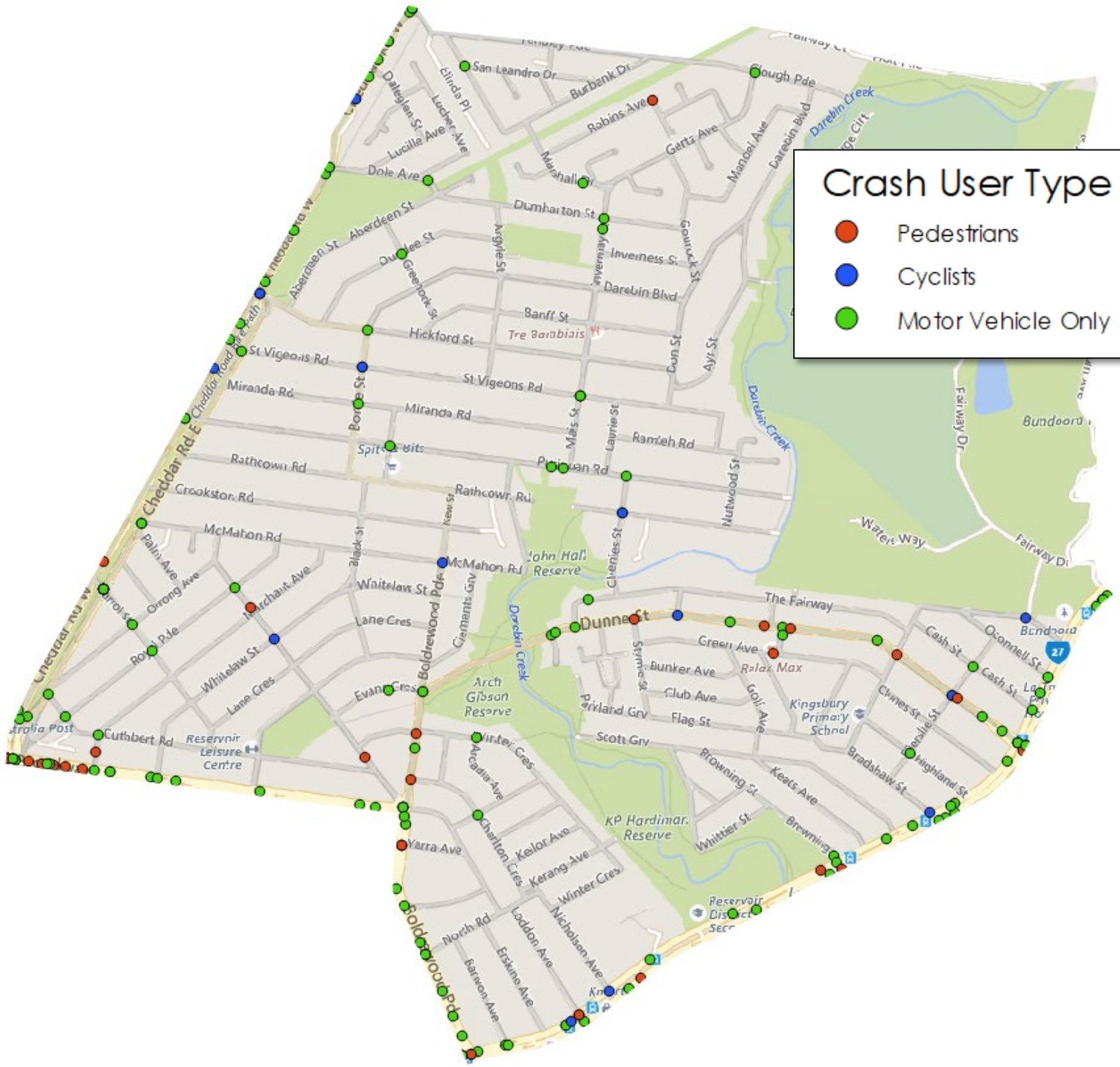


VicRoads Crash Data

Every casualty crash which is attended to by Victoria Police throughout the state is recorded in the publicly available VicRoads CrashStats database.

An analysis of the data showed the following:

- There was 254 casualty crashes in study area over the last 5 years
- Of these crashes,1 resulted in a fatality, 60 in serious injury and the remaining 180 'other injury'
- There are several locations with an identified pattern of crashes on the local road network, on Cheddar Road at the median crossings, and at the intersection of St Vigeons Road / Invermay Street
- A total of 34 casualty crashes involving motorcycles, 35 involving pedestrians and 21 involving cyclists.
- Of crashes involving vulnerable road users (i.e. cyclists and pedestrians), 30% were serious injury or fatal crashes as opposed to 20% of vehicle only crashes



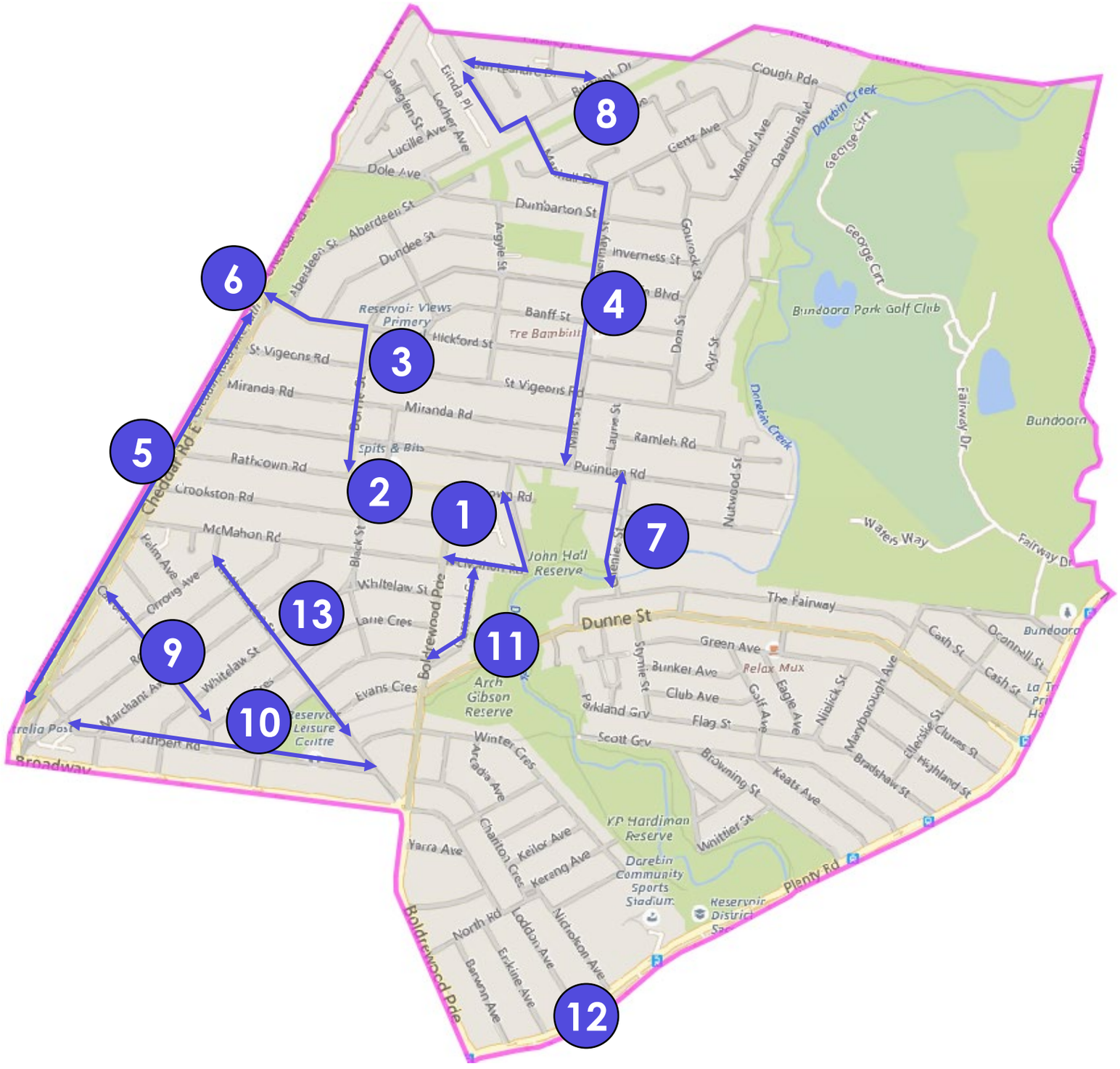
Summary of Issues Raised by Residents

Community Feedback

The following list of issues has been summarised from historic community complaints and requests received by Council regarding transport and road safety issues.

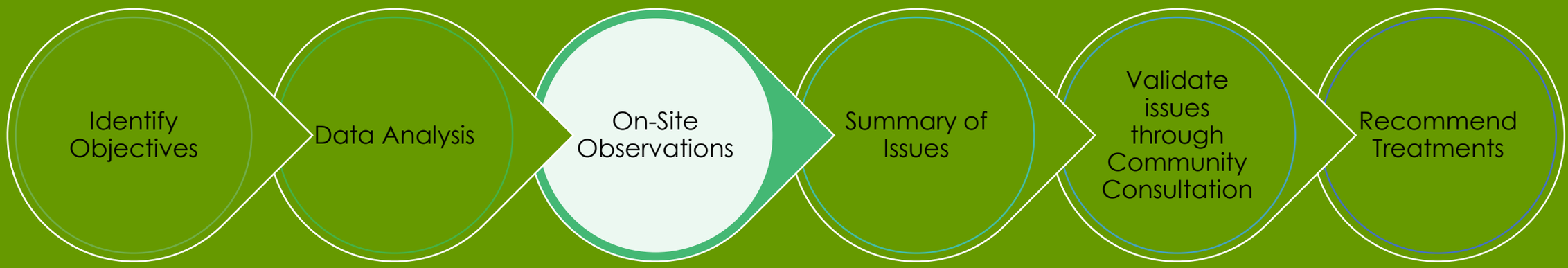
In general, most of the comments related to non-local through traffic and speeding in residential streets. These locations contributed to the targeted inspection locations.

Site	Street	Community Comment
1	Beenak Street	Rat Running
2	Rathcown Road	Hoon Activity
3	Hickford Street / Borrie Street	Rat Running
4	Burbank Drive to Invermay Street	Rat Running
5	Cheddar Road	Hoon Activity and Speeding
6	Cheddar Road and Hickford Street	Dangerous Roundabout
7	Chenies Road	Speeding
8	San Leandro Drive	Speeding
9	Carrol Street	Rat Running and Speeding
10	Cuthbert Street	Rat Running and Speeding
11	Clements Grove	Hoon Activity and Speeding
12	Loddon Avenue	Entering Wrong Way
13	Strathmerton Street	Speeding



03

VERIFYING THE PROBLEM



Verifying the Problem

A comprehensive site inspection was conducted in order to gain an appreciation of the local area. Several streets (identified on the map over the page) were targeted during the inspection after they were identified as potential problem areas through data analysis or community feedback.

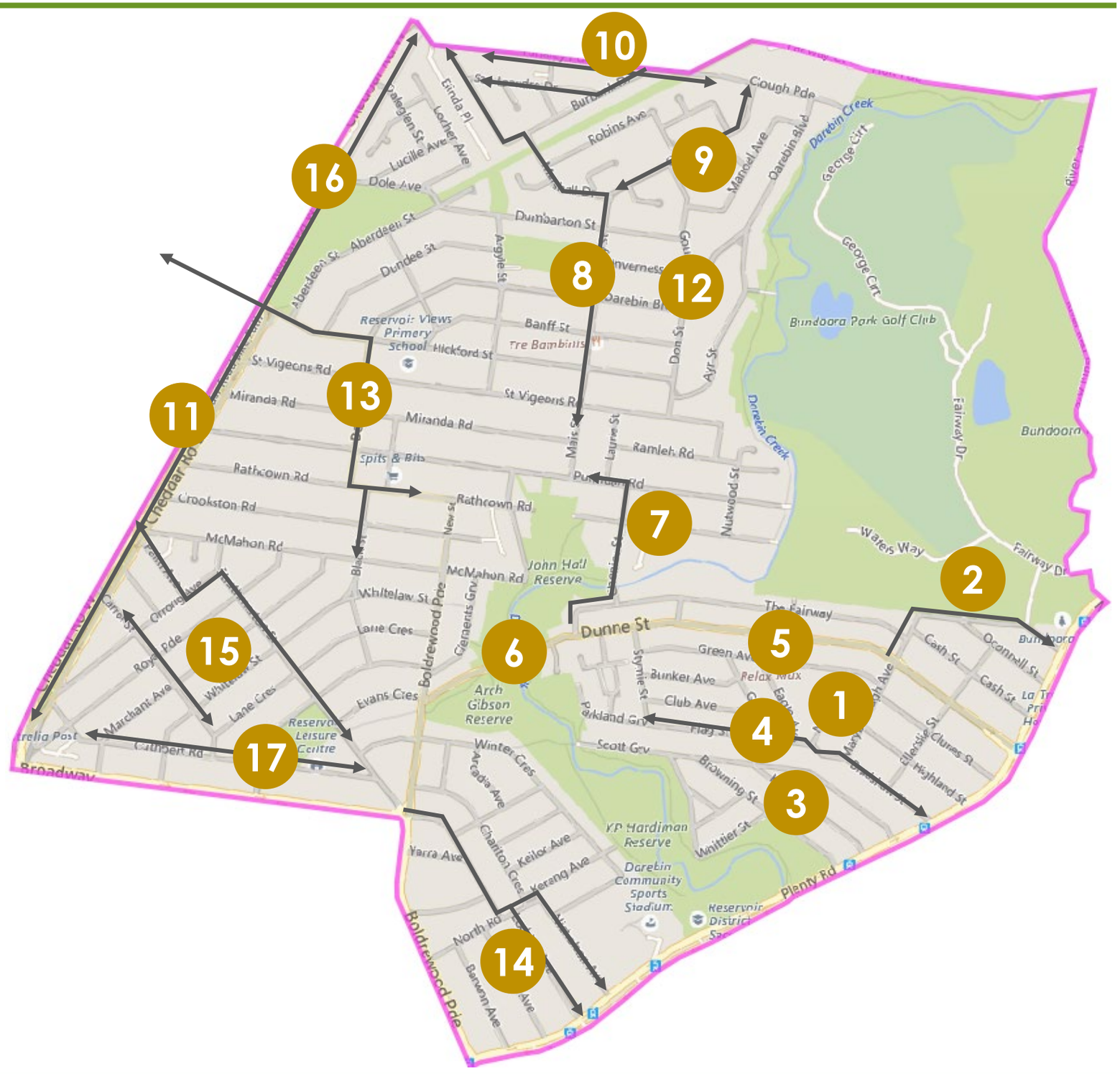
Each site was inspected for the surrounding land use, mode share and other factors which may be not be evident during a desktop audit such as road geometry and topography.

The site inspection assisted us to make a professional judgement as to whether the concern was a perceived issue or supported by evidence.

Details on the issues facing each of the streets identified are shown in the following pages. Based on the traffic survey data and the site inspection, a professional judgement was made as to whether the issue was supported by evidence.

Sites Proposed for Inspection

Site	Street	Potential issue
1	Kingsbury Primary School	Speeding, safety
2	Curtain Street	Rat-running
3	Keats Avenue / Scott Grove / Browning Street	Speeding
4	Flag Street / Bradshaw Street	Speeding, safety
5	Link Street (*Kingsbury Place*)	Pedestrian safety
6	Dunne Street	Pedestrian and bicycle safety
7	The Fairway / Chenies Street	Rat-running, speeding
8	Burbank Drive / Marshall Drive / Invermay Street	Speeding, safety
9	Gertz Avenue	Speeding
10	San Leandro Drive / Tunaley Parade	Speeding, safety
11	Cheddar Road (and crossing points)	Speeding, rat-running
12	Inverness Road / Darebin Boulevard	Safety, rat-running
13	Hickford Street / Borrie Street	Rat-running, speeding, safety
14	Reservoir East Primary School / Reservoir High School	Pedestrian safety, speeding
15	Carrol Street Strathmerton Street	Speeding, safety
16	Dole Avenue	Safety
17	Cuthbert Street	Speeding, Safety



On-Site Observations: Findings

1/ Kingsbury Primary School

The school was inspected during the morning peak. There was a high occurrence of pedestrians and school drop offs by vehicle.

Also adjacent to the school is *Our Lady of the Way* and *Maryborough Kindergarten*

40km/h hour speed limits apply to streets along the frontage of the two primary schools.

Green Avenue (pictured), Niblick Street and Maryborough Avenue all have carriageway widths of approx. 7.2-7.5m

Green Avenue (looking east)

Data analysis

- 85th percentile speeds in Niblick Street were 45.2km/h
- 85th percentile speeds in Green Avenue were 45.4km/h
- Posted 40km/h speed limit and school crossings (both supervised and unsupervised) in Green Ave, Niblick Street and Maryborough Ave
- Intersection at northern end is slightly skewed which could promote high speed entry
- Extensive parking bans at the southern end during school times may encourage higher speeds due to increased trafficable road width and removal of the requirement to give way to oncoming vehicles.

SUPPORTED BY EVIDENCE

2/ Curtain Street

Curtain Street is a local residential street with Bundoora Park on the northern side, including a fenced dog park.

There is limited traffic calming at the eastern section of Curtain Street, including along the whole length of O'Connell Street.

Parking along the north side is indented at 90 degree and parallel in different sections. There is no continuous footpath along the northern side of the street and no clear crossing point.

Curtain Street has an undivided carriageway width of approx. 7.0m.

Curtain Street (looking east)

Data analysis

- No traffic classifier information available for Curtain Street
- 85th percentile speeds in Maryborough Ave between Dunne Street and The Fairway were 43.0km/h (default 50km/h speed limit)
- One casualty crash involving a cyclist attempting to cross to or from Bundoora Park stuck by a vehicle

NOT SUPPORTED BY EVIDENCE

On-Site Observations: Findings

3/ Keats Avenue and Browning Street

Keats Avenue, Browning Street and Scott Grove provide access from residential properties to Plenty Road. Several intersections, including the one shown below have a Y-configuration and insufficient pedestrian facilities.

There is a shopping centre along Plenty Road at the end of these streets and recreational and open space facilities are located at the eastern end of Browning Street.

All streets generally have an undivided carriageway width of 7.0-7.2m.

Intersection of Keats Ave / Scott Grv and Golf Ave

4/ Flag Street / Bradshaw Street

Flag Street / Bradshaw Street for the most part is a long and straight road with no requirement to give way to side road traffic.

There is a series of horizontal and vertical curves near Kingsbury Primary School. At this location is also a 'recommended crossing point'.

Flag Street / Bradshaw Street has an undivided carriageway width of approx. 7.2 – 7.4m.

Data analysis

- 85th percentile speeds in both Scott Grove and Keats Avenue were 51.0km/h (speed limit 50km/h)
- Volumes in both streets are low (300-400vpd) as expected for a local access street
- No recorded casualty crashes in last 5 years

NOT SUPPORTED BY EVIDENCE

Bradshaw Street (looking east)

Data analysis

- 85th percentile speeds in Flag Street west of Golf Avenue were 53.0km/h
- 85th percentile speeds in Bradshaw Street, near Plenty Road were 48.0km/h
- Both streets have a default 50km/h speed limit
- No recorded casualty crashes in last 5 years
- Long and straight road, with the exception of multiple consecutive curves near Kingsbury P.S.

NOT SUPPORTED BY EVIDENCE

On-Site Observations: Findings

5/ Kingsbury Place (Link Street)

Kingsbury Place consists of a small shopping strip on one side of the road and a playground and park on the other.

Included in the shopping strip is footpath trading and alfresco dining as well as seating and bicycle hoops.

90 degree parking is indented and provided on both sides of the road. There is an unprioritised pedestrian crossing point half way between Dunne Street and Green Ave.

Link Street is 75m long and has an undivided carriageway width of approx. 7.4m.

Link Street (looking south)

6/ Dunne Street

Dunne Street is a Council collector road with a posted speed limit of 50km/h and connects Broadway and Boldrewood Pde to Plenty Road.

Several bus routes operate along Dunne Street. There is an on road bicycle route which is not consistently marked along the entire length. Open space and recreation facilities to the north and south also require users to cross Dunne Street at designated points.

The carriageway width varies along the length of Dunne Street however there is generally one lane of traffic unobstructed in each direction except at some bus stops.

Data analysis

- There has been five casualty crashes in the vicinity of Kingsbury Place in the last 5 years but only one in Link Street.
- 3 of the crashes involved pedestrians crossing to or from land adjacent to Link Street.
- Supervised school crossing on Dunne Street adjacent to the park
- 85th percentile speeds along Dunne Street at this location are 58.2km/h (including 5.5km/h over the speed limit between the school drop off period of 8am-9am)

SUPPORTED BY EVIDENCE

Dunne Street near Darebin Creek (looking east)

Data analysis

- As mentioned above at site 5, 85th percentile speeds are high in Dunne Street
- At No.10, 86 Dunne St and Darebin Creek, 85th percentile speeds were 56.5km/h, 58.2km/h and 59.0km/h respectively
- At No.86 Dunne Street, 56% of vehicles were exceeding the speed limit
- Not including the intersections of Plenty Road and Boldrewood Pde, there has been 15 casualty crashes in the last 5 years
- Dunne Street is part of the PBN and has bicycle and bus priority under the VicRoads SmartRoads system
- Of these crashes, 5 involved pedestrians and 2 cyclists

SUPPORTED BY EVIDENCE

On-Site Observations: Findings

7/ The Fairway and Chenies Street

The Fairway is a one way street and provides connectivity to properties north of the creek travelling from the east (Plenty Road) without having to go around Boldrewood Parade.

This section of the Fairway has high volumes of traffic for a residential street. Observed speeds on site including around corners were high as there is no requirement to give way to other vehicles.

There is a crossing point for the Darebin Creek Trail along Chenies Street however it is offset and the bridge has narrow footpaths, potentially pushing pedestrians or cyclists onto the road at this location.

Data analysis

- One single vehicle crash in The Fairway, and three other crashes at the intersections of Chenies Road and Purinuan Street and Rathcown Road
- No traffic classifier data available
- Concerns are observational

NOT SUPPORTED BY EVIDENCE

Chenies Street (looking north)

Invermay Street (looking south)

8/ Burbank Drive to Invermay Street

Burbank Drive through to Invermay Street is a designated higher function collector road which connects the intersection of Keon Road and Dalton Parade to Boldrewood Parade and properties in between.

It is a bus route and part of the bicycle shimmy route through Reservoir.

There is no clear direction for traffic to travel and difficult to navigate, given the layout of the road network.

Carriageway widths generally range from 7.0-7.4m.

Data analysis

- Marshall Drive: 85th percentile speeds were 51.5km/h and weekday average volumes were 3500 vpd
- Invermay Street: 85th percentile speeds were 53.2km/h and weekday average volumes were 4200 vpd
- Mais Street: 85th percentile speeds were 48.4km/h and weekday average volume 4100 vpd
- Approx. 25% of vehicles exceeded the speed limit of 50km/h in Invermay Street.
- There is a Black Spot at the intersection of St Vigeons Street with 3 other injury crashes in the last 5 years. St Vigeons Street is also adjacent to a recreation reserve and nearby to a small shopping strip.
- In the last 5 years, there has been a total of 9 crashes along this route, from Marshall Drive to Purinuan Road including 2 serious injury crashes.
- None of the injury crashes involved cyclists or pedestrians.

SUPPORTED BY EVIDENCE

On-Site Observations: Findings

9/ Gertz Avenue

The northern side of Gertz Avenue has both a small 'off street' shopping strip as well as the Northern School for Autism.

A 40km/h speed limit applies to the western section in front of the school.

Gertz Avenue is a bus route in one direction only and the bus stops are on the south side of the road.

Gertz Avenue has an undivided carriageway width of 8.6-8.8m with parking permitted on both sides of the road.

Gertz Avenue (looking west)

Data analysis

- The speed limit in front of the school is a posted 40km/h
- 85th percentile speeds along Gertz Avenue in front of the school are 49.9km/h
- No recorded casualty crashes in last 5 years

SUPPORTED BY EVIDENCE

Curtain Street (looking east)

10/ Tunaley Parade and San Leandro Drive

Tunaley Parade and Clough Parade make up part of the on road bicycle route which connects the Cheddar Road bicycle path to the Darebin Creek.

Tunaley Parade has traffic calming in between the two entrances to Burbank Drive and San Leandro Drive runs parallel and does not have traffic calming.

In between Tunaley Parade and San Leandro Drive is an Aged Care Facility and a retirement village.

Tunaley Drive and San Leandro Drive have undivided carriageway widths of approx. 8.9m and 7.1m respectively.

Data analysis

- Traffic classifier data showed that the 85th percentile speed in San Leandro Drive was 56.6km/h however volumes only 191 vehicles per day
- There was no recorded crashes in Tunaley Parade, Clough Parade or San Leandro Drive in the past 5 years
- Speeds on Tunaley Parade and Clough Parade were observed on site to be excessive, even though traffic calming was present

PARTIALLY SUPPORTED BY EVIDENCE

On-Site Observations: Findings

11/ Cheddar Road

Cheddar Road is a major multi-modal Council road which runs in a north-south direction, connecting Dalton Road / Keon Road to Broadway / High Street. The road is a bus route and carries heavy vehicles and has a shared path along the entire length.

North of Hickford Street, the road is undivided and has a undivided carriageway width of approx. 9.6m. There is multiple pedestrian refuges along the length of the road, connecting residential properties and open space / recreation facilities on both sides of the road.

South of Hickford Street, the road is divided by a large median strip. There are several openings in the median strip similar to that shown below. Pedestrians do not have priority along the shared path at each of these median crossings.

There are 2-lanes of traffic in each direction and carriageway widths vary between 7.2 and 9.6m. Although parking is permitted along the residential side southbound there are no vehicles parked on the road. There is however indented parking provided on the right hand side of the carriageway.

Cheddar Road (looking south)

Cheddar Road median opening at Purinuan Road

Data analysis

- 34 casualty crashes have occurred in Cheddar Road in the past 5 years (between Keon Road and High Street) including 11 crashes (32%) at median strip crossings
- Speed limit is 60km/h an hour and observations on site suggested that many vehicles were travelling at speeds over 60km/h however survey data suggests an 85th percentile of around 60km/h.
- No traffic classifier data available for the divided section of Cheddar Road (south of Hickford Street)

PARTIALLY SUPPORTED BY EVIDENCE

On-Site Observations: Findings

12/ Inverness Street and Darebin Boulevard

The intersection of Inverness Street, Gourock Street and Darebin Boulevard has poor visibility approaching from the west due to the topography of the land. There is also a Y-intersection at Gourock Street and Darebin Boulevard.

There is three intersections which surround a small pocket park and the priorities are not clear given the triangular shape of the intersection.

Darebin Boulevard has an undivided carriageway width of approx. 8.6m while Inverness Street and Gourock Street have widths of 7.0-7.2m.

Data analysis

- No recorded crashes at this location in the past 5 years
- The 85th percentile in Gourock Street was recorded at 48km/h and volumes were below 300vpd

NOT SUPPORTED BY EVIDENCE

Darebin Boulevard (looking west)

Hickford Street / Borrie Street roundabout

13/ Hickford Street and Borrie Street

Hickford Street and Borrie Street are heavily used local streets connecting Cheddar Road to Boldrewood Street.

Hickford Street west of Cheddar Road connects Keon Road in the north. The intersection of Cheddar Road and Hickford Street is controlled by a roundabout making it more appealing than the median strip openings on Cheddar Road to the south.

Hickford Street and Borrie Street are both residential areas and the route passes Reservoir Views Primary School.

The route is also a bus route and does not have any traffic calming devices.

Carriageway widths vary between 7.0m and 8.6m.

Data analysis

- In the past 5 years, there has been 4 casualty crashes in Borrie Street, including 1 serious injury crash.
- The crashes occurred at the intersection of Hickford Street, Miranda Road and St Vigeons Road.
- There was also 4 other injury crashes at the roundabout at Hickford Street and Cheddar Road.
- Along Hickford Street between Cheddar Road and Borrie Street, the recorded average weekday volume was 6,787 vehicles per day and the 85th percentile was 50.2km/h (speed limit 50km/h)
- In Borrie Street adjacent to Reservoir Views Primary School, the average weekday volume was 5197 vehicles per day and the 85th percentile speeds were 44.2km/h in a 40km/h zone.

SUPPORTED BY EVIDENCE

On-Site Observations: Findings

14/ Reservoir East Primary School and Reservoir High School

Streets directly fronting Reservoir East Primary School and Reservoir High School with a school gates have a 40km/h speed limit.

There is a small strip shopping centre at Yarra Avenue near Boldrewood Drive. A bus route exists through the area and there are no traffic calming devices.

Gisborne Crescent is accessible from the roundabout at Boldrewood Parade and Broadway and provides access to non local traffic avoiding the lights at Plenty Road.

Streets within the area generally have carriageway widths of between 7.2-7.6m.

Data analysis

- Nicholson Avenue used as major drop off pick up point for Reservoir High School.
- 85th percentile speeds along Nicholson Avenue in front of the school are 52.1km/h within the 40km/h limit
- No supervised school crossing in Nicholson Avenue
- Complex and potential unsafe intersection at North Road / Charlton Crescent / Nicholson Avenue / Kerang Avenue
- Bus route uses local streets in the vicinity and is a bus priority route under the VicRoads SmartRoads system.
- High speeds also recorded in Yarra Street (85th percentile was 45.1km/h in a 40km/h zone) and in Winter Crescent (85th percentile was 51.9km/h in a 50km/h zone)

PARTIALLY SUPPORTED BY EVIDENCE

Yarra Ave (looking east)

Intersection of Carrol Street and Cheddar Road

15/ A. Carrol Street

Carrol Street provides an alternative route to Cheddar Road and Broadway through residential streets.

Carrol Street is used as a "rat run" to cross through the median opening with motorists selecting poor gap distances and failing to give way to southbound vehicles on Cheddar Road.

Carrol Street has a carriageway width of approx. 7.5-8.0m and is controlled by several roundabouts. There is no delineation for lanes along the length of the road.

Data analysis

- 85th percentile speeds in Carrol Street were found to be 47.9km/h with an average daily volume of 2800+ vehicles per day (speed limit 50km/h)
- Crash data for the five year period ending December 2018 shows 8 casualty crashes with three serious injury and 5 other injury crashes at Cheddar Road and Carrol Street.

SUPPORTED BY EVIDENCE

On-Site Observations: Findings

15/ B. Strathmerton Street

Strathmerton Street provides an alternative routes to Cheddar Road and Broadway through residential streets.

Strathmerton Street has a carriageway width of approx. 8.6-9.0m and is controlled by several roundabouts. There is no delineation for lanes along the length of the road.

There is also a small shopping strip at the northern end of Strathmerton Street and Reservoir Leisure Centre and adjacent playground at the south-eastern end.

There was multiple locations which showed evidence of hoon behaviour along Strathmerton Street and surrounding area.

Data analysis

- Evidence of burnouts was found along the length of Strathmerton Street
- 85th percentile speeds along Strathmerton Street at between Dunnoly Crescent and Cuthbert Street, and between Royal Parade and Marchant Avenue were found to be 57.8km/h and 53.5km/h respectively (speed limit 50km/h
- Volumes in Strathmerton Street were found to be up to 4300+ near No.38 which makes up part of the on-road bicycle route.
- In the past 5 years, there was a total of 4 crashes in Strathmerton St, including 2 serious pedestrian injuries and 1 crash involving a cyclist

SUPPORTED BY EVIDENCE

Strathmerton Street and Marchant Street

16/ Dole Avenue

Dole Avenue provides access to Cheddar Road through residential streets and is heavily utilised.

Dole Avenue has a carriageway width of approx. 7.5-8m.

A raised threshold treatment across Dole Avenue near Cheddar Road along the Pipeline Bike Path.

Dole Avenue provides access to IW Dole Reserve, Keon Park Children's Hub and DR Atkinson Reserve via Dumbarton Street.

Dole Ave (looking east)

On-Site Observations: Findings

17/ Cuthbert Street and Broadway

Broadway connects High Street to Plenty Road and is a secondary arterial road (VicRoads) with a 400m long shopping strip. The majority of parking is on street, including centre median, with one large off street car park situated off Bernard Street (south of Broadway)

There is marked on street bicycle lanes in both directions and a very high occurrence of pedestrians on the footpath and crossing the road.

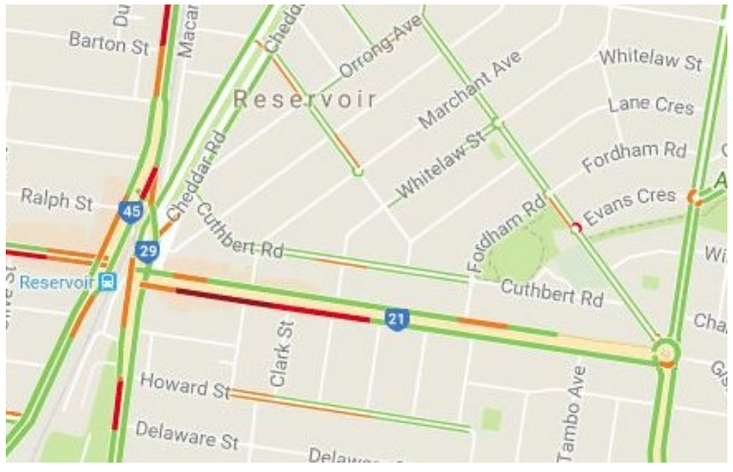
The permanent speed limit along this section of Broadway is 40km/h.

Cuthbert Street runs parallel to Broadway also provides access to Reservoir Leisure Centre and TW Andrews Reserve.

A default speed limit of 50km/h applies to Cuthbert Street.

Cuthbert Street has an undivided carriageway width of approximately 7.2-7.5m

Broadway during PM peak hour (looking west)



Source: VicTraffic, Broadway 5pm 20/11/17

Data analysis

- In the past 5 years, there was a total of 6 crashes involving pedestrians on Broadway including 3 serious injuries and 1 fatality
- Recent traffic classifier counts found that the 85th percentile was between 4.3km/h and 6.9km/h above the speed limit (40km/h)
- Average weekday volumes along Broadway were between 18,000-20,000 vehicles per day
- On Cuthbert Street, average weekday volumes were between 2,100 and 3,050, with 85th percentile speeds recorded between 41-48km/h (speed limit 50km/h)

SUPPORTED BY EVIDENCE

Cuthbert Street looking west

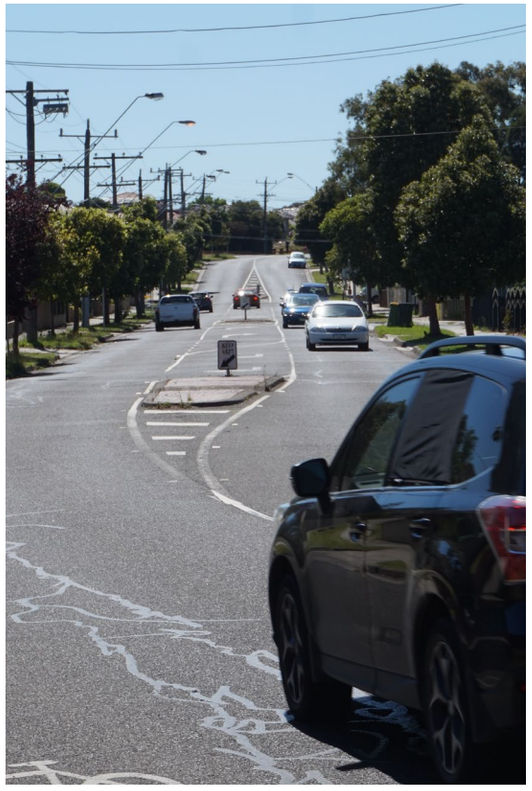
Site Conditions - Summary

Mais Street Modified 'T' treatment

Kingsbury Place Pedestrian Crossing Point

General Observations

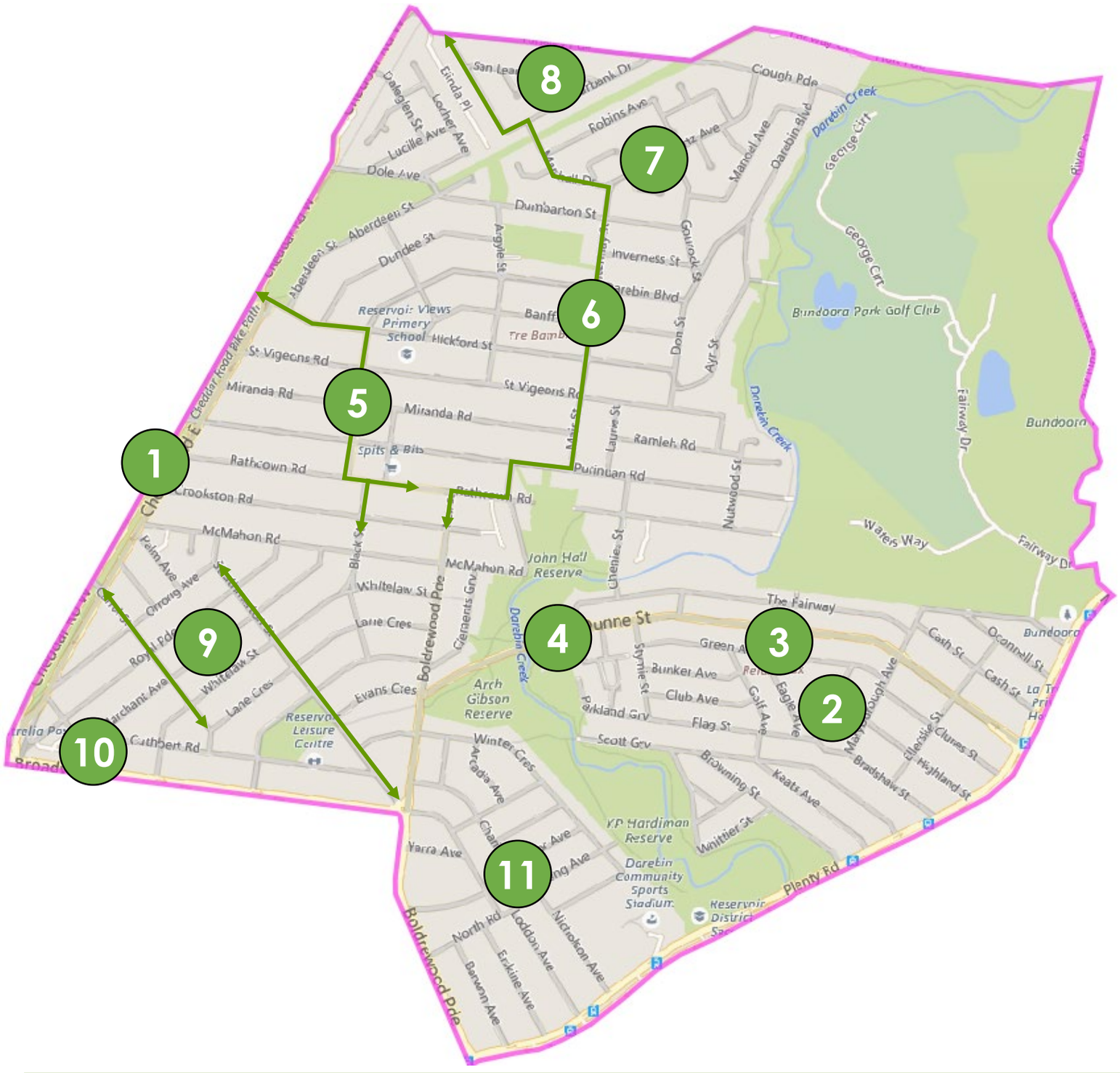
- There is not much consistency with regards to types of traffic management devices across the study areas but it was noted that vehicles in streets with traffic calming had visibly less traffic and lower speeds.
- Most streets within the study area do not meet the generic definition of a narrow street, and as such, vehicles could park on both sides of the road without obstructing traffic.
- The only areas witnessed which experienced any level of parking congestion was near Broadway and Plenty Road.
- Vehicles appeared to avoid parking on roads with high traffic volumes such as Invermay Street and Cheddar Road. This has the effect of making the roads look wider. When vehicles parked on trafficable areas of road, this creates the visual sense of a narrower roadway and may require vehicles to give way to oncoming traffic.



Dunne Street (looking East)

Dole Avenue at Cheddar Road

Summary of Issues:
Prior to community consultation workshops



1 **Cheddar Road (between Hickford Street and Broadway)**
Address the problems with the high rate of crashes occurring in Cheddar Road and improve pedestrian priority at side roads and along the shared path

2 **Kingsbury Primary School and Surrounds**
Reduce speeds along Green Avenue, Niblick Street and Maryborough Avenue along the school frontages

3 **Kingsbury Place (Link Street)**
Improve pedestrian safety in and around the shopping strip

4 **Dunne Street**
Improve cyclist and pedestrian safety, especially in the vicinity of Kingsbury Place and Darebin Creek

5 **Hickford Street and Borrie Street**
Reduce speeds and volumes of non-local traffic, especially in front of the school. Consideration should also be given to treating adjacent roads including Miranda Rd and St Vigeons Road

6 **Burbank Street to Purinuan Road**
Reduce speeds and volumes of non-local traffic. Improve safety at high collision intersections

7 **Gertz Avenue**
Reduce speeds in front of the school and shops to improve pedestrian safety

8 **San Leandro Drive**
Take measures to discourage non-local traffic and reduce speeds in the street

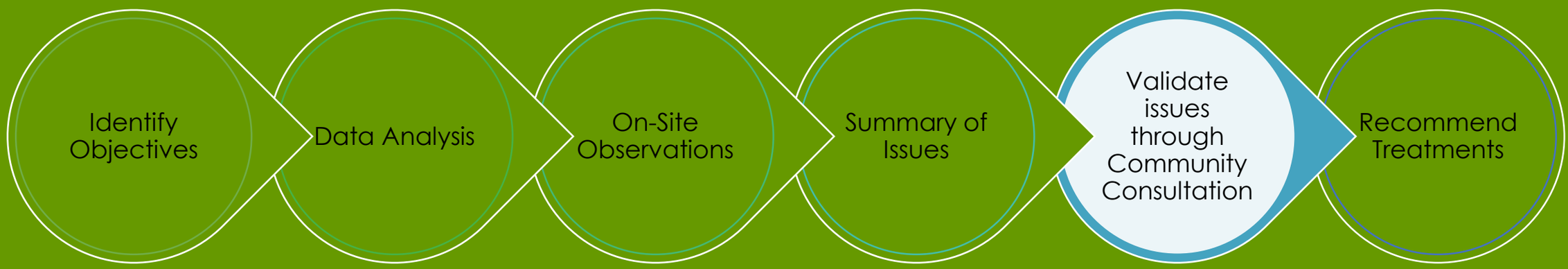
9 **Carrol Street and Strathmerton Street**
Discourage non-local traffic, reduce speeds and improve pedestrian and cyclist safety around shopping strips and recreational facilities.

10 **Broadway and Cuthbert Road**
Improve pedestrian safety along Broadway and reduce non-local traffic in Cuthbert Road

11 **Reservoir East Primary School and Reservoir High School**
Improve pedestrian safety around the two schools and reduce speeds and volumes of non-local traffic

04

ENGAGING THE COMMUNITY



Community Consultation

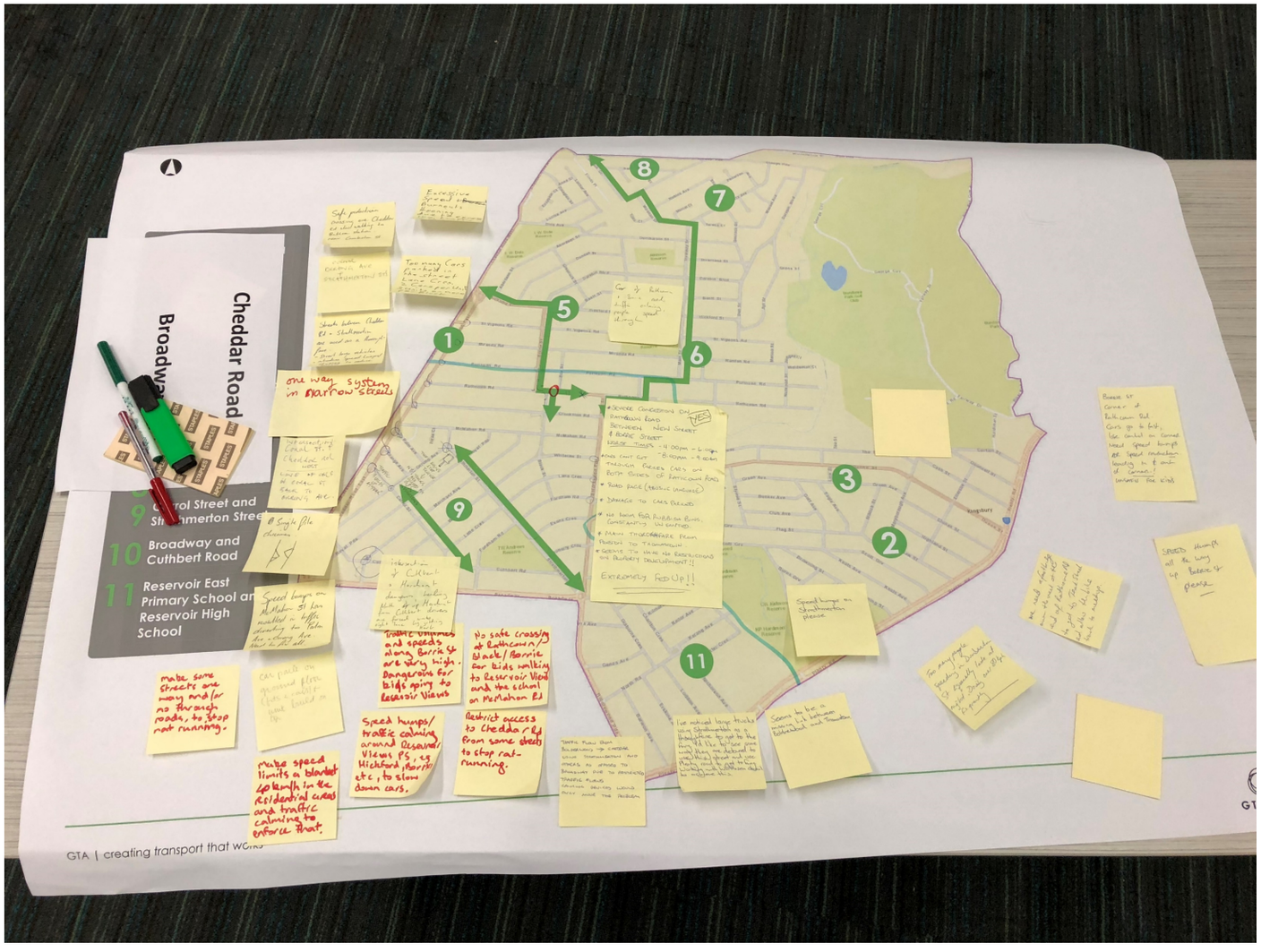
During February and March 2018, two community consultation workshops were facilitated by Council and attended by GTA.

The purpose of the workshops was to validate the understanding of existing transport issues, and seek feedback from residents as the experts in their local area.

The workshops were well attended and many issues were raised in areas which had not been previously identified in the data analysis and subsequent site inspections.

Participants were initially split into three geographical areas by residence, however they were encouraged to contribute to other areas. They were asked to discuss and identify issue locations on maps, as well as providing suggested treatments. The maps provided the initial findings of the LATM study and provided the basis to start discussion on traffic management issues in their area.

The main issues raised were rat-running and speeding, especially throughout the entire western section of the study area. The following slides summarise the feedback from the workshops and along with the data analysis, and provide the basis for the development of the concept traffic management plan.



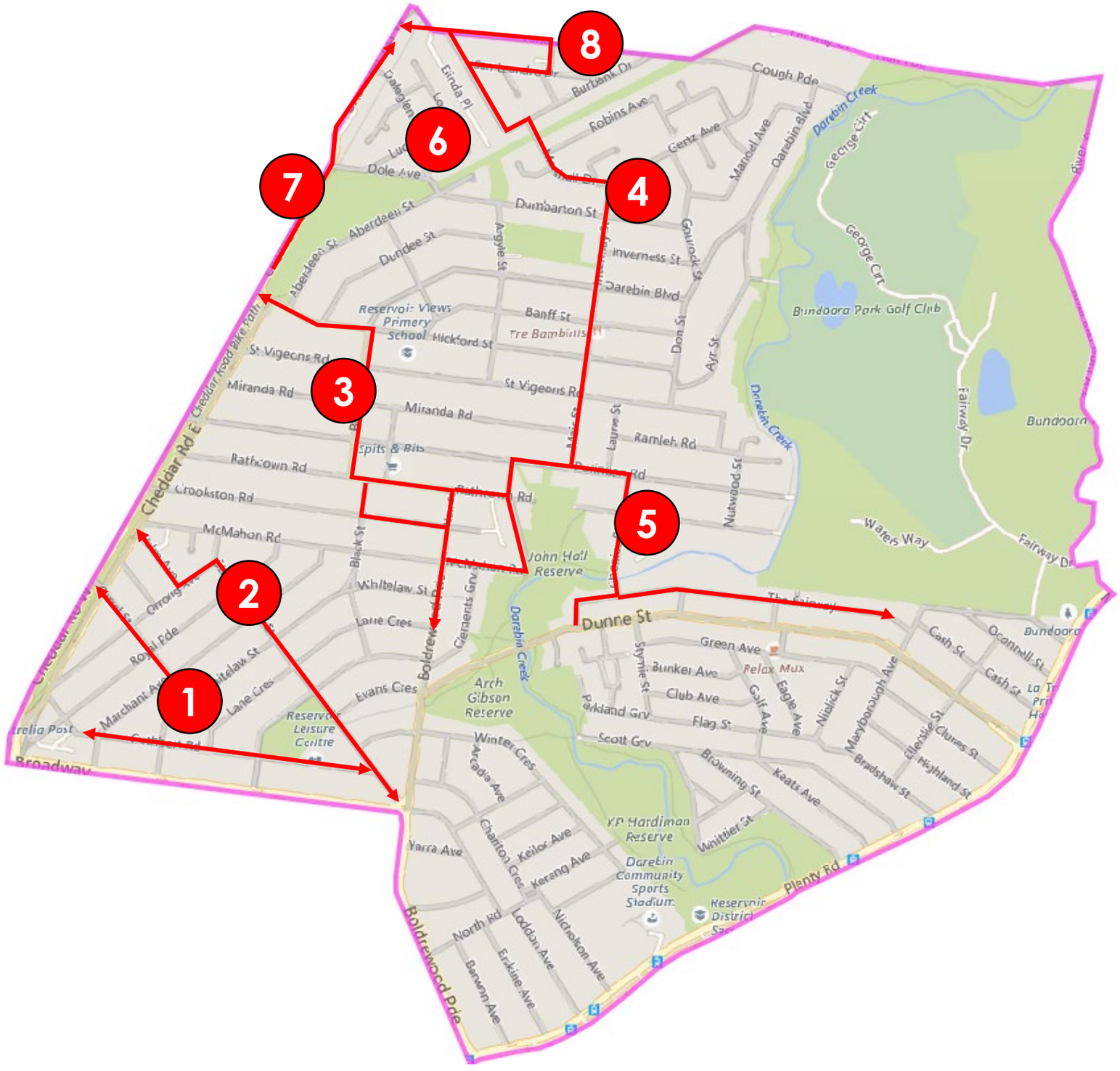
Workshop Feedback: Road Network

The most common issue raised throughout the workshops was non-local traffic using residential streets to avoid traffic congestion on the arterial road network, especially at the north and south ends of Cheddar Road.

Several locations within the study area were identified by residents to have varying levels of traffic congestion, however these were generally limited to arterial and Council collector roads.

The identified locations were generally in line with what had been previously identified in the data analysis and verification on site.

Site	Street	Identified Problem
1	Cuthbert Street and Carrol Street	Rat running
2	Strathmerton Street / Palm Avenue	Rat running and trucks
3	Hickford Street / Borrie Street / Rathcown Road	Rat running
4	Marshall Drive / Invermay Street	Rat running and trucks
5	The Fairway	Rat running
6	Marshall Drive	Congestion (peak times)
7	Cheddar Road	Congestion (peak times)
8	San Leandro Drive	Rat running to get priority on Tunaley Parade



Workshop Feedback: Speeding

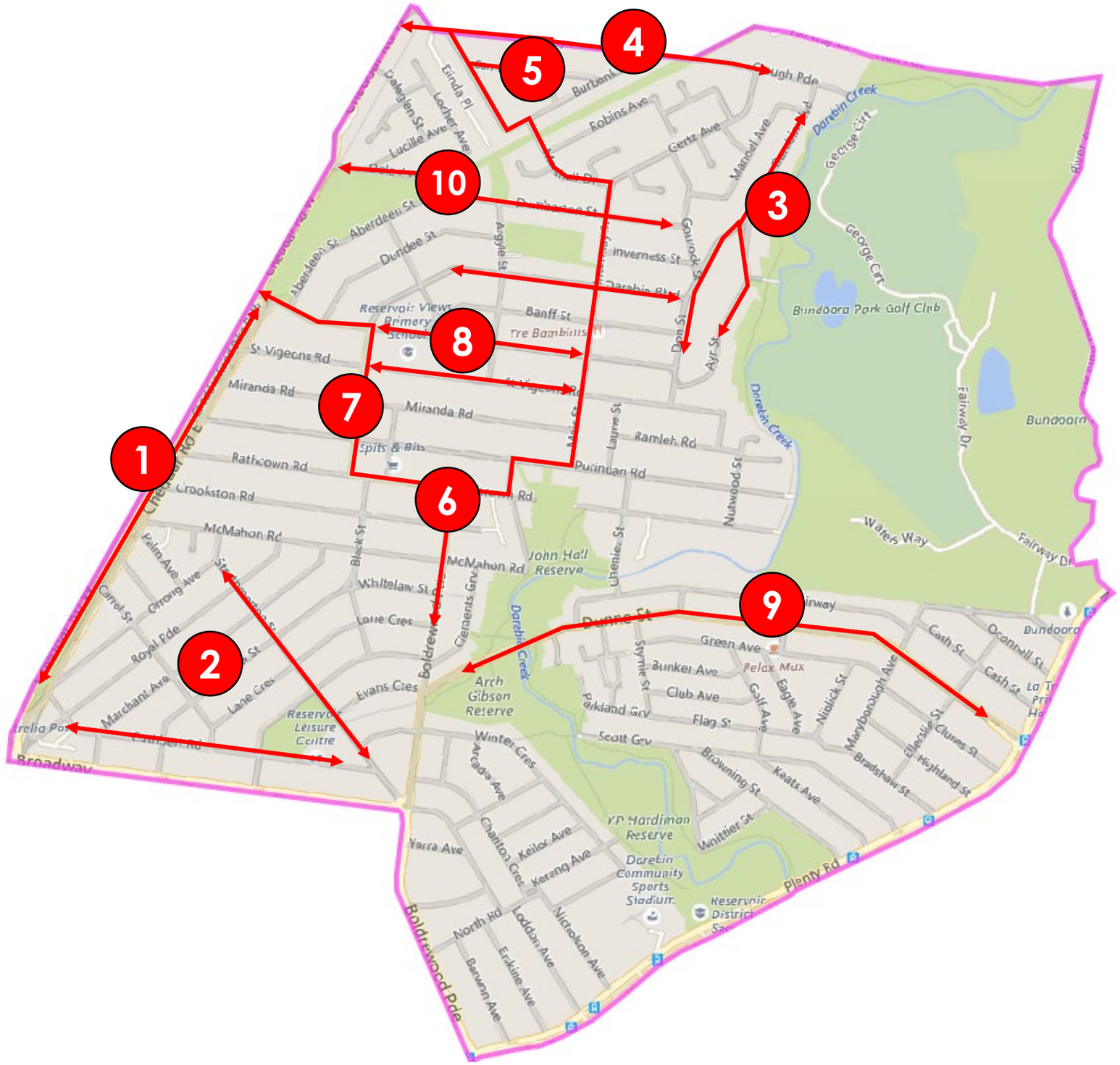
While it was not the main concern raised in the community workshops, speeding was still a problem perceived by residents at many locations, including streets with traffic calming.

Again, the locations were generally consistent with those identified from the data analysis however noting that the perception of vehicle speeds is often greatly different to actual speeds.

As such, the data will be largely relied upon to determine streets with speeding problems and to prioritise streets for traffic calming.

It is important to note however that almost every street will have a number of vehicles exceeding the speed limit, and that hooning is not a problem that is primarily solved with traffic calming, rather a targeted approach of enforcement and education has been shown to be much more effective.

Site	Street
1	Cheddar Road (duplicated section)
2	Cuthbert Road / Strathmerton Street
3	Ayr Street / Darebin Boulevard / Don Street
4	Tunaley Parade / Clough Parade
5	San Leandro Drive
6	Boldrewood Parade / New Street
7	Hickford Street / Borrie Street
8	Hickford Street / St Vigeons Road
9	Dunne Street
10	Dole Avenue / Dumbarton Street

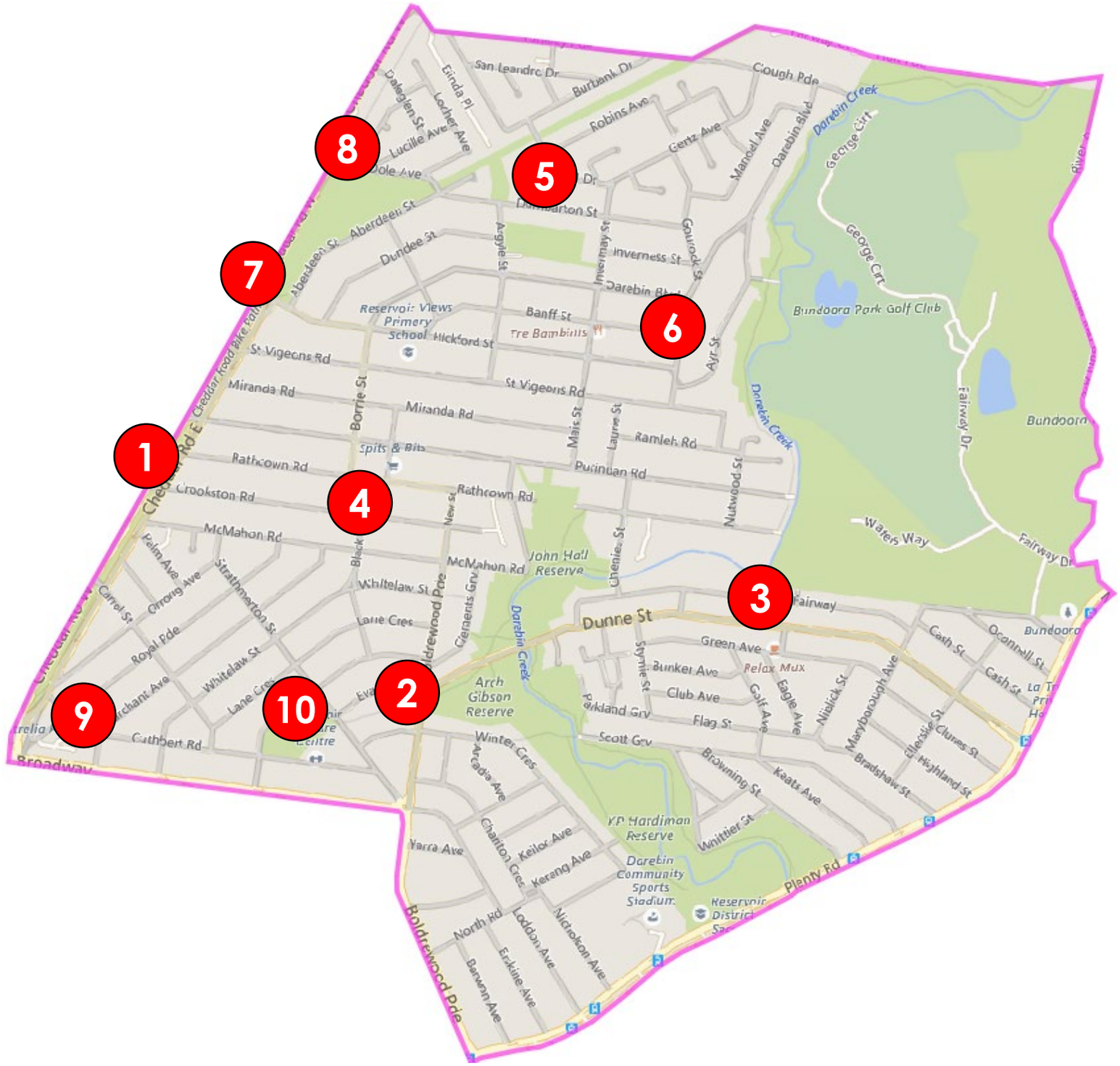


Workshop Feedback: Safety

The majority of concerns relating to road safety were regarding the safety of pedestrians, in particular around schools and crossing points along the collector / arterial road network.

While speeding issues have not been described here, there were also issues with regards to high speeds around corners, confusing priorities and poor sight distance.

Site	Street	Identified Problem
1	Cheddar Road	Unsafe crossing points (pedestrians and vehicles)
2	Boldrewood Parade	Bus stop location
3	Dunne Street	Unsafe bicycle and pedestrian crossing points
4	Rathcown Road/ Borrie Street	Unsafe corner
5	Marshall Drive	Unsafe bend
6	Darebin Boulevard / Don Street	Unsafe intersection
7	Cheddar Road / Hickford Street	Pedestrian safety issues at roundabout
8	Cheddar Road / Dole Avenue	Dangerous crossing point at shared path
9	Cuthbert Road	Unsafe bend
10	Cuthbert Road / Strathmerton Street	Pedestrian safety around leisure centre



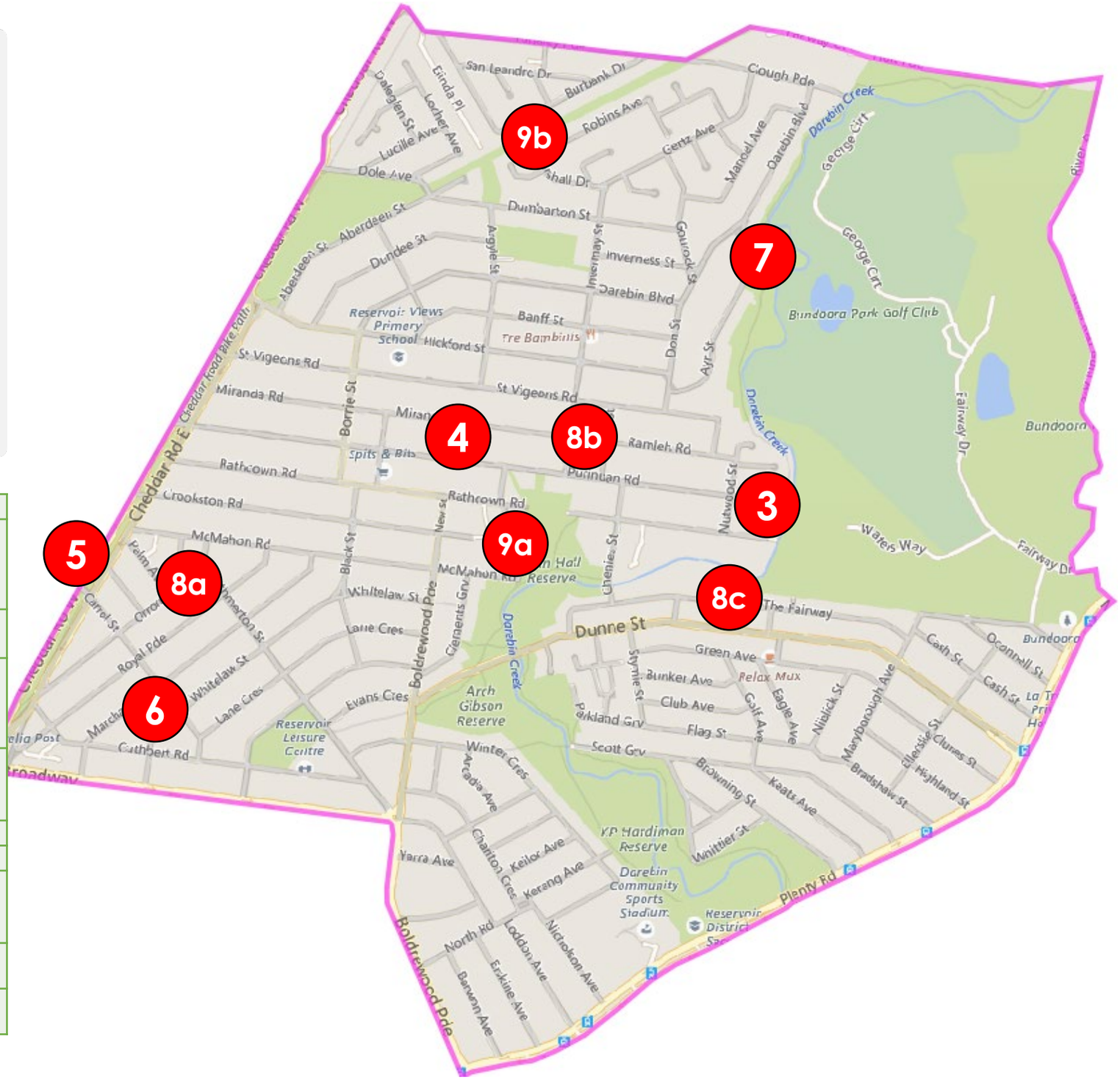
Workshop Feedback: General

Further to the road safety and rat-running issues, there were also a number of general comments and concerns which are transport related however not within the scope of the LATM study.

These included housing developments, parked vehicles creating sight obstructions or blocking traffic, and poor signage / lighting.

One of the most common comments received was regarding the lack of crossings for pedestrians and cyclists across the Darebin Creek, especially at the eastern end of Rathcown Road.

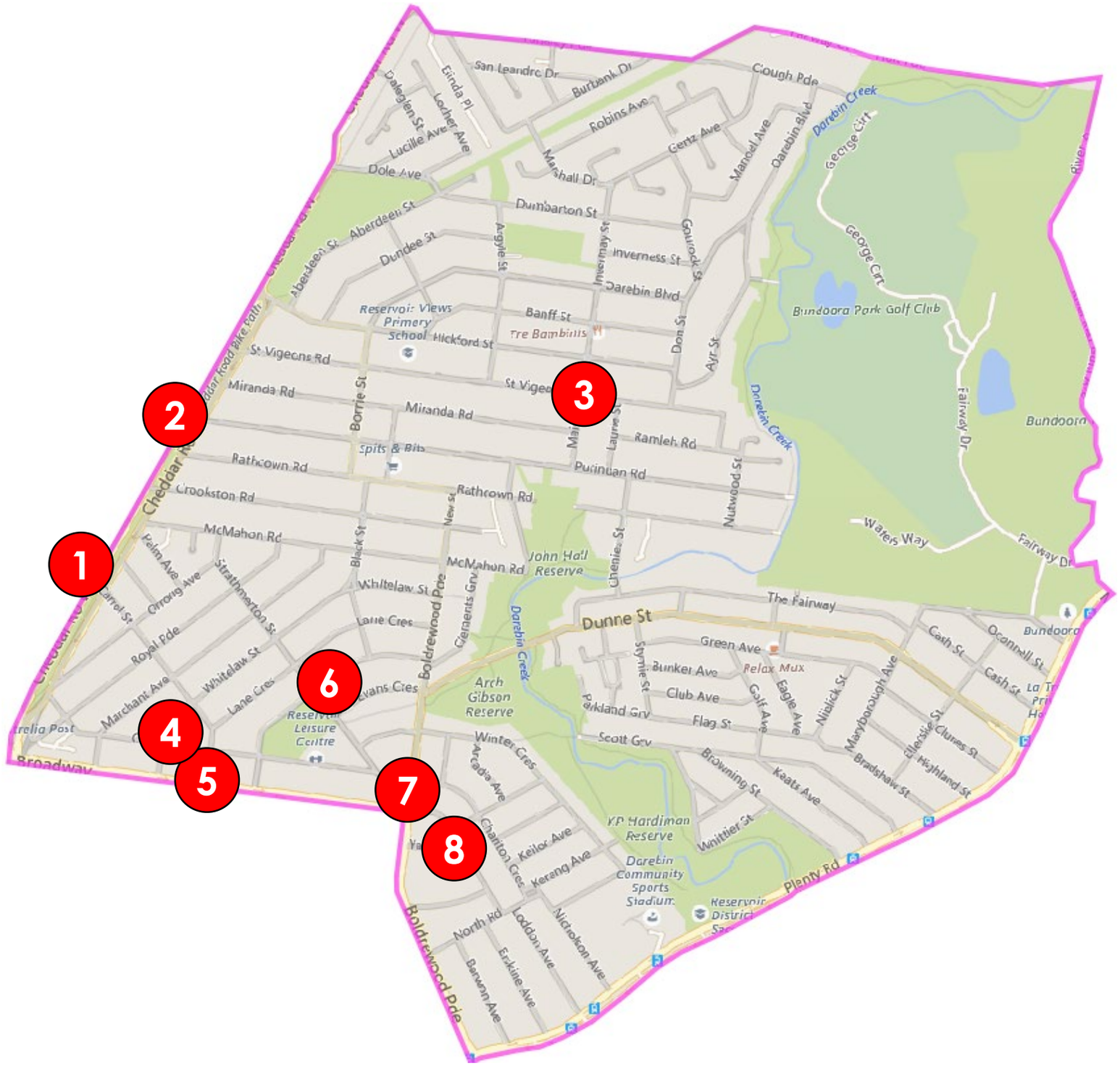
Site	Street	Identified Problem
1	Area wide	Overdevelopment of medium density housing with lack of off-street parking
2	High St	Level crossing removal upcoming works
3	Rathcown Road (east)	No pedestrian or cycling link across creek connecting towards Plenty Road
4	Rathcown Road	Over development and congestion due to parked vehicles on narrow road
5	Cheddar Road	Poor street signage
6	Carrol Street	Poor lighting
7	Darebin Creek	Lack of crossing points is a barrier to increased pedestrian and cycling
8	Various (see map)	Parking too close to intersections
9	Various (see map)	Parked cars creating congestion



Other Community Feedback

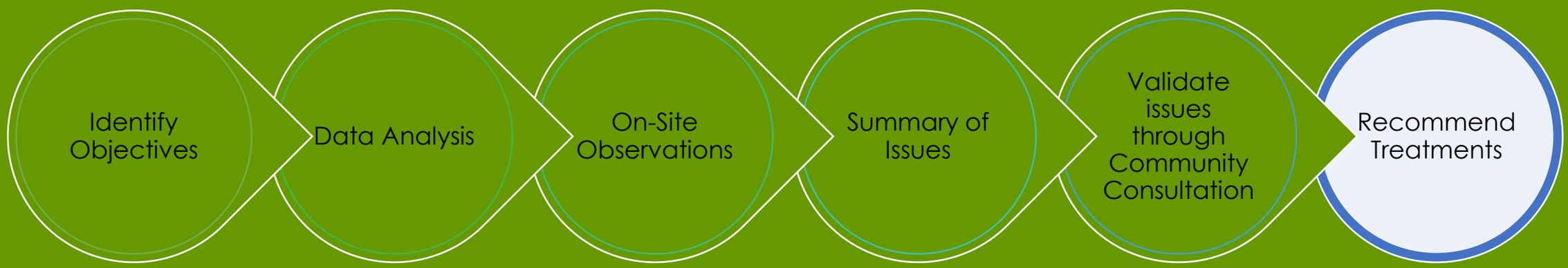
Several members of the community were interested, but not able to attend the community consultation workshops. Instead, they provided written feedback to Council. The majority of the feedback aligned with the feedback already received during the consultation sessions. However, any new issues have been identified and summarised on the image to the right, and the table below.

Site	Street	Identified Problem
1	Cheddar Road	Cycling safety at shared path crossings
2	Cheddar Road / Purinian Road	No safe pedestrian crossing points
3	St Vigeons / Mais St	Road safety, speeding and rat-running
4	Cuthbert Road / Whitelaw Street	Road safety
5	Broadway	Congestion
6	Fordham Road	Speeding
7	Boldrewood Parade / Broadway	Congestion
8	Gisborne Crescent	Speeding and rat-running



05

TRAFFIC MANAGEMENT PLAN



Traffic Management Plan

The final stage of the study is to consider all the issues raised through data analysis, site inspection and community feedback and determine treatments that respond to issues without compromising community expectations, the operation of the bus network, and represent good value for money. In particular, given that availability of car parking was raised as a significant issue throughout consultation, devices that require significant loss of car parking were not considered for this traffic management plan as they are unlikely to be acceptable to the community.

The following section outlines:

- the need to cater for bus network operation, and access by service and emergency vehicles when choosing treatment types
- a list of LATM treatment types that were considered when determining suitable treatment types and consideration of potential appropriateness to the study area
- a proposed traffic management plan, with a list of treatments and their estimated costs.

Considerations – Existing conditions

Public Transport, service and emergency vehicles

When considering locations for local area traffic management, allowances must be made for the movement of larger vehicles (i.e. roundabouts big enough to accommodate a bus), and passenger comfort and safety.

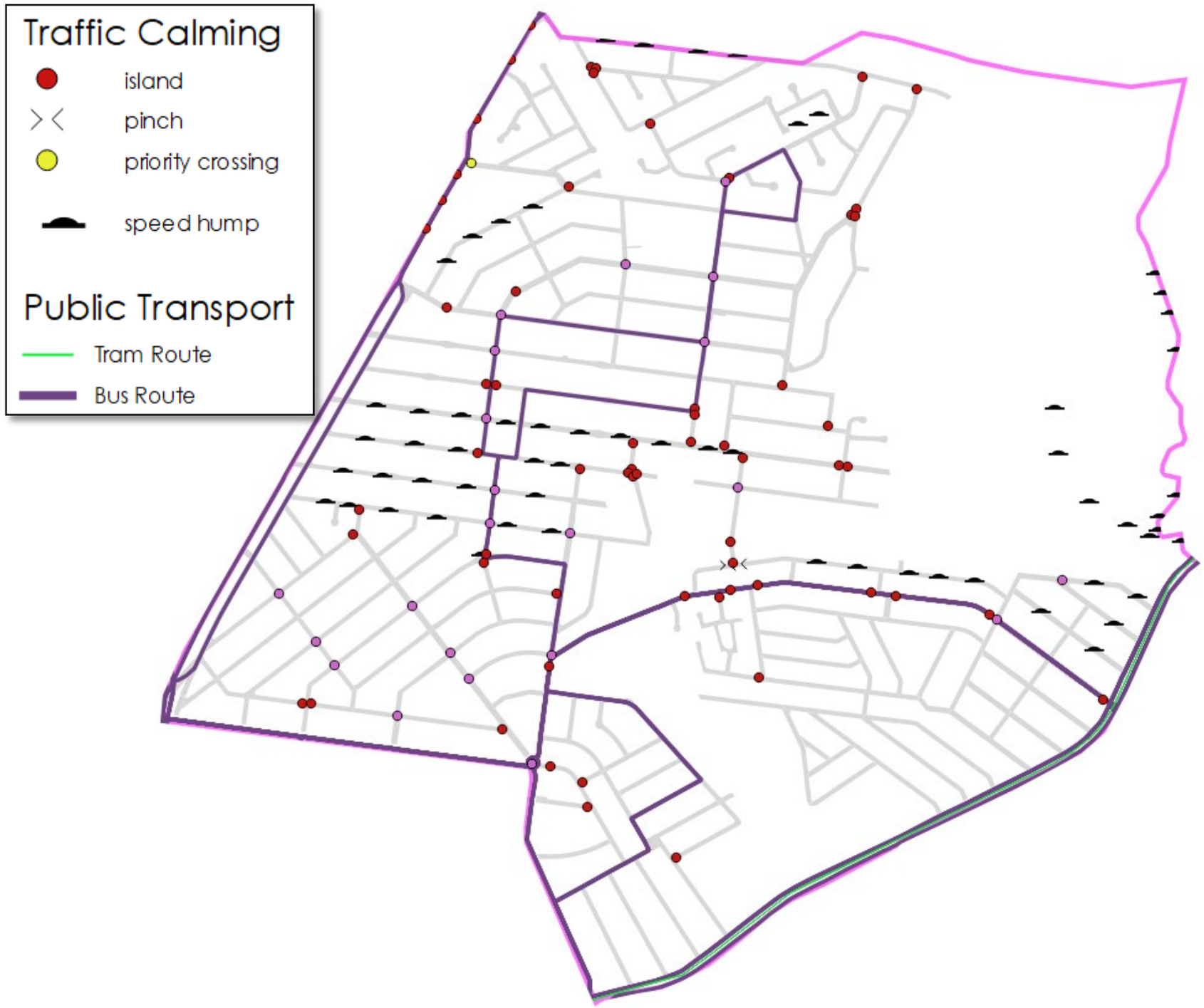
One of the main constraints across the study area is the presence of a bus route utilising the local road network due to the lack of a suitable collector road.

As such, treatments such as traditional speed humps are not always appropriate on bus routes.

Existing Traffic Management

Current local area traffic management across the study area is primarily made up of roundabouts, traffic islands (modified t-intersections, pedestrian refuges and intersection splitter islands) and speed humps.

There is little consistency across the area and many gaps in the road network where traffic appears to have shifted based on the location of existing installations of traffic calming devices.



Considerations: LATM options

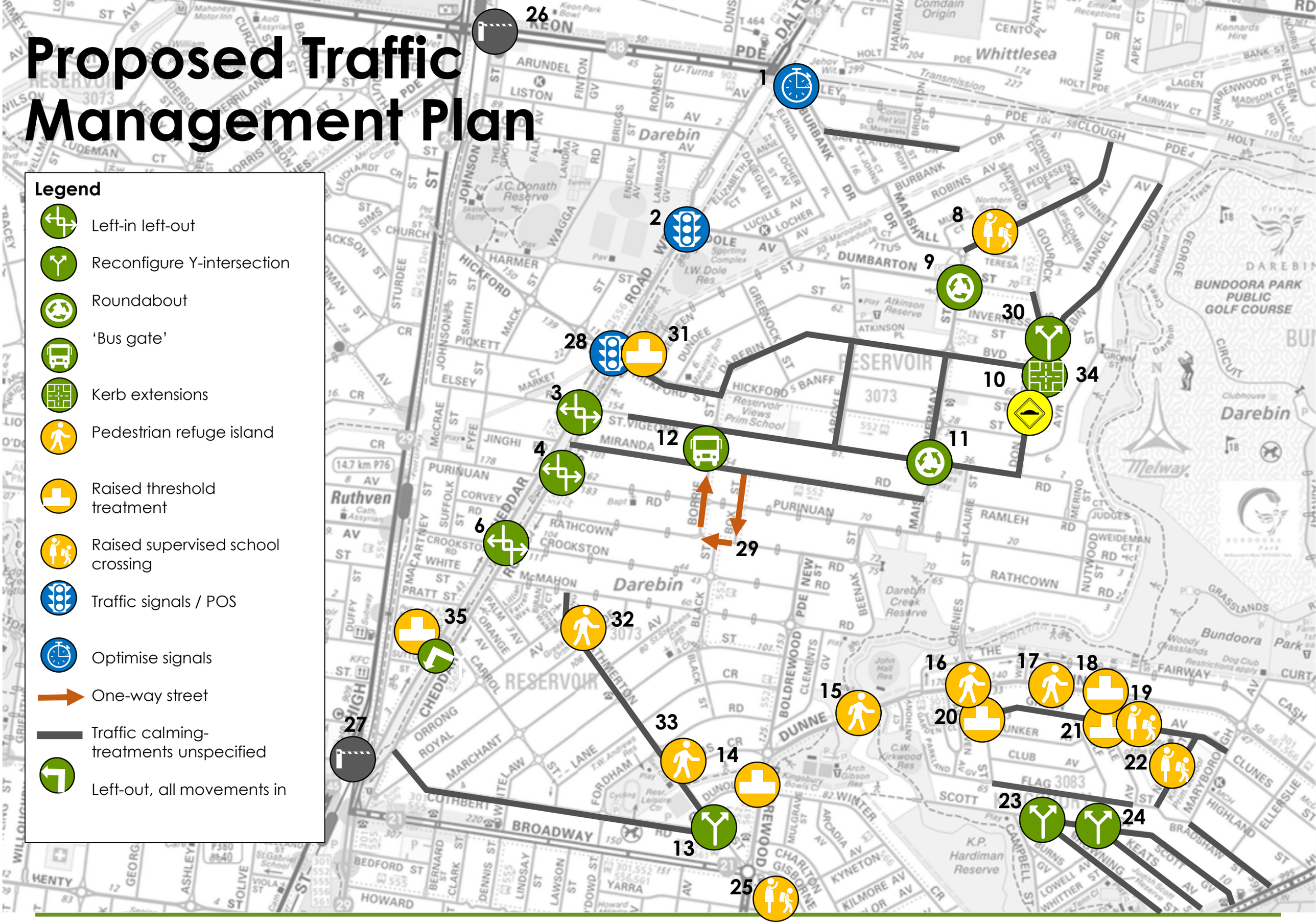
Measure		Benefits					Appropriate for study area?
		Reduce speeds	Reduce traffic volumes	Reduce crash risk	Increase pedestrian safety	Increase bicycle safety	
Vertical Deflection	Road humps	✔	✔	✔			Considered appropriate except for streets with bus routes and bike paths
	Road cushions	✔	✔	✔		✔	Considered appropriate for streets with bus routes and high speeds
	Flat-top road humps	✔	✔	✔	✔	✔	Considered appropriate except for streets with bus routes
	Wombat crossings	✔	✔	✔	✔		Considered appropriate particularly at school crossings and in shopping strips
	Raised intersections	✔	✔	✔		✔	In this context, the effectiveness of the treatment doesn't warrant the capital expenditure
Horizontal deflection devices	Lane narrowing / kerb extensions	✔			✔		Community consultation showed there was limited tolerance for loss of parking
	Slow points	✔	✔				Community consultation showed there was limited tolerance for loss of parking
	Centre blister islands	✔	✔		✔		Significant number of driveways meant there was often not sufficient space to fit this treatment
	Driveway links	✔	✔		✔	✔	Community consultation showed there was limited tolerance for loss of parking
	Mid-block median treatments	✔		✔	✔	✔	Streets requiring treatment were too narrow for median treatments
	Roundabouts	✔	✔	✔			In most instances there was not sufficient space without property acquisition
Diversion devices	Full road closure		✔	✔	✔	✔	Results in unacceptable level of diverted traffic to adjacent streets. Would require significant traffic management intervention to control the impacts
	Half road closure		✔	✔	✔	✔	Considered appropriate when applied in conjunction with other treatments to manage the diversion of traffic
	Diagonal road closure		✔	✔	✔	✔	Results in unacceptable level of diverted traffic to adjacent streets.
	Modified T-intersection	✔	✔	✔	✔	✔	Considered appropriate where road safety concerns warrant the capital expenditure
	Left-in / left-out islands		✔	✔	✔		Considered appropriate when applied across multiple streets to manage the diversion of traffic

Considerations: LATM options cont'd

Measure		Benefits					Appropriate for study area?
		Reduce speeds	Reduce traffic volumes	Reduce crash risk	Increase pedestrian safety	Increase bicycle safety	
Signs, line-marking and other treatments	Speed limit signs	✔		✔	✔	✔	Limited effectiveness when not coupled with Police enforcement. Recommend implementing as part of the 40km/h area roll out.
	Prohibited traffic movement signs		✔	✔		✔	Limited effectiveness when not coupled with Police enforcement
	One-way (street) signs		✔	✔	✔		Only appropriate on short street segments or coupled with speed reduction treatments, otherwise speed increases are likely
	Give way signs	✔	✔	✔	✔	✔	Not recommended as a standalone treatment as reassignment of priority might not perform safely if placed contrary to driver expectations
	Stop signs	✔	✔	✔	✔	✔	
	Shared zones	✔	✔		✔	✔	No location was deemed to have the requisite density of pedestrian movements to operate effectively
	School zones	✔		✔	✔	✔	Already in place
	Threshold treatments	✔	✔	✔	✔	✔	Recommended when coupled with a raised pavement along collectors and shopping strips
	Tactile surface treatments	✔					Not recommended in areas where cyclists or motorbikes are present
	On-street bicycle facilities			✔		✔	Considered appropriate, but not considered as part of the scope of this project
	On-street bus facilities		✔				Considered appropriate along bus routes with high volumes
	Centre line marking	✔		✔			Considered appropriate on streets with high speeds and sufficient road width

Table developed based on the AustRoads Guide to Traffic Management Part 8: Local Area Traffic Management (2016 Edition)

Proposed Traffic Management Plan



List of treatments incl. cost estimates

Location		Suggested Treatment		Priority
31	Aberdeen Street / Hickford Street		Raised pedestrian threshold treatment at the intersection of Aberdeen Street and Hickford Street	Low
14	Boldrewood Parade		Raised pedestrian threshold treatment between Winter Cres and Dunne Street to support safe access along the creek trail	Medium
12	Borrie Street		Midblock road closure of Borrie Street to prevent vehicle through trips, with the exception of buses and service vehicles. It would be positioned such that residents on the street can still access their driveways.	High
29	Box Street / Borrie Street		One-way treatment in direction of bus travel (clockwise) including necessary infrastructure changes to restrict illegal turning movements	High
3, 4, 6	Cheddar Road (various)		Install left-in left-out treatments at the intersections of Cheddar Road and St Vigeons Road, Purinuan Road and Crockston Road. The central islands should be wide enough to double as pedestrian refuge islands	High
10	Darebin Boulevard		Traffic calming on north and west approaches of intersection with Don Street to improve safety at the intersection. Alternatively, consider kerb extensions.	Low
2	Dole Avenue		Fully signalised intersection at Cheddar Road	High
34	Don Street		Extend kerb to reduce road width on Don Street at intersection with Darebin Boulevard	Low
9	Dumbarton Street		Roundabout at the intersection with Invermay Street	Low
15, 17	Dunne Street		New and upgraded pedestrian refuges along Dunne Street at Wedge Street and Darebin Creek Trail to improve pedestrian safety	High
16	Dunne Street		New and upgraded pedestrian refuges along Dunne Street (west of Stymie Street) between bus stops to improve pedestrian safety	High
18, 20	Dunne Street		Raised pedestrian threshold treatments at Dunne Street and Stymie Street to improve pedestrian priority and slow turning vehicles	High
8	Gertz Avenue		Raised supervised school crossing to slow vehicles in existing permanent 40km/h speed zones	High
19	Green Avenue		Raised supervised school crossing to slow vehicles in existing permanent 40km/h speed zones	High

List of treatments incl. cost estimates

Location		Suggested Treatment		Priority
28	Hickford Street		Convert roundabout to traffic signals and reconsider traffic management west of Cheddar Road	Low
26, 27	Level crossings at Keon Parade and High Street		The level crossing removals are likely to have significant impacts on local area traffic movements. It is recommended that Darebin City Council work with the Level Crossing Removal Authority to mitigate these impacts, and review and monitor this traffic management plan in relation to the works.	-
21	Link Street		Raised pedestrian threshold treatments at both ends of street to improve pedestrian priority and slow turning vehicles	High
22	Niblick Street		Raised supervised school crossing to slow vehicles in existing permanent 40km/h speed zones	High
11	St Vigeons Road		Reduce speeds on approach to Invermay Street including consideration of a roundabout and a raised intersection with a pedestrian link for the east and south leg.	High
32, 33	Strathmerton Street		New and upgraded pedestrian refuges along Strathmerton Street to improve pedestrian safety at the shopping strip and Reservior Leisure Centre.	Medium
1	Tunaley Parade		Optimize signal timing at the intersection of Tunaley Parade and Keon Parade to give more green time to Cheddar Road (nb. VicRoads approval required)	High
25	Yarra Avenue		Raised supervised school crossing to slow vehicles in existing permanent 40km/h speed zones	High
-	All local access roads		Roll out 40km/h area zones throughout the study area	Medium
13, 23, 24, 30	Various		Make improvements to, or remove / reconfigure identified dangerous Y-intersections: • Strathmerton Street and Cuthbert Road • Scott Grove and Browning Street • Scott Grove and Keats Avenue • Darebin Boulevard and Gourock Street	Medium
35	Cheddar Road / Carrol Street		Proposed kerb outstands, raised threshold treatment, left out of Carrol Street	High

[1] Broad level or initial feasibility planning construction cost estimates prepared by GTA Consultants must not be relied upon for quoting, budgeting or construction purposes. More detailed estimates can only be prepared from detailed civil engineering design drawings and require the services of a qualified quantity surveyor.
[2] Points 5 and 7 were treatments proposed in a previous version of this report and have since been removed.

Traffic Calming Locations

Traffic calming locations (type not specified)		
Street	**Location**	**Priority**
Strathmerton Street	Full length	High
Cuthbert Road	Full length	High
St Vigeons Road	Full Length	Medium
Miranda Road	Between Cheddar Road and Borrie Street	Medium
Hickford Street	Between Cheddar Road and Borrie Street	Medium
Darebin Boulevard	Full Length	Medium
Green Avenue	Full Length	High
Flag Street / Bradshaw Street	Full Length	Medium
Browning Street / Keats Avenue / Scott Grove	Full Length	Medium
San Leandro Drive	Full Length	High
Nicholson Avenue	Full Length	High
Niblick Street	Full Length	High
Gertz Avenue	Full Length	High

V127140
23 July 2018 (Rev 1)
11 March 2020 (Rev 2)

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