

# **Lot 2 Clarkes Lane, Wangaratta**

## Transport Impact Assessment



211032TIA001M-F

9 February 2024

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## APPENDICES

### APPENDIX A CONCEPT LAYOUT PLAN

# 1 INTRODUCTION

onemilegrid has been requested by Robert Luxmoore Pty Ltd to undertake a Transport Impact Assessment of the proposed residential subdivision at Lot 2 Clarkes Lane, Wangaratta.

As part of this assessment the subject site has been reviewed with due consideration of the development proposal, traffic data has been sourced and relevant background reports have been reviewed.

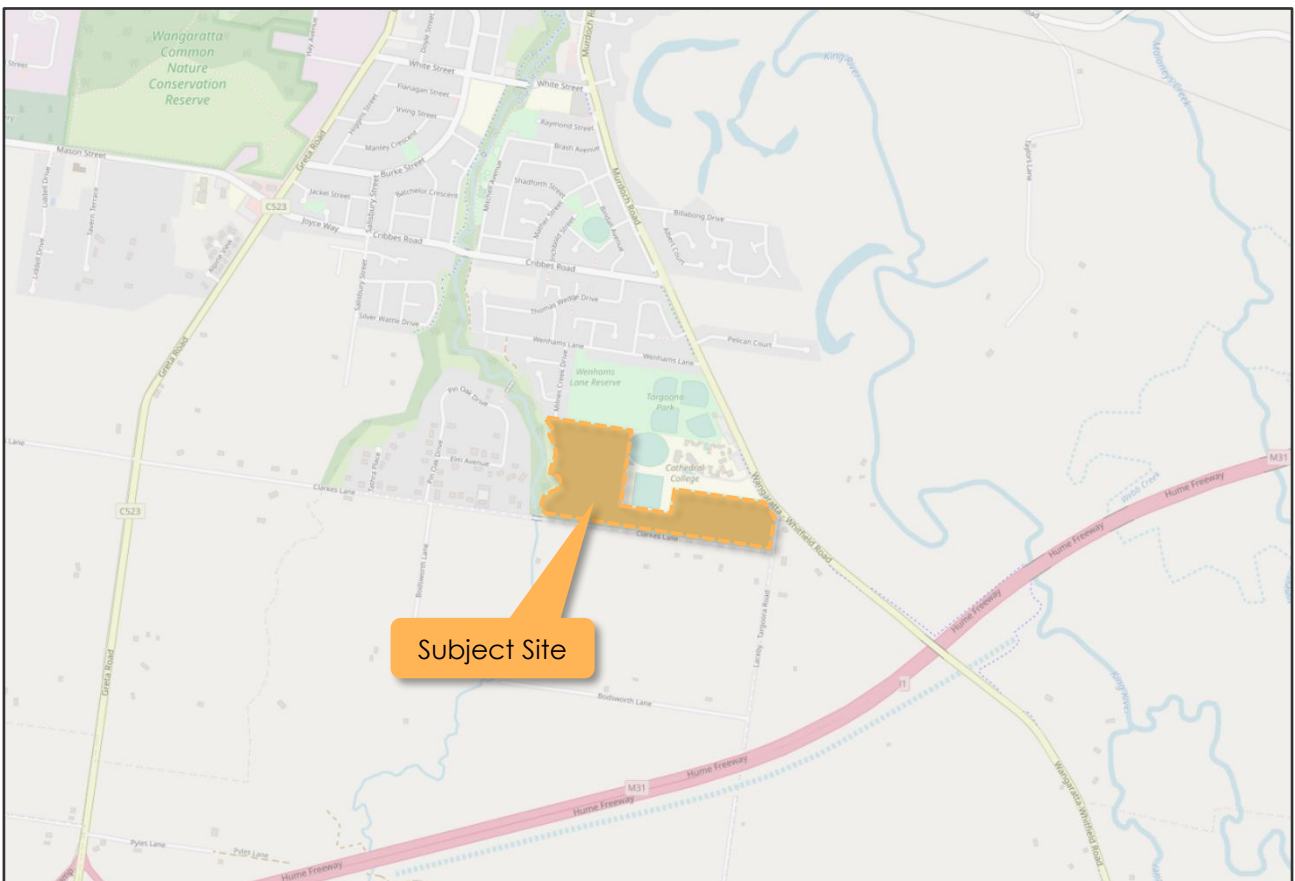
This report has been updated to respond to Council's letter of 10 May 2023 and the DTP (Head, Transport for Victoria) letter dated 28 September 2023, where applicable to traffic engineering matters.

## 2 EXISTING CONDITIONS

### 2.1 Site Location

The subject site is located at Lot 2 Clarkes Lane, Wangaratta, as shown in Figure 1.

**Figure 1 Site Location**



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The subject site is principally located on the northern side of Clarkes Lane, with abutments to Lacey-Targoora Road and Wangaratta-Whitfield Road in the east and Milnes Creek Drive in the northwest.

The site is irregular in shape, with frontage to Clarkes Lane, Lacey-Targoora Road and Wangaratta-Whitfield Road of approximately 975 metres, 109 metres and 118 metres respectively. In the northwest corner, Milnes Creek Drive terminates.

The site is currently vacant, with access provided via a single width crossover from Clarkes Lane. Land use in the immediate vicinity of the site is largely residential in nature, and includes a mix of low density and rural residential land. Cathedral College Wangaratta and Targoora Park are located directly north of the site, whilst One Mile Creek runs along the western boundary of the site. An aerial view of the subject site is provided in Figure 2.

**Figure 2 Site Context (11 November 2021)**



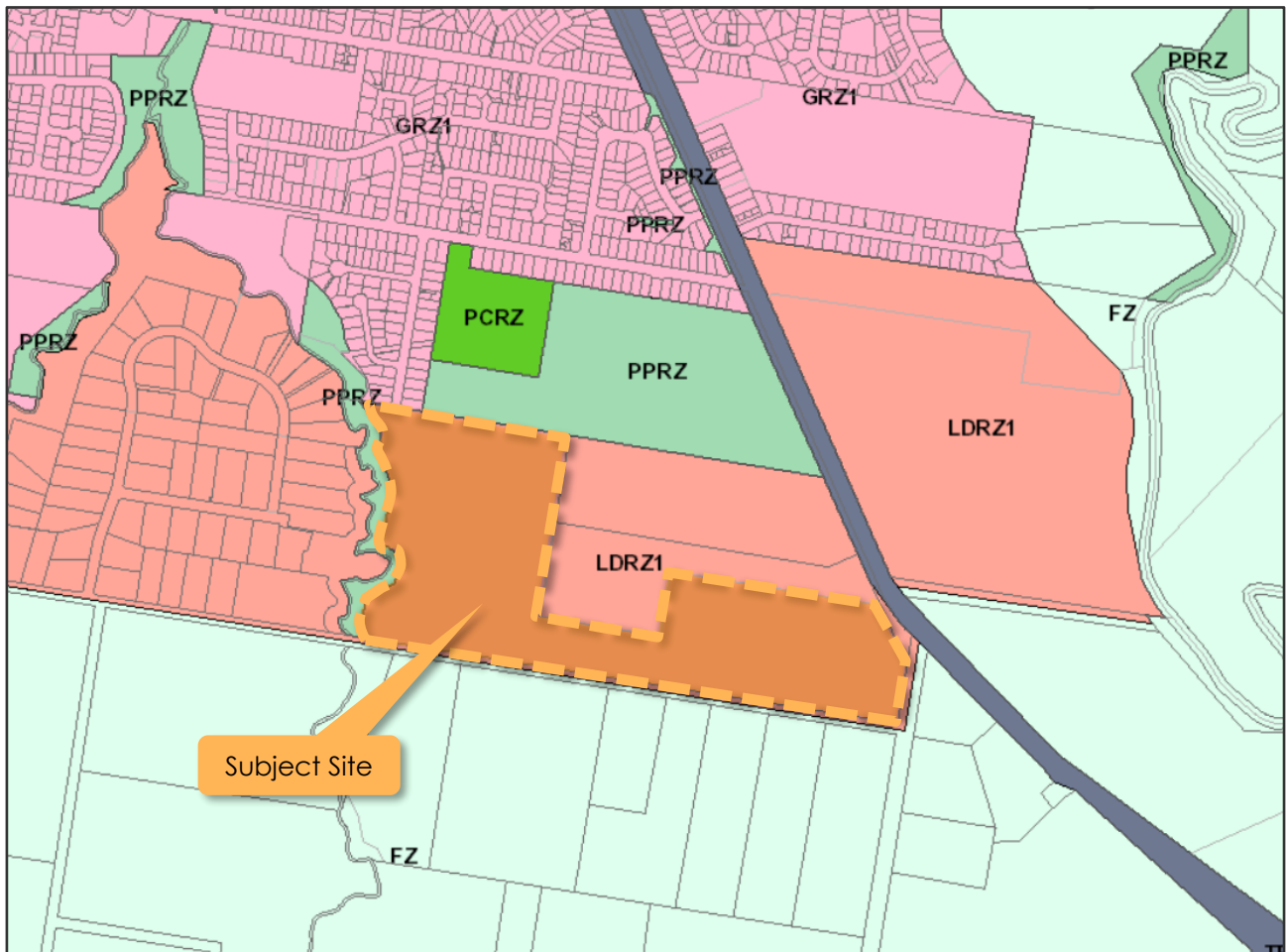
Copyright Nearmap

## 2.2 Planning Zones and Overlays

It is shown in Figure 3 that the site is located within a Low Density Residential Zone (LDRZ).

Additionally, the site abuts Wangaratta-Whitfield Road, which is within a Transport Zone (TRZ2); Principal Road Network.

**Figure 3 Planning Scheme Zones**



Furthermore, a Design Development Overlay (DDO6-A3) and a Land Subject to Inundation Overlay (LSIO) applies to the subject site.

## 2.3 Road Network

### 2.3.1 Clarkes Lane

Clarkes Lane is a local road generally aligned east-west, running between Greta Road in the west, and Laceby-Targoora Road in the east. Clarkes Lane operates within a wide pavement that provides a single traffic lane in each direction with unsealed shoulders on both sides.

The cross-section of Clarkes Lane at the frontage of the site is shown in Figure 4 and Figure 5.

**Figure 4** Clarkes Lane, looking west from the Laceby-Targoora Road intersection



**Figure 5** Clarkes Lane, looking east adjacent to the subject site



An 80km/h speed limit applies to Clarkes Lane in the vicinity of the site.



### 2.3.2 Wangaratta-Whitfield Road

Wangaratta-Whitfield Road is an arterial road generally aligned northwest-southeast, running between Wangaratta in the north and Whitfield approximately 45 kilometres in the south. Wangaratta-Whitfield Road provides a single traffic lane with unsealed shoulders in each direction adjacent to the site.

The cross-section of Wangaratta-Whitfield Road in the vicinity of the site is shown in Figure 6.

**Figure 6 Wangaratta-Whitfield Road looking south from the Cathedral College entrance**



**Figure 7 Wangaratta-Whitfield Road looking north from Laceby-Targoora Rd intersection**



Wangaratta-Whitfield Road operates with a 60km/h speed limit at the Wangaratta-Whitfield Road / Laceby-Targoora Road intersection, and transitions to 100km/h approximately 100 metres south-east of the intersection. A portion of road north of the site is located within a school zone, hence a 40km/h speed limit applies during school pick-up/drop-off periods.

### 2.3.3 Laceby-Targoora Road

Laceby-Targoora Road is a local road generally aligned north-south, running between Wangaratta-Whitfield Road in the north, and terminates approximately 850 metres in the south. Laceby-Targoora Road operates within a single width pavement offering two way traffic movements with gravel shoulders on each side of the road.

The cross-section of Laceby-Targoora Road at the frontage of the site is shown in Figure 8.

**Figure 8** Laceby-Targoora Road, looking north from the Clarkes Lane intersection



### 2.3.4 Milnes Creek Drive

Milnes Creek Drive is a local residential street generally aligned north-south, running between Wenhams Lane in the north and terminating approximately 300 metres in the south at the boundary of the subject site. Milnes Creek Drive operates with a standard residential cross section which allows for two-way traffic movements, intermittent kerbside parking and footpaths on both sides.

## 2.4 Existing Traffic Volumes

Traffic volume surveys were undertaken by Trans Traffic Survey on behalf of **onemilegrid** on Friday 4<sup>th</sup> February 2022, between 7:00am and 9:30am, and between 2:30pm and 6:30pm at the following intersections:

- Clarkes Lane / Laceby – Targoora Road;
- Wangaratta-Whitfield Road / Laceby – Targoora Road;
- Wangaratta-Whitfield Road / Wenhams Lane; and
- Wenhams Lane / Milnes Creek Drive.

The peak hour results of the surveys are shown below in Figure 9 and Figure 10.

**Figure 9 Existing AM Peak Hour Traffic Volumes – Friday 4<sup>th</sup> February 2022**



Figure 10 Existing PM Peak Hour Traffic Volumes – Friday 4<sup>th</sup> February 2022



## 2.5 Crash History

Crash history information for the Wangaratta-Whitfield Road / Laceby-Targoora Road and the Wangaratta-Whitfield Road / Wenhams Lane intersections were obtained through the Department of Transport (VicRoads) CrashStats (the Victorian accident statistics and mapping program) for the latest 5-year period (2014 – 2019 inclusive).

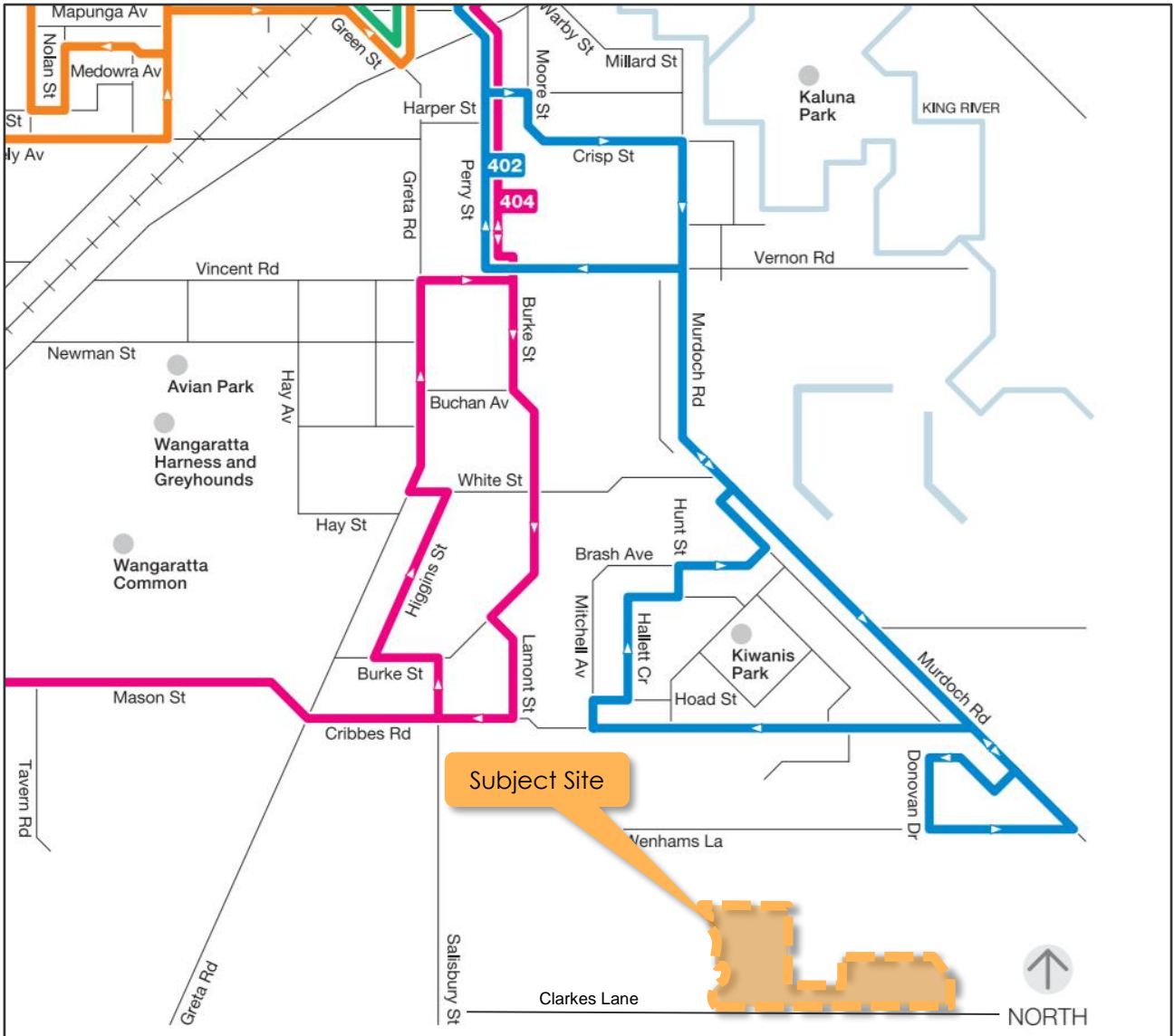
The crash data found that no crashes were recorded at either intersection over the 5-year period.

## 2.6 Sustainable Transport

### 2.6.1 Public Transport

An extract of the Wangaratta Public Transport Network is provided below in Figure 11. The public transport is limited to the route 402 bus service operating along Welham's Lane.

**Figure 11 Public Transport Provision**

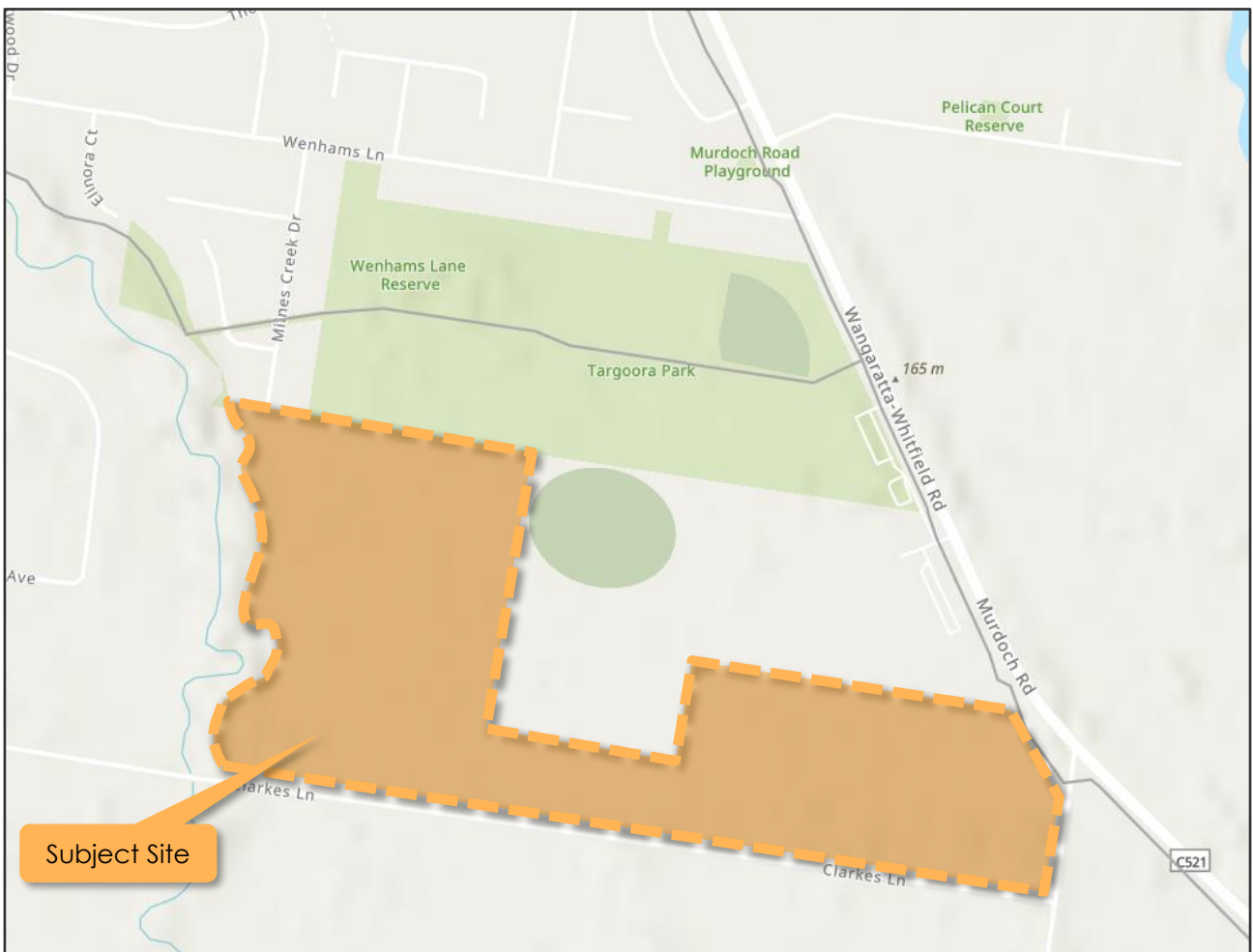


## 2.6.2 Bicycle Facilities

The Principal Bicycle Network (PBN) is a “network of existing and proposed cycle routes identified to help people ride to major destinations around metropolitan Melbourne”. The PBN was originally established in 1994. The Department of Transport (VicRoads) undertook an extensive review of the PBN between 2009 and 2012 and identified numerous improvements.

The PBN in the vicinity of the site is shown in Figure 12, which identifies a shared offroad cycling route along Wangaratta-Whitfield Road, as well as an offroad bicycle route north of the site which crosses Milnes Creek Drive and runs through Targoora Park. Both of the above cycling paths have connections to the Wangaratta Activity Centre.

**Figure 12 Principal Bicycle Network**



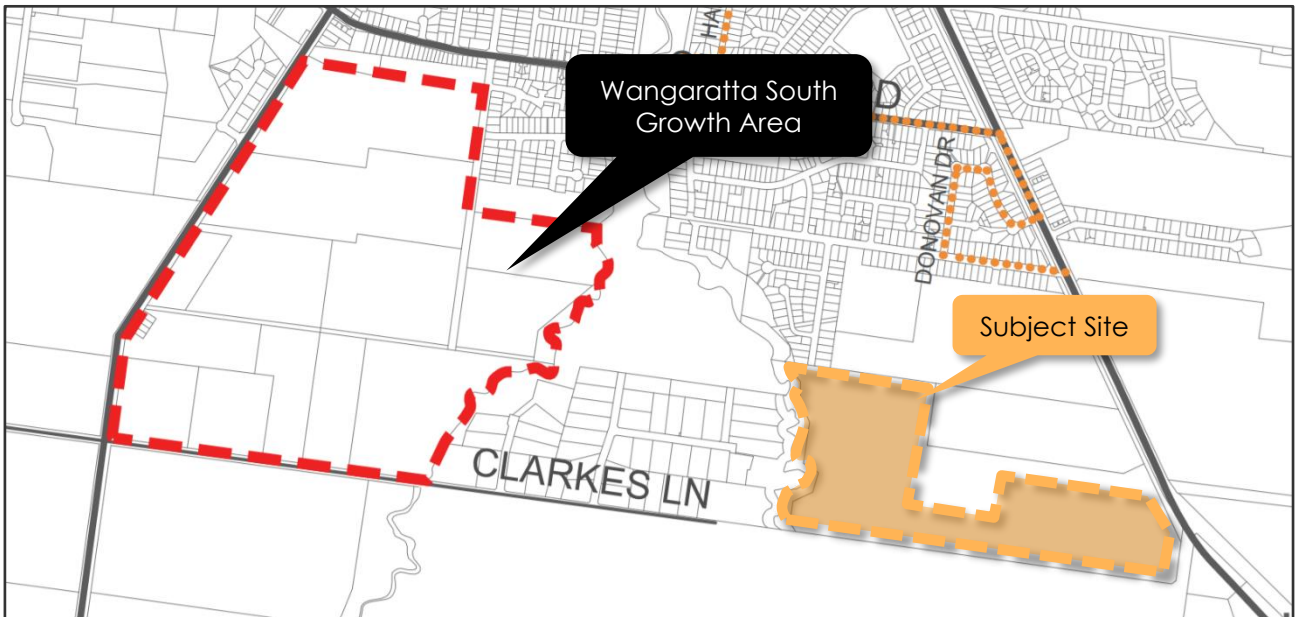
## 2.7 Wangaratta South Growth Area Structure Plan

The Wangaratta South Growth Area Structure Plan outlines the future structure for the movement network and land uses for one of two identified growth areas within Wangaratta. The Structure Plan area is shown below in Figure 13.

Whilst the subject site is not located within the Structure Plan area, as shown in Figure 14 it is located just to the east.

Of relevance to the subject site, Clarkes Lane is identified as a collector road with a possible future bus route operating along its length.

**Figure 13 Wangaratta South Growth Area**



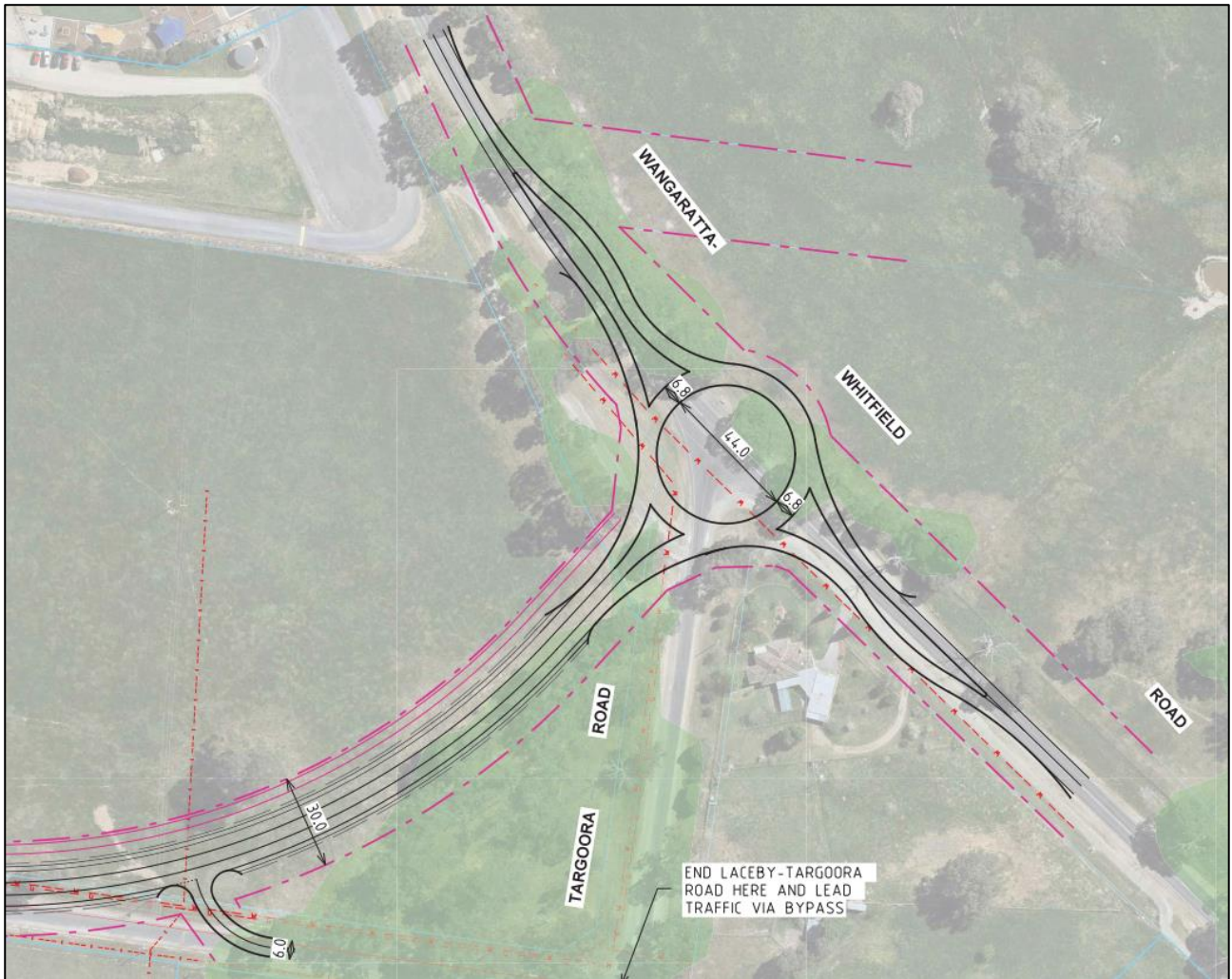
**Figure 14 Wangaratta South Growth Area – Future Road Network**



## 2.8 Draft Wangaratta Bypass / Freight Route

As part of the most recent RFI response from Council, it is understood that a determination with regard to the design for Clarkes Road has been reached. Of note, the proposed design includes the provision of a roundabout at the intersection of the Wangaratta – Whitfield Road and the realigned Clarkes Lane. A concept plan was prepared by Stantec for Council to illustrate the proposed ultimate roundabout, an extract of which is provided in Figure 16.

**Figure 15 Draft Wangaratta Bypass Intersection Plan**





### 3 DEVELOPMENT PROPOSAL

#### 3.1 General

It is proposed to develop the subject site for the purposes of a residential subdivision, containing 233 lots including 3 superlots.

The subdivision will be served by a simple internal road network, with several green pedestrian corridors throughout the site and green open spaces along One Mile Creek to the west and in the southeast corner.

A view of the road network and lot layout is provided in Figure 16 below.

**Figure 16 Proposed Development**



#### 3.2 Vehicle Access

As part of the proposal, the existing Wangaratta-Whitfield Road / Laceby-Targoona Road intersection will be modified to provide for an improved intersection configuration and will also allow for a new road connection to the subject site in proximity to Wangaratta-Whitfield Road. The new road extension through the site and the associated intersection configuration has been designed to take into account the future Clarkes Lane alignment as proposed within the draft Wangaratta Bypass study, including land setbacks along the entire frontage. The existing Laceby-Targoona Road connection will be relocated marginally to the south and will intersect with the new road before the main intersection.

As part of the proposal, the existing Wangaratta-Whitfield Road / Laceby-Targoona Road intersection will be upgraded to provide for a channelised right turn lane (CHR) and an auxiliary left turn lane (AUL) in line with the DTP draft permit conditions. **onemilegrid** has prepared a concept plan to illustrate these works which is included as an Appendix.

Primary access to the site is proposed from Clarkes Lane toward the southwestern corner of the site which will lead to a Boulevard Type Road set within a 22 metre reservation. The proposed site access will include a left and right turn lane to allow for unimpeded access into the site. As noted

a second access will be created in the north eastern corner of the site through a road extension from the Wangaratta-Whitfield Road intersection which will lead to the internal road network. A secondary connection through to Milnes Creek Drive is proposed in the northwest corner of the site to create for a connected and permeable series of neighbourhoods.

All site access points will lead to the internal road network which includes primarily local access streets.

Ultimately when the Draft Wangaratta Bypass / Freight Route roundabout is installed, the site access will modify to allow for Clarkes Lane to continue as part of its intended route through to the west. The site has been designed to ensure a seamless transitions for this to occur in the future.

### 3.3 Internal Road Network

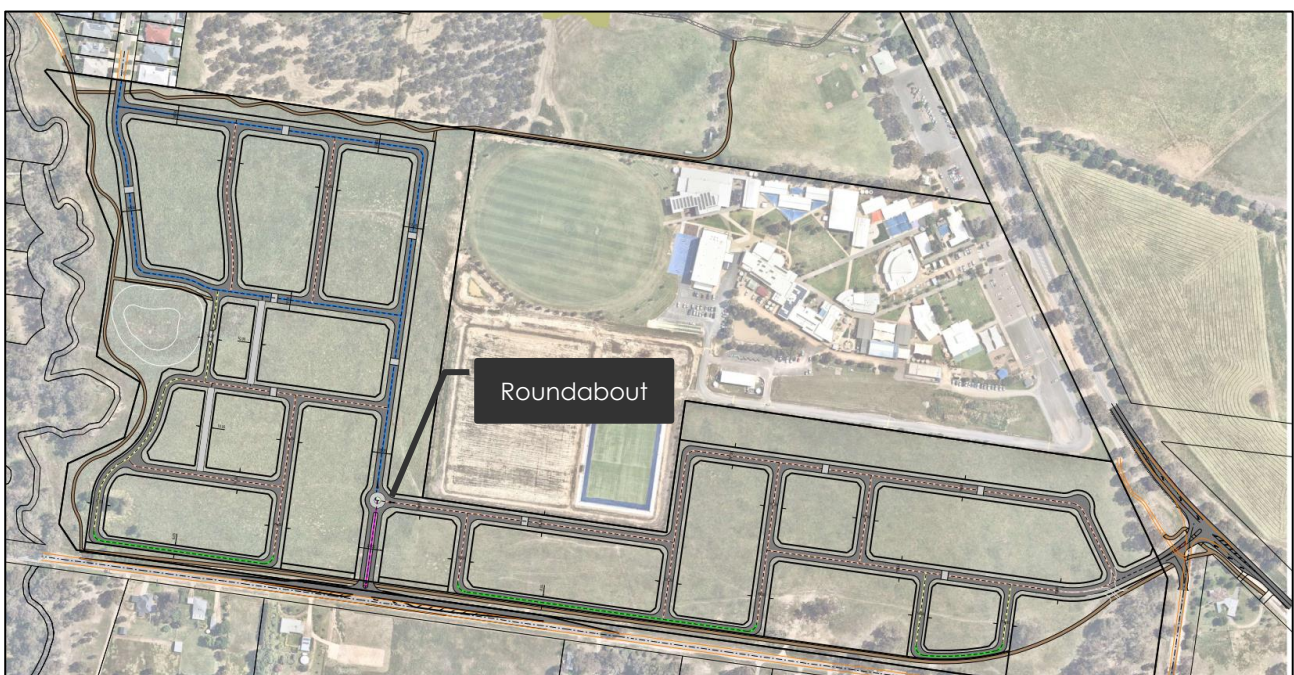
The subdivision will be serviced by a network of local access streets which provides for a connective neighbourhood for future residents. The local access streets are primarily set within a road reservation of 16 metres, with reduced reservations with lots on one-side and open space / adjoining road interface on the other side (i.e. Clarkes Lane 'service road'). In the vicinity of the proposed bioretention basin, reduced road reservations are provided with rear access proposed.

Primary access into the site will be from a Boulevard road which will intersect with internal local access streets at a roundabout. The roundabout will act as a feature as well as a traffic management device.

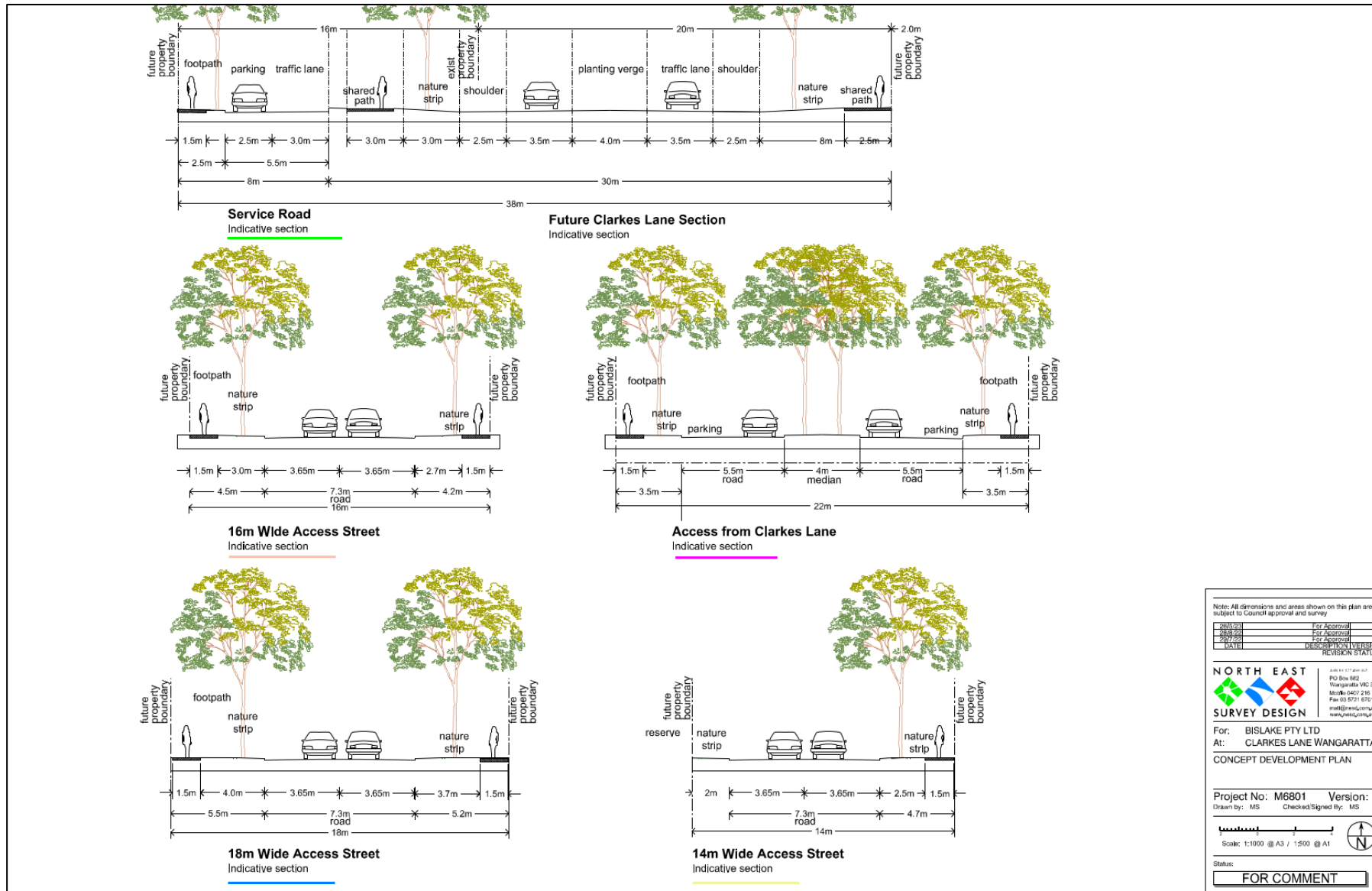
Allowance for the ultimate cross section of Clarkes Lane has been allowed for within the design of the subdivision and adjacent road network. Of note, the ability for Clarkes Lane to be widened to a four lane carriageway has been considered. As part of the proposed development, no upgrade works will be undertaken to Clarkes Lane noting the limited traffic activity across the road network. Any future upgrades will be facilitated by Council with the land made available by the applicant to ensure that the future cross section can be delivered when and if required. As noted, the site has been set back and land reserved for the future upgrade of Clarkes Lane as per the roundabout design prepared for the Draft Wangaratta Bypass / Freight Route.

A view of the proposed internal road network is provided in Figure 17, with a view of the proposed road cross sections prepared by North East Survey Design provided in Figure 18.

**Figure 17 Proposed Internal Road Network**



**Figure 18 Road Cross Sections**

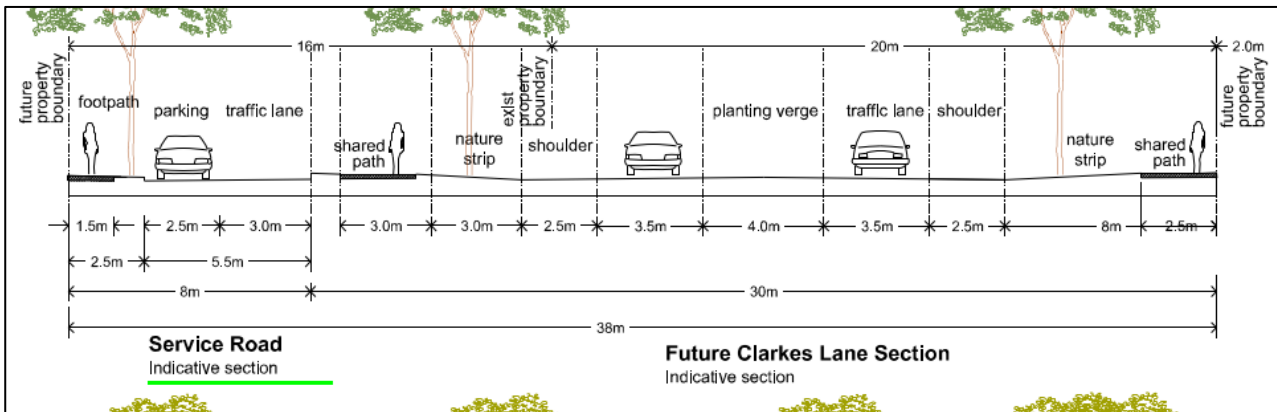


### 3.4 Clarkes Lane

The applicant has been in detailed discussions with Council in relation to the ultimate configuration of Clarkes Lanes and how that configuration can be integrated into the development. Council have provided a plan that has been prepared by Council's consultant for the ultimate configuration of Clarkes Lane through the site. The site boundaries have been modified to allow for the future reservation for the ultimate configuration of Clarkes Lane.

The ultimate road cross section is shown in Figure 19.

**Figure 19 Clarkes Lane Cross Section (with Service Road)**

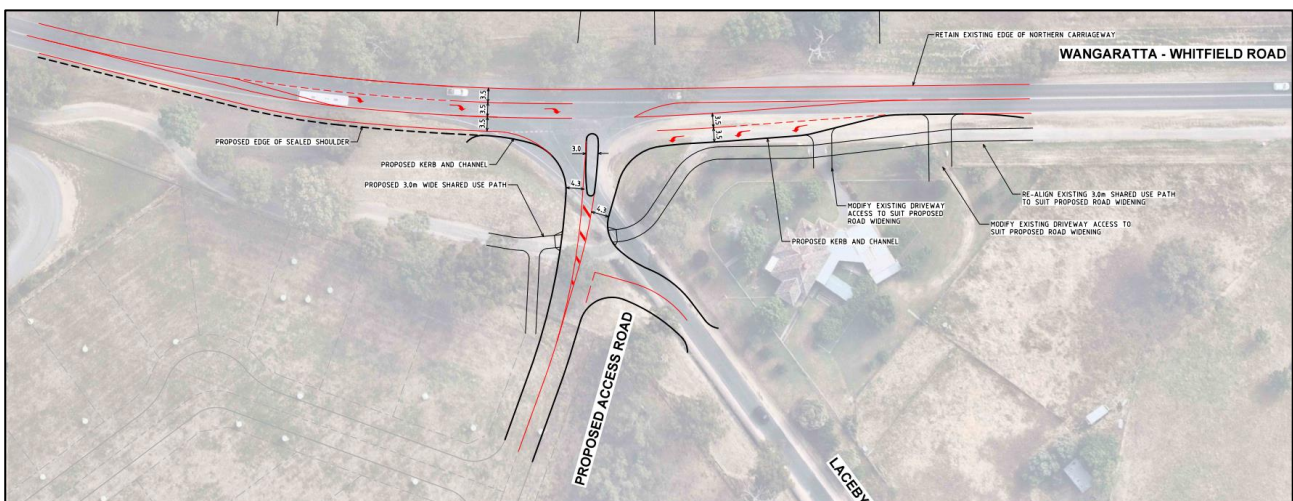


### 3.5 Wangaratta-Whitfield Road / Laceby-Targoora Road Intersection Upgrade

As part of the development, a new section of road which is on the future Clarkes Lane alignment will realign to the north and intersect with Wangaratta-Whitfield Road. The existing Laceby-Targoona Road connection will be relocated and will connect to the new roadway approximately 30 metres south of the existing Laceby-Targoona Road / Wangaratta-Whitfield Road intersection. The existing Wangaratta-Whitfield Road / Laceby-Targoora Road intersection will be upgraded to provide for a channelised right turn lane (CHR) and an auxiliary left turn lane (AUL) in line with the DTP draft permit conditions.

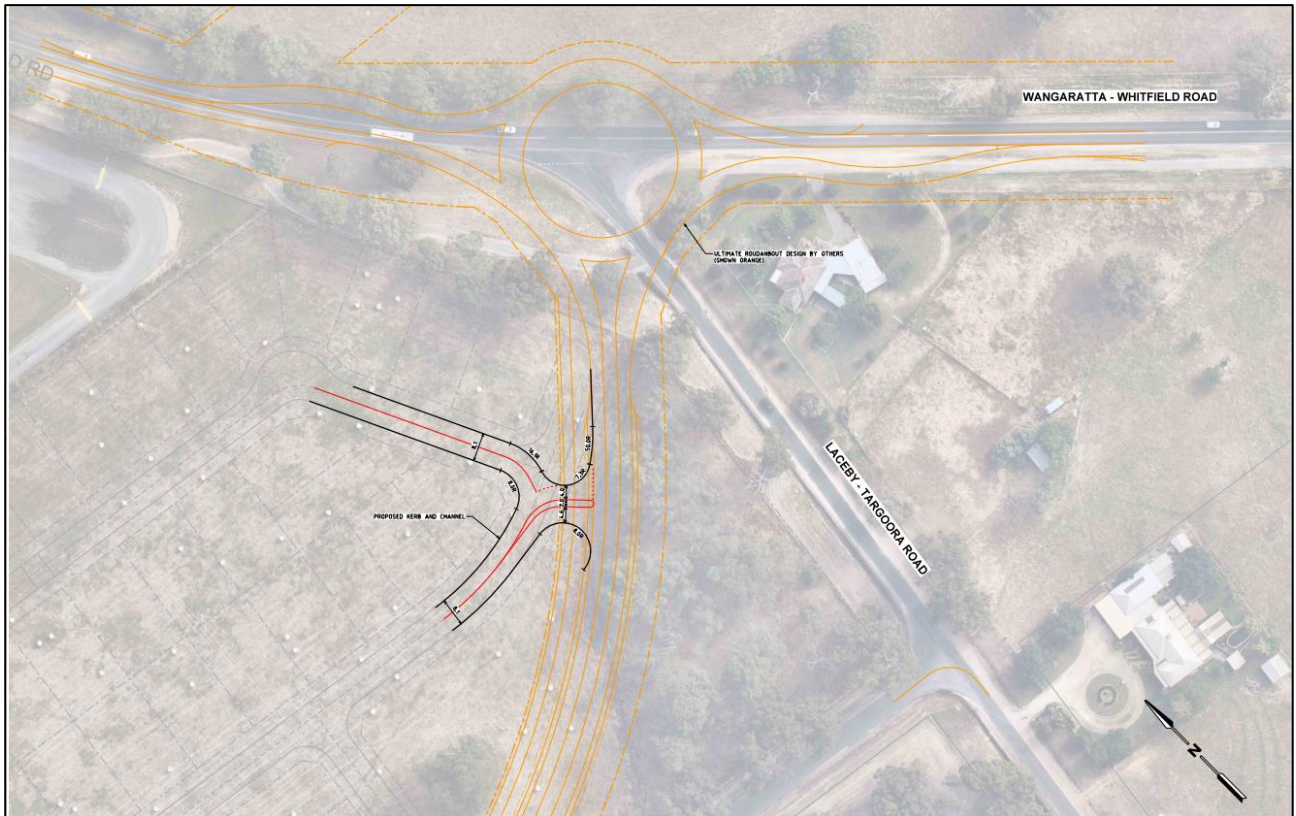
An extract of the plan is provided in Figure 20 below.

**Figure 20 Proposed Intersection Configuration**



As noted, the future intersection as part of the upgrades proposed by Council will include a roundabout. **onemilegrid** has prepared a concept plan which integrates the roundabout design with the site access arrangements to demonstrate that the roundabout can be delivered without impacting on the subject site. The plan is included as an Appendix to this report, an extract of which is provided in Figure 21.

**Figure 21 Proposed Ultimate Intersection Configuration (by others)**



## 4 DESIGN ASSESSMENT

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### 4.1 Clause 52.29 – Land Adjacent to the Principal Road Network

The development proposal is subject to the requirements of Clause 52.29 of the Wangaratta Planning Scheme which applies to land adjacent to the Principal Road Network (Wangaratta-Whitfield Road) and aims to ensure appropriate access is provided to identified roads.

Relevant to the proposed development, the Clause states that a permit is required to create or alter access to a road in a Transport 2 Zone, and that the proposal is to be referred to the relevant referral authority (in this case the Department of Transport (VicRoads)).

While subject site proposes no direct access to Wangaratta-Whitfield Road, it is proposed to alter the intersection with Laceby-Targoora Road.

Before deciding on the appropriateness or otherwise of an application to alter access to the Principal Road Network, the responsible authority must consider the following:

- *The Municipal Planning Strategy and the Planning Policy Framework.*
- *The views of the relevant road authority.*
- *The effect of the proposal on the operation of the road and on public safety.*
- *Any policy made by the relevant road authority pursuant to Schedule 2, Clause 3 of the Road Management Act 2004 regarding access between a controlled access road and adjacent land.*

The proposed development seeks to upgrade the intersection with Wangaratta-Whitfield Road and Laceby-Targoora Road to improve the existing configuration of the intersection. Of note, formalisation of the intersection to provide for a channelised right turn lane and auxiliary left turn lane are proposed.

Furthermore, as part of the Wangaratta South Growth Area Structure Plan, Clarkes Lane will be upgraded to a collector road and is projected to experience increased traffic volumes in the future. To allow for this, the proposed development has been set back to allow for any future upgrade works to the road cross section.

Full analysis of the proposed intersection is provided in Section 6, demonstrating it will operate with sufficient efficiency.

In light of the above, it is considered that the proposed development will satisfy the requirements of Clause 52.29.

## 5 RESIDENTIAL SUBDIVISION DESIGN ASSESSMENT

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### 5.1 General

The design of the residential subdivision has been assessed, in relation to the approved Masterplan for the site and Clause 56 of the Wangaratta Planning Scheme (Residential Subdivision), and the Infrastructure Design Manual (IDM) to which Council are a signatory.

### 5.2 Wangaratta Planning Scheme – Clause 56

Clause 56.06 identifies Access and Mobility Management requirements for residential subdivisions such as that proposed at the site. The following Clauses are applicable.

#### 5.2.1 Clause 56.06-2, Walking and cycling network objectives

##### Standard C15

*The walking and cycling network should be designed to:*

- *Implement any relevant regional and local walking and cycling strategy, plan or policy for the area set out in this scheme.*
- *Link to any existing pedestrian and cycling networks.*
- *Provide safe walkable distances to activity centres, community facilities, public transport stops and public open spaces.*
- *Provide an interconnected and continuous network of safe, efficient and convenient footpaths, shared paths, cycle paths and cycle lanes based primarily on the network of arterial roads, neighbourhood streets and regional public open spaces.*
- *Provide direct cycling routes for regional journeys to major activity centres, community facilities, public transport and other regional activities and for regional recreational cycling.*
- *Ensure safe street and road crossings including the provision of traffic controls where required.*
- *Provide an appropriate level of priority for pedestrians and cyclists.*
- *Have natural surveillance along streets and from abutting dwellings and be designed for personal safety and security particularly at night.*
- *Be accessible to people with disabilities.*

The proposed development generally includes footpaths on both sides of all internal streets, with the exception of several 14 metre wide sections of road throughout the site. These roads have lot frontage on one side of the road only, with the other side fronting either green open space or Clarkes Lane which is proposed with a pedestrian footpath as part of the road upgrade within the Wangaratta South Growth Area Structure Plan.

Internal roads are expected to have minimal traffic volumes and low speeds, and are considered suitable for cyclists.

All roads and paths are provided with natural surveillance, with several pedestrian links located throughout the site.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-2.

## 5.2.2 Clause 56.06-3, Public transport network objectives

### Standard C16

The public transport network should be designed to:

- Implement any relevant public transport strategy, plan or policy for the area set out in this scheme.
- Connect new public transport routes to existing and proposed routes to the satisfaction of the relevant public transport authority.
- Provide for public transport links between activity centres and other locations that attract people using the Principal Public Transport Network in Metropolitan Melbourne and the regional public transport network outside Metropolitan Melbourne.
- Locate regional bus routes principally on arterial roads and locate local bus services principally on connector streets to provide:
  - ✦ Safe and direct movement between activity centres without complicated turning manoeuvres.
  - ✦ Direct travel between neighbourhoods and neighbourhood activity centres.
  - ✦ A short and safe walk to a public transport stop from most dwellings.

The internal road network has not been designed to cater for a public transport route, therefore the requirements of Clause 56.06-3 do not apply.

The portion of Clarkes Lane adjacent to the subject site has been designed in line with the Wangaratta South Growth Area Structure Plan and is capable of accommodating any future potential bus routes.

## 5.2.3 Clause 56.06-4, Neighbourhood street network objective

### Standard C17

The neighbourhood street network must:

- Take account of the existing mobility network of arterial roads, neighbourhood streets, cycle paths, cycle paths, footpaths and public transport routes.
- Provide clear physical distinctions between arterial roads and neighbourhood street types.
- Comply with the Roads Corporation's arterial road access management policies.
- Provide an appropriate speed environment and movement priority for the safe and easy movement of pedestrians and cyclists and for accessing public transport.
- Provide safe and efficient access to activity centres for commercial and freight vehicles.
- Provide safe and efficient access to all lots for service and emergency vehicles.
- Provide safe movement for all vehicles.
- Incorporate any necessary traffic control measures and traffic management infrastructure.

The neighbourhood street network should be designed to:

- Implement any relevant transport strategy, plan or policy for the area set out in this scheme.
- Include arterial roads at intervals of approximately 1.6 kilometres that have adequate reservation widths to accommodate long term movement demand.
- Include connector streets approximately halfway between arterial roads and provide adequate reservation widths to accommodate long term movement demand.
- Ensure connector streets align between neighbourhoods for direct and efficient movement of pedestrians, cyclists, public transport and other motor vehicles.
- Provide an interconnected and continuous network of streets within and between neighbourhoods for use by pedestrians, cyclists, public transport and other vehicles.
- Provide an appropriate level of local traffic dispersal.
- Indicate the appropriate street type.
- Provide a speed environment that is appropriate to the street type.



- Provide a street environment that appropriately manages movement demand (volume, type and mix of pedestrians, cyclists, public transport and other motor vehicles).
- Encourage appropriate and safe pedestrian, cyclist and driver behaviour.
- Provide safe sharing of access lanes and access places by pedestrians, cyclists and vehicles.
- Minimise the provision of culs-de-sac.
- Provide for service and emergency vehicles to safely turn at the end of a dead-end street.
- Facilitate solar orientation of lots.
- Facilitate the provision of the walking and cycling network, integrated water management systems, utilities and planting of trees.
- Contribute to the area's character and identity.
- Take account of any identified significant features.

The internal street network provides connectivity to each of the lots and efficient vehicle access throughout the site.

The detailed road network provided within the proposed development includes connectivity to surrounding development with a defined road hierarchy.

All streets within the development are to comprise of typical Access Street carriageways, with the road reserve varying based on the provision of paths within the road reserve.

The road network has been implemented to avoid the creation of end road treatments and provides local intersections with suitable alignments.

It is therefore considered that the subdivision generally satisfies the objectives of Clause 56.06-4.

## 5.2.4 Clause 56.06-5, Walking and cycling detail network objectives

### Standard C18

Footpaths, shared paths, cycle paths and cycle lanes should be designed to:

- Be part of a comprehensive design of the road or street reservation.
- Be continuous and connect.
- Provide for public transport stops, street crossings for pedestrians and cyclists and kerb crossovers for access to lots.
- Accommodate projected user volumes and mix.
- Meet the requirements of Table C1.
- Provide pavement edge, kerb, channel and crossover details that support safe travel for pedestrians, footpath bound vehicles and cyclists, perform required drainage functions and are structurally sound.
- Provide appropriate signage.
- Be constructed to allow access to lots without damage to the footpath or shared path surfaces.
- Be constructed with a durable, non-skid surface.
- Be of a quality and durability to ensure:
  - ✦ Safe passage for pedestrians, cyclists, footpath bound vehicles and vehicles.
  - ✦ Discharge of urban run-off.
  - ✦ Preservation of all-weather access.
  - ✦ Maintenance of a reasonable, comfortable riding quality.
  - ✦ A minimum 20 year life span.
- Be accessible to people with disabilities and include tactile ground surface indicators, audible signals and kerb ramps required for the movement of people with disabilities.

The proposal includes continuous footpath connections along the proposed Access Streets, generally satisfying the objectives of Clause 56.06-5.

Additionally, several pedestrian links are proposed throughout the site, providing pedestrians with easy access to all areas of the subdivision.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-5.

## 5.2.5 Clause 56.06-6, Public transport network detail objectives

### Standard C19

*Bus priority measures must be provided along arterial roads forming part of the existing or proposed Principal Public Transport Network in Metropolitan Melbourne and the regional public transport network outside Metropolitan Melbourne to the requirements of the relevant roads authority.*

*Road alignment and geometry along bus routes should provide for the efficient, unimpeded movement of buses and the safety and comfort of passengers.*

*The design of public transport stops should not impede the movement of pedestrians.*

*Bus and tram stops should have:*

- *Surveillance from streets and adjacent lots.*
- *Safe street crossing conditions for pedestrians and cyclists.*
- *Safe pedestrian crossings on arterial roads and at schools including the provision of traffic controls as required by the roads authority.*
- *Continuous hard pavement from the footpath to the kerb.*
- *Sufficient lighting and paved, sheltered waiting areas for forecast user volume at neighbourhood centres, schools and other locations with expected high patronage.*
- *Appropriate signage.*

The internal road network has not been designed to cater for a public transport route, therefore the requirements of Clause 56.06-6 do not apply.

The portion of Clarkes Lane adjacent to the subject site has been designed in line with the Wangaratta South PSP and is capable of accommodating any future potential bus routes.

## 5.2.6 Clause 56.06-7, Neighbourhood street network detail objective

### Standard C20

The design of streets and roads should:

- Meet the requirements of Table C1. Where the widths of access lanes, access places, and access streets do not comply with the requirements of Table C1, the requirements of the relevant fire authority and roads authority must be met.
- Provide street blocks that are generally between 120 metres and 240 metres in length and generally between 60 metres to 120 metres in width to facilitate pedestrian movement and control traffic speed.
- Have verges of sufficient width to accommodate footpaths, shared paths, cycle paths, integrated water management, street tree planting, lighting and utility needs.
- Have street geometry appropriate to the street type and function, the physical land characteristics and achieve a safe environment for all users.
- Provide a low-speed environment while allowing all road users to proceed without unreasonable inconvenience or delay.
- Provide a safe environment for all street users applying speed control measures where appropriate.
- Ensure intersection layouts clearly indicate the travel path and priority of movement for pedestrians, cyclists and vehicles.
- Provide a minimum 5 metre by 5 metre corner splay at junctions with arterial roads and a minimum 3 metre by 3 metre corner splay at other junctions unless site conditions justify a variation to achieve safe sight lines across corners.
- Ensure streets are of sufficient strength to:
  - ✦ Enable the carriage of vehicles.
  - ✦ Avoid damage by construction vehicles and equipment.
- Ensure street pavements are of sufficient quality and durability for the:
  - ✦ Safe passage of pedestrians, cyclists and vehicles.
  - ✦ Discharge of urban run-off.
  - ✦ Preservation of all-weather access and maintenance of a reasonable, comfortable riding quality.
- Ensure carriageways of planned arterial roads are designed to the requirements of the relevant road authority.
- Ensure carriageways of neighbourhood streets are designed for a minimum 20 year life span.
- Provide pavement edges, kerbs, channel and crossover details designed to:
  - ✦ Perform the required integrated water management functions.
  - ✦ Delineate the edge of the carriageway for all street users.
  - ✦ Provide efficient and comfortable access to abutting lots at appropriate locations.
  - ✦ Contribute to streetscape design.
- Provide for the safe and efficient collection of waste and recycling materials from lots.
- Be accessible to people with disabilities.
- Meet the requirements of Table C1. Where the widths of access lanes, access places, and access streets do not comply with the requirements of Table C1, the requirements of the relevant fire authority and roads authority must be met. Where the widths of connector streets do not comply with the requirements of Table C1, the requirements of the relevant public transport authority must be met.

A street detail plan should be prepared that shows, as appropriate:

- The street hierarchy and typical cross-sections for all street types.
- Location of carriageway pavement, parking, bus stops, kerbs, crossovers, footpaths, tactile surface indicators, cycle paths and speed control and traffic management devices.
- Water sensitive urban design features.
- Location and species of proposed street trees and other vegetation.
- Location of existing vegetation to be retained and proposed treatment to ensure its health.
- Any relevant details for the design and location of street furniture, lighting, seats, bus stops, telephone boxes and mailboxes.

**Table C1 Design of roads and neighbourhood streets**

<b>Element</b>	<b>Access Lane</b>	<b>Access Place</b>	<b>Access Street – Level 1</b>	<b>Access Street – Level 2</b>	<b>Connector Street – Level 1</b>	<b>Connector Street – Level 2</b>
Traffic Volume	300 vpd	300-1000 vpd	1000-2000 vpd	2000-3000 vpd	3000 vpd	3000-7000 vpd
Target Speed	10 km/h	15 km/h	30 km/h	40 km/h	50 km/h (40 km/h at schools, 20km/h at crossing points)	60 km/h or 50 km/h (40 km/h at schools)
Carriageway Width	5.5m	5.5m	5.5m	7 – 7.5m	3.5m per lane (4.0m at intersections)	3.5m per lane (4.0m at intersections)
Parking Within Street	None	1 verge space per 2 lots, or one-side on carriageway	1 verge space per 2 lots	Both sides	Dedicated lane 2.3m where required	Dedicated lane 2.3m where required
Verge Width	Not required	7.5m (3.5m / 2.5m min)	4.0 / 4.0m	4.5 / 4.5m	4.5 / 4.5m	6.0 / 6.0m
Footpath Provision	Shared Zone	1.5m (Not required if < 5 dwellings)	2 x 1.5m (2.0m at schools, shop, activity centre)	2 x 1.5m (2.0m at schools, shop, activity centre)	2 x 1.5m (2.0m at schools, shop, activity centre)	2 x 1.5m (2.0m at schools, shop, activity centre)
Cycle Path Provision	None	None	Shared Zone	Shared Zone	0.7 - 1.7m	0.7 - 1.7m or shared path

Appropriate splays are provided on the corner of intersections, providing appropriate sight distances.

Speed control measures are proposed on extended sections of road in the form of raised pavements.

The proposed access streets within the development generally have a road reserve of 18 metres, and generally accord with the Access Street Level 2 classification.

Furthermore, the road reservation is proposed at 14 metres where adjacent to open space or Clarkes Lane, assuming no requirement for a footpath along the side with no lot frontage, in general accordance with the Access Street Level 2 classification.

Additionally, several 10 metre laneways are proposed to assist with access to lots with a narrow road frontage, also in general accordance with the Access Lane classification.

The internal roads are expected to carry between 2,000 and 3,000 vehicles per day. An Access Street Level 2 has an indicative capacity of 2,000 – 3,000 vehicles per day, and anticipated volumes are expected to fall within this range.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-7.

## 5.2.7 Clause 56.06-8, Lot access objective

### Standard C21

Vehicle access to lots abutting arterial roads should be provided from service roads, side or rear access lanes, access places or access streets where appropriate and in accordance with the access management requirements of the relevant roads authority.

Vehicle access to lots of 300 square metres or less in area and lots with a frontage of 7.5 metres or less should be provided via rear or side access lanes, places or streets.

The design and construction of a crossover should meet the requirements of the relevant road authority.

No lots are provided with direct access to an arterial road.

Six of the proposed lots are accessed from a rear access lane, however these lots are more than 300m<sup>2</sup> with a frontage of more than 7.5 metres.

It is therefore considered that the subdivision satisfies the objectives of Clause 56.06-8.

## 5.3 Traffic Management

It is proposed to include traffic management measures across the subdivision where road lengths exceed 240 metres in line with the Planning Scheme requirements. These traffic management measures could include speed humps or localised road narrowing.

## 5.4 Infrastructure Design Manual

The Infrastructure Design Manual (IDM) is a document prepared by numerous Victorian rural and regional Councils including the Rural City of Wangaratta, providing a set of consistent requirements and standards for the design and development of infrastructure.

The manual provides cross-sectional requirements for rural and urban roads, with the relevant requirements to the subject site reproduced in Table 1.

**Table 1 IDM Road Cross-Sectional Requirements – Urban Roads**

Road Type	Max. Traffic Volumes (veh/day)	Min. Reserve	Carriageway Width	Min. Verge Width	Parking	Pedestrian / Cycle Provision
Access Lane	300	N/A	5.5m	N/A	Yes (x1)	No footpath No cycles
Access Place	300	14.0m	6.0m	3.5m	Yes (x1)	Footpath x2 No cycles
Access Street	1,000	16.0m	7.3m	3.5m	Yes (x2)	Footpath x2 No cycles
Collector Street Level 1	3,000	24.0m	11.0m	6.0m	Yes (x2)	Shared path x2
Collector Street Level 2	6,000	34.0m	2x7.0m + 5m median	6.0m	Yes (x2)	Footpath x2 Shared path x2
Court Bowl (Residential)	N/A	28.0m	10.0m radius	3.5m	N/A	Footpath x2 No cycles

The proposed internal roads, comprising 18 metre, 16 metres and 14 metre access streets, and 10 metre access lanes comply with the requirements of the IDM.

In relation to the variant cross section for the local access street on the northern boundary, a pavement of 6m is provided with a separate indented parking lane on the north side. Whilst there is no specification above, it is considered that the cross section is appropriate and will comfortably cater for the identified function.

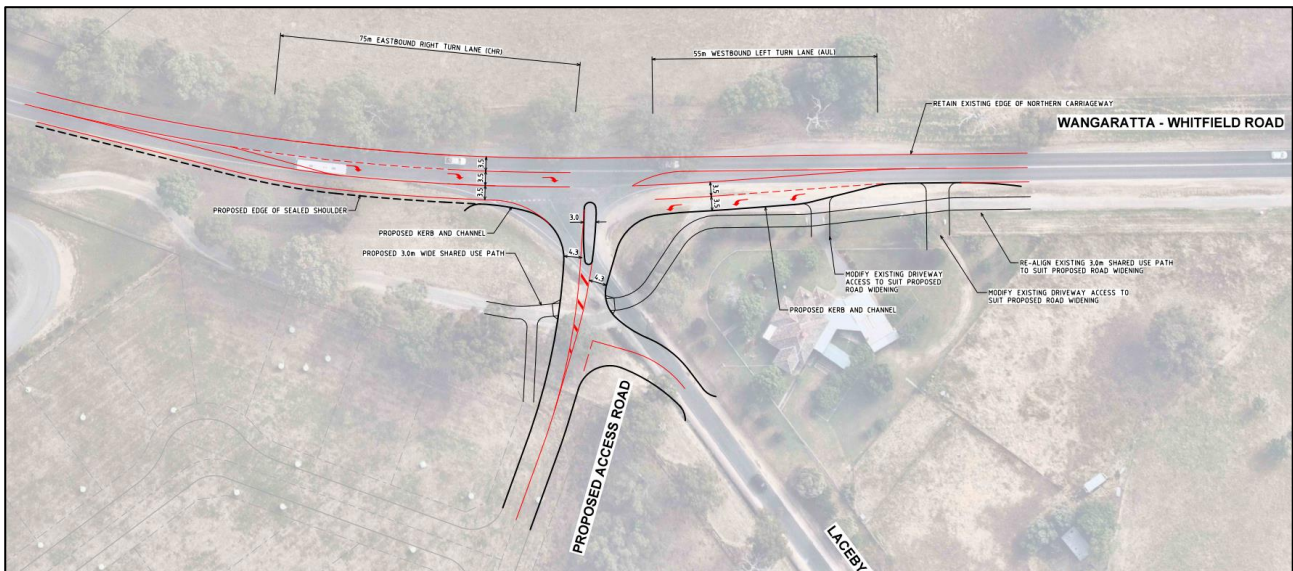
## 5.5 Wangaratta-Whitfield Road Intersection Upgrade

It is proposed to upgrade the intersection at Wangaratta-Whitfield Road to provide for a channelised right turn lane (CHR) and an auxiliary left turn lane (AUL) in line with the DTP draft permit conditions.

The proposed intersection upgrade has been designed to accommodate vehicles up to a 12.5m heavy rigid vehicle (HRV).

A concept plan has been prepared, demonstrating the proposed intersection arrangement and associated turning treatments. An extract from this plan is provided in Figure 22 below.

**Figure 22 Concept Plan Extract**



## 5.6 Clarkes Lane Upgrade

The subdivision and its connections to Clarkes Lane have been developed in conjunction with the Council concept plan which also includes a roundabout at the Wangaratta – Whitfield Road intersection. The existing configuration of Clarkes Lane has been retained to allow for immediate site access connections with future provisions to allow for widening if required by the authorities in the future.

Specifically, Clarkes Lane will include a shared path within future land to the south and have the potential to accommodate bus routes in the future.

The road reservation has been allocated through the site to allow for Clarkes Lane to continue through the site and connect to Wangaratta-Whitfield Road if desired by Council in the future. As part of this development the existing cross section and alignment will remain.

## 6 TRAFFIC

### 6.1 Traffic Generation

As previously discussed in section 2.4, traffic volume surveys were undertaken by Trans Traffic Survey on behalf of **onemilegrid** on Friday 4<sup>th</sup> February 2022, between 7:00am and 9:30am, and between 2:30pm and 6:30pm at various intersections in the vicinity of the site, including the intersection of Wenhams Lane and Milnes Creek Drive to the north of the site.

Lots on Milnes Creek Drive and two off-shooting streets are provided with only one access point at the Wenhams Road / Milnes Creek Drive intersection. Therefore, vehicle movements in and out of Milnes Creek Drive from this intersection can be used to determine the traffic generation rates of residential land in this area for a site specific rate.

A view of the relevant lots and the resulting traffic data is provided below.

**Figure 23 Milnes Creek Drive Case Study Area**



**Table 2 Milnes Creek Drive Traffic Volumes**

Peak Period	Inbound	Outbound	Total	Traffic Generation Rate
AM Peak (8:00AM – 9:00AM)	5	17	22	0.37 movements per lot
PM Peak (3:15PM – 4:15PM)	28	11	39	0.66 movements per lot

Based on the above, the 59 lot area generates approximately 0.37 movements per lot in the AM peak and 0.66 movements per lot in the PM peak.

Furthermore, the traffic distribution of the survey area is provided in Table 3 below.

**Table 3 Milnes Creek Drive Traffic Distribution**

<i>Peak Period</i>	<i>Inbound</i>	<i>Outbound</i>
AM Peak	23%	77%
PM Peak	72%	28%

The above traffic generation figures and distribution is generally consistent with traffic generation data collected by onemilegrid and other traffic engineering firms.

In order to provide a conservative assessment, a rate of 7 vehicle movements per day and 0.7 vehicle movements during each of the peak hours will be adopted. Applying this rate to the proposed 233 lot development, the following level of traffic is anticipated to be generated.

**Table 4 Anticipated Traffic Generation**

<i>Period</i>	<i>Inbound</i>	<i>Outbound</i>	<i>Total</i>
AM Peak	38	125	163
PM Peak	117	46	163
Daily	815	816	1,631

## 6.2 Traffic Distribution

Considering the location of the site in relation to the arterial road network, public transport facilities, schools, recreation and retail and employment precincts, the directional distribution shown in Table 5 has been adopted.

**Table 5 Adopted Traffic Distribution**

<i>Origin/Destination</i>	<i>Percentage</i>
Wangaratta-Whitfield Road – Northeast site access	50%
Clarkes Lane – West site access	30%
Milnes Creek Drive – North site access	20%

Furthermore, the adopted external destination distribution for the site is provided below.

**Table 6 Site Access Directional Traffic Distribution**

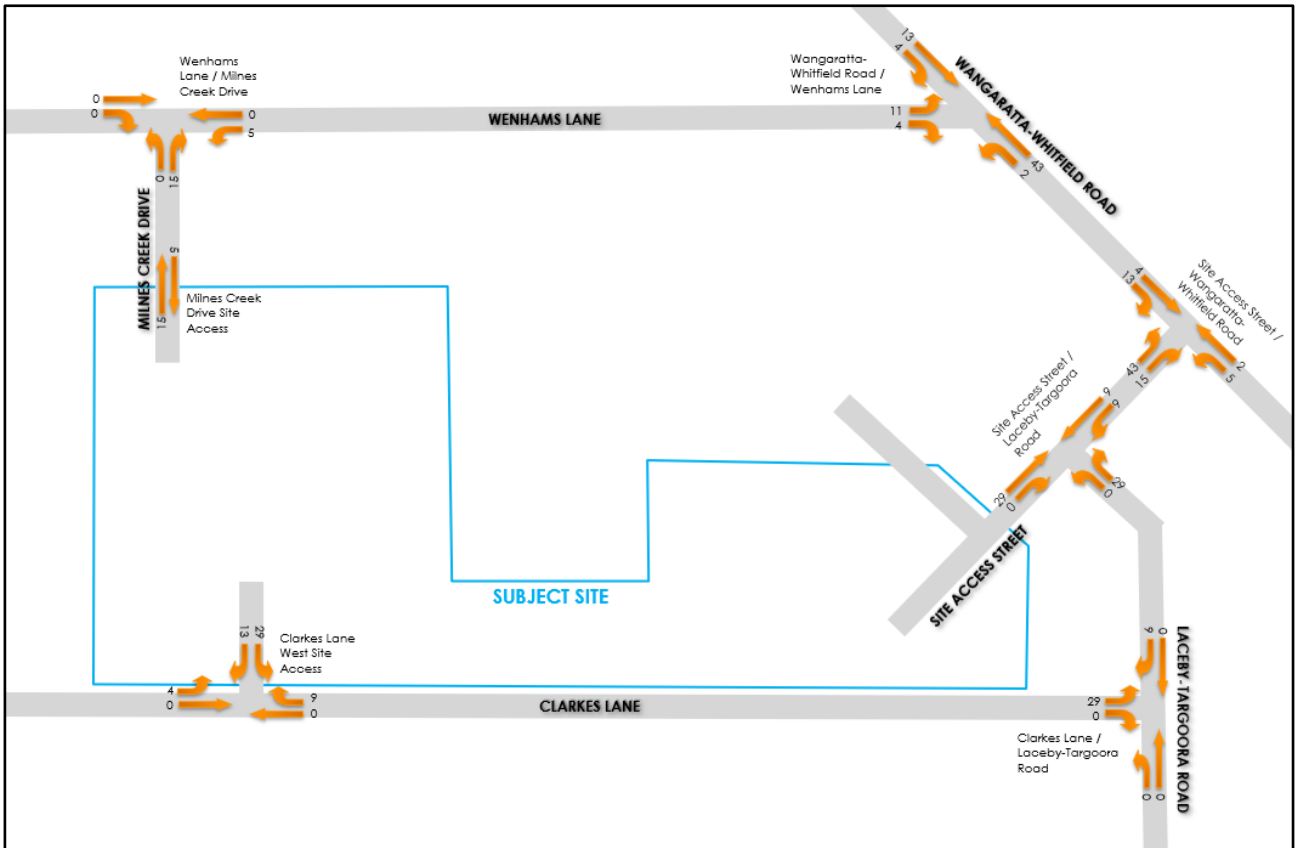
<i>Origin/Destination</i>	<i>Percentage</i>
Wangaratta-Whitfield Road - North	63%
Wangaratta-Whitfield Road - South	22%
Clarkes Lane – West	15%



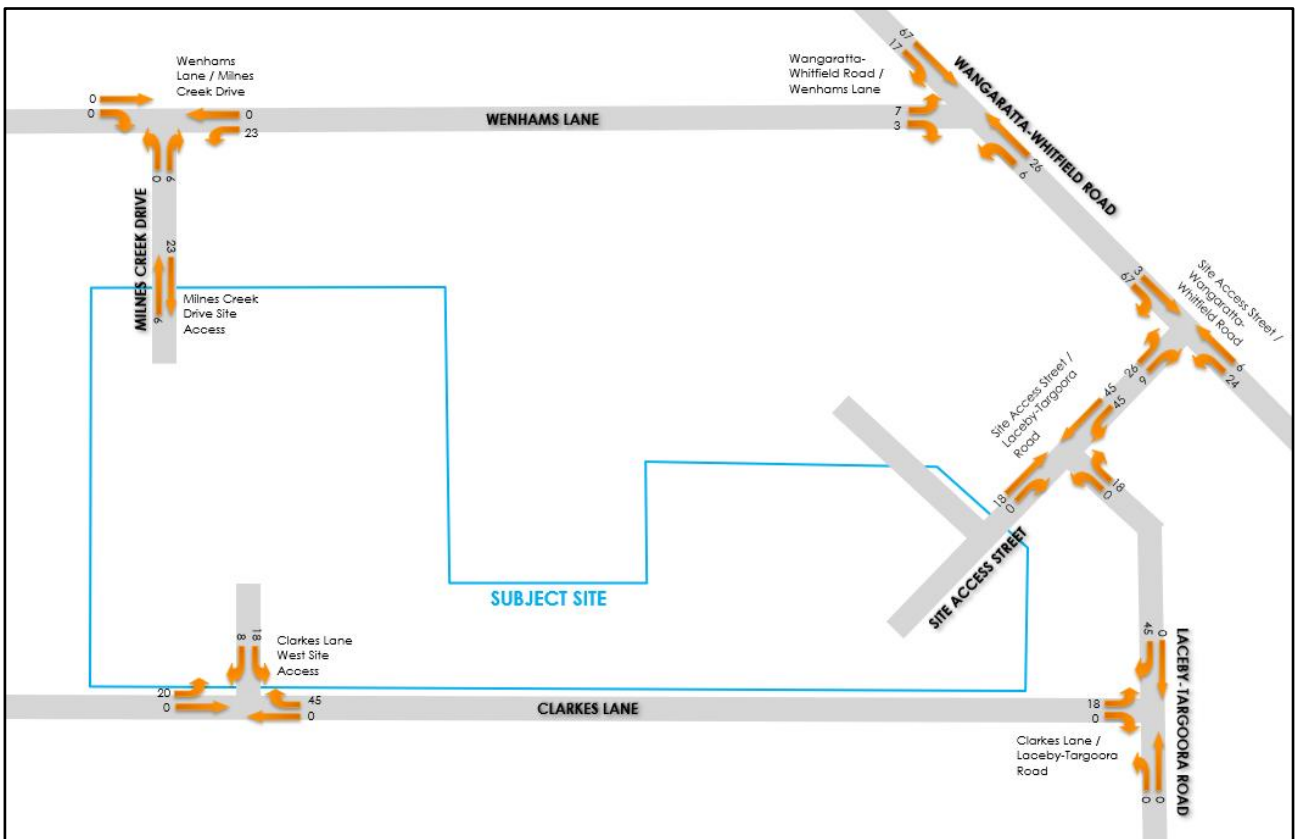
### 6.3 Generated Traffic Volumes

Based on the above, the following traffic volumes are expected to be generated by the proposed development in the vicinity of the site.

**Figure 24** Generated Traffic Volumes – AM Peak



**Figure 25 Generated Traffic Volumes – PM Peak**



## 6.4 Future Traffic Volumes

As previously discussed, Clarkes Lane is proposed to be upgraded to a collector road as per the Wangaratta South PSP. Timing is currently unknown for the upgrade, however the eventual upgrade will see increased traffic growth on Clarkes Lane which will effect the operation of the proposed Clarkes Lane / Wangaratta-Whitfield Road intersection.

In order to incorporate this traffic growth in the assessment of the Wangaratta-Whitfield Road / Site Access Street intersection, it has been conservatively assumed that the post upgrade traffic volumes along Clarkes Lane will be double those of the existing volumes.

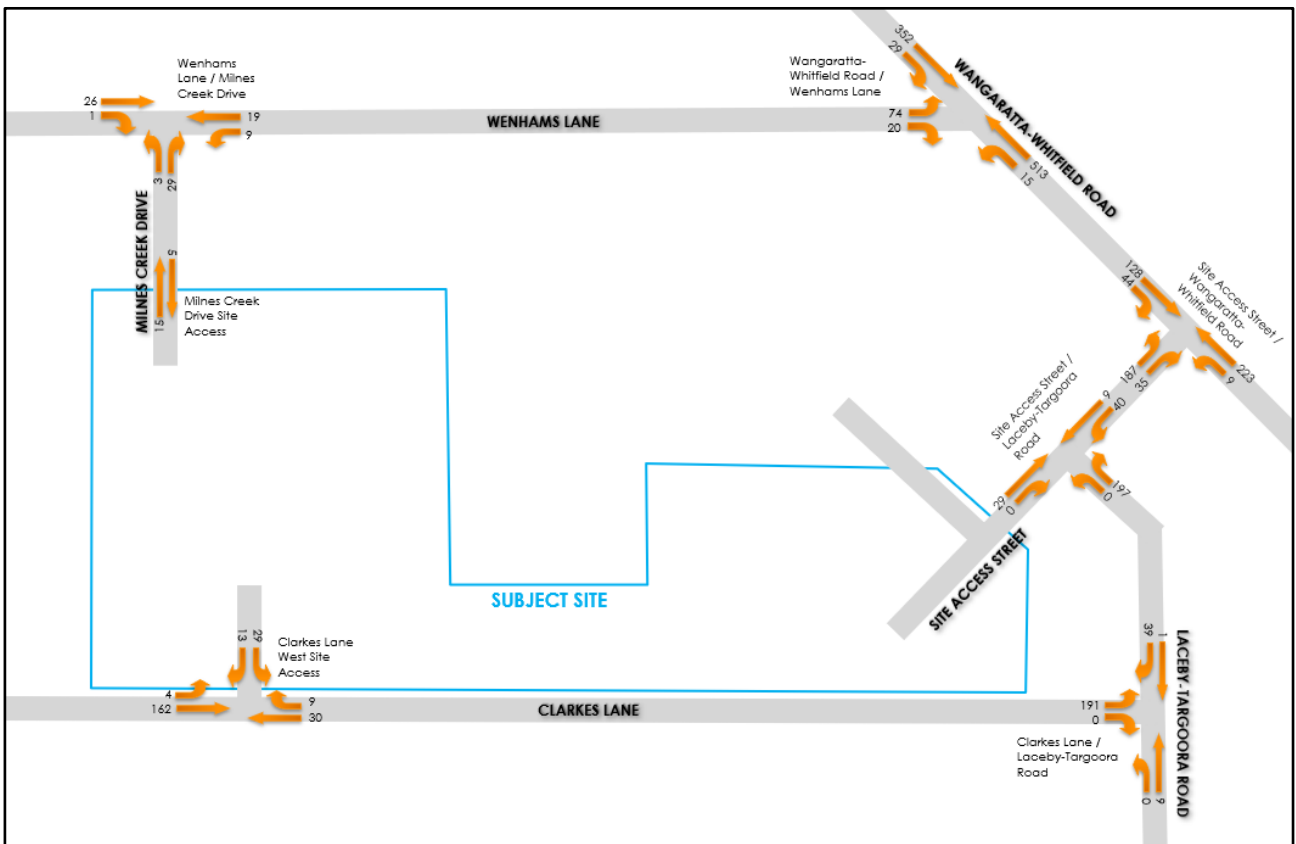
The existing traffic volumes and adopted future volumes along Clarkes Lane are provided below.

**Table 7 Existing Clarkes Lane Traffic Volumes**

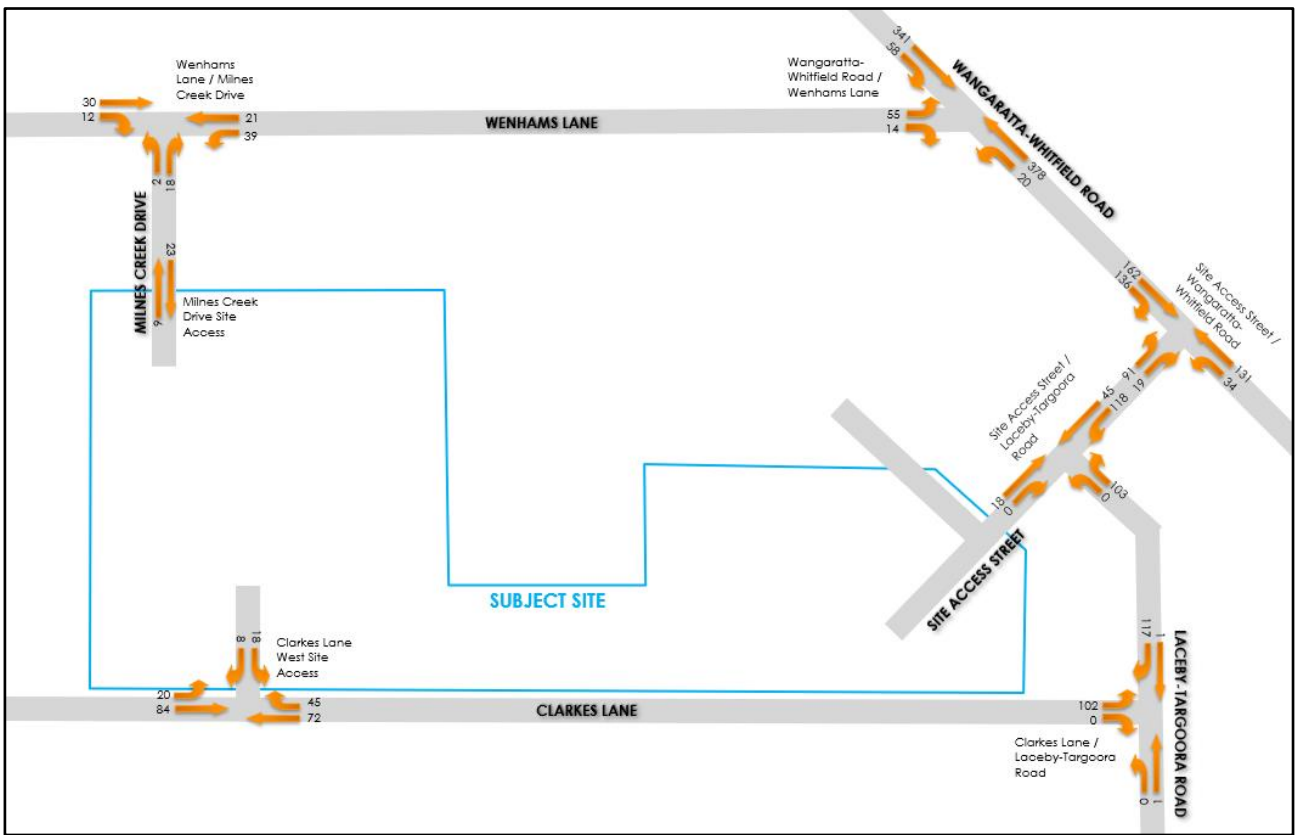
	Peak Period	Eastbound	Westbound	Total
Existing	AM Peak	81	15	96
	PM Peak	42	36	78
Future	AM Peak	162	30	192
	PM Peak	84	72	156

Applying the above future volumes produces the following post development traffic generation for Clarkes Lane and the surrounding road network.

**Figure 26 Future AM Peak Traffic Volumes**



**Figure 27 Future PM Traffic Volumes**



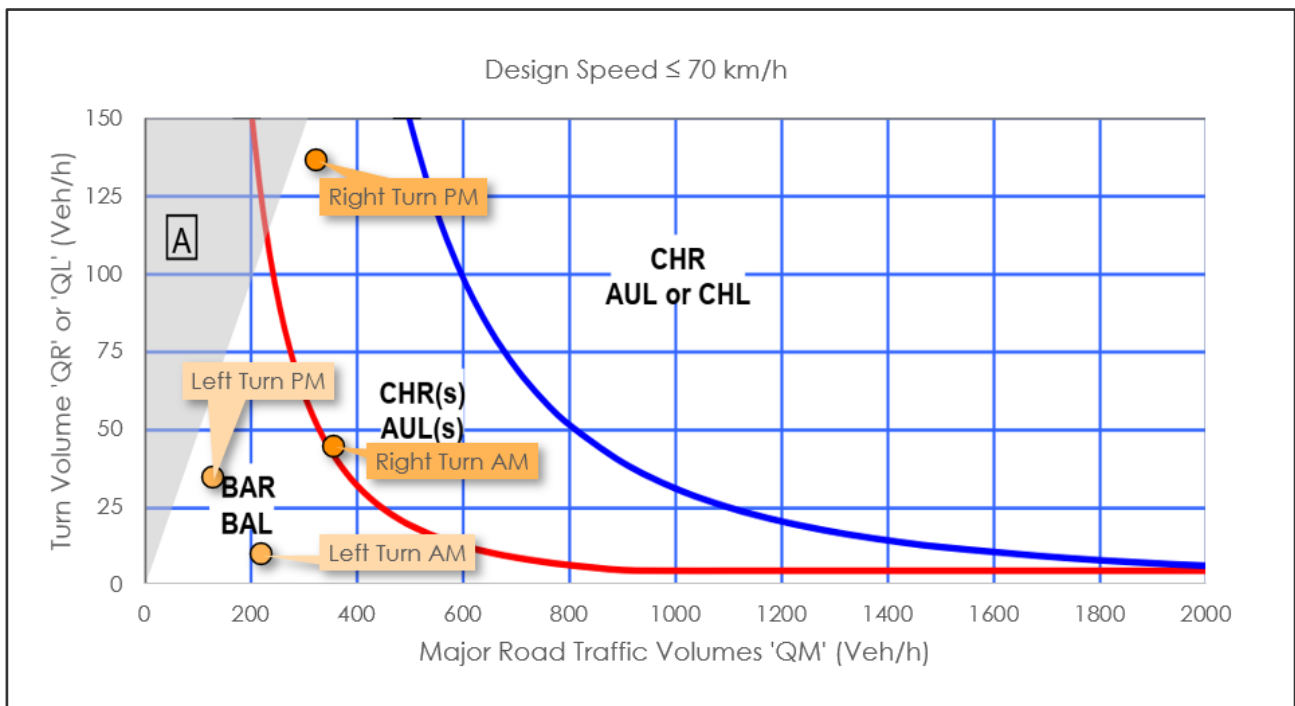
## 6.5 Traffic Impact

### 6.5.1 Clarkes Lane Boulevard Site Access

In determining an appropriate intersection configuration for primary site access to Clarkes Lane, the anticipated post-development peak hour volumes were assessed against the turn lane treatment warrants specified in the *Austrroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings*.

Based on the anticipated post-development traffic volumes including the future growth due to the Clarkes Lane road upgrade, the turn lane requirements relating to the proposed development is provided below.

**Figure 28** Austrroads Turn Treatment Warrants – Clarkes Lane / Site Access



As identified in the figure above, the anticipated turning movements at the Site Access Street intersection indicate that a short channelised right turn (CHR(s)) would be required.

With the regard to the left turn treatment, Figure 27 identifies that a basic left turn treatment (BAL) would be required. It is proposed to provide an Auxiliary left Turn treatment (AUL), in excess of the requirements.

### 6.5.2 Other Site Access Points

Reviewing the volumes above, it is noted that a maximum of 46 vehicle movements per hour are expected for any one movement in or out of the site, occurring at the west site access during the PM peak period. This amount of traffic is less than one vehicle trip every minute, which is considered very low in traffic engineering terms, and is expected to be easily absorbed into the surrounding road network.

### 6.5.3 Wangaratta-Whitfield Road Intersection

Reviewing the traffic volumes for the Wangaratta-Whitfield Road intersection, a maximum of 187 movements are expected after applying future growth.

To assess the operation of the intersection the traffic volumes have been input into SIDRA Intersection, a traffic modelling software package.

The SIDRA Intersection software package has been developed to provide information on the capacity of an intersection with regard to a number of parameters. Those parameters considered relevant are, Degree of Saturation (DoS), 95th Percentile Queue, and Average Delay as described below.

**Table 8 SIDRA Intersection Parameters**

Parameter	Description														
Degree of Saturation (DoS)	The DoS represents the ratio of the traffic volume making a particular movement compared to the maximum capacity for that particular movement. The value of the DoS has a corresponding rating depending on the ratio as shown below.														
	<table border="1"> <thead> <tr> <th>Degree of Saturation</th> <th>Rating</th> </tr> </thead> <tbody> <tr> <td>Up to 0.60</td> <td>Excellent</td> </tr> <tr> <td>0.61 – 0.70</td> <td>Very Good</td> </tr> <tr> <td>0.71 – 0.80</td> <td>Good</td> </tr> <tr> <td>0.81 – 0.90</td> <td>Fair</td> </tr> <tr> <td>0.91 – 1.00</td> <td>Poor</td> </tr> <tr> <td>Above 1.00</td> <td>Very Poor</td> </tr> </tbody> </table>	Degree of Saturation	Rating	Up to 0.60	Excellent	0.61 – 0.70	Very Good	0.71 – 0.80	Good	0.81 – 0.90	Fair	0.91 – 1.00	Poor	Above 1.00	Very Poor
	Degree of Saturation	Rating													
	Up to 0.60	Excellent													
	0.61 – 0.70	Very Good													
	0.71 – 0.80	Good													
	0.81 – 0.90	Fair													
0.91 – 1.00	Poor														
Above 1.00	Very Poor														
It is noted that whilst the range of 0.91 – 1.00 is rated as 'poor', it is acceptable for critical movements at an intersection to be operating within this range during high peak periods, reflecting actual conditions in a significant number of suburban signalised intersections.															
Average Delay (seconds)	Average delay is the time delay that can be expected for all vehicles undertaking a particular movement in seconds.														
95th Percentile (95%ile) Queue	95%ile queue represents the maximum queue length in metres that can be expected in 95% of observed queue lengths in the peak hour														

The results of the analysis are provided in Table 9.

**Table 9 Wangaratta-Whitfield Road / Laceby – Taroogra Road – Future Conditions**

<i>Approach</i>	<i>Movement</i>	<i>DoS</i>	<i>Avg. Delay (sec)</i>	<i>Queue (m)</i>
AM Peak				
Wangaratta-Whitfield Road – South	Left	0.005	5.6	0.0
	Through	0.124	0.0	0.0
Wangaratta-Whitfield Road – North	Through	0.072	0.0	0.0
	Right	0.043	6.6	1.2
Laceby – Taroogra Road	Left	0.253	6.9	7.7
	Right	0.253	10.0	7.7
PM Peak				
Wangaratta-Whitfield Road – South	Left	0.020	5.6	0.0
	Through	0.073	0.0	0.0
Wangaratta-Whitfield Road – North	Through	0.091	0.0	0.0
	Right	0.121	6.3	3.7
Laceby – Taroogra Road	Left	0.119	6.2	3.3
	Right	0.119	10.0	3.3

As shown above the intersection is operating under excellent conditions during both the morning and afternoon peak hours with minimal queues and delays experienced by motorists. For the critical right-in and left-out movements, delays will not exceed 10 seconds, and queues will not exceed one vehicle in length.

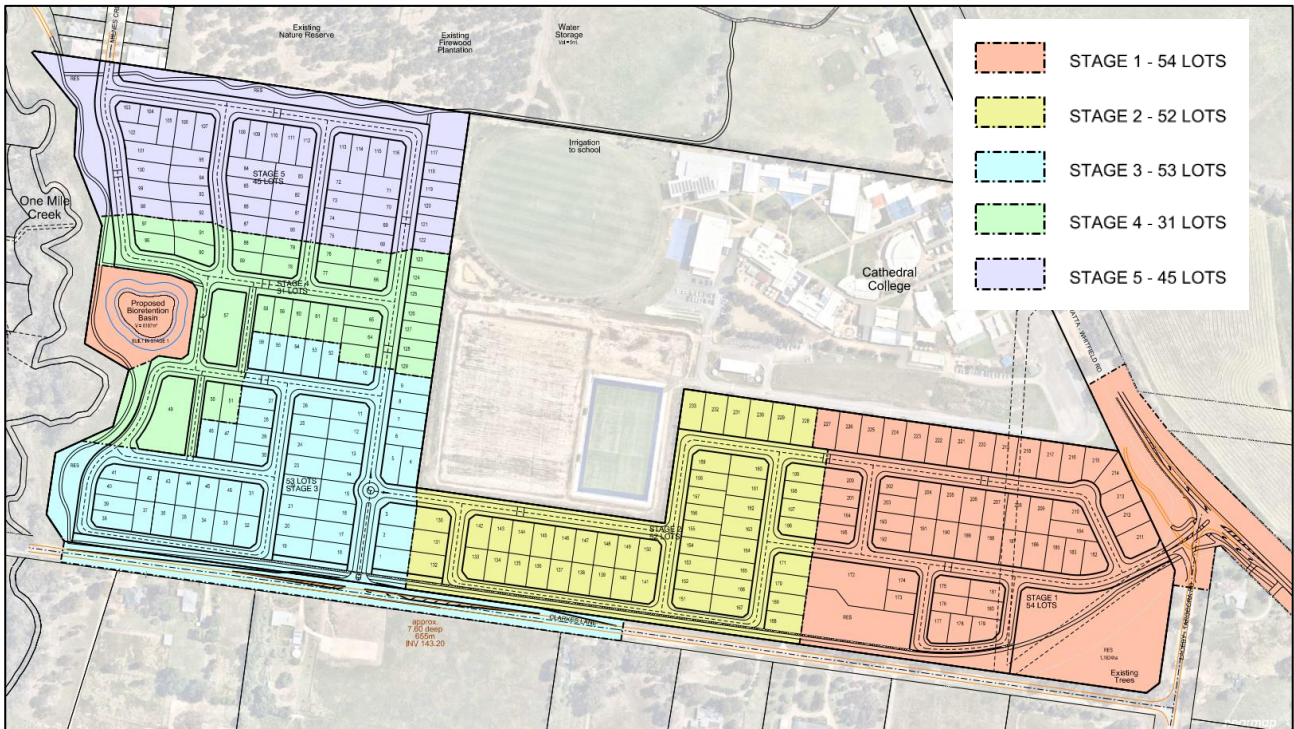
In view of the foregoing, the proposed arrangement is considered satisfactory.

## 7 STAGED DEVELOPMENT REVIEW

It is proposed to stage the development of the residential estate as well as the delivery of road upgrades at the Wangaratta-Whitfield Road. Specifically, at the outset of the development, no road works are proposed at Wangaratta-Whitfield Road, rather it is proposed to utilise the existing intersection configuration. The existing intersection includes localised widening at the intersection to allow vehicles to pass as required.

The first stages of development are proposed to occur within the eastern portion of the site as shown in Figure 29 progressively moving west with a total of 5 stages.

**Figure 29 Proposed Staging**



Based on the proposed staging of construction, all traffic will naturally be directed to the existing Wangaratta-Whitfield Road / Laceby-Targoora Road intersection.

Stage 1 includes a total of 54 lots whilst Stage 2 includes 52 lots. Based on the traffic generation rates, these two stages will generate a maximum (PM peak at 0.66 movements per lot) of 70 movements during the peak hour. Considering the prevailing road conditions in the vicinity of the site and noting the current performance of the intersection, it is expected that a large proportion of Stage 1 and 2 could be accommodated by the existing intersection.

Notwithstanding, it is recommended that at such time as all of Stage 1 and 50% of Stage 2 is delivered that construction works of the upgraded intersection should have commenced. This equates to approximately 80 lots.



## 8 CONCLUSIONS

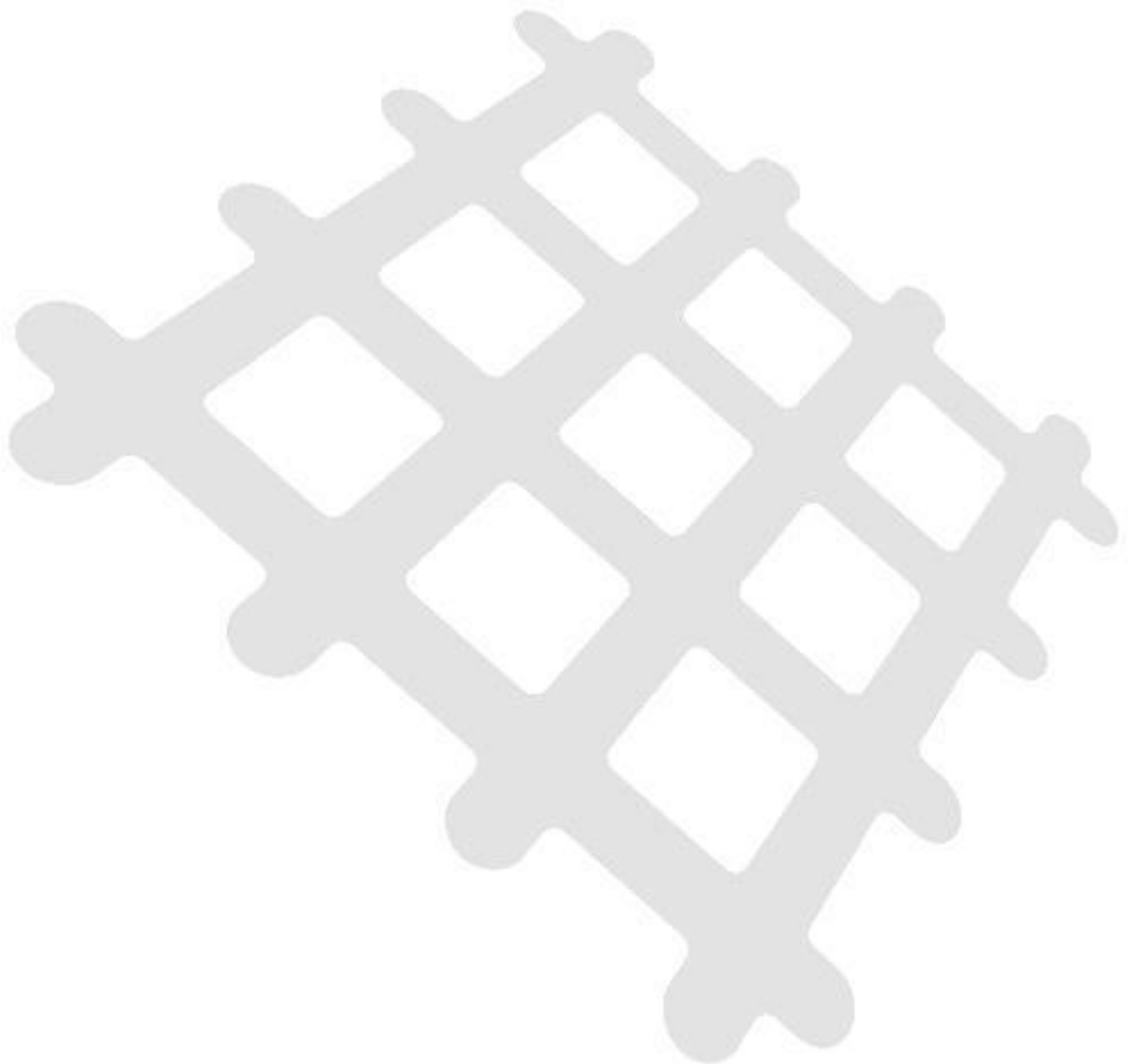
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It is proposed to develop the subject site for the purposes of a 233 lot residential subdivision including 3 superlots. As part of the proposal, it is proposed alter the arrangements of the Wangaratta-Whitfield Road / Laceby-Targoora Road to provide for an improved configuration.

Considering the analysis presented above, it is concluded that:

- The design of the proposed subdivision is generally in accordance with Clause 56 requirements of the Wangaratta Planning Scheme and the Infrastructure Design Manual.
- The proposed internal road network and connections to Clarkes Lane are expected to be suitable to accommodate the proposed development traffic generation;
- The configuration of Clarkes Lane has been developed in conjunction with Council's future plan;
- The ultimate cross section of Clarkes Lane (which will be delivered by others) has been allowed for within the proposed subdivision design;
- The proposed Wangaratta-Whitfield Road intersection arrangement is considered appropriate in accommodating the traffic generation of the proposed development and any future traffic growth in the future;
- Up to 80 lots can be delivered prior to the upgrade works at the Wangaratta-Whitfield Road intersection; and
- The proposed Laceby-Targoora Road / Clarkes Lane intersection arrangement is considered appropriate in the ultimate configuration.

# ***Appendix A    Concept Layout Plan***





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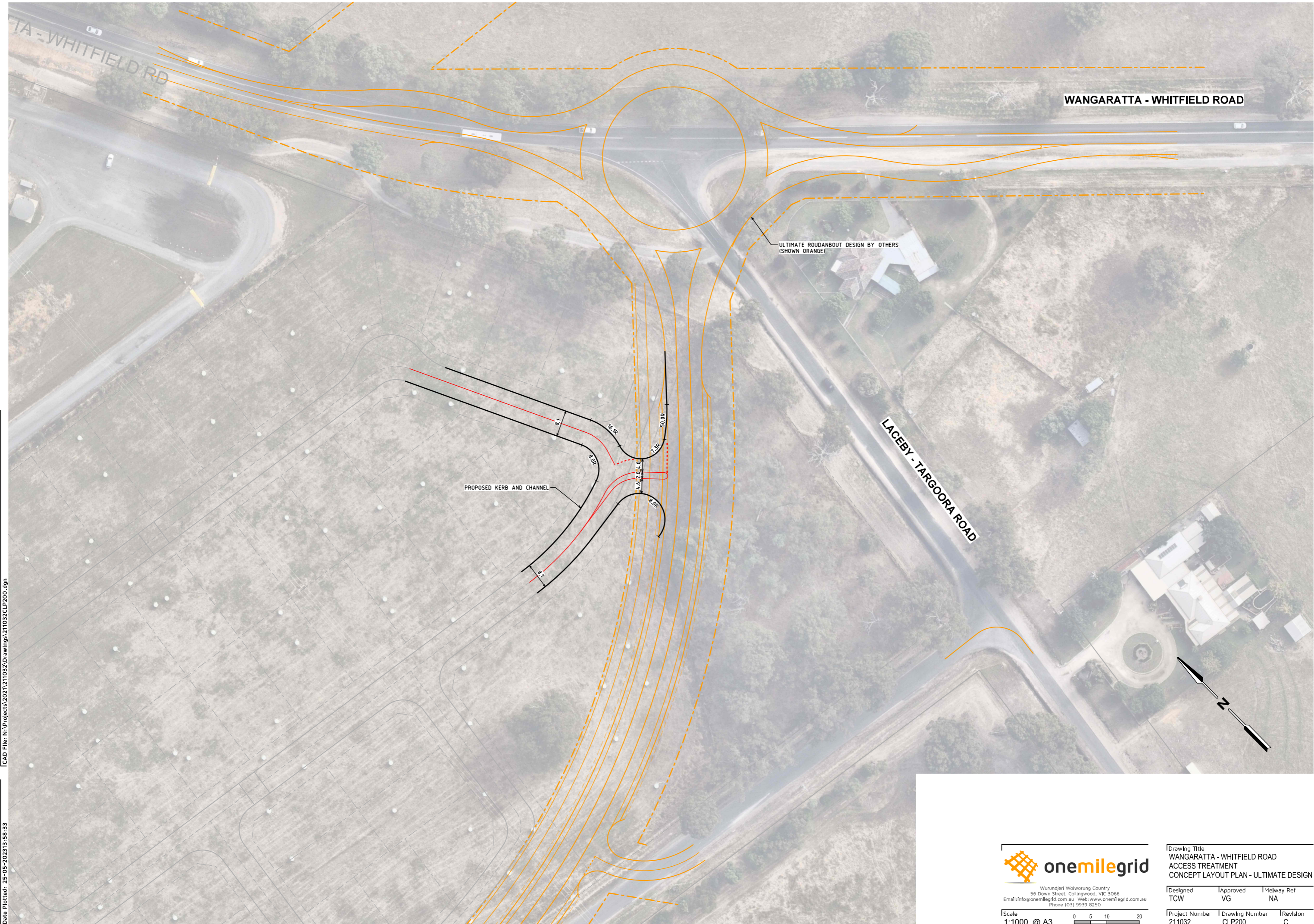
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Aerial Photography  
Aerial photography provided by Nearmap

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Drawing Title WANGARATTA - WHITFIELD ROAD ACCESS TREATMENT CONCEPT LAYOUT PLAN		
Designed TCW	Approved VG	Metway Ref NA
Project Number 211032	Drawing Number CLP100	Revision D



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Aerial Photography  
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Drawing Title WANGARATTA - WHITFIELD ROAD ACCESS TREATMENT CONCEPT LAYOUT PLAN - ULTIMATE DESIGN		
Designed TCW	Approved VG	Metway Ref NA
Project Number 211032	Drawing Number CLP200	Revision C

Scale  
1:1000 @ A3

