Traffix Group

Integrated Transport Assessment

Merrimu Precinct Structure Plan

Prepared for
Bacchus Marsh Developments Pty Ltd

March 2025

G23398R-02B

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1 Executive Summary

Traffix Group has been engaged by Stamoulis Property Group to prepare an Integrated Transport Assessment to inform the preparation of the Merrimu Precinct Structure Plan (PSP).

The Merrimu PSP has a total precinct area of 1,205 hectares and a net developable area of 508 hectares and has been designed to accommodate an ultimate population in the order of 18,000 people within 6,470 households.

The precinct will include high amenity compact urban neighbourhoods centred around walkable village centres, three schools and an extensive network of open space, walking and cycling facilities to support active travel.

The Merrimu PSP includes amenities and initiatives to increase internal capture and reduce reliance on private vehicles, including early provision of community infrastructure, retail and employment spaces, and will support hybrid work by providing flexible working spaces within the neighbourhood centres and designing dwellings with home-office potential.

The first development stage will include a town centre and a developer sponsored bus link to Bacchus Marsh town centre and railway station to establish sustainable travel behaviours from day one.

Vehicular access to the precinct will be provided via new and upgraded intersections to the surrounding arterial road network including Gisborne Road, Bacchus Marsh Road and Diggers Rest-Coimadai Road.

The internal PSP road network is independent of the future Bacchus Marsh Eastern Link Road (ELR). In addition, the internal PSP connector road network has been designed to discourage any external through traffic and minimise any impacts on established rural residential lots within the precinct.

2 Introduction

Traffix Group has been engaged by Stamoulis Property Group to prepare an Integrated Transport Assessment to inform the preparation of the Merrimu Precinct Structure Plan (PSP).

The report considers the transport infrastructure needs to facilitate development of the Merrimu Precinct Structure Plan including public transport provision, pedestrian and cycling networks as well as access for private motor vehicles including access point locations, intersection upgrades and road cross-section requirements.

3 Background

The Merrimu PSP area is located to the northeast of the existing Bacchus Marsh township, within the Moorabool Shire Council area.

3.1 Moorabool Shire

Moorabool Shire is a peri-urban municipality located on the Western Freeway corridor between metropolitan Melbourne and the regional township of Ballarat.

The municipality covers more than 2,110 square kilometres and incorporates the significant townships of Bacchus Marsh and Ballan as well as a number of smaller towns and localities, surrounded by rural landscapes.

The population of Moorabool Shire is estimated to increase by 76 percent between 2021 and 2041 from 36,344 to 63,831.

3.2 Bacchus Marsh

Bacchus Marsh is the largest town in the Moorabool Shire, and provides a range of services and facilities for the broader rural catchment.

Clause 02.03-1 (Settlement) of the Moorabool Planning Scheme identifies that three new residential growth precincts have been identified to accommodate an additional 30,000 people in the Bacchus Marsh area, including:

- Merrimu to the northeast of the existing settlement,
- Parwan Station to the southeast of the existing settlement, and
- Hopetoun Park to the south of the Western Freeway, midway between Bacchus Marsh and Melton.

3.3 Bacchus Marsh Urban Growth Framework (2018)

The Bacchus Marsh Urban Growth Framework (UGF) was prepared by the Victorian Planning Authority (VPA) in consultation with Moorabool Shire Council in August 2018.

The UGF identifies Merrimu as a future residential-focussed growth precinct. The key growth actions identified in the UGF that relate to Merrimu are as follows:

- Eastern Link corridor alignment study to ensure integration of transport networks and land use planning.
- Update the Bacchus Marsh Integrated Transport Strategy to include consideration of the Bacchus Marsh Urban Growth Framework.
- Merrimu Residential Growth Precinct: planning scheme amendment to implement a PSP and ICP.

The UGF identifies an expected annual population growth rate for Bacchus Marsh of 3% from 2015 to 2031 and a range of 2.2-3.5% from 2031 to 2041, with the population expected to double from 20,000 to 40,000 over this period.

Merrimu is expected to accommodate in the order of 13,400 – 20,000 people (4,800 to 7,200 households) and is the largest of the three growth precincts.

The UGF sets out the following transport objectives for Bacchus Marsh:

- *Provide a connected and efficient arterial road network.*
- *Maintain the Western Freeway as the key east-west link across Bacchus Marsh and as a scenic route be the Central Highland Region gateway.*
- *Provide a second north-south arterial road.*
- *Improve the accessibility and capacity of the train service.*
- *Improve and expand bus coverage to key existing and future destinations.*
- *Facilitate walking and cycling as viable transport modes.*
- *Review optimal management and investment opportunities at the Bacchus Marsh Aerodrome.*
- *Strengthen the potential for road networks to manage local traffic movement.*

The UGF sets out the following relevant transport strategies that relate to the Merrimu precinct:

<u>*Road Network*</u>

- *Plan for a complete grid network that facilitates efficient through and cross-town movements.*
- *Plan for well-connected new growth areas that offer multimodal trips.*
- *Use developer contributions to undertake necessary road improvements arising from new development.*
- *Limit freight traffic movement through Bacchus Marsh.*

- *Work with VicRoads and key stakeholders to deliver actions indicated in the Integrated Transport Strategy to manage existing road congestion and facilitate multimodal movement within Bacchus Marsh.*

Western Freeway

- *Maximise the efficiency of existing connections to the Western Freeway to meet growth needs.*
- *Manage built form impacts on escarpments, hills faces and other significant landscape features within key views and vistas from the Western Freeway.*

Eastern Link Road

- *Work with VicRoads and relevant state agencies to confirm the alignment, funding, delivery and construction of the Eastern Link Road.*

Rail

- *Plan Bacchus Marsh as the key train station for settlement in the short term and the (potential future) station at Parwan as a second station in the medium to long term.*
- *Actively seek improved rail services.*

Walking and Cycling

- *Plan for integrated pedestrian and cycling networks within new growth areas, between growth areas, and between new growth areas and the existing Bacchus Marsh urban area.*

Bus

- *Plan for one or more 'park and ride' bus stations within Merrimu urban growth precinct, co-located with activity centres.*
- *Plan for efficient and connected bus routes in new residential areas.*
- *Ensure bus infrastructure provides for passenger amenity and comfortable access.*

3.4 Bacchus Marsh Integrated Transport Strategy (2015)

The Bacchus Marsh Integrated Transport Strategy 2015 (BMITS) prepared by Moorabool Shire Council identifies and prioritises a range of transport infrastructure and other improvements to support the Bacchus Marsh Community.

The transport infrastructure improvements recommended in the BMITS are shown in Figure 1 below.

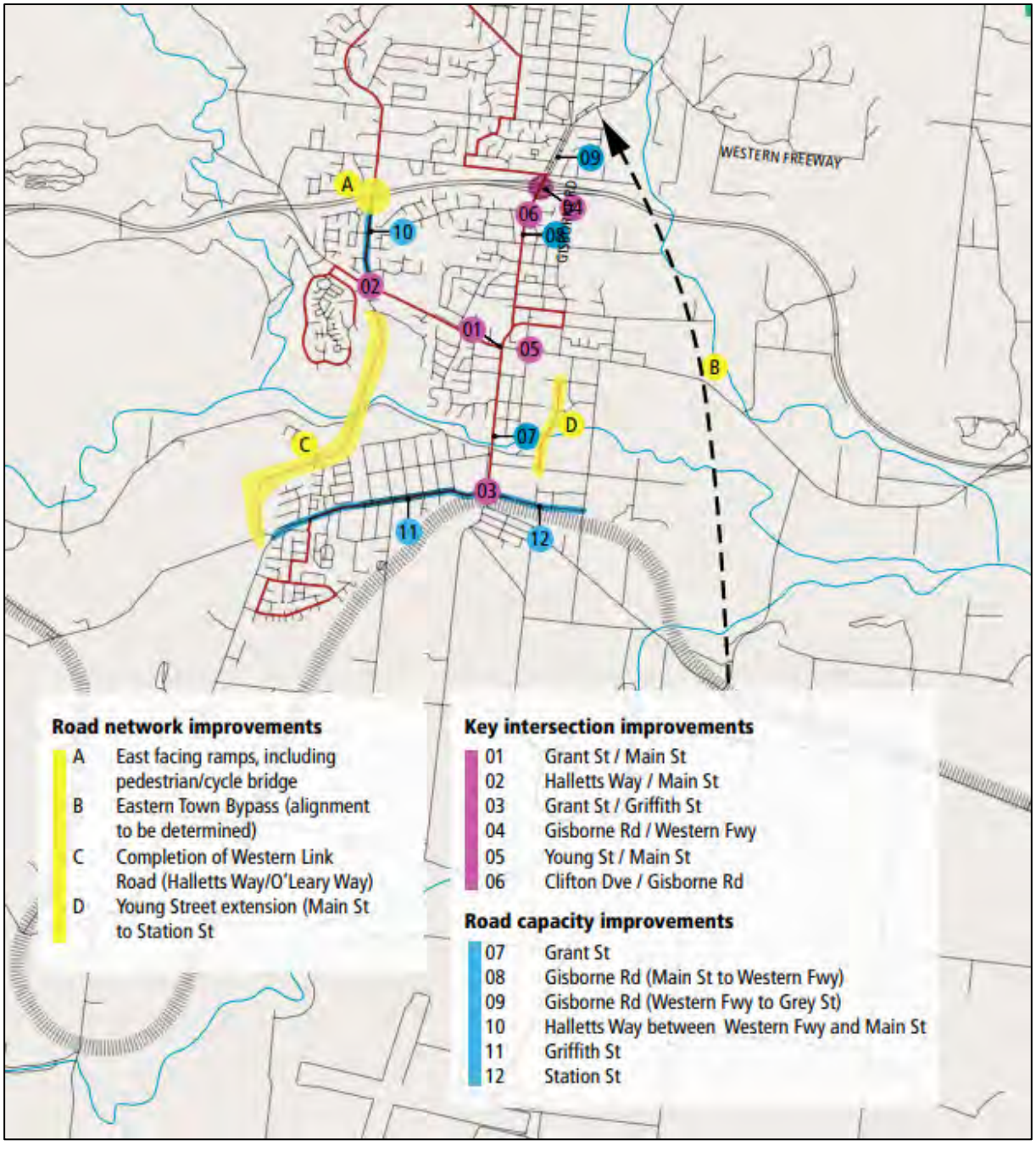


Figure 1: Bacchus Marsh Integrated Transport Strategy (2015) Key Actions and Priorities

3.5 Eastern Link Road (ELR)

Transport Victoria has recently identified a preferred alignment for a future Eastern Link Road to divert heavy vehicle traffic out of the centre of Bacchus Marsh, as shown in Figure 2 below.

Figure 2: ELR Preferred Alignment (RRV 2023)

The ELR passes through the Merrimu PSP area. The alignment is still subject to a planning approval process, and the land has not yet been reserved in a Public Acquisition Overlay (PAO).

There are currently no plans for the construction of the ELR, and no timeline has been indicated for its construction.

3.6 Infrastructure Design Manual (IDM)

The Infrastructure Design Manual (Version 5.40 – release date 1 September 2022) is produced and maintained by the Local Government Infrastructure Design Association (LGIDA). It was originally prepared by the Cities of Greater Bendigo and Greater Shepparton and the Shire of Campaspe in 2007, with the three municipalities recognising the benefits of working together towards consistent requirements and standards for the design and development of infrastructure. The IDM has now been adopted by most regional and rural municipalities across Victoria, including Moorabool Shire Council.

The IDM covers a comprehensive set of design standards and requirement for infrastructure provision within new subdivisions, including requirements for:

- Traffic Impact Assessment Report (TIAR) to determine the impact of subdivision on the external road network and identify appropriate mitigating works,
- Traffic Management Assessment Report (TMAR) to determine the internal road layout, road widths, functions and connectivity,
- Road Safety Audits, and
- design of roads, including classification, widths, verge provision, parking provision, pedestrian and cycle infrastructure within road reserves, kerbing, provision for turning and service and emergency vehicle accessibility.

4 Merrimu Precinct Structure Plan

A “future urban structure” plan has been prepared for Merrimu (subject to revision) identifying future residential areas, activity centres, schools, community facilities and open space areas, as presented in Figure 3.

Key features within the Merrimu PSP area include:

- three compact urban “cores”, including:
  - a northern 4.8 hectare ‘village centre’ mixed use activity centre,
  - a central 0.5 hectare local mixed-use convenience centre with co-located community centre, and
  - a southern 1.4 hectare ‘village centre’ mixed use activity centre with co-located community centre,
- three school sites, including:
  - a government primary school and a non-government primary school within walking distance of the northern village centre, and
  - a government primary school adjacent to the southern village centre,
- active open space including sporting ovals adjacent to the school sites,
- a mix of residential development opportunities, including standard density residential, urban living/medium density and rural residential,
- credited open space,
- escarpment/regional park,
- waterways/drainage, and
- supporting road network with connections to Flanagans Drive, Diggers Rest-Coimadai Road, Gisborne Road and Oconnell Road.

The Merrimu PSP area has a total net developable area of approximately 508.2 hectares and is expected to ultimately yield approximately 6,470 new dwellings.

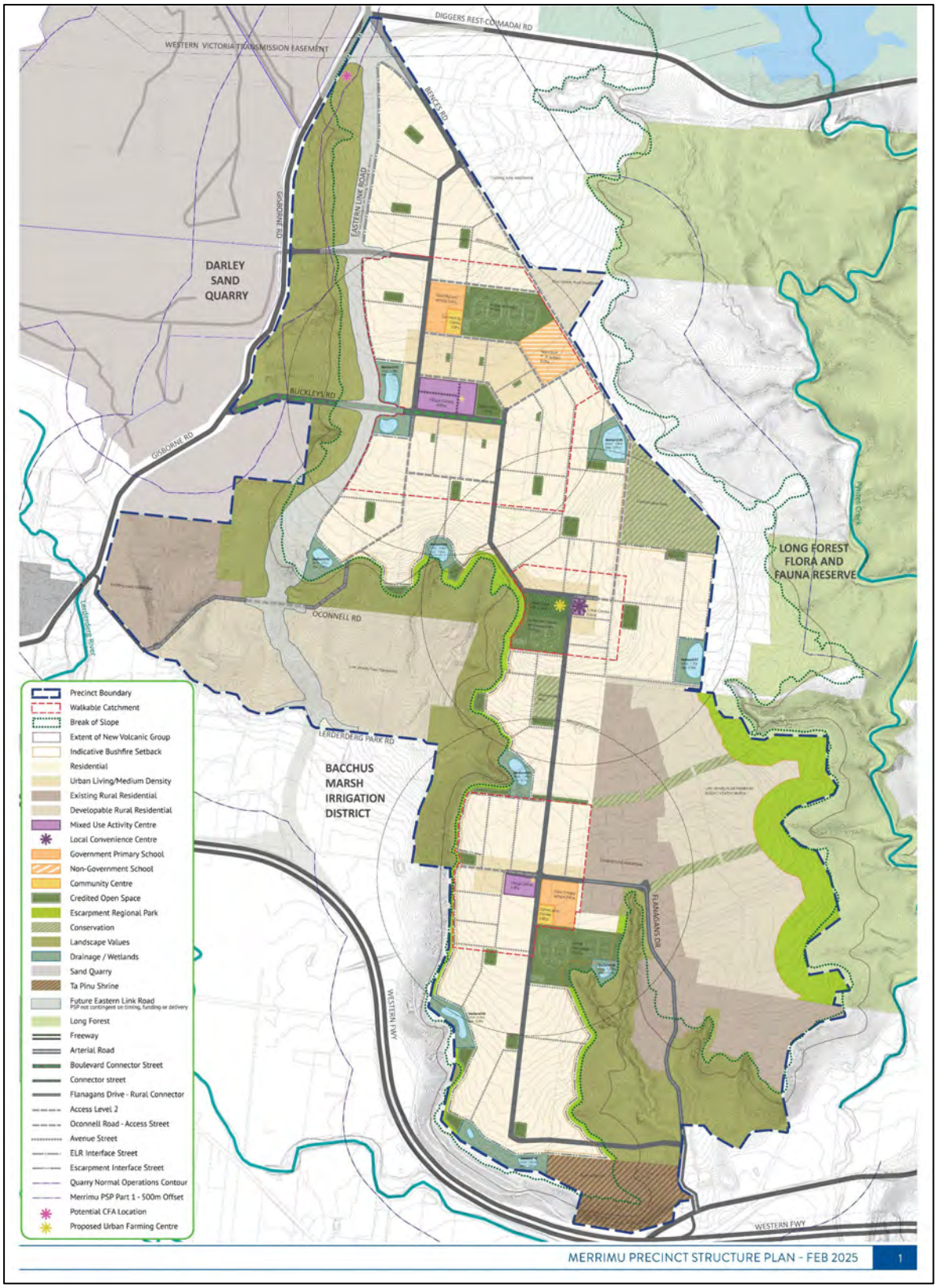


Figure 3: Merrimu PSP – Future Urban Structure

The PSP is proposed to be delivered in seven stages as shown in Figure 4 below.

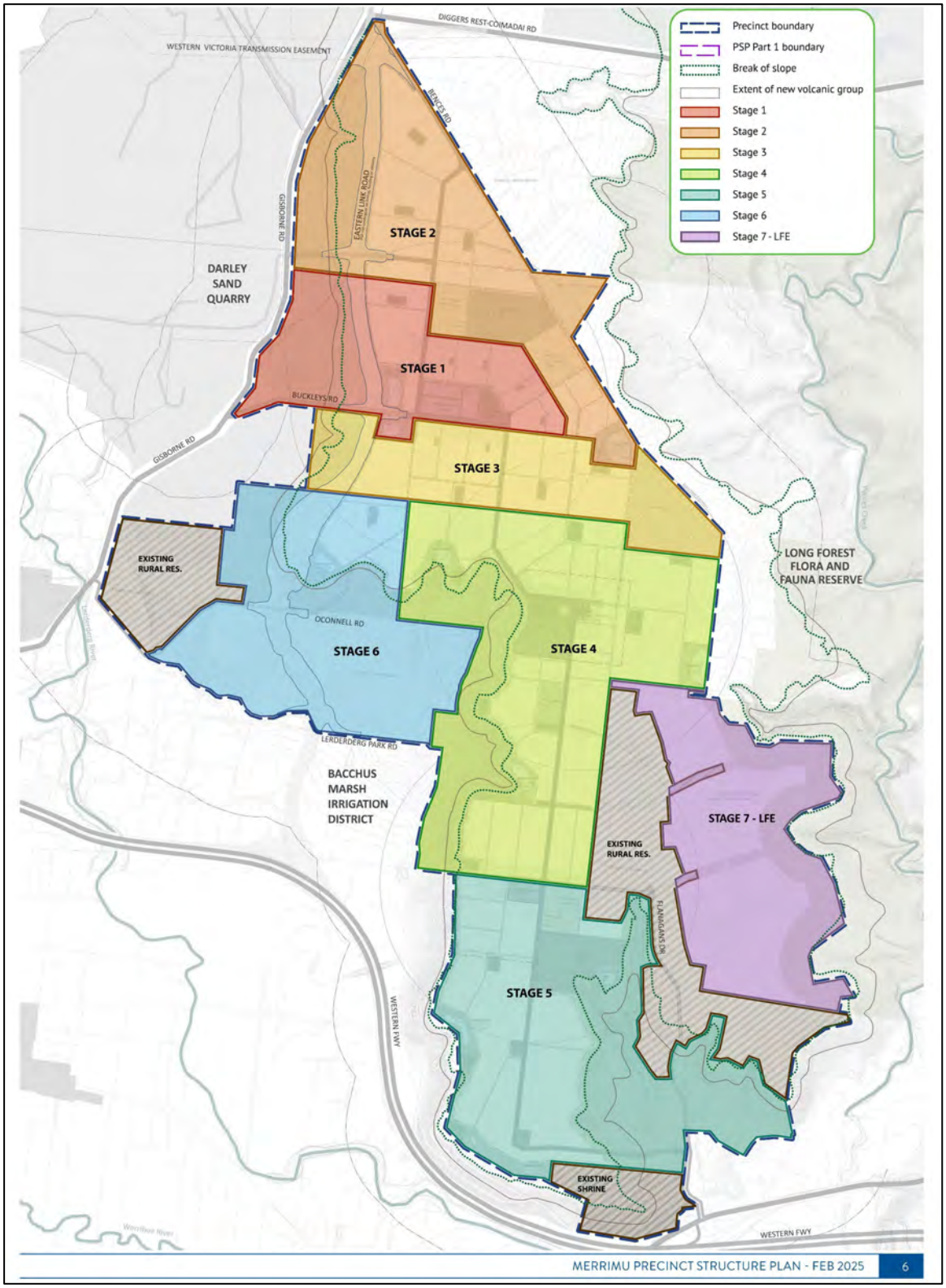


Figure 4: Merrimu PSP Staging Plan

The estimated yield broken down into development stages is set out in Table 1 below.

Table 1: PSP Development Yield

	Activity Centre	Urban Core	Walkable Neighbourhood	Suburban	Rural Residential	TOTAL
Stage 1	140	549	284	-	-	973
Stage 2	-	-	270	704	6	980
Stage 3	-	105	637	132	-	874
Stage 4	10	238	543	1,308	-	2,099
Stage 5	30	50	234	884	-	1,198
Stage 6	-	-	-	208	68	276
Stage 7	-	-	-	-	70	70
TOTAL	**180**	**942**	**1,968**	**3,236**	**144**	**6,470**

Road network connections are proposed to be delivered as follows:

- Stage 1 will take access to Gisborne Road via an upgraded Buckleys Road. Buckleys Road will remain unsealed for emergency vehicle access only at the eastern end. Bences Road and Flanagans Drive will remain as per existing conditions and there will be no Stage 1 traffic accessing these roads.
- Stage 2 will take access via an upgraded Bences Road connecting to Diggers Rest-Coimadai Road and via a new connection to Gisborne Road to the north of Buckleys Road. Buckleys Road will be extended to Bences Road in Stage 2. The existing Bences Road/Flanagans Drive connection will temporarily remain in its current form in Stage 2.
- Stage 3 will not provide any new external road connections.
- Stage 4 will deliver an upgraded link to Flanagans Drive and the Flanagans Drive/Bacchus Marsh Road intersection. The main thoroughfare for Stage 4 traffic accessing Flanagans Drive in Stage 4 will be via a new north-south connector road to the west of Bences Road, connecting to FlanagansD Rive via Lindsay Avenue.
- Stage 5 will deliver a new east-west connector road to Flanagans Drive north of the Our Lady Ta Pinu Shrine.
- Stage 6 will include upgrades to Oconnell Road.
- Stage 7 will not provide any new external road connections.

5 Existing Conditions

5.1 Locality Map

A locality map showing the Merrimu PSP area in the context of the broader area is presented in Figure 5 below.

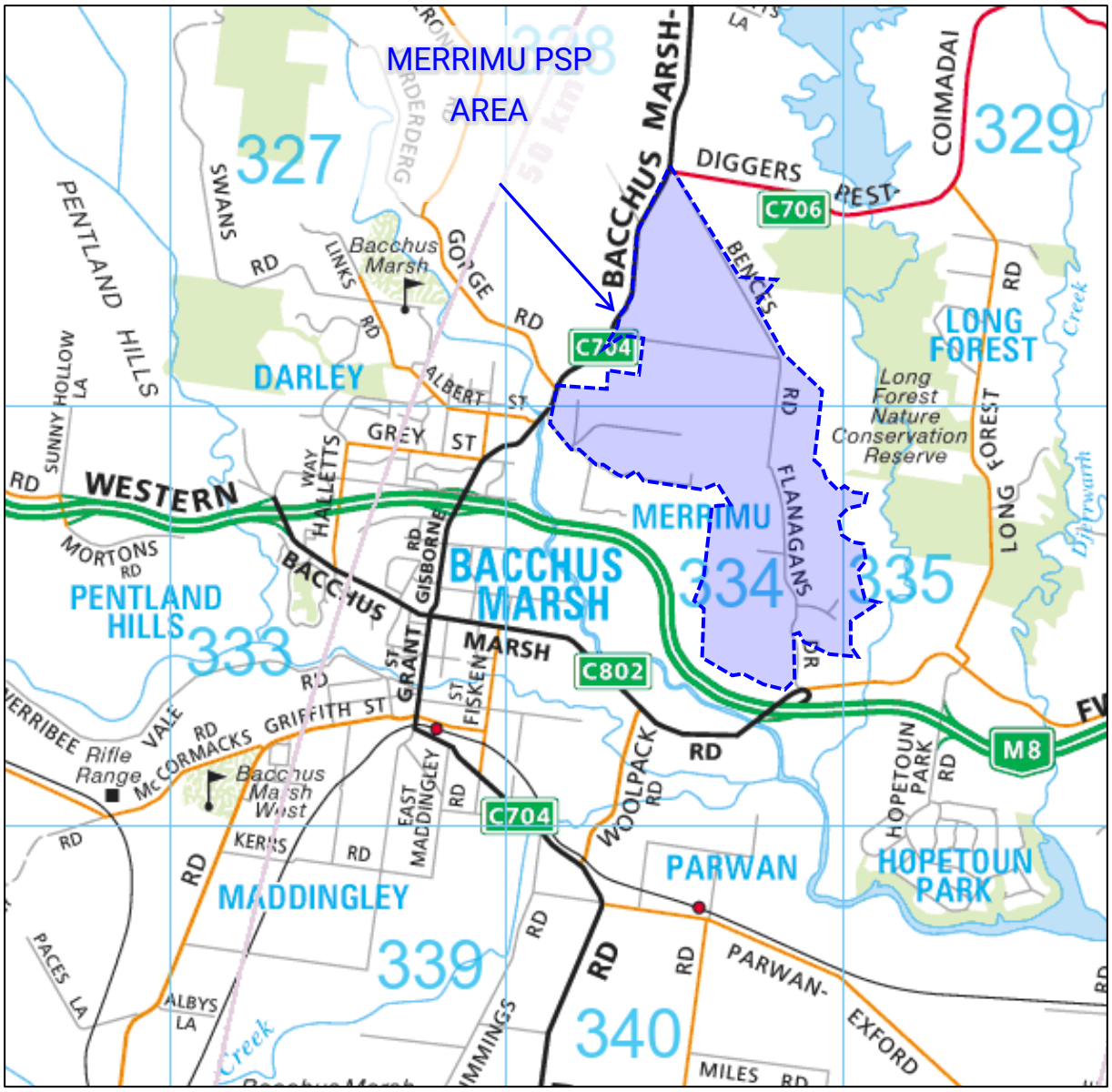


Figure 5: Locality Map

An aerial view of the PSP area is presented in Figure 6.

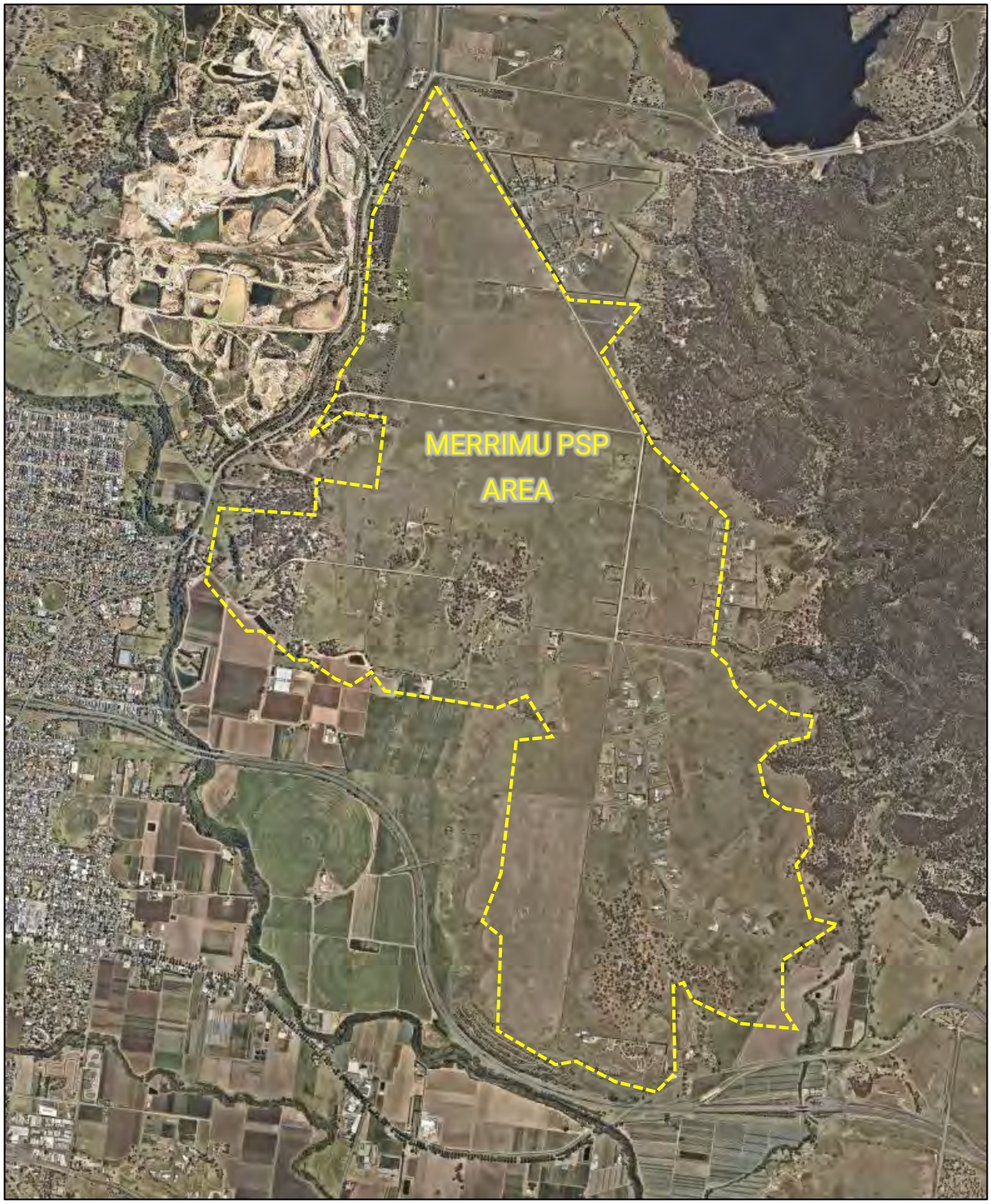


Figure 6: Aerial View – Merrimu PSP Area

5.2 External Road Network

Gisborne Road (Route C704)

Gisborne Road is a State Arterial (Road Zone – Category 1) which extends 32km between Main Street, Bacchus Marsh and Station Road, Gisborne. To the south of Main Street in Bacchus Marsh, it continues as Grant Street and then Parwan Road/Geelong-Bacchus Marsh Road, with Route C704 connecting to Geelong.

In the vicinity of the study area, Gisborne Road is configured with two northbound traffic lanes to allow for overtaking on the ascent, and one southbound traffic lane. The road reservation varies and is predominantly at least 60m wide with a pinch-point at the bridge crossing of the Lerderderg River. The bridge is configured with a 6m wide carriageway carrying one traffic lane in each direction.

The posted speed limit is 80km/h, reducing to 60km/h on the approach to the Bacchus Marsh Township.

Figure 7: Gisborne Road Looking North Towards Buckleys Road

Diggers Rest-Coimadai Road (C706)

Diggers Rest-Coimadai Road is a State Arterial (Road Zone – Category 1) which extends approximately 25km in an east-west direction between Old Calder Highway in Diggers Rest and Gisborne Road at the northern boundary of the Merrimu Investigation Area.

In the vicinity of the site, Diggers Rest-Coimadai Road is configured with one traffic lane in each direction within a 46m road reservation. Between Gisborne Road and Bences Road, the traffic lanes are separated by a narrow raised median. A separate left-turn deceleration lane is provided for traffic entering Bences Road from Diggers Rest-Coimadai Road.

Figure 8: Diggers Rest-Coimadai Road Looking East from Gisborne Road

Western Freeway (M8)

The Western Freeway is a State Freeway located to the south of the Merrimu Investigation Area. The Western Freeway/Highway is the Victorian part of the principal route linking Melbourne and Adelaide and extends between the Western Ring Road and the South Australian border.

In the vicinity of the site, it is configured with a divided carriageway carrying two traffic lanes in each direction separated by a wide median. A full diamond interchange is provided at Gisborne Road, and freeway off-ramps are provided at Bacchus Marsh Road for vehicles travelling in both directions.

Bacchus Marsh Road/Old Western Hwy (C802)

Bacchus Marsh Road (The Avenue of Honour)/Old Western Highway is a State Arterial Route (C802) which passes through the centre of the Bacchus Marsh Township. The eastern end changes name to High Street and connects to Melton.

Flanagans Drive intersects Old Western Highway immediately east of the eastbound freeway off-ramps. In the vicinity of Flanagans Drive, the arterial Route C802 is configured with a single traffic lane in each direction.

Figure 9: Bacchus Marsh Road Looking West from Flanagans Drive

5.3 Existing Internal/Local Road Network

Moorabool Shire Council's Road Management Plan classifies roads as per the road hierarchy definitions set out in Table 2 below.

Table 2: Moorabool Council Road Hierarchy Definitions

Classification	Urban	Rural
Link (L)	These roads provide a link between major roads, communities, industrial centres, and are designed to cater for high traffic volumes and heavy vehicles.	These roads provide a link between major roads, townships or industrial centres and are designed to cater for high traffic volumes and heavy vehicles.
Collector (C)	These roads connect to districts, minor tourist or industrial centres or between major roads, and are designed to cater for high traffic volumes and heavy vehicles.	These roads connect to districts, minor tourist or industrial centres or between major roads and are designed to cater for high traffic volumes and heavy vehicles.
Access 1 (A1)	These roads are designed to give access to residences or secondary commercial access. They are designed for low volume commercial vehicle traffic generated by adjoining farms. They are not designed to cater for regular heavy vehicle through traffic.	These roads are designed to give access to farms and residences. They are designed for low volume commercial vehicle traffic generated by adjoining farms. They are not designed to cater for regular heavy vehicle through traffic.
Access 2 (A2)	These roads are designed for low volume car access to properties. They are not designed to cater for regular through traffic or regular commercial vehicle usage.	These roads are designed for low volume car access to properties. They are not designed to cater for regular heavy through vehicular traffic.
Fire Access Track	Not applicable.	These are formed or unformed tracks which have been identified specifically to provide emergency access for CFA vehicles or to provide for an emergency escape route in the event of bush fires.

Buckleys Road

Buckleys Road is classified as an Unsealed Level 2 road under Council's Register of Public Roads, and is a gravel road which extends approximately 2km in an east-west direction between Bences Road and Gisborne Road. The western end descends steeply downwards towards Gisborne Road.

The existing gravel carriageway varies in width between 4.7m and 7.8m, within a 20m road reservation.

Figure 10: Buckleys Road Looking East from Gisborne Road

Bences Road

Bences Road is classified as an Access Level 1 road under Council's Register of Public Roads. The road reservation extends approximately 5.7km south from Diggers Rest-Coimadai Road, and terminates at the northern boundary of Our Lady Ta Pinu Marian Centre.

The northern 1.5km section is sealed with a 6.8m (approx.) carriageway within a 22m road reservation. The central section of Bences Road is constructed with a 7.3m (approx.) gravel carriageway. South of Flanagans Drive, Bences Road is an unconstructed (paper) road.

Figure 11: Bences Road Looking South where it transitions from Sealed to Unsealed

Flanagans Drive

Flanagans Drive is classified as an Access Level 1 sealed road under Council's Register of Public Roads and extends approximately 2.7km north from Bacchus Marsh Road/Old Western Hwy, bending west at its northern end to form an informal link to Bences Road.

It is noted that the Flanagans Drive reservation forms a dead-end at its northern end and the informal link

Flanagans Drive is configured with a sealed 6.5m (approx.) carriageway within a 20m road reservation. The informal link section connecting to Bences Road is unsealed.

Figure 12: Flanagans Drive Looking South towards Bacchus Marsh Road/Old Western Hwy

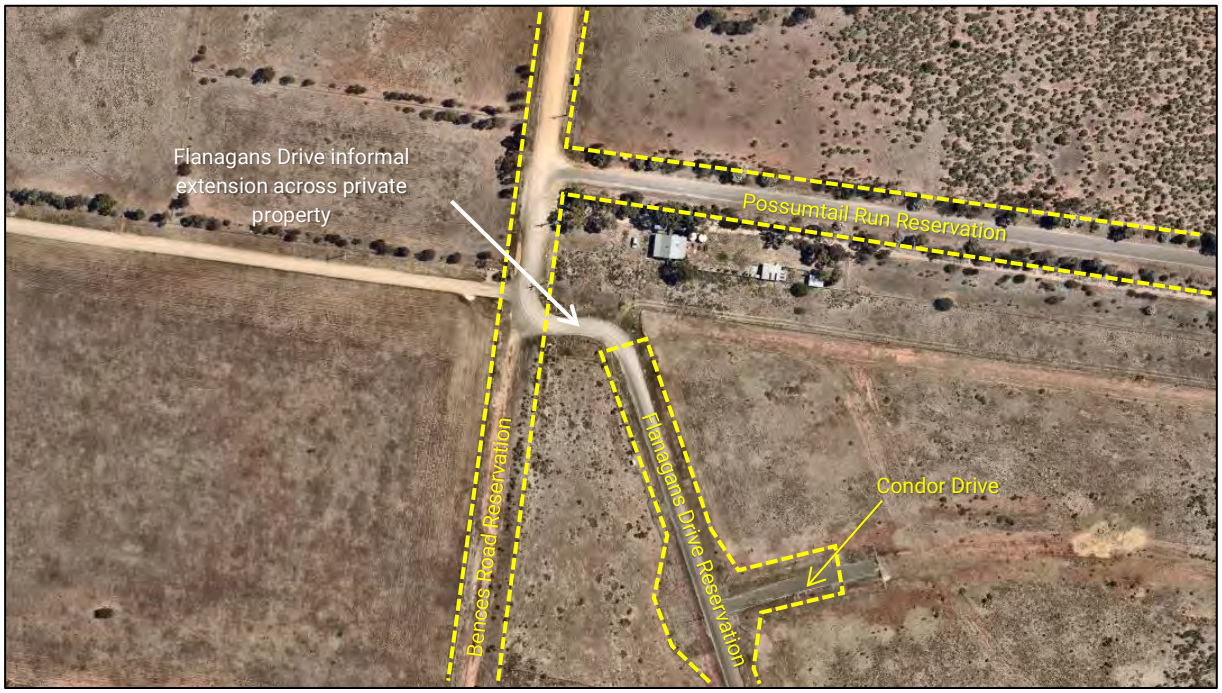


Figure 13: Flanagans Drive Northern Connection to Bences Road

Lindsay Avenue

Lindsay Avenue is classified as an Access Level 2 sealed road under Council's Register of Public Roads and extends approximately 320m in an east west direction between Flanagans Drive and the unmade section of Bences Road.

Lindsay Avenue is currently configured with a 6.5m (approx.) sealed carriageway within a 20m reservation.

Figure 14: Lindsay Avenue Looking West

Oconnell Road

Oconnell Road is classified as an Unsealed Level 1 road under Council's Register of Public Roads and extends approximately 1.4km north-east then east from Lerderderg Park Road, terminating at a dead-end.

Oconnell Road is currently configured with a varying width gravel carriageway, with some sections insufficient for two-way traffic, within a 20m road reservation. The south-western end has significant vegetation within the road reserve.

Figure 15: View Towards Oconnell Road From Lerderderg Park Road

Lerderderg Park Road

Lerderderg Park Road is classified as an Access Level 1 road under Council's Register of Public Roads, and extends approximately 2km east from Gisborne Road with a meandering alignment, terminating at a dead-end. The western end bends sharply to intersect Gisborne Road a short distance north of the northern abutment of the bridge crossing of Lerderderg River.

Figure 16: Lerderderg Park Road Viewed from Gisborne Road Intersection

Figure 17: Lerderderg Park Road Looking West

5.4 Public Transport

There are no existing public transport services within the Merrimu PSP Area or along the arterial road frontages.

Bacchus Marsh has a railway station located at the southern end of the Bacchus Marsh Township which connects to Melbourne and Ballarat via V/Line services.

There are three connecting bus services which currently serve Bacchus Marsh, as follows:

- Route 433 connects between the town centre and the Hillview Estate via the railway station,
- Route 434 connects between the railway station and Telford Park via the town centre, and
- Route 435 connects between the railway station and Darley via the town centre.

The existing Bacchus Marsh public transport map is shown in Figure 18 below.

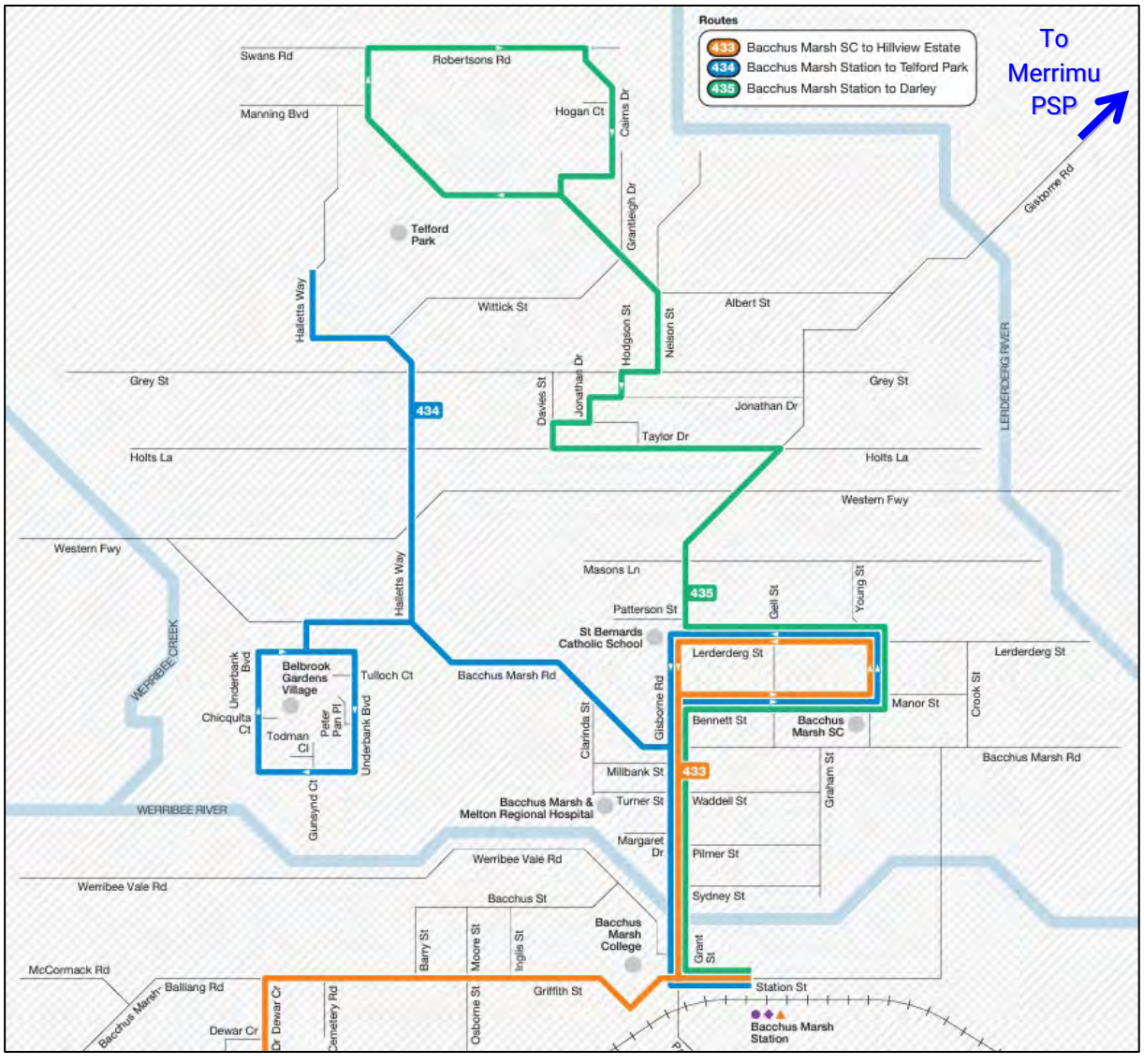


Figure 18: Bacchus Marsh – Existing Public Transport Network Map (source: ptv.vic.gov.au)

5.5 Existing Traffic Volumes

The Department of Transport Open Data Portal provides traffic volume data for freeways and arterial roads throughout Victoria. The data provided is for the current year, with values derived from traffic surveys or estimates.

The relevant data for key arterial roads providing access to the Merrimu Investigation Area is provided in Table 3 below.

Table 3: Arterial Road Traffic Volumes

Road Name	Location	AADT[1]	% Trucks	Annual Growth Rate
Gisborne Road	South of Diggers Rest-Coimadai Road	5,300 vpd	10%	2.5%
Diggers Rest-Coimadai Road	East of Gisborne Road	2,800 vpd	20%	1.7%
Bacchus Marsh Road	At Eastern Interchange	14,000 vpd *(8,500vpd EB, 5,500vpd WB)*	6%	4.7% EB 0.9% WB
Old Western Highway	At Flanagans Drive	9,000vpd	16%	1.6%
Western Freeway	East of Gisborne Road Interchange	34,000vpd	13%	2.5%

Traffic counts were undertaken by Austraffic in the first week of December 2018 on Gisborne Road. The results of these counts are summarised in Table 4 below.

Table 4: Gisborne Road Traffic Volumes – December 2018

Road Name	North of Buckleys Road			North of Diggers Rest Road		
	NB	SB	Total	NB	SB	Total
Weekday Average Daily Traffic	2846vpd	3203vpd	6049vpd	1646vpd	1662vpd	3308vpd
Weekday AM Peak	234vph	242vph	368vph	146vph	149vph	295vph
Weekday PM Peak	240vph	356vph	580vph	153vph	152vph	299vph
Peak Hours	8am-9am & 4pm-5pm			8am-9am & 3pm-4pm		
Commercial Vehicles (CV)	16.5%			14.1%		

[1] AADT = Average Annual Daily Traffic, which is the sum of all traffic for a year divided by 365.

Traffix Group has also commissioned AM/PM peak hour turning movements counts on 27 March 2024 between 7:00am – 9:30am and 3:30pm – 6:30pm for the following GIVE-WAY controlled intersections.

- Gisborne Road/Diggers Rest-Coimadai Road,
- Gisborne Road/Lerderderg Gorge Road,
- Flanagans Drive/Bacchus Marsh Road, and
- Gisborne Road/Mountain View Quarries Access.

The AM and PM peak hours for the intersections are outlined in the table below.

Table 5: Existing Intersection Peak Hours

Intersection	AM Peak	PM Peak
Gisborne Road/Diggers Rest-Coimadai Road	8-9am	3:30-4:30pm
Gisborne Road/Mountain View Quarries Access	7:45-8:45am	3:30-4:30pm
Gisborne Road/Lerderderg Gorge Road	8-9am	3:45-4:45pm
Flanagans Drive/Bacchus Marsh Road	8-9am	3:30-4:30pm

The recorded peak hour turning movements are shown in Figures 19 – 22 below.

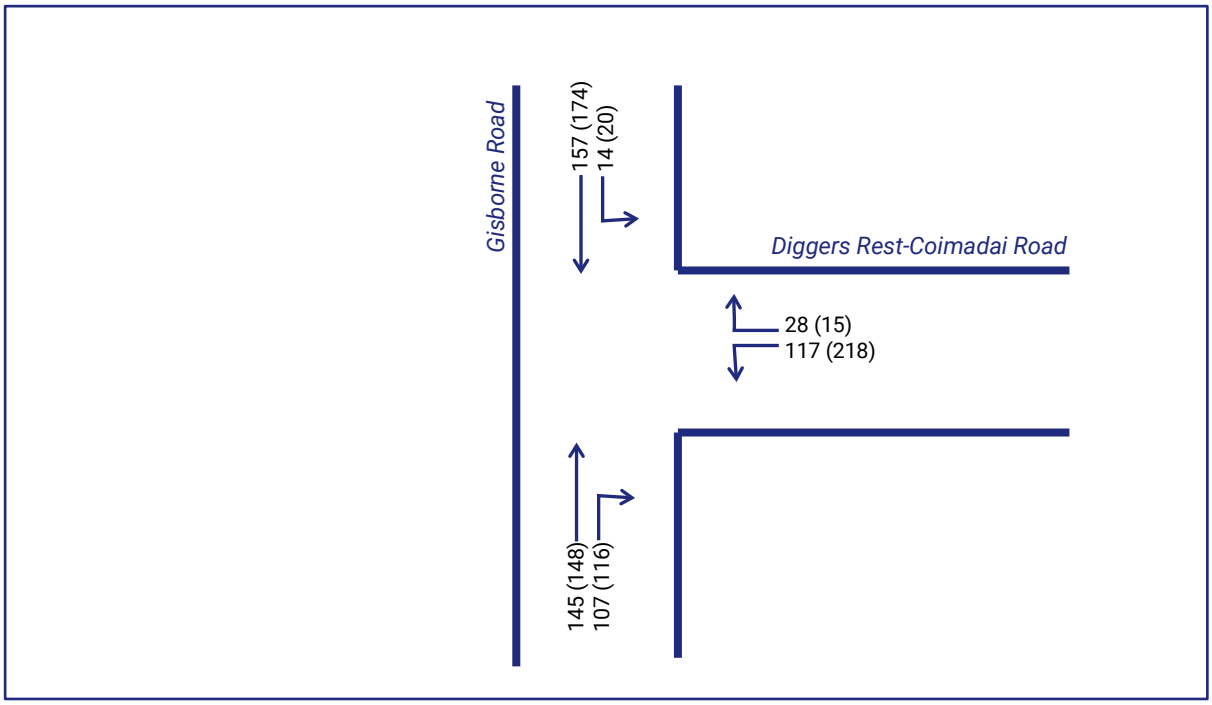


Figure 19 Gisborne Road/Coimadai Road Intersection – Existing AM(PM) Peak Hour Traffic Volumes 2024

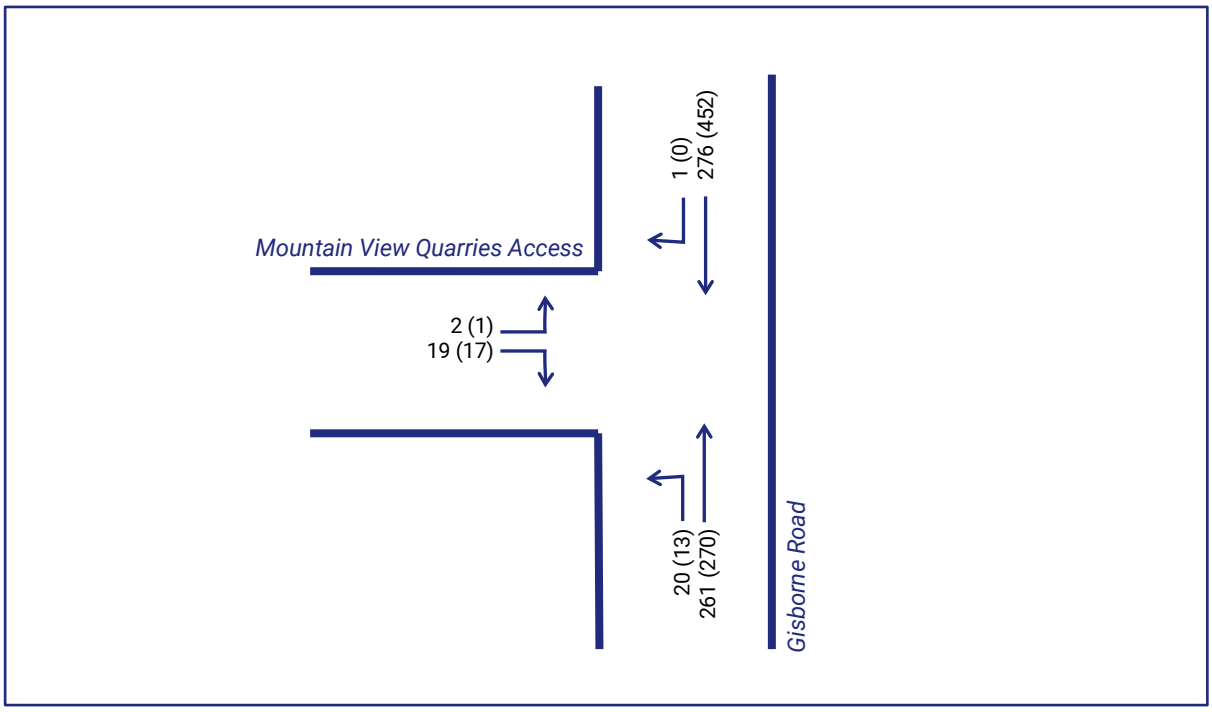


Figure 20: Gisborne Road/Mountain View Quarries Access – Existing AM(PM) Peak Hour Traffic Volumes 2024

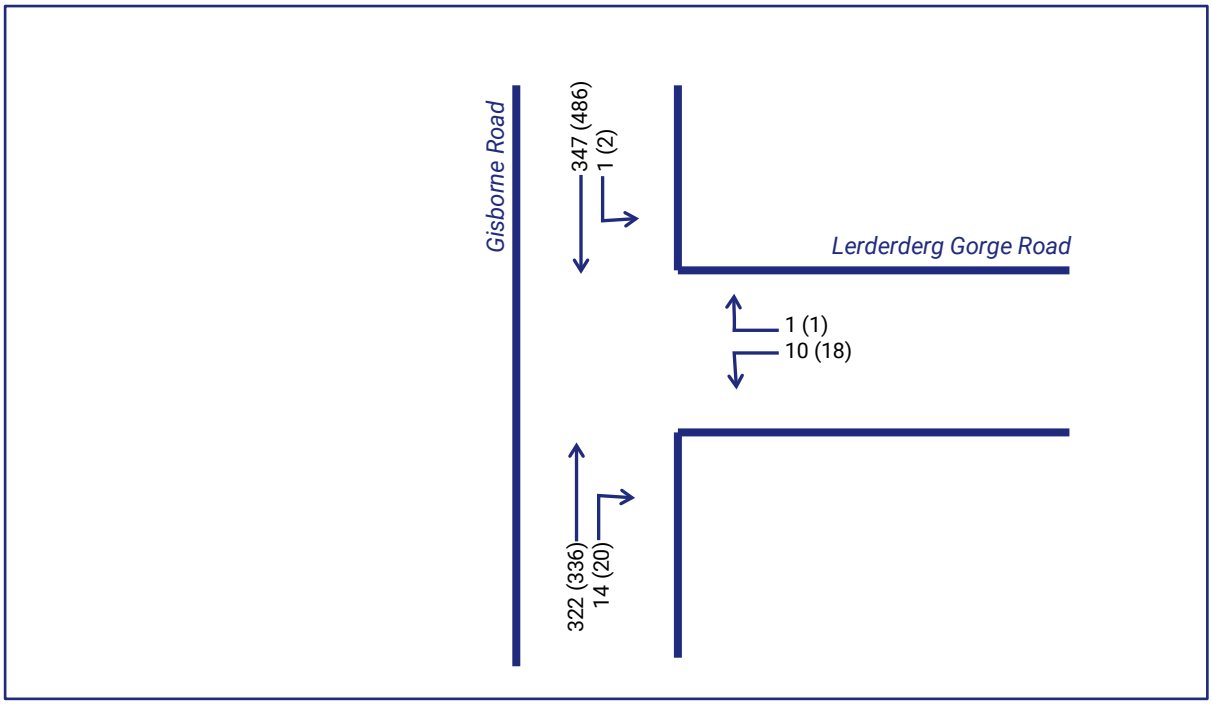


Figure 21: Gisborne Road/ Lerderderg Gorge Road Intersection – Existing AM(PM) Peak Hour Traffic Volumes 2024

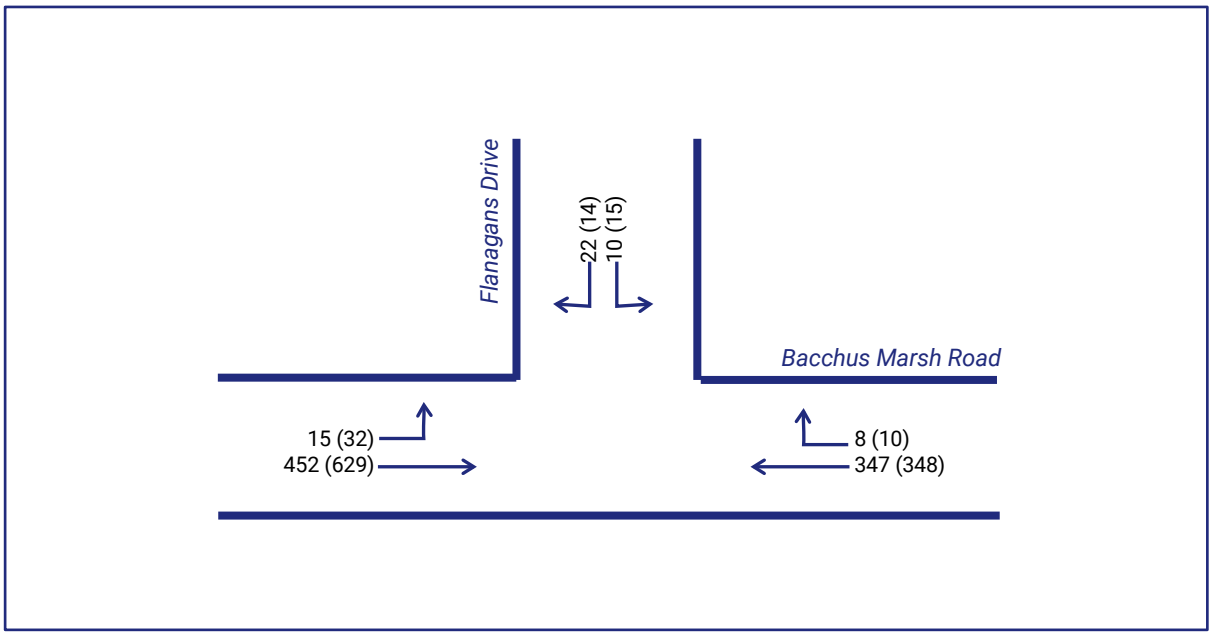


Figure 22: Flanagans Drive/Bacchus Marsh Road Intersection – Existing AM(PM) Peak Hour Traffic Volumes 2024

6 PSP Traffic Generation

6.1 Traffic Generation Rates

RTA Guide (2002)

The RTA Guide to Traffic Generating Developments (2002) (RTA Guide) sets out traffic generation rates for a range of developments, based on survey data collected in New South Wales (NSW), and is generally regarded as a standard for metropolitan development characteristics.

The RTA Guide sets out the following rates for dwelling houses, based on surveys conducted where new subdivisions are being built:

Standard Dwellings:

- *Daily Vehicle Trips = 9 per dwelling*
- *Weekday Peak Hour Vehicle Trips = 0.85 per dwelling*

The RTA Guide further states that:

- *With new subdivisions, where standard lots are given, some additional allowance may be made for dual occupancy and group homes, where there are sufficient numbers of these types of residences. The Australian Model Code for Residential Development (AMCORD) assumes a daily vehicle generation rate of 10.0 per dwelling, with 10% of that taking place in the commuter peak period. The use of these figures provides some allowance for later dual occupancy development.*
- *Note that not all trips are external trips. As a guide, about 25% of trips are internal to the subdivision, involving local shopping, schools and local social visits. When reviewing the impact of the traffic generated on sub-regional and regional roads, some adjustment is necessary, depending on the location of shops, schools and recreational facilities.*

TDT (2013/04a)

Technical Direction TDT 2013/04a provides updated traffic generation rates for some of the land uses in the RTA Guide, based on more up-to-date survey information.

For low-density residential subdivisions, TDT 2013/04a provides a revised rate of 7.4 vehicle trips per dwelling per day in regional areas. This rate is based on surveys of five regional areas in NSW. None of the surveyed regional residential areas included any schools, shopping villages or the like.

Local Case Study – Bacchus Marsh

It is noted that the RTA Guide and TDT rates are based on surveys undertaken prior to Covid. Post-covid traffic patterns have changed due to a range of factors, including an increased prevalence of hybrid working arrangements allowing employees to work from home at least some of the time, and flexible working hours.

Bacchus Marsh and Merrimu are located on the peri-urban fringe of Metropolitan Melbourne, within commuting distance, and as such, are likely to attract residents who may commute two or three days a week and work from home on the other days.

In order to quantify the current (post-covid) traffic generation characteristics of the Bacchus Marsh area to inform the traffic impact analysis for the Merrimu precinct, a traffic generation case study has been conducted.

The case study was conducted at Stonehill Drive in Maddingley for the seven-day period from Wednesday 31 July 2024 to Tuesday 6 August 2024.

This location is shown in Figure 23 below, and was selected because:

- it is a fully developed and established closed residential catchment with a single point of access and egress, allowing all traffic movements to be captured by a tube count,
- it is located within a newer residential area on the periphery of Bacchus Marsh similar to the future Merrimu community,
- there are no non-residential uses within the catchment and accordingly the data will provide accurate traffic generation rates for residential land use, and
- there are 118 dwellings located within the catchment area, which is a sufficiently large sample size to ensure that generation rates aren't skewed by outliers.

Figure 23: Case Study Catchment Area

The tube count data showed the following:

- Weekday average traffic volume of 779 vehicle trips, corresponding to a daily traffic generation rate of 6.6 vehicle trips per dwelling per day.
- An AM peak hour (8-9am) weekday average traffic generation of 79vph, corresponding to an AM peak hour traffic generation rate of 0.67 vehicle trip-ends per dwelling.
- A PM peak hour (5-6pm) weekday average traffic generation of 83vph, corresponding to a PM peak hour traffic generation rate of 0.70 vehicle trip-ends per dwelling.

All of the dwellings within the case study catchment area are standard density residential dwellings. There are no medium density units or townhouses.

Figure 24 below shows the weekday average (two-way) traffic volume profile.

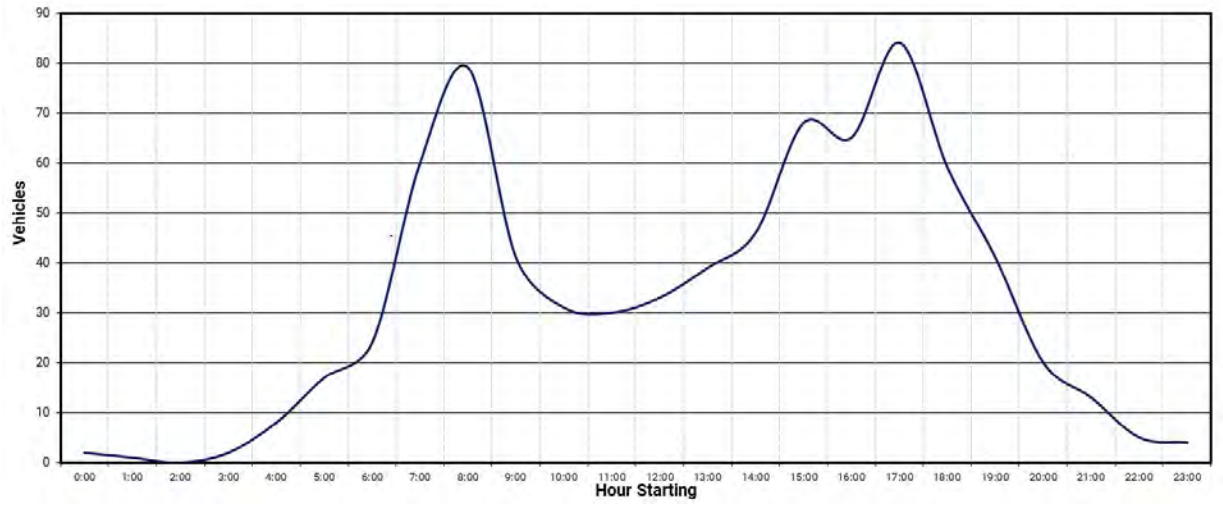


Figure 24: Weekday Average (Two-Way) Traffic Volume Profile

IDM

The Moorabool Shire Council has adopted the Infrastructure Design Manual (IDM).

Clause 12.3.1 of the IDM specifies that estimated traffic volumes for undeveloped areas should normally be based upon at least 10 vehicle movements per day per lot.

Notably, Austroads suggests that a rate of 10 vehicle movements per day per lot is a sufficiently conservative figure to adopt for road pavement design purposes, however this rate is too conservative for traffic impact analysis purposes based on the case study data for Bacchus Marsh.

Medium Density Dwellings

The RTA Guide to Traffic Generating Developments (RTA Guide) sets out lower traffic generation rates for medium density dwellings (units and townhouses) as follows:

- Smaller (1 – 2 bedroom) units: 4 – 5 vehicle trips per unit per day
- Larger units and townhouses (3+ bedrooms): 5 – 6.5 vehicle trips per unit per day

These rates are based on pre-covid case study data. Notably, medium density dwellings typically generate lower traffic volumes because they have less occupants on average than standard dwellings.

This is also likely to be the case in Merrimu.

Given that the standard dwelling local case study data showed that traffic generation in Bacchus Marsh post-covid is lower than the traditional standard RTA Guide and TDT rates, medium density dwellings are also expected to generate lower overall daily traffic volumes than the pre-covid "standard" metropolitan rates for this dwelling type.

Therefore, for the purpose of analysis, the lower end of the range set out in the RTA Guide has been adopted, i.e. 4 daily vehicle trips per unit for one and two bedroom medium density dwellings, and 5 daily vehicle trips per unit for larger townhouses.

6.2 Future Conditions & Capture

A number of amenities and initiatives are proposed within the Merrimu development to increase capture[2] and reduce reliance on private vehicles, including:

- early provision of community infrastructure, including schools, childcare, community rooms, etc. as well as retail and employment spaces within the development plan area to capture trips which would otherwise contribute to the external road network,
- provision of extensive walking and cycling networks to encourage active travel, and
- provision of on-demand bus services to and from Bacchus Marsh and the railway station scheduled so as to provide a smooth transition to the rail service during commuter peak hours.

The PSP will also support hybrid work for Merrimu residents by providing flexible working spaces within the neighbourhood centres, as well as by designing dwellings with home-office potential. These opportunities will become available with stage 2 onwards.

For the purpose of analysis, the following 'internal capture' assumptions have been adopted:

- 10% internal capture for stage 2, and
- 20% internal capture for stage 3 onwards.

6.3 Breakdown of Dwelling Type

The PSP development summary breaks down the dwelling yield into the following dwelling types:

- Activity Centre
- Urban Core
- Walkable Neighbourhood
- Suburban
- Rural Residential

[2] Capture refers to household trips which are contained within the local network and thus do not use the external arterial roads.

For the purpose of analysis, the following assumptions have been adopted:

- Activity Centre and Urban Core dwellings are medium density (terrace and town houses):
  - Activity Centre dwellings will be split 40% small (two bedrooms) and 60% larger (three or more bedrooms),
  - Urban Core dwellings will be split 25% small (two bedrooms) and 75% larger (three or more bedrooms), and
- All other dwelling types (walkable neighbourhood, suburban and rural residential) are standard density dwellings.

6.4 Traffic Generation Summary

Table 6 below shows the anticipated daily traffic generation for each development stage based on:

- 7 vehicle trips per day for standard dwelling,
- 5 vehicle trips per day for larger medium density townhouse dwellings,
- 4 vehicle trips per day for smaller medium density townhouse dwellings, and
- internal capture of 10% for Stage 2 and 20% from Stage 3 onwards.

Table 6: Daily Traffic Generation

Stage No.	Dwelling Yield				Traffic Generation	Traffic Gen. Cumulative	Traffic Gen. External
	2-Bed Townhouse	3+ Bed Townhouse	Standard Density	Total			
1	193	496	284	**973**	5,240	5,240	5,240
2	-	-	980	**980**	6,860	12,100	10,890
3	26	79	769	**874**	5,882	17,982	14,385
4	64	185	1,851	**2,099**	14,134	32,115	25,692
5	25	56	1,118	**1,198**	8,202	40,317	32,253
6	-	-	276	**276**	1,932	42,249	33,799
7	-	-	70	**70**	490	42,739	34,191
TOTAL				**6,470**	**42,739**	**42,739**	**34,191**

Table 6 indicates that the Merrimu PSP area is expected to generate up to 34,191 vehicle movements per day on the external road network.

Table 7 below shows the anticipated AM and PM peak hour vehicle movements for each development stage based on:

- 0.67 vehicle trips per standard dwelling in the AM peak hour,
- 0.70 vehicle trips per standard dwelling in the PM peak hour,
- 0.5 vehicle trips per dwelling in the peak hours for larger medium density townhouse dwellings,
- 0.4 vehicle trips per dwelling in the peak hours for smaller medium density townhouse dwellings, and
- internal capture of 10% for Stage 2 and 20% from Stage 3 onwards.

Table 7: Peak Hour Traffic Generation

Stage No.	Yield	AM Peak Traffic Generation			PM Peak Traffic Generation		
		Staged	Cumulative	External	Staged	Cumulative	External
1	973	515	515	515	524	524	524
2	980	657	1,172	1,055	686	1,210	1,089
3	874	565	1,737	1,390	588	1,798	1,439
4	2,099	1,358	3,095	2,476	1,413	3,212	2,569
5	1,198	787	3,882	3,105	820	4,032	3,225
6	276	185	4,067	3,253	193	4,225	3,380
7	70	47	4,113	3,291	49	4,274	3,419
TOTAL	**6,470**	**4,113**	**4,113**	**3,291**	**4,255**	**4,274**	**3,419**

7 Staged Traffic Distribution & Impact Analysis

7.1 Peak Hour Directional Splits

For the purpose of analysing the capacity requirements of intersection connections to the external arterial road network, the following peak hour directional splits have been adopted based on the existing surveyed splits at the case study site in Maddingley:

- 29% IN and 71% OUT in the AM peak
- 63% IN and 37% OUT in the PM peak

7.2 Peak Hour Trip Destinations

Peak hour traffic generation will principally be associated with commuter traffic. Merrimu is well sited to facilitate commuter trips to Melbourne CBD, Northern and Western suburbs which represents the major component of employment opportunities within a 60-minute drivetime catchment.

Table 8 below sets out the number and share of jobs within the 60-minute drivetime catchment based on travel times from the Buckleys Road/Gisborne Road intersection[3].

Table 8: Distribution of Jobs – 60 Minute Drivetime Catchment

Place of Work - Region	No. of Jobs	Share (%)
Bacchus Marsh	6,700	0.6
Ballan, Ballarat and Surrounds	62,800	5.6
Greater Geelong and Surrounds	90,700	8.1
Melbourne CBD and Inner Suburbs	473,300	42.1
Melbourne East and Southeast	100	0.0
Melton	15,100	1.3
Northern Melbourne Suburbs and North Central Victoria	223,300	19.8
Western Melbourne Suburbs	253,500	22.5
TOTAL	**1,125,500**	**100.0**

[3] Jobs analysis undertaken by Urban Enterprise.

7.3 Travel Time Analysis

In order to determine the likely travel distribution, one needs to consider the various travel time differences in chosen routes.

Significantly, for trips to the east of Merrimu towards the city, travel via Diggers Rest-Coimadai Road on average offers a quicker alternative route than the Western Freeway as demonstrated by the travel time data presented below.

7.3.1 Travel Time Data

Tables 9 and 10 below set out the travel times for a typical Thursday between Merrimu and Melbourne Airport and between Merrimu and Melbourne CBD. Two origin points have been tested within the Merrimu PSP area as follows:

- Buckleys Road (within the Stage 1 development area), and
- Dodemaide Circuit (adjacent to the Stage 2 development area).

Departure times from Merrimu have been tested at 15-minute intervals from 7:00am till 8:00am and departure times for the return trip to Merrimu in the PM peak have been tested at 15-minute intervals from 4:30pm till 5:30pm.

These times have been chosen as they represent the likely peak commuter travel times for work-related trips generated by Merrimu residents.

The "typical travel time" data has been sourced from Google Maps for Thursday 13 February 2025. Notably, Google Maps relies on real-time data sources and is reflective of the actual expected travel times.

Table 9: Travel Time Data – Typical Thursday – Buckleys Road, Merrimu

Departure Time	Melbourne Airport			Melbourne CBD		
	Via Diggers Rest-Coi Rd	Via Western Freeway	Difference	Via Diggers Rest-Coi Rd	Via Western Freeway	Difference
AM PEAK (Departing from Merrimu)						
7:00am	44 min	48 min	4 min	62 min	74 min	12 min
7:15am	44 min	49 min	5 min	63 min	78 min	15 min
7:30am	44 min	51 min	7 min	66 min	79 min	13 min
7:45am	43 min	50 min	7 min	66 min	77 min	11 min
8:00am	43 min	48 min	5 min	64 min	74 min	10 min
PM PEAK (Returning to Merrimu)						
4:30pm	44 min	55 min	11 min	69 min	93 min	24 min
4:45pm	45 min	56 min	11 min	70 min	95 min	25 min
5:00pm	44 min	58 min	14 min	71 min	92 min	21 min
5:15pm	43 min	56 min	13 min	70 min	81 min	23 min
5:30pm	42 min	53 min	11 min	67 min	76 min	14 min

The travel routes between Buckleys Road and the tested destinations for the 7:30am and 5:00pm peaks are shown below.

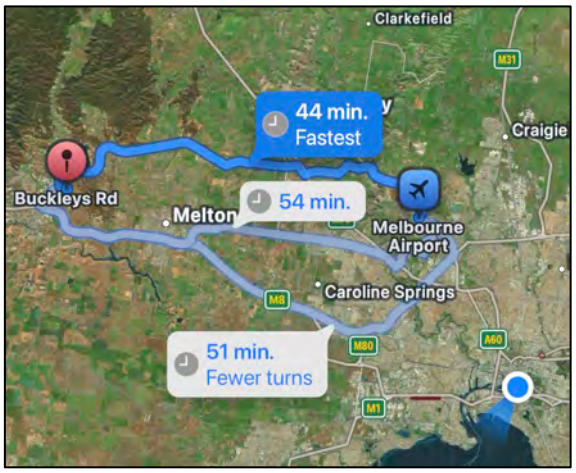


Figure 25: Buckleys Road to Melbourne Airport 7:30am

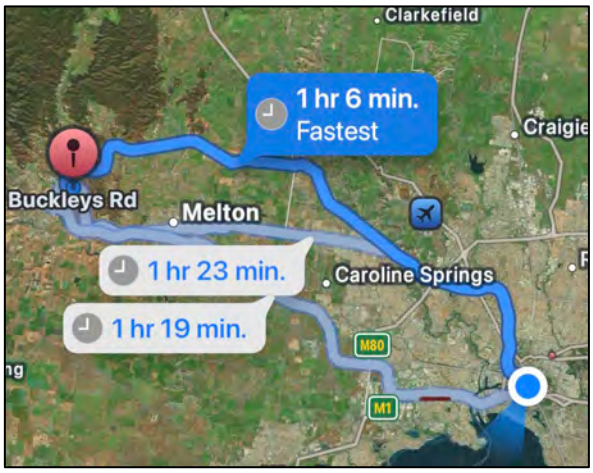


Figure 26: Buckleys Road to Melbourne CBD 7:30am

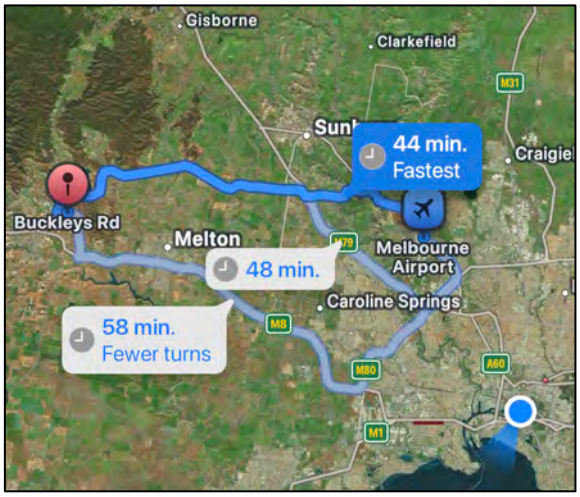


Figure 27: Melbourne Airport to Buckleys Road 5:00pm

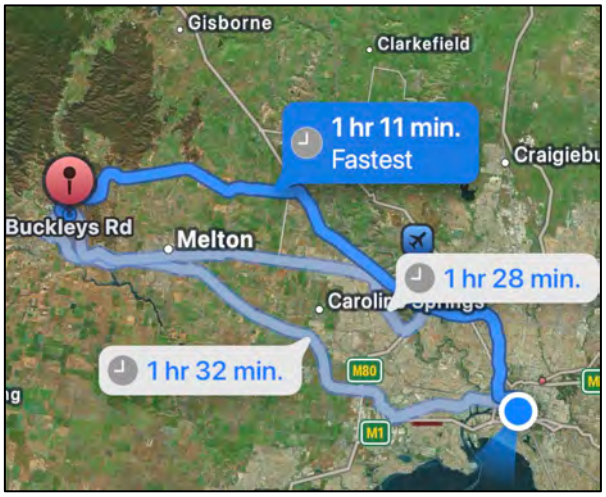


Figure 28: Melbourne CBD to Buckleys Road 5:00pm

Table 10: Travel Time Data – Typical Thursday – Dodemaide Circuit, Merrimu

Departure Time	Melbourne Airport			Melbourne CBD		
	Via Diggers Rest-Coi Rd	Via Western Freeway	Difference	Via Diggers Rest-Coi Rd	Via Western Freeway	Difference
AM PEAK (Departing from Merrimu)						
7:00am	43 min	53 min	10 min	60 min	77 min	17 min
7:15am	43 min	52 min	9 min	62 min	80 min	18 min
7:30am	42 min	53 min	11 min	65 min	81 min	16 min
7:45am	42 min	52 min	10 min	65 min	78 min	13 min
8:00am	42 min	50 min	8 min	63 min	76 min	13 min

Departure Time	Melbourne Airport			Melbourne CBD		
	Via Diggers Rest-Coi Rd	Via Western Freeway	Difference	Via Diggers Rest-Coi Rd	Via Western Freeway	Difference
PM PEAK (Returning to Merrimu)						
4:30pm	43 min	59 min	16 min	68 min	96 min	28 min
4:45pm	43 min	62 min	19 min	69 min	95 min	26 min
5:00pm	42 min	59 min	17 min	69 min	92 min	23 min
5:15pm	41 min	56 min	15 min	69 min	89 min	20 min
5:30pm	41 min	54 min	13 min	66 min	83 min	17 min

The travel routes between Dodemaide Circuit and the tested destinations for the 7:30am and 5:00pm peaks are shown below.

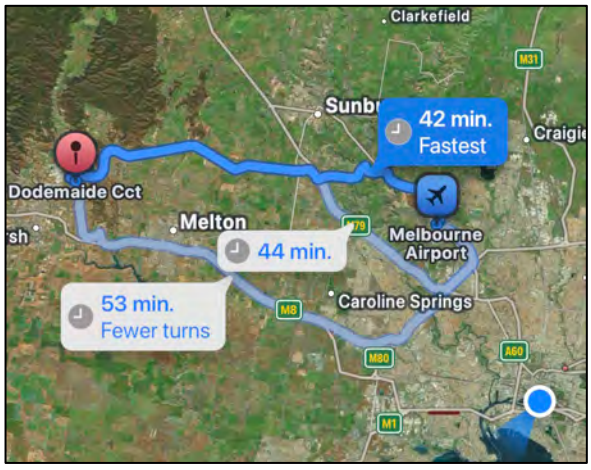


Figure 29: Dodemaide Cct to Melbourne Airport 7:30am

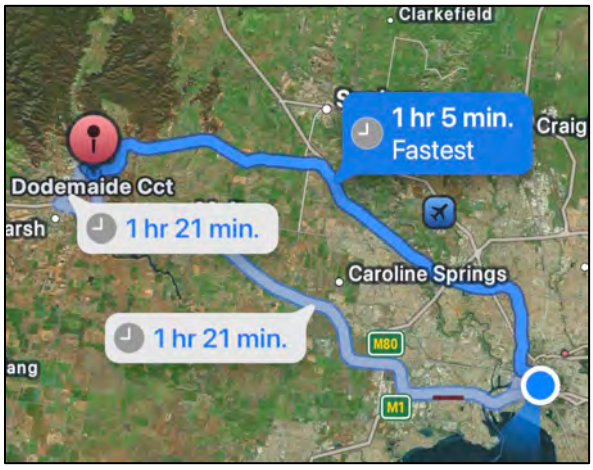


Figure 30: Dodemaide Cct to Melbourne CBD 7:30am

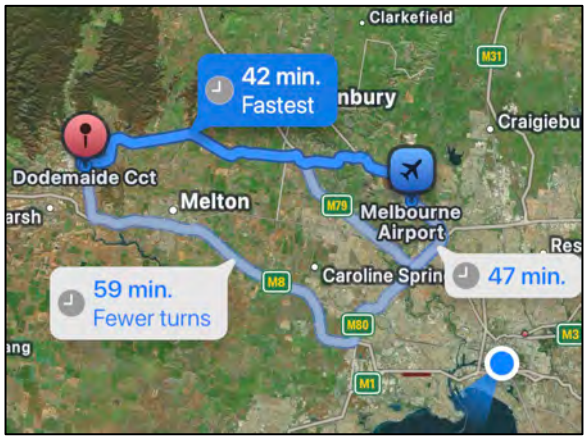


Figure 31: Melbourne Airport to Dodemaide Cct 5:00pm

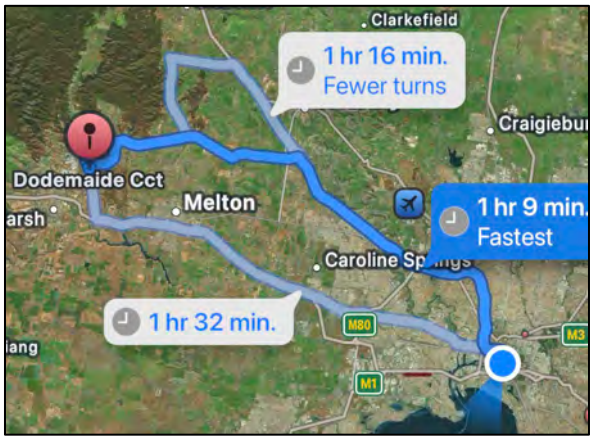


Figure 32: Melbourne CBD to Dodemaide Cct 5:00pm

The travel time data indicates that for both tested points of origin within the Merrimu PSP, the northern route via Diggers Rest-Coimadai Road towards both the Melbourne Airport and the CBD is consistently the shortest route in terms of travel time, at most times with a considerable margin.

These findings are consistent with the findings of the Ethos Urban travel time data[4].

7.3.2 Adopted Distributions

Prior to the construction of the Flanagans Drive link (Stage 4) it is estimated that 80% of city bound traffic will use the Diggers Rest-Coimadai Road route and the other 20% will travel to the Western Freeway. Similarly, it is estimated 50% of the Melton-bound traffic will use the Diggers Rest-Coimadai Road route in the first three development stages.

Once the Flanagans Drive connection is in place, it is anticipated that 80% of Stages 4, 5 and 6 traffic will use the Western Freeway to access Melbourne and Melton.

A detailed analysis of the traffic distribution and impact at each development stage is addressed below.

7.4 Stage 1

Development Stage 1 is located on the north side of Buckleys Road. The following infrastructure is proposed to be delivered at Stage 1:

- an upgrade of the Gisborne Road/Buckleys Road intersection,
- upgrade of Buckleys Road to a divided “entry boulevard”,
- intersection IN-04 (signalised intersection) Buckleys Road/activity centre,
- wetlands WL-01 and interim stormwater detention, and
- open spaces including a district level park.

Notably, all Stage 1 traffic will enter and exit the arterial road network via the Gisborne Road/Buckleys Road intersection.

Table 11 below shows the distribution of traffic between Gisborne Road (south) and Diggers Rest-Coimadai Road (north) based on the following assumptions for Stage 1:

- Melbourne CBD and Inner Suburbs: 80% via DR-Coi Road, 20% via Western Fwy
- Melton: 50% via DR-Coi Road, 50% via Western Fwy
- Northern suburbs: 10% via DR-Coi Road, 90% via Western Fwy
- All other destinations: 100% to/from south via Gisborne Rd

[4] Ethos Urban monitored travel times on weekdays between 8 November 2024 and 12 February 2025 for a consistent departure time of 9am from Merrimu and 4pm from Melbourne Airport and the CBD.

Table 11: Traffic Distribution for Stage 1

Place of Work - Region	No. of Jobs	Share (%)	Gisborne Road	Diggers Rest-Coimadai Road
Bacchus Marsh	6,700	0.6	0.6%	-
Ballan, Ballarat and Surrounds	62,800	5.6	5.6%	-
Greater Geelong and Surrounds	90,700	8.1	8.1%	-
Melbourne CBD and Inner Suburbs	473,300	42.1	8.4%	33.6%
Melbourne East and Southeast	100	0.0	0.0%	-
Melton	15,100	1.3	0.67%	0.67%
Northern Melbourne Suburbs and North Central Victoria	223,300	19.8	2.0%	17.9%
Western Melbourne Suburbs	253,500	22.5	22.5%	-
TOTAL	**1,125,500**	**100.0**	**47.8%**	**52.2%**

Table 11 indicates that for Stage 1, 47.8% of traffic will be generated to/from the south via Gisborne Road and 52.2% of traffic will be generated to/from the north via Diggers Rest-Coimadai Road.

In Stage 1, there will not be any internal connection via Bences Road directly to Diggers Rest-Coimadai Road and accordingly all traffic heading to/from the north will do so via Left-IN and Right-OUT at the Gisborne Road/Buckleys Road intersection (IN-03).

7.4.1 Background Traffic Growth

While the external arterial roads may experience a small degree of background traffic growth over time as the Merrimu Precinct is developed, the other development fronts in the region are located to the west and south of Bacchus Marsh and can access key destinations including schools, shops, the railway station and the Western Freeway without passing the Merrimu Precinct.

Accordingly, the future traffic growth on the adjacent arterial road network including Gisborne Road, Diggers Rest-Coimadai Road and Bacchus Marsh Road is expected to consist almost entirely of traffic generated by the Merrimu Precinct.

For the purpose of undertaking a robust analysis, the surveyed “existing” (2024) traffic volumes have been factored up by 10% to account for any background traffic growth generated by external (non-PSP) areas, and the PSP traffic has been added on top of the background growth assumptions.

7.4.2 Stage 1 – Design Volumes

Based on the preceding assumptions, the “design” peak hour Stage 1 traffic volumes at the Gisborne Road/Buckleys Road (IN-03) intersection are shown in Figure 33 below.

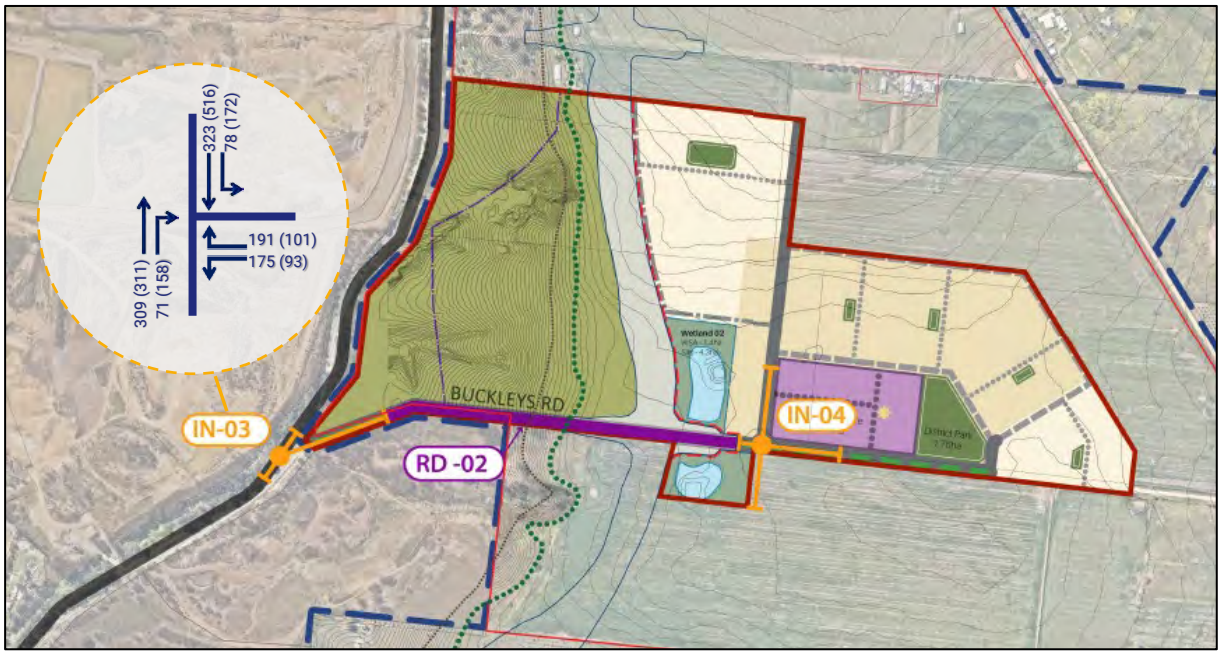


Figure 33: Design Stage 1 AM(PM) Peak Hour Traffic Volumes – Gisborne Road/Buckleys Road (IN-03)

7.4.3 Stage 1 – IN-03 Analysis

Intersection analysis using SIDRA Intersection 9.1 was undertaken to determine intersection performance for each of the arterial road intersections on the PSP boundary and establish what works will be required to accommodate the PSP at each development stage and at the ultimate full-build-out of the PSP traffic volumes.

It is noted that since the ELR is unfunded and the timing is not known, the PSP traffic impact analysis is based on the assumption that the ELR will not be constructed until some time after the PSP is complete. This assumption will ensure that the PSP provides sufficient road network capacity and is not reliant on the construction of the ELR.

For an intersection to be deemed functioning below capacity it must have a degree of saturation (DOS) of less than 1.0 and would desirably have a degree of saturation below 0.90 for a signalised intersection, 0.85 for a roundabout or 0.80 for a sign-controlled intersection to be considered to be operating at a good standard.

Buckleys Road is currently a minor (gravel) local road carrying negligible traffic volumes. In the vicinity of Buckleys Road, Gisborne Road is currently configured with a sealed carriageway carrying two northbound lanes and one southbound lane. The second northbound lane commences approximately 500m south of the Buckleys Road intersection. There are no existing auxiliary left or right turn lanes on Gisborne Road at the Buckleys Road intersection.

For the purpose of undertaking the Stage 1 SIDRA analysis, it is assumed that the Gisborne Road/Buckleys Road intersection will be upgraded (interim) to include Auxiliary Left (AUL) and Chanelised Right (CHR) turn lanes, as well as separate left and right lanes for vehicles exiting Buckleys Road. GIVE-WAY control has been assumed.

The SIDRA output is summarised in Table 12 below.

Table 12: Gisborne Road/Buckleys Road (IN-03) STAGE 1 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Road (S)	0.178	0.274	1.4 sec	3.8 sec	2.2m	8.2m
Buckleys Road (E)	0.576	0.613	15.0 sec	25.4 sec	22.6m	18.7m
Gisborne Road (N)	0.186	0.297	1.1 sec	1.4 sec	0.0m	0.0m

Table 12 indicates that the Gisborne Road/Buckleys Road (IN-03) intersection will operate well within acceptable limits as a standard Give-Way-controlled T-intersection at the completion of development Stage 1.

7.5 Stage 2

Development Stage 2 is located to the north of Stage 1 and includes all of the land north of Buckleys Road, extending to Diggers Rest-Coimadai Road. The following infrastructure is proposed to be delivered at Stage 2:

- delivery of a second Gisborne Road connection IN-02,
- upgrade of Bences Road to an urban standard,
- upgrade of the Diggers Rest-Coimadai Road/Bences Road intersection (IN-10),
- intersection IN-01 (Give-Way) Bences Road/connector,
- community centre CI-01 and AOS-01, and
- wetlands WL-05.

Notably, Stage 2 traffic will be able to enter and exit the arterial road network via three intersections IN-02, IN-03 and IN-10.

For Stage 2, the overall peak hour traffic distribution will be consistent with Stage 1, i.e. 47.8% of traffic will be generated to/from the south via Gisborne Road and 52.2% of traffic will be generated to/from the north via Diggers Rest-Coimadai Road.

However, in Stage 2 the internal PSP connection to Diggers Rest-Coimadai Road via Bences Road will be the most direct route for all Stage 1 and Stage 2 traffic. Accordingly, the volume of traffic turning Left-IN and Right-OUT of Buckleys Road at Gisborne Road (IN-03) will drop substantially once the Bences Road connection is delivered in Stage 2.

For the purpose of analysis, the following distribution assumptions have been adopted for Stage 2:

- traffic generated to/from the south via Gisborne Road will be split 50% via the Buckleys Road intersection (IN-03) and 50% via the new Northern Connector intersection (IN-02),
- all traffic generated to/from the north via Diggers Rest-Coimadai Road will utilise Bences Road (IN-10), and

- while negligible PSP traffic is expected to turn Right-OUT/Left-IN at the Gisborne Road intersections (IN-02 and IN-03) and Left-OUT/Right-IN at the Bences Road intersection (IN-10), a nominal figure of 10% has been added in order to provide a robust analysis.

7.5.1 Background Traffic Growth

As set out in the Stage 1 analysis, the surveyed "existing" (2024) traffic volumes on the arterial road network have been factored up to 10% to account for any background traffic growth generated by external (non-PSP) areas, and the PSP traffic has been added on top of the background growth assumptions.

7.5.2 Stage 2 – Design Volumes

Based on the preceding assumptions, the "design" peak hour Stage 2 traffic volumes at the IN-02, IN-03 and IN-10 intersections are shown in Figure 34 below.

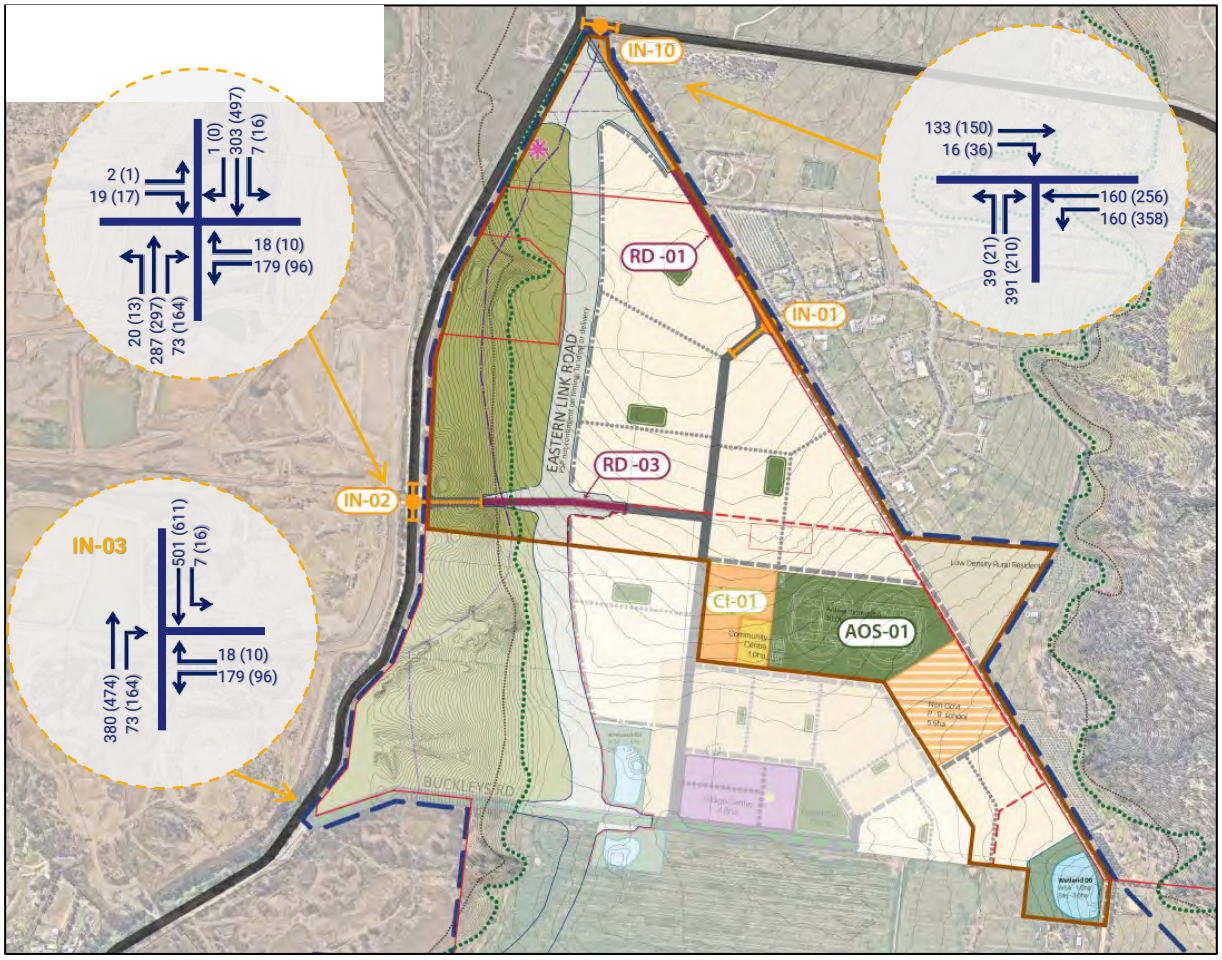


Figure 34: Design Stage 2 AM(PM) Peak Hour Traffic Volumes

7.5.3 Stage 2 – IN-02 Analysis

The Northern Connector (IN-02) is proposed to be located directly opposite the existing quarry access. Accordingly, when the PSP connection is provided the intersection will be a cross-intersection.

For the purpose of undertaking the Stage 2 SIDRA analysis, it is assumed that the Gisborne Road/Northern Connector Road intersection will be constructed as a roundabout-controlled intersection to safely manage cross-intersection turning movements including existing truck traffic at this location.

The SIDRA output is summarised in Table 13 below.

Table 13: Northern Connector Road/Buckleys Road (IN-02) STAGE 2 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Road (S)	0.266	0.312	5.2 sec	5.8 sec	1.8m	17.5m
Buckleys Road (E)	0.197	0.129	6.3 sec	7.5 sec	1.1m	0.8m
Gisborne Road (N)	0.257	0.460	4.8 sec	5.6 sec	1.5m	3.2m
Quarry Access (W)	0.037	0.035	12.6 sec	13.6 sec	0.2m	0.2m

Table 13 indicates that the Gisborne Road/Northern Connector Road intersection (IN-02) intersection will operate well within acceptable limits as a single lane roundabout-controlled intersection at the completion of development Stage 2.

7.5.4 Stage 2 – IN-03 Analysis

For the purpose of undertaking the Stage 2 SIDRA analysis, it is assumed that the Gisborne Road/Buckleys Road intersection will retain the same configuration as in Stage 1, i.e. GIVE-WAY control with AUL and CHR.

The SIDRA output is summarised in Table 14 below.

Table 14: Gisborne Road/Buckleys Road (IN-03) STAGE 2 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Road (S)	0.217	0.272	1.4 sec	2.8 sec	2.6m	8.1m
Buckleys Road (E)	0.259	0.168	10.4 sec	12.5 sec	7.2m	4.1m
Gisborne Road (N)	0.285	0.350	0.2 sec	0.3 sec	0.0m	0.0m

Table 14 indicates that the Gisborne Road/Buckleys Road (IN-03) intersection will operate well within acceptable limits as a standard Give-Way-controlled T-intersection at the completion of development Stage 2.

Notably, while the through traffic volumes on Gisborne Road will increase due to traffic accessing the new Northern Connector (IN-02), the traffic turning right-out at IN-03 will reduce once the Bences Road connection is provided, and accordingly the overall DOS at IN-03 will improve in Stage 2.

7.5.5 Stage 2 – IN-10 Analysis

For the purpose of undertaking the Stage 2 SIDRA analysis, it is assumed that the Bences Road/Diggers Rest-Coimadai Road intersection will retain its existing configuration which comprises a GIVE-WAY control with an Auxiliary Left (AUL). Vehicles turning right in to Bences Road from Diggers Rest-Coimadai Road will do so from the through traffic lane. This is consistent with the existing arrangements. Notably, negligible traffic is expected to turn Right-IN.

The SIDRA output is summarised in Table 15 below.

Table 15: Bences Road/Diggers Rest-Coimadai Road (IN-10) STAGE 2 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Bences Road (S)	0.576	0.425	11.6 sec	13.0 sec	35.6m	16.7m
Dig Rest-Coi Road (E)	0.089	0.199	2.8 sec	3.2 sec	0.0m	0.0m
Dig Rest-Coi Road (W)	0.091	0.137	1.0 sec	3.0 sec	1.2m	3.9m

Table 15 indicates that the Bences Road/Diggers Rest-Coimadai Road (IN-10) intersection will operate well within acceptable limits as a standard Give-Way-controlled T-intersection at the completion of development Stage 2.

7.6 Stage 3

Development Stage 3 is located to the south of Stage 1 on the south side of Buckleys Road. No additional road infrastructure is proposed at Stage 3.

Notably, Stage 3 traffic will be able to enter and exit the arterial road network via the three established intersections IN-02, IN-03 and IN-10.

For Stage 3, the overall peak hour traffic distribution will be consistent with Stages 1 and 2, i.e. 47.8% of traffic will be generated to/from the south via Gisborne Road and 52.2% of traffic will be generated to/from the north via Diggers Rest-Coimadai Road.

For the purpose of analysis, the following distribution assumptions have been adopted for Stage 3:

- traffic generated to/from the south via Gisborne Road will be split 60% via the Buckleys Road intersection (IN-03) and 40% via the new Northern Connector intersection (IN-02),
- all traffic generated to/from the north via Diggers Rest-Coimadai Road will utilise Bences Road (IN-10), and
- while negligible PSP traffic is expected to turn Right-OUT/Left-IN at the Gisborne Road intersections (IN-02 and IN-03) and Left-OUT/Right-IN at the Bences Road intersection (IN-10), a nominal figure of 10% has been added in order to provide a robust analysis.

7.6.1 Background Traffic Growth

As set out in the Stage 1 and 2 analysis, the surveyed "existing" (2024) traffic volumes on the arterial road network have been factored up to 10% to account for any background traffic growth generated by external (non-PSP) areas, and the PSP traffic has been added on top of the background growth assumptions.

7.6.2 Stage 3 – Design Volumes

Based on the preceding assumptions, the "design" peak hour Stage 3 traffic volumes at the IN-02, IN-03 and IN-10 intersections are shown in Figure 35 below.

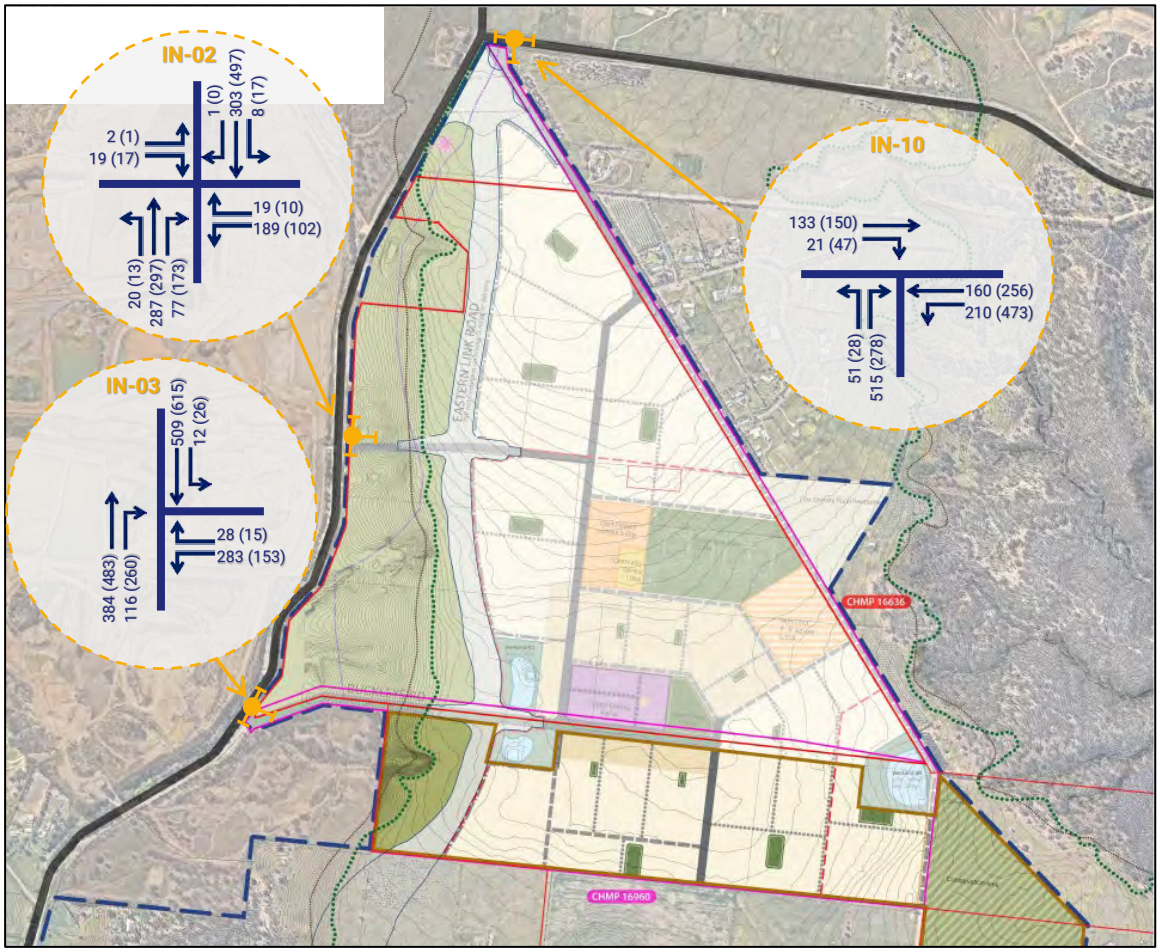


Figure 35: Design Stage 3 AM(PM) Peak Hour Traffic Volumes

7.6.1 Stage 3 – IN-02 Analysis

For the purpose of undertaking the Stage 3 SIDRA analysis, it is assumed that the Gisborne Road/Northern Connector Road intersection will retain the same configuration as in Stage 1 and 2, i.e. a roundabout-controlled intersection.

The SIDRA output is summarised in Table 16 below.

Table 16: Northern Connector Road/Buckleys Road (IN-02) STAGE 3 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Road (S)	0.272	0.322	5.2 sec	5.9 sec	14.3m	18.2m
Buckleys Road (E)	0.213	0.141	6.3 sec	7.5 sec	8.7m	6.0m
Gisborne Road (N)	0.260	0.468	4.8 sec	5.8 sec	11.5m	24.9m
Quarry Access (W)	0.038	0.035	12.5 sec	13.8 sec	2.1m	2.0m

Table 16 indicates that the Gisborne Road/Northern Connector Road intersection (IN-02) intersection will operate well within acceptable limits as a single lane roundabout-controlled intersection at the completion of development Stage 3.

7.6.2 Stage 3 – IN-03 Analysis

For the purpose of undertaking the Stage 3 SIDRA analysis, it is assumed that the Gisborne Road/Buckleys Road intersection will retain the same configuration as in Stage 1 and 2, i.e. GIVE-WAY control with AUL and CHR.

The SIDRA output is summarised in Table 17 below.

Table 17: Gisborne Road/Buckleys Road (IN-03) STAGE 3 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Road (S)	0.221	0.453	2.1 sec	4.5 sec	4.5m	17.2m
Buckleys Road (E)	0.428	0.279	12.0 sec	14.5 sec	15.7m	7.7m
Gisborne Road (N)	0.293	0.354	0.2 sec	0.3 sec	0.0m	0.0m

Table 17 indicates that the Gisborne Road/Buckleys Road (IN-03) intersection will operate well within acceptable limits as a standard Give-Way-controlled T-intersection at the completion of development Stage 3.

7.6.3 Stage 3 – IN-10 Analysis

For the purpose of undertaking the Stage 3 SIDRA analysis, it is assumed that the Bences Road/Diggers Rest-Coimadai Road intersection will retain its existing configuration which comprises a GIVE-WAY control with an Auxiliary Left (AUL). Vehicles turning right in to Bences Road from Diggers Rest-Coimadai Road will do so from the through traffic lane. This is consistent with the existing arrangements. Notably, negligible traffic is expected to turn Right-IN. The SIDRA output is summarised in Table 18 below.

Table 18: Bences Road/Diggers Rest-Coimadai Road (IN-10) STAGE 3 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Bences Road (S)	0.808	0.638	17.9 sec	17.7 sec	88.7m	33.3m
Dig Rest-Coi Road (E)	0.120	0.270	3.2 sec	3.7 sec	0.0m	0.0m
Dig Rest-Coi Road (W)	0.098	0.170	1.4 sec	4.7 sec	1.7m	6.1m

Table 18 indicates that the Bences Road/Diggers Rest-Coimadai Road (IN-10) intersection will be approaching practical capacity at the completion of development Stage 3, with a DOS of 0.808 during the AM peak hour. Notably, a DOS of up to 0.8 is considered to be good operating conditions for a GIVE-WAY controlled intersection.

The critical movement is the right-turn OUT movement during the AM peak hour, which will experience an average delay of 17.9 seconds and a 95th percentile queue length of 88.7m which corresponds to approximately 13 vehicles.

Bences Road/Diggers Rest-Coimadai Road (IN-10) intersection has been modelled with an upgraded layout providing for a reverse priority-T arrangement, giving priority to the higher volume east and south legs and requiring the western leg to give way. The modelled revised layout is shown in Figure 36 below.

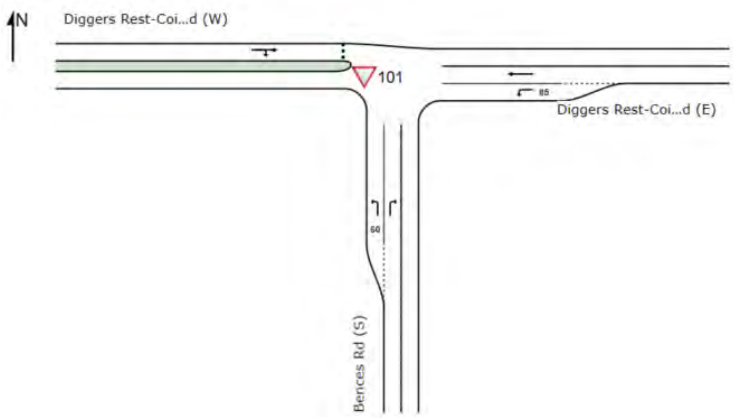


Figure 36: Modified Layout – Bences Road/Diggers Rest-Coimadai Road (IN-10)

The revised SIDRA output for IN-10 (Stage 3) based on the modified intersection layout is summarised in Table 19 below.

Table 19: Bences Road/Diggers Rest-Coimadai Road (IN-10) STAGE 3 – SIDRA Output (Revised Layout)

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Bences Road (S)	0.353	0.211	6.3 sec	6.6 sec	14.7m	7.4m
Dig Rest-Coi Road (E)	0.120	0.270	3.2 sec	3.7 sec	0.0m	0.0m
Dig Rest-Coi Road (W)	0.411	0.461	15.8 sec	15.1 sec	15.0m	20.6m

Table 19 indicates that with a modified reverse priority T-intersection layout, the Bences Road/Diggers Rest-Coimadai Road (IN-10) intersection will operate well within acceptable limits at the completion of development Stage 3.

7.7 Stage 4

Development Stage 4 is located south of Stage 3 and extends south to Lindsay Avenue. The following infrastructure is proposed to be delivered at Stage 4:

- delivery of the Flanagans Drive/Bacchus Marsh Road intersection IN-09,
- upgrade to Lindsay Avenue/Flanagans Drive intersection IN-07,
- delivery of signalised intersections IN-05 and IN-06 near activity centres,
- community centre CL-02 and Urban Farm AOS-02, and
- wetlands WL-03, WL-04 and WL-07.

Notably, Stage 4 will deliver an alternative access point to the PSP via the Flanagans Drive/Bacchus Marsh Road intersection and will complete the internal links allowing for Development Stages 1, 2, 3 and 4 to access the arterial network via Gisborne Road, Diggers Rest-Coimadai Road or Bacchus Marsh Road.

It is assumed that a similar proportion of Stages 4 – 6 traffic will be attracted to the Diggers Rest-Coimadai Road route as would Stage 1 – 3 traffic to the Western Freeway via Flanagans Road. Therefore, the traffic volumes at the Bences Road/Diggers Rest-Coimadai Road intersection will not change after Stage 3.

Table 20 below shows the distribution of Stage 4 based on the following assumptions:

- Bacchus Marsh: 50% via Gisborne Road, 50% via Bacchus Marsh Road (West)
- Ballan, Ballarat & Surrounds: 50% via Gisborne Road, 50% via Bacchus Marsh Road (West)
- Greater Geelong & Surrounds: 100% via Bacchus Marsh Road (West)
- Northern Suburbs and Nth Vic: 90% via Bacchus Marsh Road (East), 10% via Bences
- All other destinations: 100% via Bacchus Marsh Road (East)

Table 20: Traffic Distribution for Stage 4

Place of Work - Region	No. of Jobs	Share (%)	Gisborne Road	Bences Road	BM Rd (East)	BM Rd (West)
Bacchus Marsh	6,700	0.6	0.3%	-	-	0.3%
Ballan, Ballarat and Surrounds	62,800	5.6	2.8%	-	-	2.8%
Greater Geelong and Surrounds	90,700	8.1	-	-	-	8.1%
Melbourne CBD and Inner Suburbs	473,300	42.1	-	-	42.1%	-
Melbourne East and Southeast	100	0.0	-	-	0.0%	-
Melton	15,100	1.3	-	-	1.3%	-
Northern Melbourne Suburbs and North Central Victoria	223,300	19.8	-		17.9%	-
Western Melbourne Suburbs	253,500	22.5	-		22.5%	-
TOTAL	**1,125,500**	**100.0**	**3.1%**	**2.0%**	**83.8%**	**11.1%**

Table 20 indicates that 3.1% of Stage 4 traffic will be generated to/from Gisborne Road via IN-03, 2% of Stage 4 traffic will be generated to/from Bences Road via IN-10, and the balance (94.9%) will utilise Flanagans Drive and the upgraded Flanagans Drive/Bacchus Marsh Road intersection (IN-09) to access the broader arterial road network.

Notably, the small proportion of "Northern Melbourne Suburbs and North Central Victoria" traffic which has been allocated north towards Bences Road is anticipated to be the share which may turn Left-OUT and Right-IN at the Bences Road/Diggers Rest-Coimadai Road intersection to head north towards Gisborne, Woodend and beyond (i.e. Central Victoria). An allowance for these movements has already been made in the Stages 1 – 3 analysis and accordingly IN-10 does not need to be reassessed for Stage 4 traffic impacts.

For vehicles returning to Flanagans Drive from the east on the Western Freeway, the travel time is approximately the same via either the Hopetoun Park Road exit or the Bacchus Marsh Road exit and accordingly a 50/50 split has been adopted for the return movements. There is no on-ramp for citybound traffic at the Bacchus Marsh Road interchange and accordingly all citybound traffic will enter the freeway at the Hopetown Park Road interchange.

7.7.1 Stage 4 – Design Volumes

Based on the preceding assumptions, the "design" peak hour Stage 4 traffic volumes at the IN-02, IN-03 and IN-09 intersections are shown in Figure 37 below. These design volumes include a 10% background growth rate on surveyed arterial road volumes, consistent with the Stages 1 – 3 analysis.

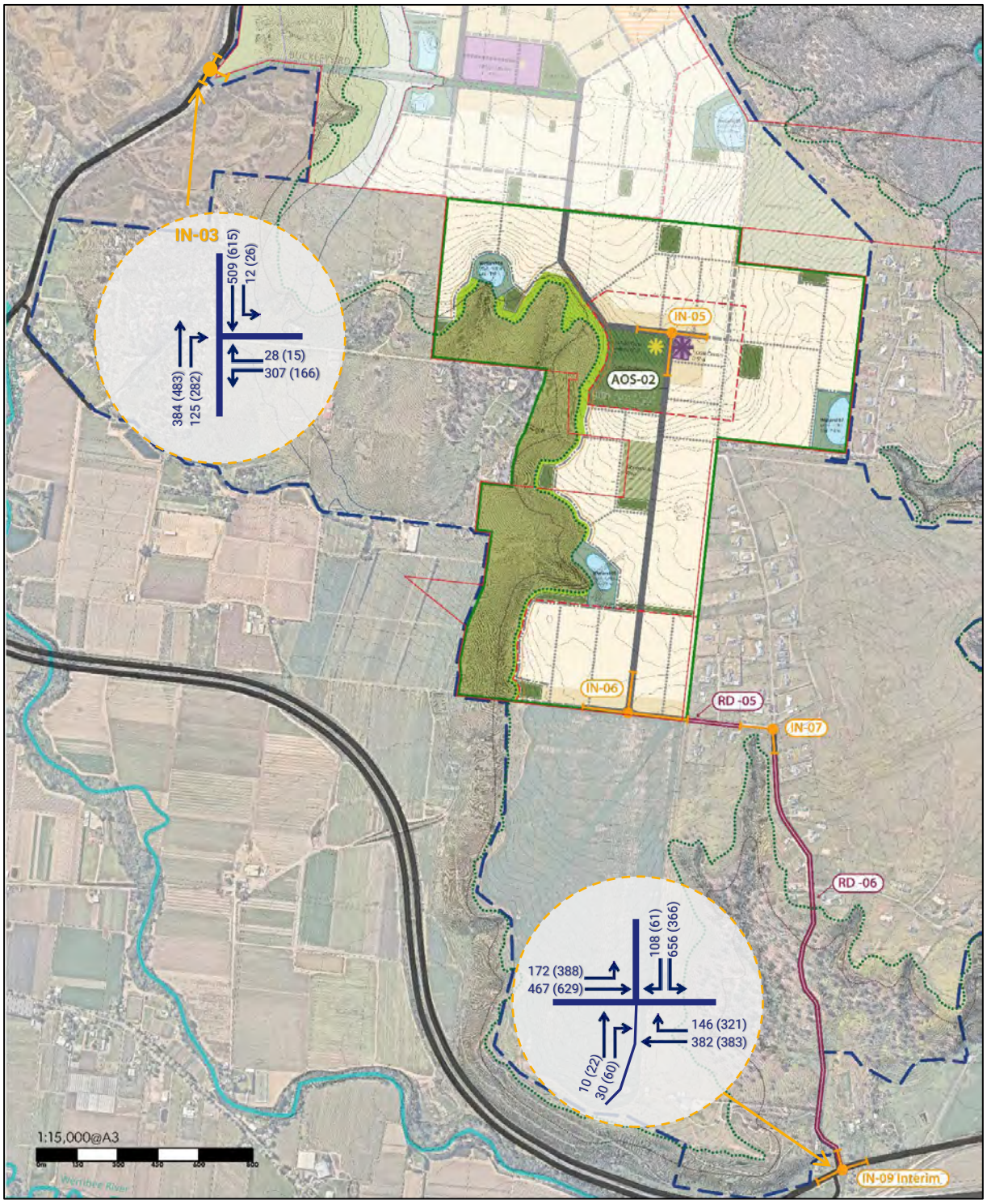


Figure 37: Design Stage 4 AM(PM) Peak Hour Traffic Volumes

7.7.2 Stage 4 – IN-03 Analysis

For the purpose of undertaking the Stage 4 SIDRA analysis, it is assumed that the Gisborne Road/Buckleys Road intersection will retain the same configuration as in Stage 1, 2 and 3, i.e. GIVE-WAY control with AUL and CHR.

The SIDRA output is summarised in Table 21 below.

Table 21: Gisborne Road/Buckleys Road (IN-03) STAGE 4 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Road (S)	0.221	0.493	2.3 sec	4.9 sec	4.9m	19.7m
Buckleys Road (E)	0.466	0.303	12.2 sec	14.6 sec	18.1m	8.7m
Gisborne Road (N)	0.293	0.354	0.2 sec	0.3 sec	0.0m	0.0m

Table 21 indicates that the Gisborne Road/Buckleys Road (IN-03) intersection will operate well within acceptable limits as a standard Give-Way-controlled T-intersection at the completion of development Stage 4.

7.7.3 Stage 4 – IN-09 Analysis

The Flanagans Drive/Bacchus Marsh Road intersection is currently a rural STOP-controlled T-intersection with no formal auxiliary turn lanes. The west approach has a sealed shoulder. Stage 4 development will substantially increase the traffic volumes within Flanagans Drive and the current intersection layout requires upgrading. In order to determine a layout which will accommodate Stage 4 traffic, an iterative approach was undertaken.

The layout shown in Figure 38 below will accommodate the Stage 4 traffic. Notably, due to the proximity of the intersection to the Western Freeway off-ramp, the right-turn leg has been incorporated into the Flanagans Drive/Bacchus Marsh Road intersection.

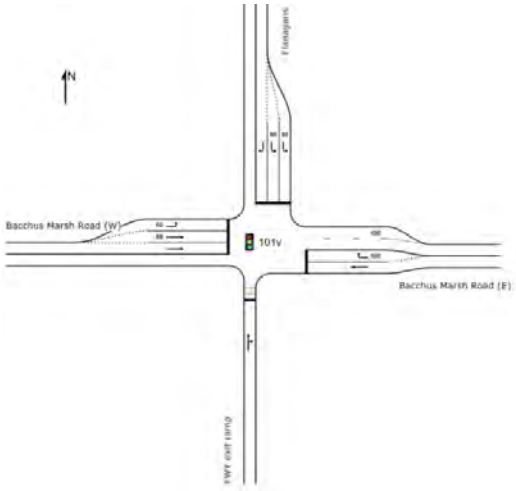


Figure 38: Modified Layout – Flanagans Drive/Bacchus Marsh Road (IN-09)

The SIDRA output is summarised in Table 22 below.

Table 22: Flanagans Drive/Bacchus Marsh Road (IN-09) STAGE 4 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Freeway Exit Ramp (S)	0.462	0.551	68.3 sec	40.1 sec	18.7m	22.4m
Bacchus Marsh Rd (E)	0.592	0.861	35.2 sec	25.6 sec	122.5m	94.8m
Flanagans Drive (N)	0.591	0.845	38.4 sec	42.2 sec	133.4m	61.4m
Bacchus Marsh Rd (W)	0.593	0.902	35.6 sec	29.6 sec	103.3m	112.1m

Table 22 indicates that the Flanagans Drive/Bacchus Marsh Road (IN-09) intersection will operate within acceptable limits as a signalised intersection based on the lane configurations shown in Figure 28, at the completion of development Stage 4.

It is noted that Flanagans Drive is offset only 20m from the intersection of Bacchus Marsh Road/Western Freeway eastbound off-ramp, and the anticipated queue lengths on the western leg of intersection IN-09 (Flanagans Drive/Bacchus Marsh Road) will significantly exceed 20m in the peak hours.

Accordingly, the IN-09 intersection works are proposed to include realignment of the Bacchus Marsh Road-Western Freeway offramp to form the southern leg of a four-way signalised intersection.

7.8 Stage 5

Development Stage 5 is located south of Stage 4 in the southern-most section of the Merrimu PSP area. The following infrastructure is proposed to be delivered at Stage 5:

- delivery of a new connector road link through the escarpment at the southern edge of the PSP linking Stage 5 with Flanagans Drive south of the existing rural residential development,
- delivery of intersection IN-08 (Flanagans Drive/Escarpment Connector),
- upgrade of the Flanagans Drive/Bacchus Marsh Road intersection IN-09,
- community centre CL-03 and AOS-03, and
- wetlands WL-08 and WL-09.

Having regard to the location of Stage 5, the most convenient and direct connection to the arterial road network will be via the Flanagans Drive/Bacchus Marsh Road intersection regardless of the destination. Given that the roads within the PSP are low speed local access roads, the only Stage 5 traffic which will head north through the PSP area will generally have a destination within the PSP.

Table 23 below shows the distribution of Stage 5 traffic based on the following assumptions:

- Bacchus Marsh Road (West): Traffic headed to/from Bacchus Marsh, Ballan, Ballarat and Surrounds and Greater Geelong and Surrounds
- Bacchus Marsh Road (East): All other destinations

Table 23: Traffic Distribution for Stage 5

Place of Work - Region	No. of Jobs	Share (%)	BM Rd (East)	BM Rd (West)
Bacchus Marsh	6,700	0.6	-	0.6%
Ballan, Ballarat and Surrounds	62,800	5.6	-	5.6%
Greater Geelong and Surrounds	90,700	8.1	-	8.1%
Melbourne CBD and Inner Suburbs	473,300	42.1	42.1%	-
Melbourne East and Southeast	100	0.0	0.0%	-
Melton	15,100	1.3	1.3%	-
Northern Melbourne Suburbs and North Central Victoria	223,300	19.8	19.8%	-
Western Melbourne Suburbs	253,500	22.5	22.5%	-
TOTAL	**1,125,500**	**100.0**	**85.8%**	**14.2%**

Table 23 indicates that the Stage 5 traffic will be split 85.8% to/from the east and 14.2% to/from the west.

Consistent with Stage 4, for vehicles returning to Flanagans Drive from the east on the Western Freeway a 50/50 split has been adopted between the Hopetoun Park Road exit and the Bacchus Marsh Road exit.

7.8.1 Stage 5 – Design Volumes

Based on the preceding assumptions, the “design” peak hour Stage 5 traffic volumes at the IN-09 intersection are shown in Figure 39 below. These design volumes include a 10% background growth rate on surveyed arterial road volumes, consistent with the Stages 1 – 4 analysis.

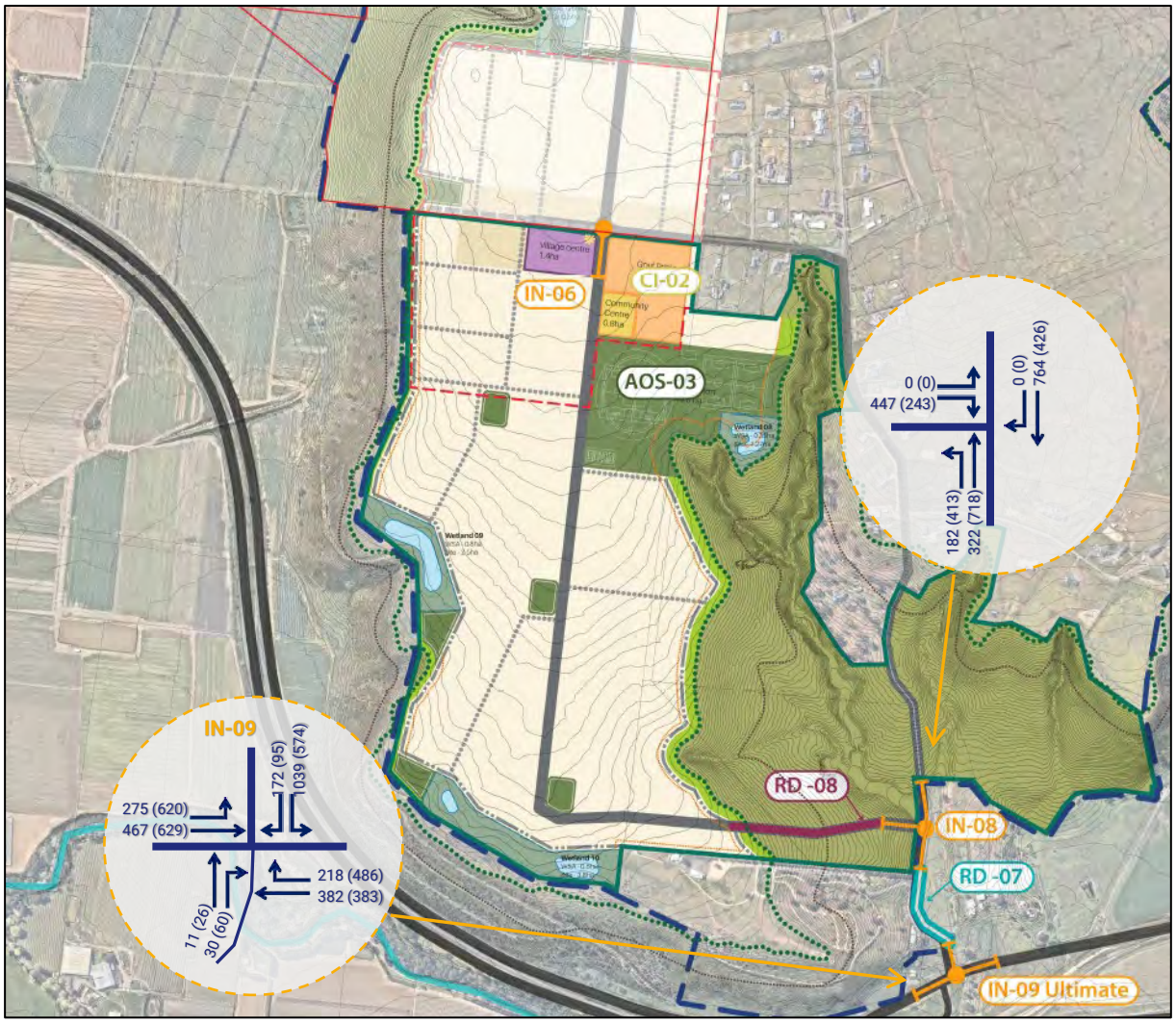


Figure 39: Design Stage 5 AM(PM) Peak Hour Traffic Volumes

7.8.2 Stage 5 – IN-09 Analysis

While Stage 5 will not increase traffic volumes in the existing rural residential section of Flanagans Drive beyond the Stage 4 volumes, the Stage 5 development will substantially increase the traffic volumes at the southern end of Flanagans Drive including at the Flanagans Drive/Bacchus Marsh Road intersection (IN-09).

The intersection layout which can accommodate Stage 4 is not sufficient to accommodate the Stage 5 traffic. In order to determine a layout which will accommodate Stage 5 traffic, an iterative approach was undertaken.

The layout shown in Figure 40 below will accommodate the Stage 5 traffic.

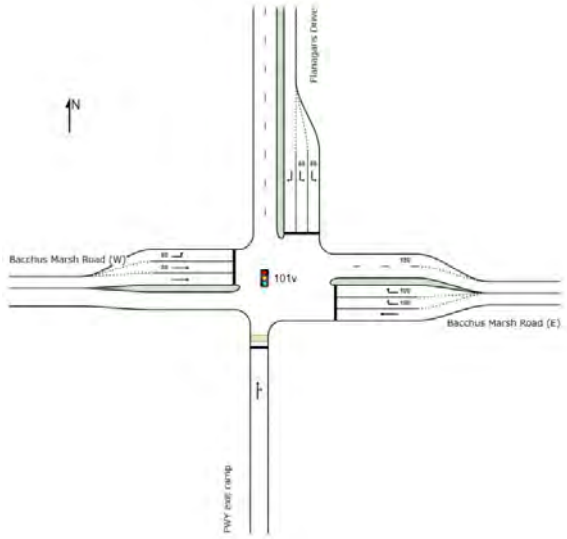


Figure 40: Modified Layout – Flanagans Drive/Bacchus Marsh Road (IN-09) (Ultimate)

The SIDRA output is summarised in Table 24 below.

Table 24: Flanagans Drive/Bacchus Marsh Road (IN-09) STAGE 5 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Freeway Exit Ramp (S)	0.434	0.681	67.8 sec	67.2sec	19.0m	40.3m
Bacchus Marsh Rd (E)	0.766	0.742	50.9 sec	39.8 sec	153.2m	107.0m
Flanagans Drive (N)	0.833	0.796	43.2 sec	52.7 sec	226.2m	138.0m
Bacchus Marsh Rd (W)	0.847	0.687	43.0 sec	30.5 sec	122.5m	134.7m

Table 24 indicates that the Flanagans Drive/Bacchus Marsh Road (IN-09) intersection will operate within acceptable limits as a signalised intersection based on the lane configurations shown in Figure 30, at the completion of development Stage 5.

7.9 Stage 6

Stage 6 will deliver approximately 276 dwellings and provide the O'Connell Road/Lerderderg Park Road connection. For the purpose of analysis, it has been assumed that all traffic generated by Stage 6 with an external destination will access the arterial road network via Lerderderg Park Road link to Gisborne Road.

Table 25 below shows the distribution of Stage 6 traffic based on the following assumptions:

- Melbourne CBD & Inner Suburbs: 50% via DR-Coi Road, 50% via Western Fwy
- Northern suburbs: 50% via DR-Coi Road, 50% via Western Fwy
- All other destinations: 100% to/from south via Gisborne Rd

Table 25: Traffic Distribution for Stage 6

Place of Work - Region	No. of Jobs	Share (%)	Gisborne Rd (South)	Gisborne Rd (North)
Bacchus Marsh	6,700	0.6	0.6%	-
Ballan, Ballarat and Surrounds	62,800	5.6	5.6%	-
Greater Geelong and Surrounds	90,700	8.1	8.1%	-
Melbourne CBD and Inner Suburbs	473,300	42.1	21.0%	21.0%
Melbourne East and Southeast	100	0.0	0.0%	-
Melton	15,100	1.3	1.3%	-
Northern Melbourne Suburbs and North Central Victoria	223,300	19.8	9.9%	9.9%
Western Melbourne Suburbs	253,500	22.5	22.5%	-
TOTAL	**1,125,500**	**100.0**	**69.1%**	**30.9%**

Table 25 indicates that the Stage 6 traffic will be split 69.1% to/from the south and 30.9% to/from the north.

7.9.1 Stage 6 – Design Volumes

Based on the preceding assumptions, the “design” peak hour Stage 6 traffic volumes at the Gisborne Road/Lerderderg Park Road intersection are shown in Figure 41 below. These design volumes include a 10% background growth rate on surveyed arterial road volumes, consistent with the Stages 1 – 5 analysis.

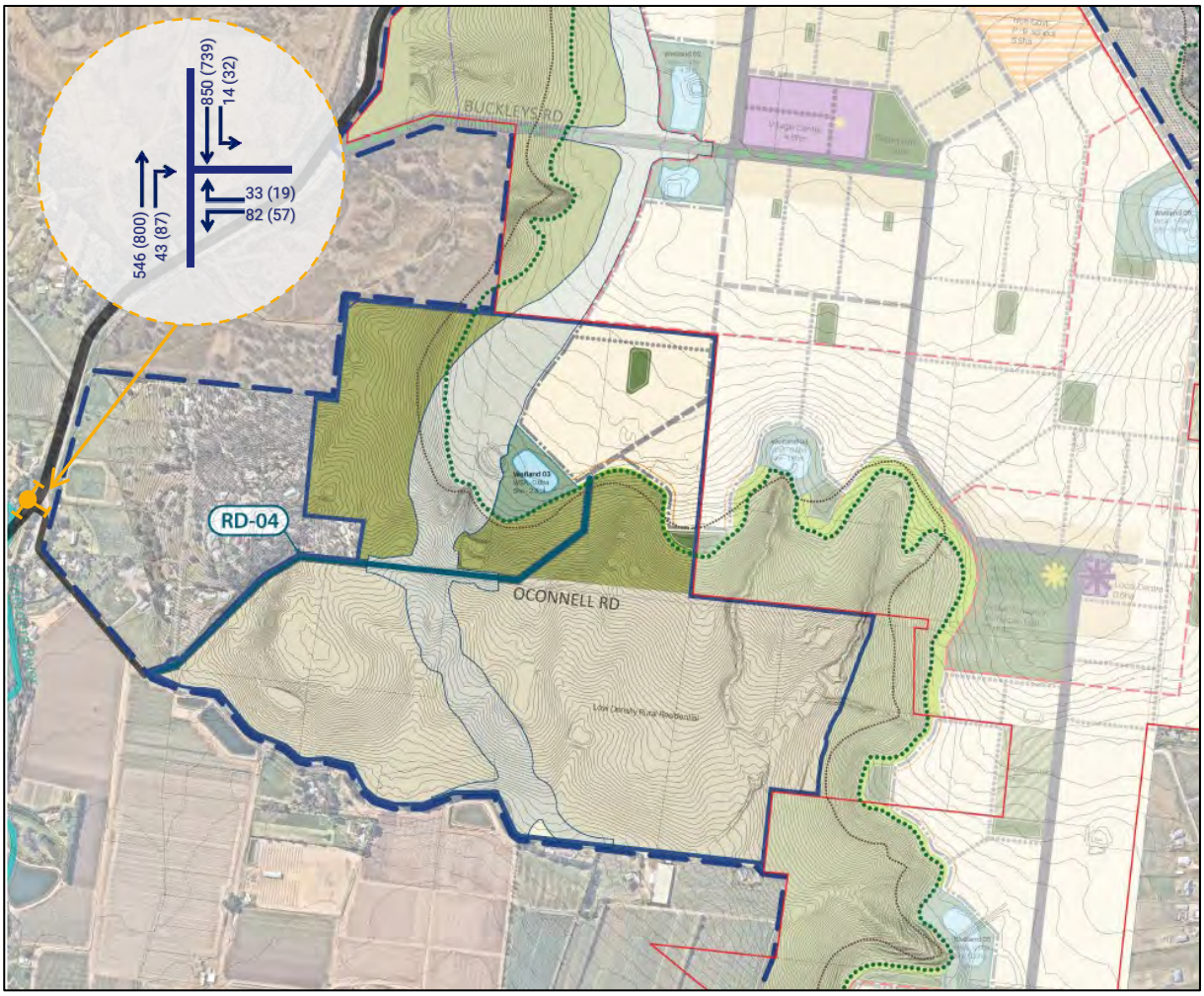


Figure 41: Design Stage 6 AM(PM) Peak Hour Traffic Volumes

7.9.2 Stage 6 – Gisborne Road/Lerderderg Park Road Analysis

In the vicinity of Lerderderg Park Road, Gisborne Road is configured with one traffic lane in each direction and there are no auxiliary turn lanes. The posted speed limit on Gisborne Road is 60kph. There is no room to construct a right turn lane into Lerderderg Park Road due to the proximity to the existing bridge across Lerderderg River. Notably, any widening of Gisborne Road at this location would be prohibitively expensive.

Accordingly, for the purpose of analysis, the existing intersection configuration has been adopted.

The SIDRA output is summarised in Table 26 below.

Table 26: Gisborne Road/Lerderderg Park Road STAGE 6 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Gisborne Rd (S)	0.404	0.608	2.9 sec	4.7 sec	11.6m	34.0m
Lerderderg Park Rd	0.445	0.338	21.7 sec	21.9 sec	11.4m	7.6m
Gisborne Rd (N)	0.497	0.443	0.3 sec	0.4 sec	0.0m	0.0m

Table 26 indicates that the Gisborne Road/Lerderderg Park Road intersection will operate within acceptable limits with the current layout.

It is noted that at times during the PM peak hour there may be a poor level of service for the right turn out movement from Lerderderg Park Road heading north along Gisborne Road. It is likely that if delays are lengthy, vehicles may turn left out instead or take an alternative route.

7.10 Stage 7

Stage 7 will release rural residential land east of the established rural residential subdivision areas, and will include provision of a 150m fire buffer setback area and conservation biolink corridors to Long Forest.

A total of 70 rural residential lots will be delivered in Stage 7, contributing in the order of 490 total daily vehicle trips on the road network of which 392vpd will be external traffic. This corresponds to approximately 1% of the total external traffic generated by the PSP.

This additional traffic is negligible in the context of the overall PSP traffic, and there is adequate capacity within each of the PSP intersections to accommodate the Stage 7 traffic without any additional mitigating works.

Access to Stage 7 will be available via Drysdale Court and Davies Court (off Flanagans Drive north) and via Possumtail Run as shown in Figure 42 below.

Notably, the existing sealed rural residential configuration of Flanagans Drive north of Lindsay Avenue will be adequate to accommodate the additional traffic generated by Stage 7.

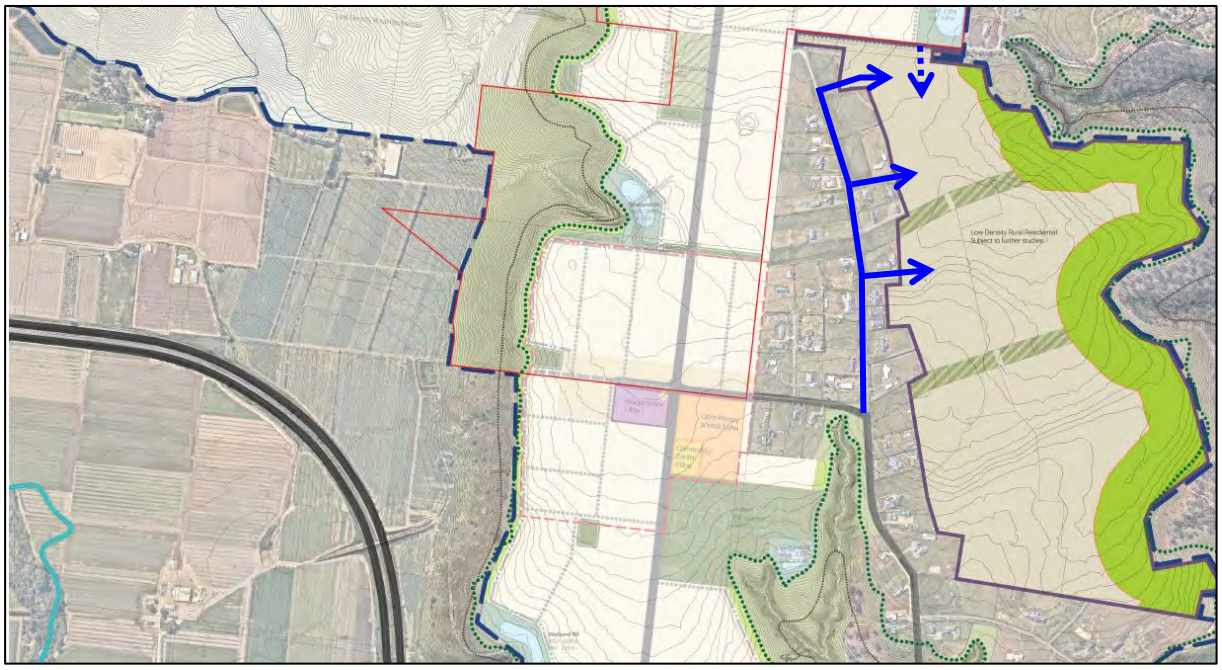


Figure 42: Stage 7 Access

7.11 Flanagans Drive Interim Connectivity

The existing road network within the Merrimu PSP area includes:

- a sealed section of Bences Road at the northern end of the PSP area providing access to established low density residential dwellings in Dodemaide Circuit and having sealed access to the arterial road network via Diggers Rest-Coimadai Road to the north,
- a sealed road network at the southern part of the PSP area comprising Flanagans Drive, Lindsay Avenue, Tucker Court and Davies Court providing access to established low density residential dwellings and having sealed access to the arterial road network via Bacchus Marsh Road to the south, and
- Possumtail Run (sealed) providing access to established low density residential dwellings and the Sunnystones Country Retreat and taking access to the broader arterial road network via unsealed rural road connections (Bences Road and Flanagans Drive).

The southern section of the Bences Road reservation is unconstructed, and there is currently a 2.3km (approx.) unsealed connection between the sealed sections of Bences Road and Flanagans Drive which includes an informal connection across private property (not within a road reservation).

The informal connection includes 50kph speed limit signage. It is noted that Bences Road is currently signed as “No Through Road” to the south of Buckleys Road, however Google Maps recognises the route extending across private land at the northern end of Flanagans Drive and directs drivers to use that route if it is the shortest. It is proposed that for Stage 1 the existing north-south unsealed rural route will be retained in its current form and will continue to provide access to existing established low density residential areas in Flanagans Drive, Possumtail Run and Dodemaide Circuit.

The Stage 1 Merrimu PSP development will not connect to this route, except to allow for local traffic access, as shown in the diagram below.

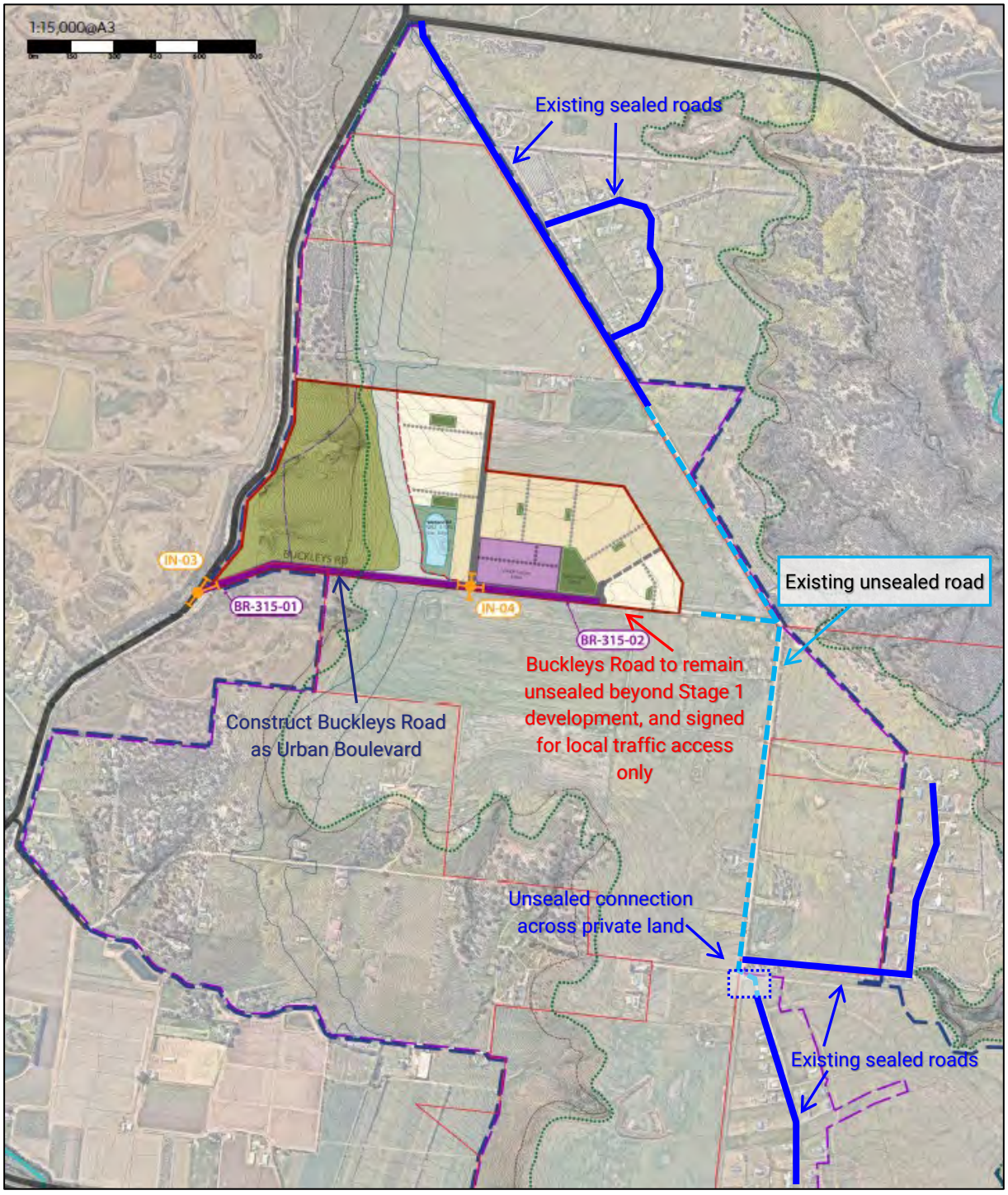


Figure 43: Stage 1 Road Network Connectivity

As part of Stage 2 of the PSP, Buckleys Road east of the village centre will be absorbed into the developable area of the PSP, with a replacement link to Bences Road provided slightly to the north as shown in Figure 44 below.

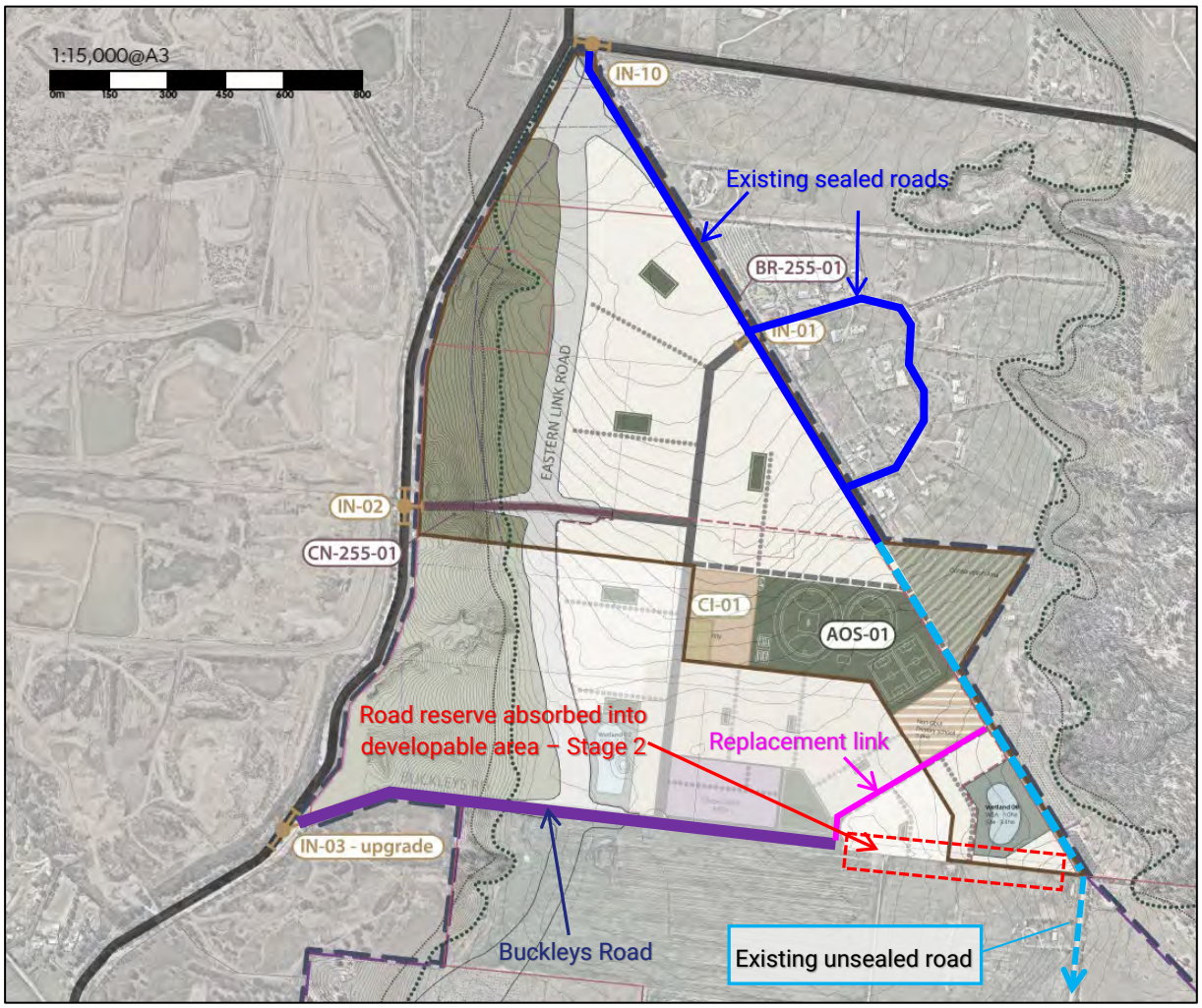


Figure 44: Stage 2 Road Network Connectivity

In PSP development stages 2 and 3, Buckleys Road will connect to Bences Road via the replacement link, giving PSP traffic the potential option to use the existing unsealed route along Bences Road to Flanagans Drive.

Notably, PSP development stages 2 and 3 will directly abut Bences Road and the northern section between IN-01 and IN-10 will be upgraded to a connector road.

The PSP does not preclude the existing Bences Road reservation being retained for its full length between Dodemaide Circuit and Buckleys Road, however an alternative higher order road connection will be provided at Stage 2 and it is anticipated that some parts of Bences Road will be discontinued to through traffic to minimise PSP traffic impacts on existing established low density residential areas and also to minimise the potential for external traffic to use the Merrimu PSP area as a bypass or cut-through.

Travel time surveys indicate that for the majority of traffic generated by Stages 1, 2 and 3, the Gisborne Road and Bences Road/Diggers Rest-Coimadai Road routes will remain the most attractive routes even if the existing Bences Road/Flanagans Drive route is accessible from the PSP area. For some trips towards Melton and Geelong from the south-eastern corner of Stage 2, the Flanagans Drive route will be faster.

It is not proposed to seal or upgrade the unsealed section of Bences Road or the connection between Bences Road and Flanagans Drive, as it is not desirable to encourage PSP traffic to use that route which passes existing established low density residential development.

For the purpose of analysis, a sensitivity test has been undertaken to determine the potential impacts of PSP traffic using the existing Bences Road/Flanagans Drive route, assuming:

- 15% of Stages 1, 2 and 3 traffic overall will use the Bences Road/Flanagans Drive connection to Bacchus Marsh Road, and
- Traffic distribution for the Stages 1, 2 and 3 traffic at Flanagans Drive/Bacchus Marsh Road intersection will be consistent with the Stage 4 distribution.

The SIDRA output for the Flanagans Drive/Bacchus Marsh Road (IN-09) intersection based on this scenario is summarised in Table 27 below.

Table 27: Flanagans Drive/Bacchus Marsh Road (IN-09) STAGE 5 – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Bacchus Marsh Rd (E)	0.253	0.332	1.1 sec	3.7 sec	3.3m	10.6m
Flanagans Drive (N)	0.328	0.309	14.0 sec	19.2 sec	10.2m	8.2m
Bacchus Marsh Rd (W)	0.306	0.447	0.6 sec	0.9 sec	0.0m	0.0m

Table 27 indicates that the Flanagans Drive/Bacchus Marsh Road (IN-09) intersection will operate within acceptable limits with its current STOP-controlled configuration at the completion of Stage 3 of the Merrimu PSP.

The indicative two-way daily traffic volumes based on the above scenario which assumes that 15% of Stage 1, 2 and 3 traffic utilises the existing Flanagans Road/Bences Road connection are as follows:

- approx. 2,100vpd at the northern end of Flanagans Drive (past existing established low density residential development), and
- approx. 2,850vpd at the southern end of Flanagans Road in proximity to Bacchus Marsh Road.

It is noted that the figure of 15% of Stage 1, 2 and 3 traffic utilising Flanagans Road is highly conservative, exceeding the likely peak hour volumes based on the economic analysis and travel time surveys, and has been tested to demonstrate that the existing Flanagans Drive/Bacchus Marsh Road intersection configuration will continue to operate well within acceptable limits without the need for any upgrades for the first three development stages of the Merrimu PSP even under a highly conservative “worst case” assessment.

The actual two-way daily traffic volumes on the northern section of Flanagans Drive past existing established low density residential properties is likely to remain well below 2,000vpd and is appropriate for the existing road classification and cross-section.

Stage 4 will deliver an alternative higher order road network route to the west of the existing unmade Bences Road reservation, allowing the existing informal roadway connection across private property at the northern end of Flanagans Drive to be discontinued. This will result in the traffic volumes on Flanagans Drive north of Lindsay Avenue reverting to current (pre-PSP) volumes.

7.12 Key Internal Intersections

7.12.1 IN-01 Analysis

Intersection IN-01 is currently a rural GIVE-WAY controlled T-intersection at Bences Road/Dodemaide Circuit (North).

It is proposed to upgrade IN-01 to a four-way cross-intersection providing access to the PSP area. The predominant traffic movement will be between Bences Road (north) and the new North-South Connector Road which will provide access to the proposed town centre, government primary school and community centre.

A SIDRA analysis has been undertaken based on the following assumptions:

- 400vpd on Dodemaide Circuit,
- 1,200vpd on Bences Road south of IN-01,
- 8,600vpd on the Bences Road north of IN-01,
- 7,600vpd on the North-South Connector, and
- 10% of daily traffic occurring during the road network peak hours.

A roundabout configuration has been adopted for the purpose of the SIDRA analysis, noting that alternative configurations which adequately provide for the dominant traffic movement between Bences Road and the North-South Connector will not provide a safe arrangement for the existing minor legs. Figure 45 below shows the "design" AM and PM peak hour traffic volumes for IN-01 and Figure 46 shows the indicative intersection configuration adopted in SIDRA.

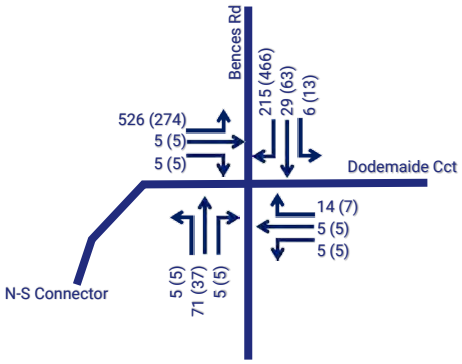


Figure 45: IN-01 Design AM (PM) Peak Hour Volumes

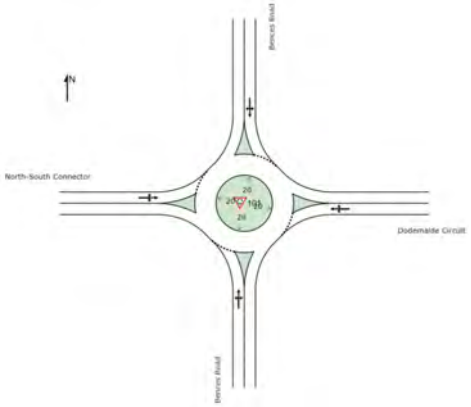


Figure 46: IN-01 Adopted Intersection Layout

The SIDRA output is summarised in Table 28 below.

Table 28: Bences Road/Dodemaide Circuit/Connector (IN-01) Ultimate – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Bences Road (SE)	0.076	0.053	5.5 sec	7.1 sec	2.7m	2.0m
Dodemaide Circuit	0.023	0.020	7.9 sec	8.8 sec	0.8m	0.7m
Bences Road (NW)	0.169	0.354	8.1 sec	8.1 sec	6.7m	17.2m
N-S Connector	0.413	0.211	4.5 sec	4.2 sec	21.8m	9.4m

Table 28 indicates that intersection IN-01 will operate within acceptable limits as a roundabout under ultimate full build-out conditions.

Intersection IN-01 will be delivered in PSP Development Stage 2.

7.12.2 IN-04 Analysis

Intersection IN-04 is a new cross-intersection on Buckleys Road which will be built as part of Stage 1 of the Merrimu PSP. The northern leg will be a new North-South Connector which will provide the primary connection between the Town Centre and Bences Road. The southern leg will be a local residential access street.

A SIDRA analysis has been undertaken based on the following assumptions:

- 2,000vpd on the south leg (local residential access street),
- 8,500vpd on the east leg (Buckleys Road within the town centre),
- 6,800vpd on the west leg (Buckleys Road connection to Gisborne Road),
- 10,700vpd on the north leg (North-South Connector), and
- 10% of daily traffic occurring during the road network peak hours.

The traffic volume estimates are based on the external traffic volume analysis and also allow for 70% of the total "internal capture" to pass through intersection IN-04, accessing the northern town centre and schools.

The intersection has been modelled in SIDRA as a signalised intersection. Notably, signals are preferred over a roundabout at IN-04 due to its location within the town centre, with signals providing opportunities for pedestrians to cross safely.

Figure 47 below shows the "design" AM and PM peak hour traffic volumes for IN-04 and Figure 48 shows the indicative intersection configuration adopted in SIDRA.

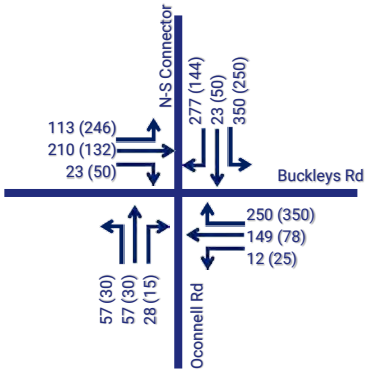


Figure 47: IN-04 Design AM (PM) Peak Hour Volumes

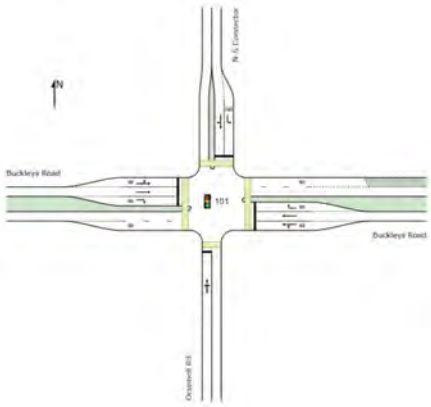


Figure 48: IN-04 Adopted Intersection Layout

The SIDRA output is summarised in Table 29 below.

Table 29: Buckleys Road/Connector (IN-04) Ultimate – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Oconnell Road Extn.	0.505	0.267	54.5 sec	52.0 sec	58.2m	29.4m
Buckleys Road (E)	0.734	0.788	53.8 sec	61.1 sec	109.8m	153.8m
N-S Connector	0.725	0.800	47.3 sec	58.0 sec	144.2m	116.0m
Buckleys Road (W)	0.739	0.789	54.6 sec	54.1 sec	94.6m	113.1m

Table 29 indicates that intersection IN-04 will operate within acceptable limits as a signalised intersection based on the layout shown in Figure 46 under ultimate full build-out conditions.

Intersection IN-04 will be delivered in PSP Development Stage 1.

7.12.3 IN-05 Analysis

Intersection IN-05 is a new T-intersection on the Central Connector Road which will be built as part of Stage 4 of the Merrimu PSP.

The western and southern legs are on the primary connector route through the PSP which connects between Buckleys Road and Flanagans Drive. The eastern leg will be a higher order local access street.

A SIDRA analysis has been undertaken based on the following assumptions:

- 2,000vpd on the east leg (local residential access street),
- 9,800vpd on the west and south legs (connector route), and
- 10% of daily traffic occurring during the road network peak hours.

The intersection has been modelled in SIDRA as a signalised intersection. Notably, signals are preferred over a roundabout at IN-05 due to its location within a local neighbourhood centre, with signals providing opportunities for pedestrians to cross safely.

Figure 49 below shows the "design" AM and PM peak hour traffic volumes for IN-05 and Figure 50 shows the indicative intersection configuration adopted in SIDRA.

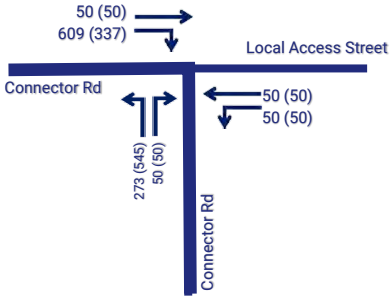


Figure 49: IN-05 Design AM (PM) Peak Hour Volumes

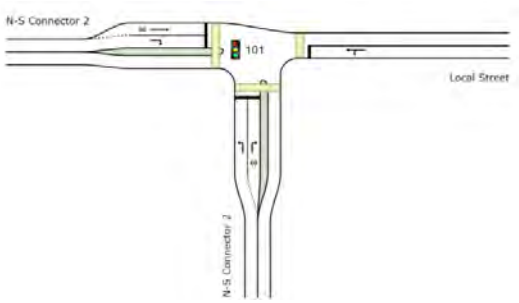


Figure 50: IN-05 Adopted Intersection Layout

The SIDRA output is summarised in Table 30 below.

Table 30: Connector Road/Local Access (IN-05) Ultimate – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Connector (W)	0.248	0.422	16.8 sec	14.8 sec	30.9m	85.2m
Local Street (E)	0.484	0.399	57.9 sec	54.4 sec	42.8m	41.2m
Connector (S)	0.595	0.349	27.8 sec	24.2 sec	163.3m	80.5m

Table 30 indicates that intersection IN-05 will operate within acceptable limits as a signalised intersection based on the layout shown in Figure 49 under ultimate full build-out conditions.

Intersection IN-05 will be delivered in PSP Development Stage 4.

7.12.4 IN-06 Analysis

Intersection IN-06 is a new cross-intersection which will be built as part of Stage 4 of the Merrimu PSP. The eastern leg is an extension of Lindsay Avenue and provides access between PSP Stage 4 and Flanagans Drive. The northern leg will be the primary connector route providing access to the Merrimu Town Centre on Buckleys Road. The western leg will be a local residential access street and the southern leg will be a future connector route extending through Stage 5 of the Merrimu PSP.

A SIDRA analysis has been undertaken based on the following assumptions:

- 4,000vpd on the south leg (PSP Stage 5 connector),
- 11,400vpd on the east leg (Lindsay Avenue extension),
- 12,600vpd on the north leg (central North-South Connector),
- 2,000vpd on the west leg (local residential access street), and
- 10% of daily traffic occurring during the road network peak hours.

The intersection has been modelled in SIDRA as a signalised intersection. Notably, signals are preferred over a roundabout at IN-06 due to its location within the southern local neighbourhood centre with a planned village centre on the southwest corner of the intersection and community facilities and a government primary school planned on the southeast corner of the intersection. Signals will provide opportunities for pedestrians including school children to cross safely.

Figure 51 below shows the "design" AM and PM peak hour traffic volumes for IN-06 and Figure 52 shows the indicative intersection configuration adopted in SIDRA.

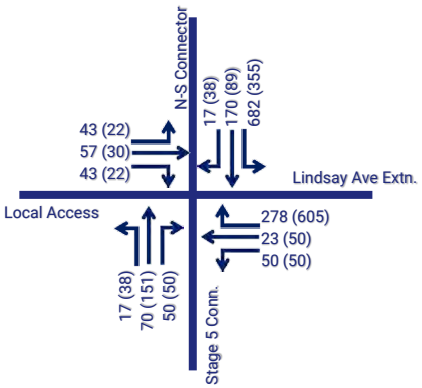


Figure 51: IN-06 Design AM (PM) Peak Hour Volumes

Figure 52: IN-06 Adopted Intersection Layout

The SIDRA output is summarised in Table 31 below.

Table 31: Lindsay Avenue Extension/Connector (IN-06) Ultimate – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Stage 5 Connector (S)	0.579	0.742	52.4 sec	60.4 sec	31.4m	84.7m
Linsay Avenue Extn.	0.417	0.774	32.8 sec	37.2 sec	90.3m	224.2m
N-S Connector (N)	0.601	0.440	23.4 sec	25.6 sec	167.6m	65.9m
Local Access (W)	0.609	0.315	57.7 sec	55.1 sec	61.5m	30.3m

Table 31 indicates that intersection IN-06 will operate within acceptable limits as a signalised intersection based on the layout shown in Figure 51 under ultimate full build-out conditions.

Intersection IN-06 will be delivered in PSP Development Stage 4.

7.12.5 IN-07 Analysis

Intersection IN-07 is the existing Flanagans Drive/Lindsay Avenue intersection. It is currently configured as a standard GIVE-WAY controlled T-intersection with north-south priority along Flanagans Drive. When PSP Stage 4 is constructed, there will be a significant increase in traffic on the western (Lindsay Avenue) and southern (Flanagans Drive) legs of the intersection.

The existing northern leg (Flanagans Drive) will continue to serve a small catchment of low-density residential dwellings. Stage 4 will also deliver an alternative connector route through the PSP area, allowing for the discontinuation of the current informal connection of Flanagans Drive to Bences Road across private property at the northern end of Flanagans Drive. Once the alternative route is in place, the northern low-density section of Flanagans Drive can revert to a dead-end, minimising any direct PSP traffic impacts on the existing dwellings in that area.

A SIDRA analysis has been undertaken based on the following assumptions:

- 12,000vpd on the Lindsay Avenue and Flanagans Drive (south) legs,
- 300vpd on the north leg (Flanagans Drive), and
- 10% of daily traffic occurring during the road network peak hours.

Taking into account the direction of the predominant traffic movements, the Flanagans Drive/Lindsay Avenue (IN-07) intersection has been modelled in SIDRA as a reverse priority T-intersection with GIVE-WAY control on the northern (Flanagans Drive) leg.

Figure 53 below shows the “design” AM and PM peak hour traffic volumes for IN-07 and Figure 54 shows the indicative intersection configuration adopted in SIDRA.

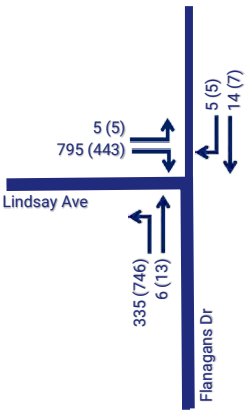


Figure 53: IN-07 Design AM (PM) Peak Hour Volumes

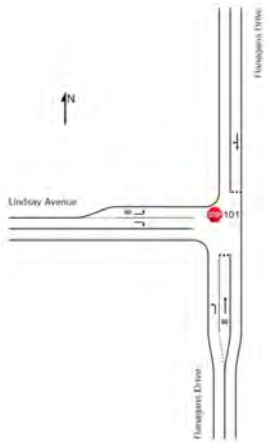


Figure 54: IN-07 Adopted Intersection Layout

The SIDRA output is summarised in Table 32 below.

Table 32: Lindsay Avenue/Flanagans Drive (IN-07) Ultimate – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Flanagans Drive (S)	0.197	0.438	5.7 sec	5.8 sec	0.3m	0.4m
Flangans Drive (N)	0.048	0.031	11.7 sec	11.6 sec	1.0m	0.6m
Lindsay Avenue	0.467	0.260	5.7 sec	5.6 sec	0.0m	0.0m

Table 32 indicates that intersection IN-07 will operate within acceptable limits as a GIVE-WAY controlled reverse priority T-intersection based on the layout shown in Figure 53 under ultimate full build-out conditions.

Intersection IN-07 will be delivered in PSP Development Stage 4.

7.12.6 IN-08 Analysis

Intersection IN-08 is a new T-intersection which will be built as part of Stage 5 of the Merrimu PSP, allowing for a second egress from the PSP to Flanagans Drive.

The escarpment connection is required to minimise the PSP impacts on existing Flanagans Drive and Lindsay Avenue properties and will ensure that the ultimate traffic volumes on Flanagans Drive and Lindsay Avenue remain within the capacity of a two-lane two-way road which fits within the existing road reservation and allows for continued direct property access to the existing lots.

A SIDRA analysis has been undertaken based on the following assumptions:

- 11,900vpd on the north leg (Flanagans Drive),
- 6,500vpd on the west leg (Escarpment Connector),
- 18,300vpd on the south leg (Flanagans Drive), and
- 10% of daily traffic occurring during the road network peak hours.

The intersection has been modelled in SIDRA as a signalised intersection.

Figure 55 below shows the “design” AM and PM peak hour traffic volumes for IN-08 and Figure 56 shows the indicative intersection configuration adopted in SIDRA.

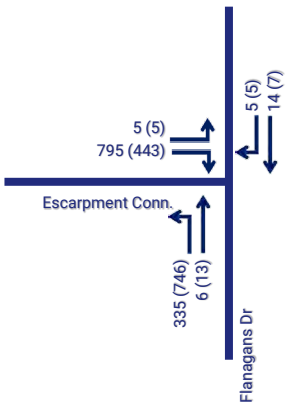


Figure 55: IN-08 Design AM (PM) Peak Hour Volumes

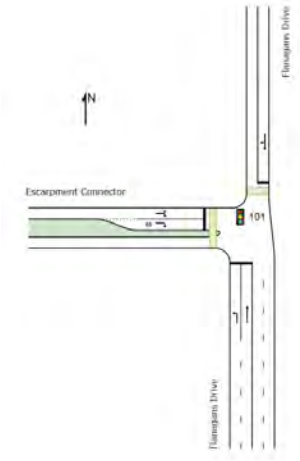


Figure 56: IN-08 Adopted Intersection Layout

The SIDRA output is summarised in Table 33 below.

Table 33: Flanagans Drive/Escarpment Connector Road (IN-08) Ultimate – SIDRA Output

Approach	DOS		Average Delay		95th Percentile Queue	
	AM	PM	AM	PM	AM	PM
Flanagans Drive (S)	0.269	0.544	8.3 sec	7.1 sec	47.1m	113.2m
Flanagans Drive (N)	0.641	0.327	9.6 sec	4.4 sec	162.9m	52.8m
Escarpment Connector	0.632	0.528	45.9 sec	51.0 sec	75.4m	42.4m

Table 33 indicates that the Flanagans Drive/Escarpment Connector Road (IN-08) intersection will operate within acceptable limits as a signalised intersection based on the lane configurations shown in Figure 55 under ultimate full build-out conditions.

8 Internal Road Network

8.1 Internal Daily Traffic Volumes

Figure 57 below shows the anticipated daily traffic volumes on the key internal road network.

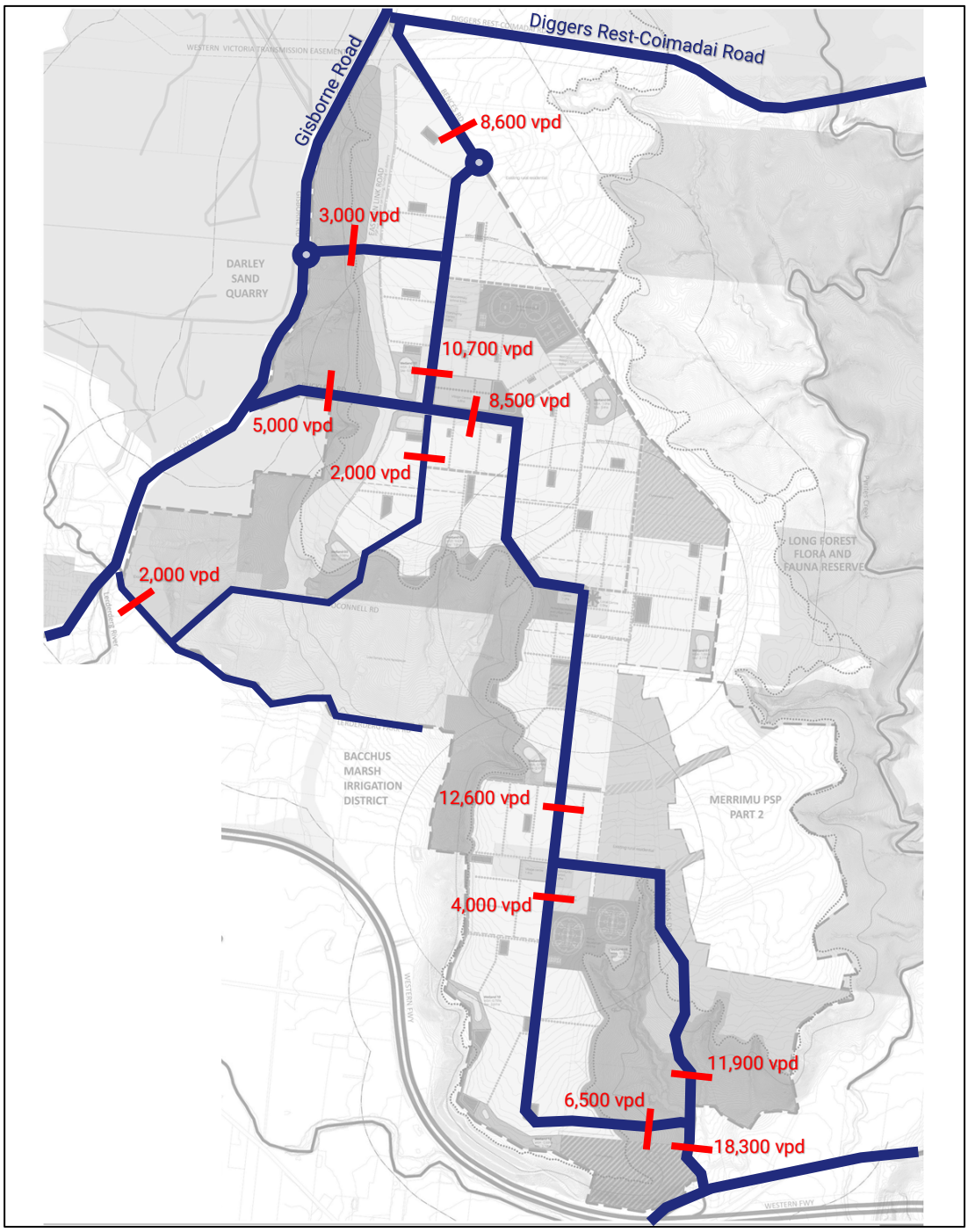


Figure 57: Ultimate Two-Way Daily Traffic Volumes

8.2 Road Hierarchy

Figure 58 below shows the proposed internal road hierarchy for the Merrimu PSP, having regard to the layout of the road network, key generators and anticipated traffic volumes.

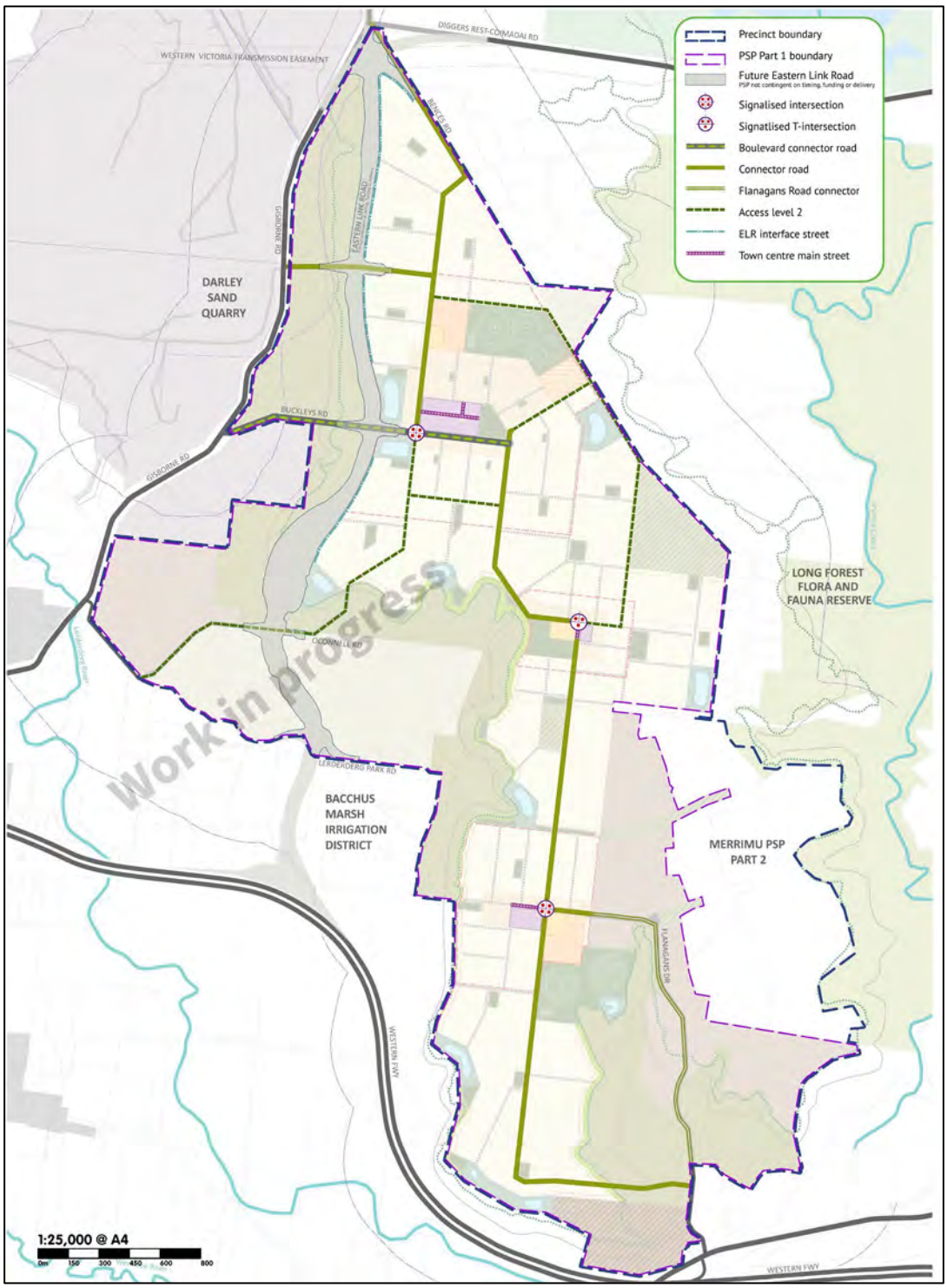


Figure 58: Road Hierarchy Plan

8.3 Cross Sections

Indicative cross-sections for new roads within the Merrimu PSP area are set out below. The adopted cross-sections are similar to those suggested in the IDM and also Clause 56.06 of the Moorabool Shire Planning Scheme.

Boulevard Connector Street – Buckleys Road (31.5m Reservation)

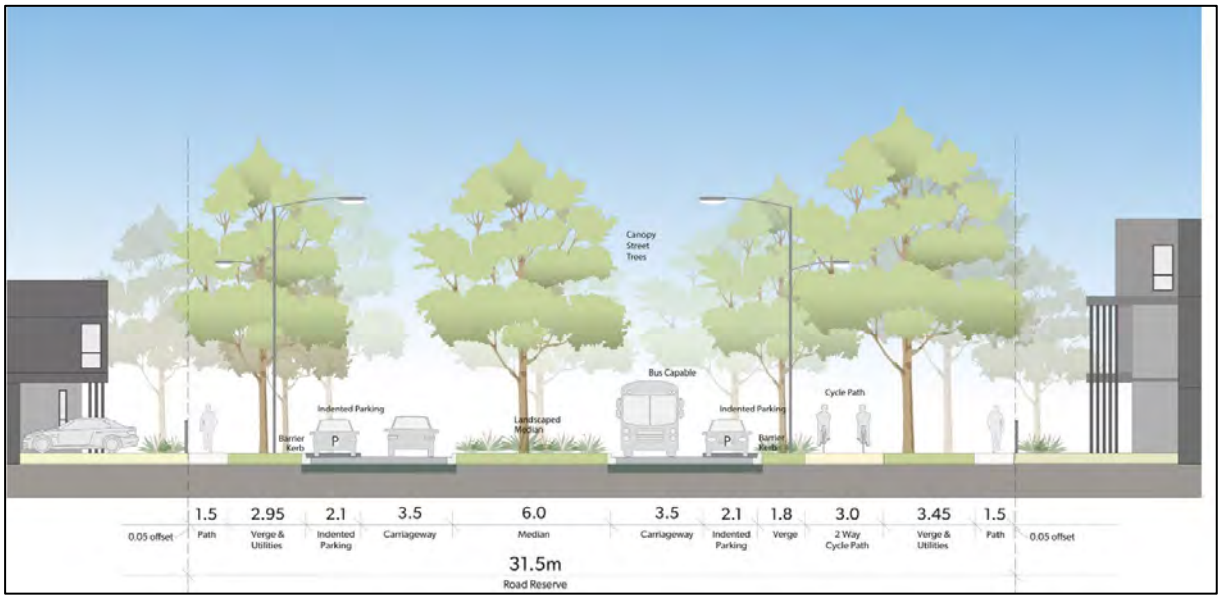


Figure 59: Boulevard Connector Street Cross-Section

Connector Street – Standard (25.5m Reservation)

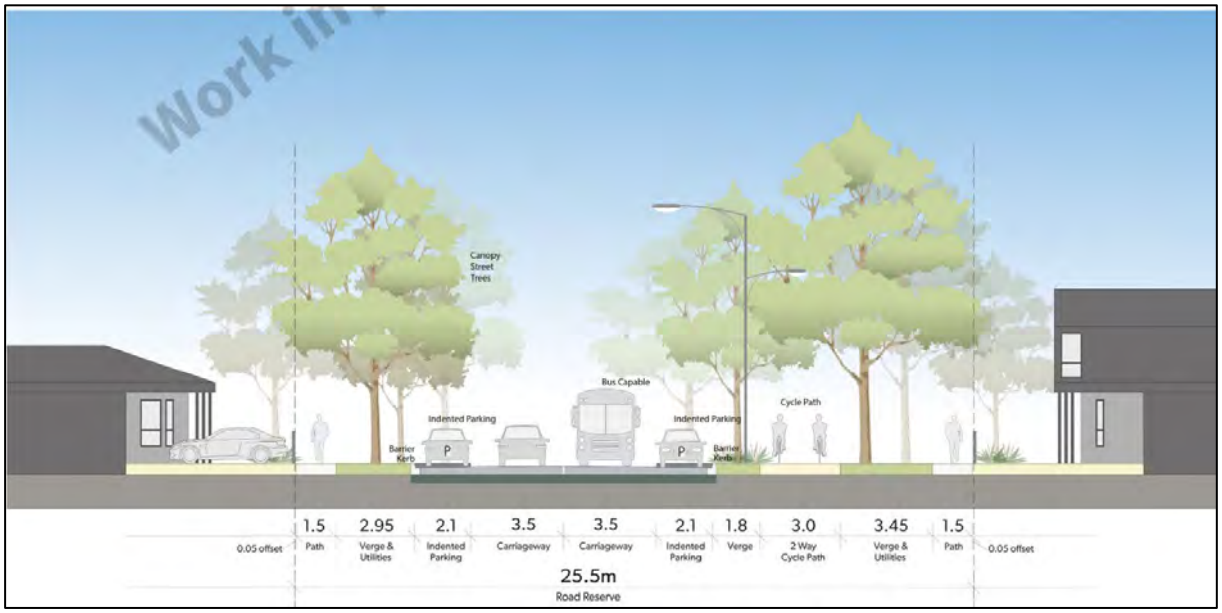


Figure 60: Standard Connector Street Cross-Section

Connector Street – Flanagans Drive Rural Connector (20.0m Existing Reservation)

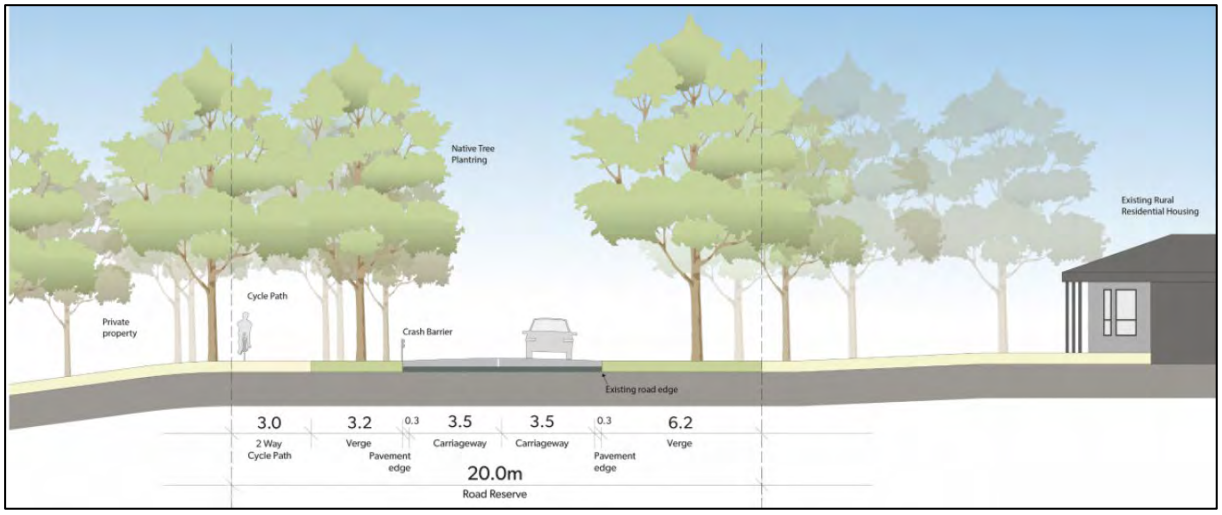


Figure 61: Rural Connector Street Cross-Section

Local Access Street – Standard (16.0m Reservation)

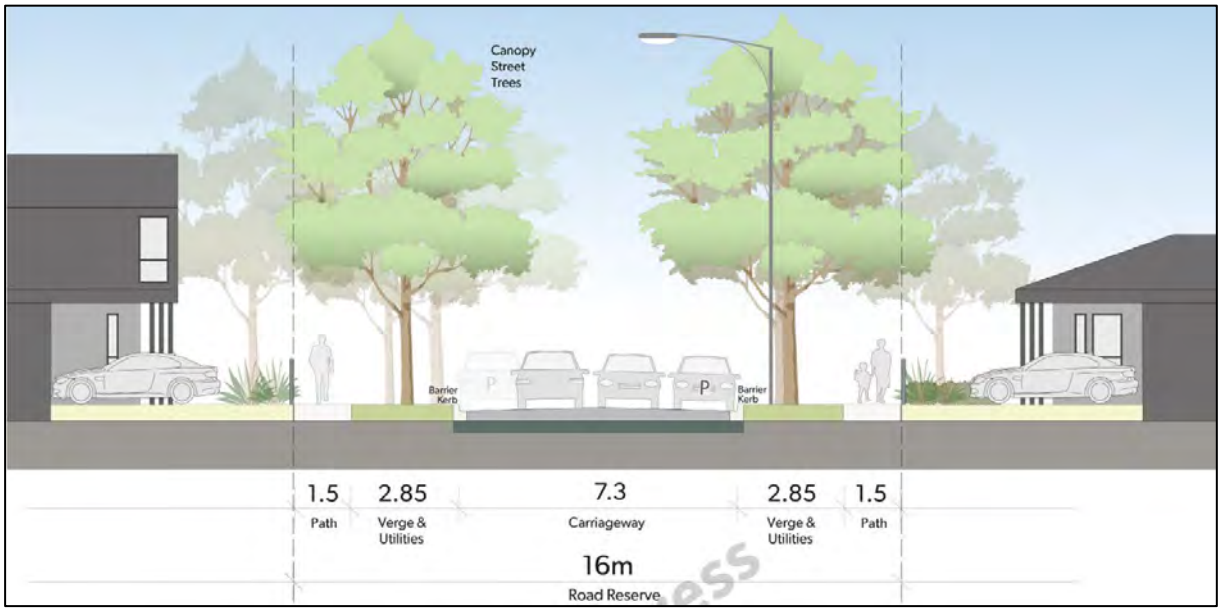


Figure 62: Standard Local Access Street Cross-Section

Local Access Street – Level 2 (21.0m Reservation)

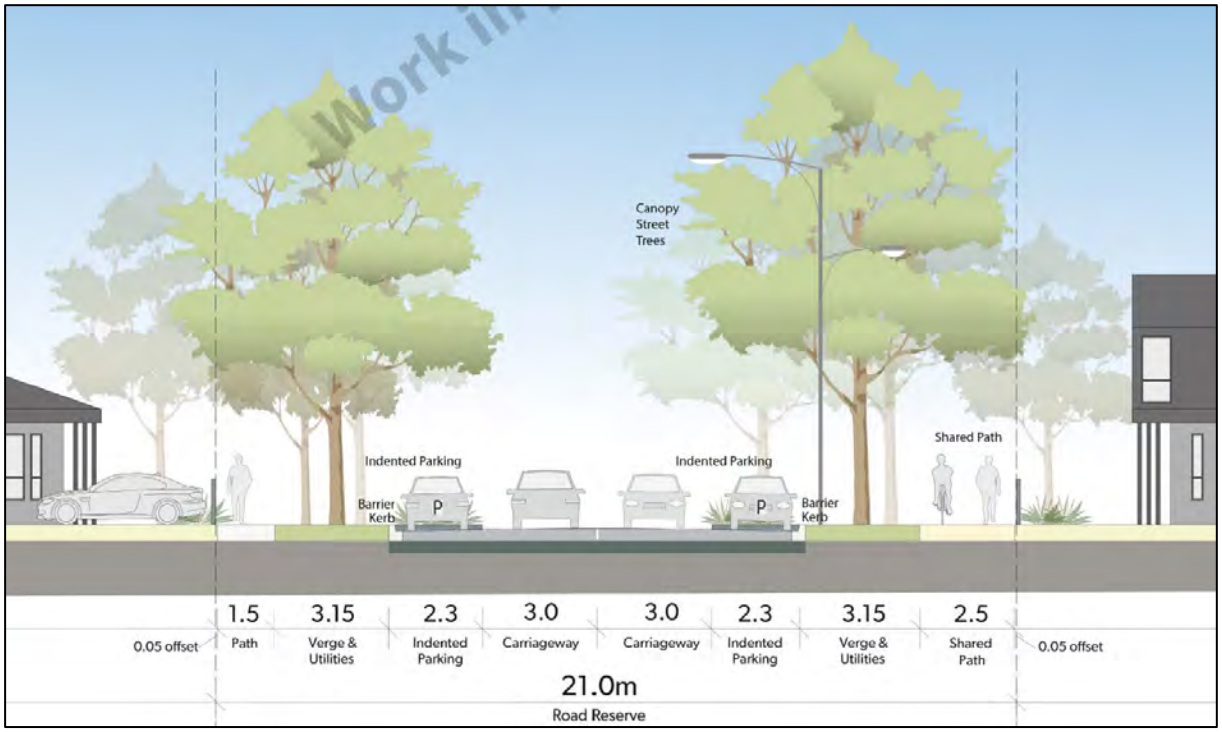


Figure 63: Level 2 Local Access Street Cross-Section

Local Access Street – Shared Path Avenue (18.5m Reservation)

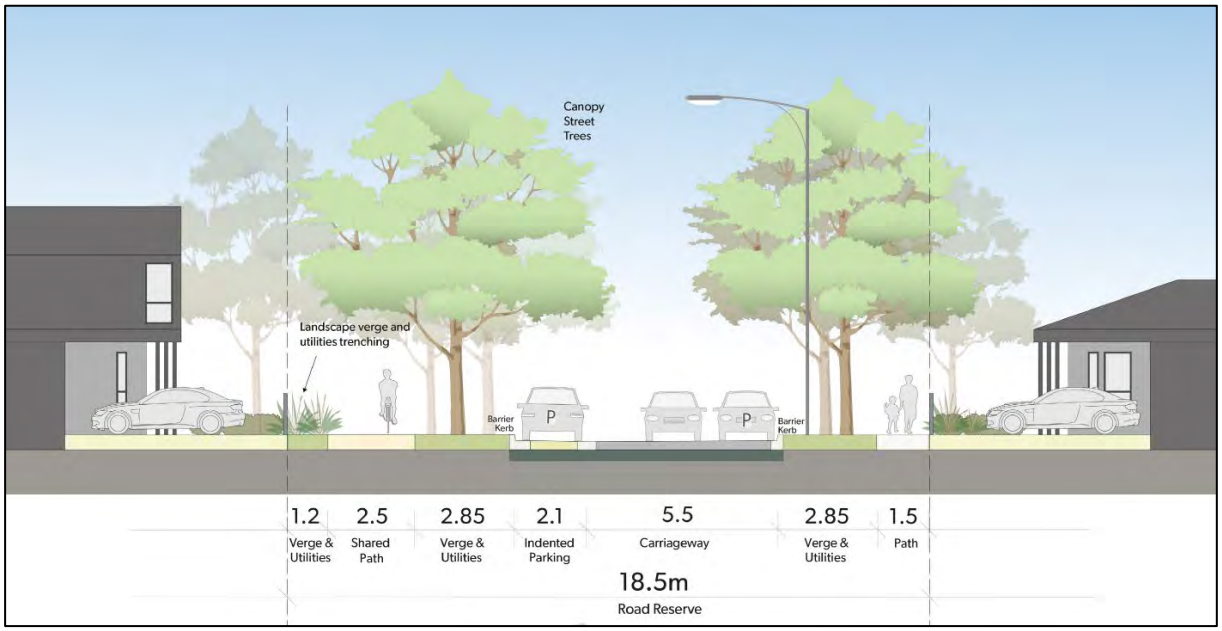


Figure 64: Shared Path Avenue Local Access Street Cross-Section

Local Access Street – Front Loaded Suburban Shade Street (16.0m Reservation)

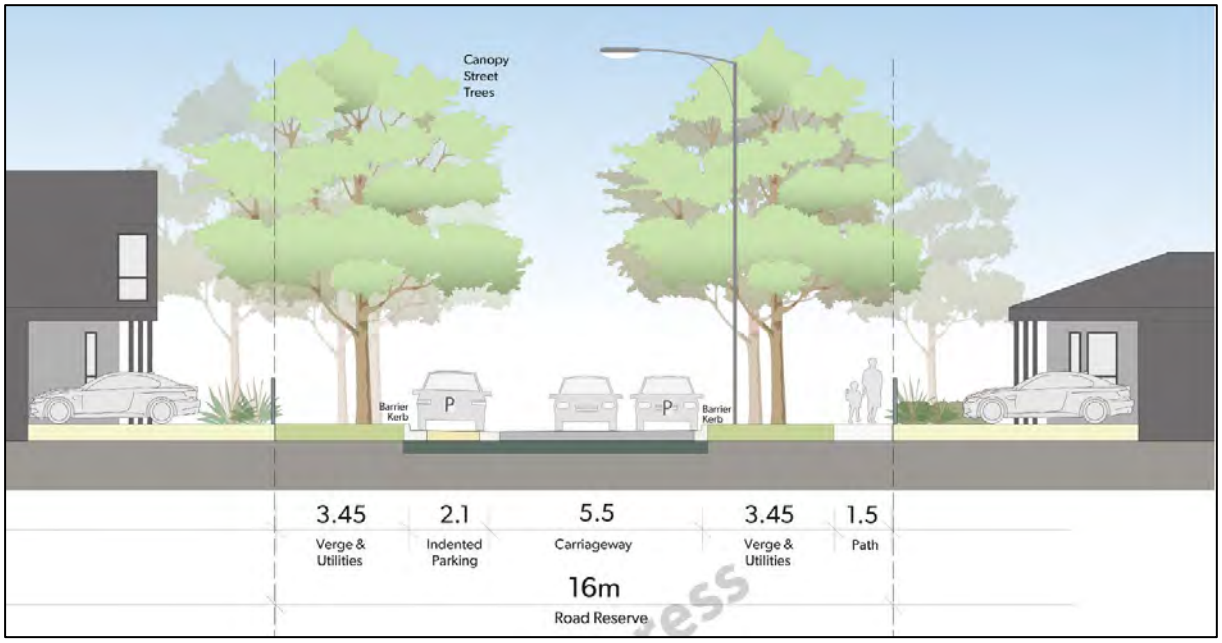


Figure 65: Suburban Shade Local Access Street Cross-Section

Local Access Street – Rear Loaded Urban Shade Street (16.0m Reservation)

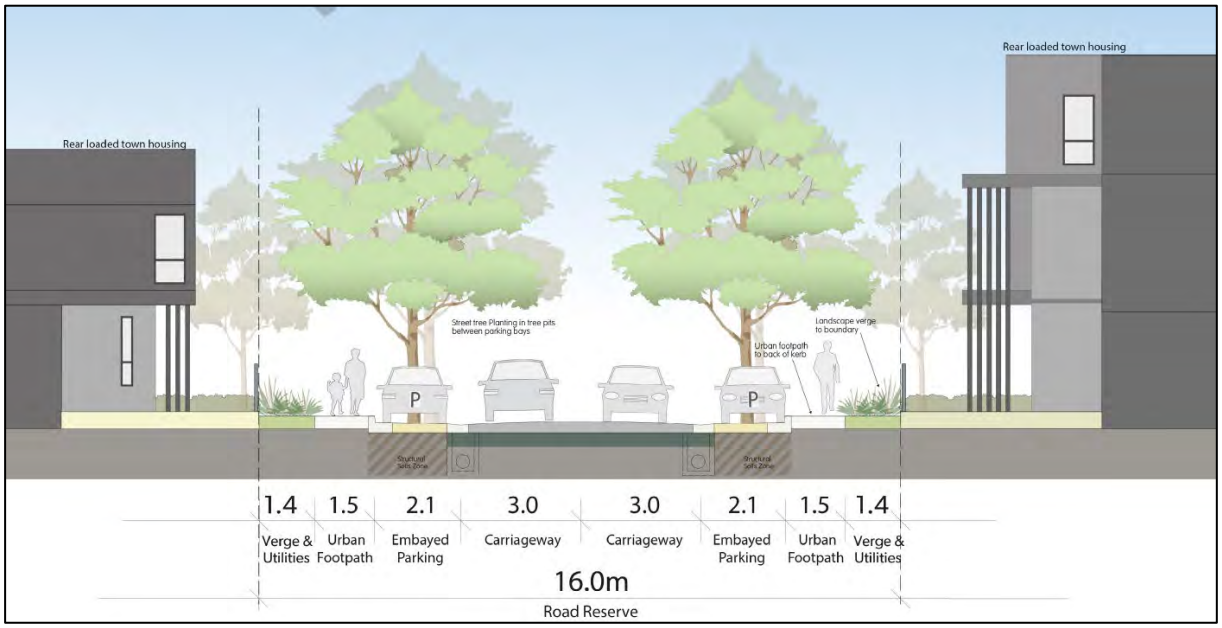


Figure 66: Rear-Loaded Urban Shade Local Access Street Cross-Section

Mixed Use Retail Street (20.0m Reservation)

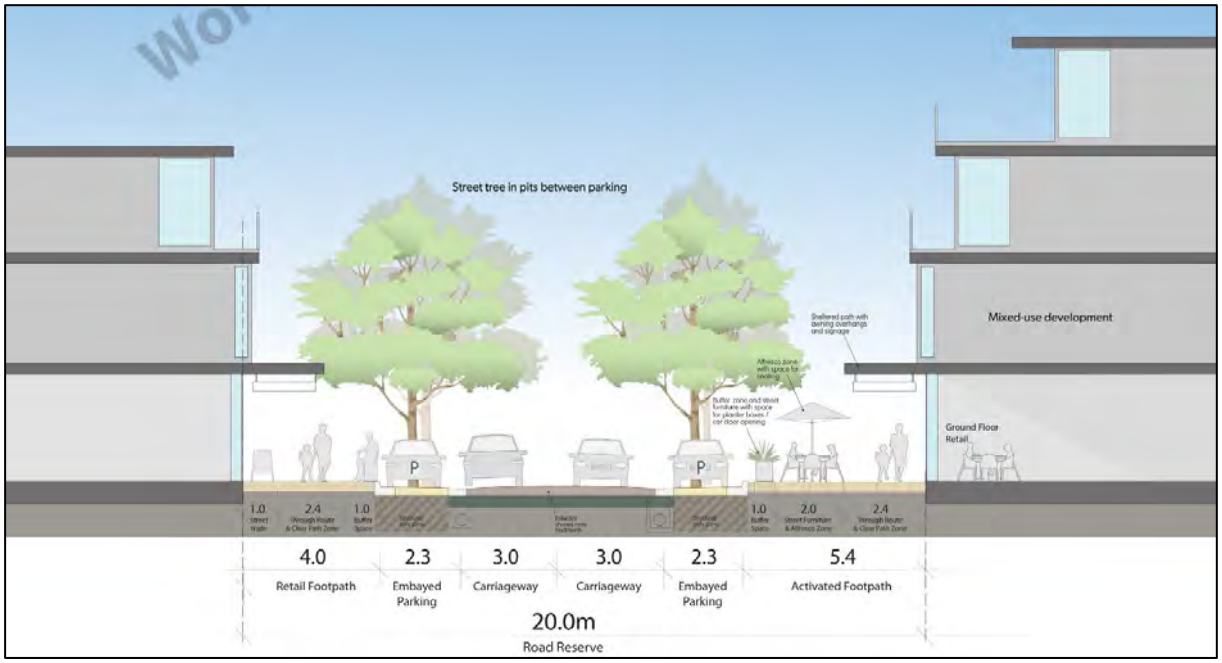


Figure 67: Mixed-Use Retail Street Cross-Section

Park Edge and ELR Interface (14.5m Reservation)

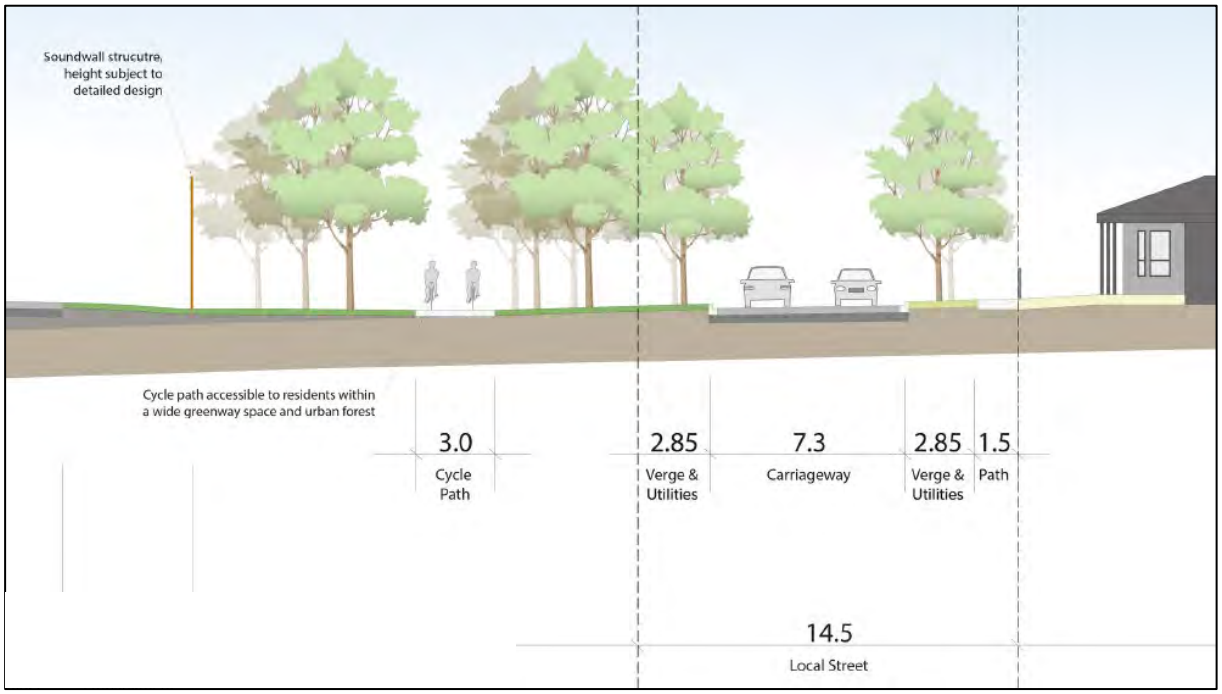


Figure 68: Park Edge and ELR Interface Local Street Cross-Section

Single Sided Laneway (7.0m Reservation)

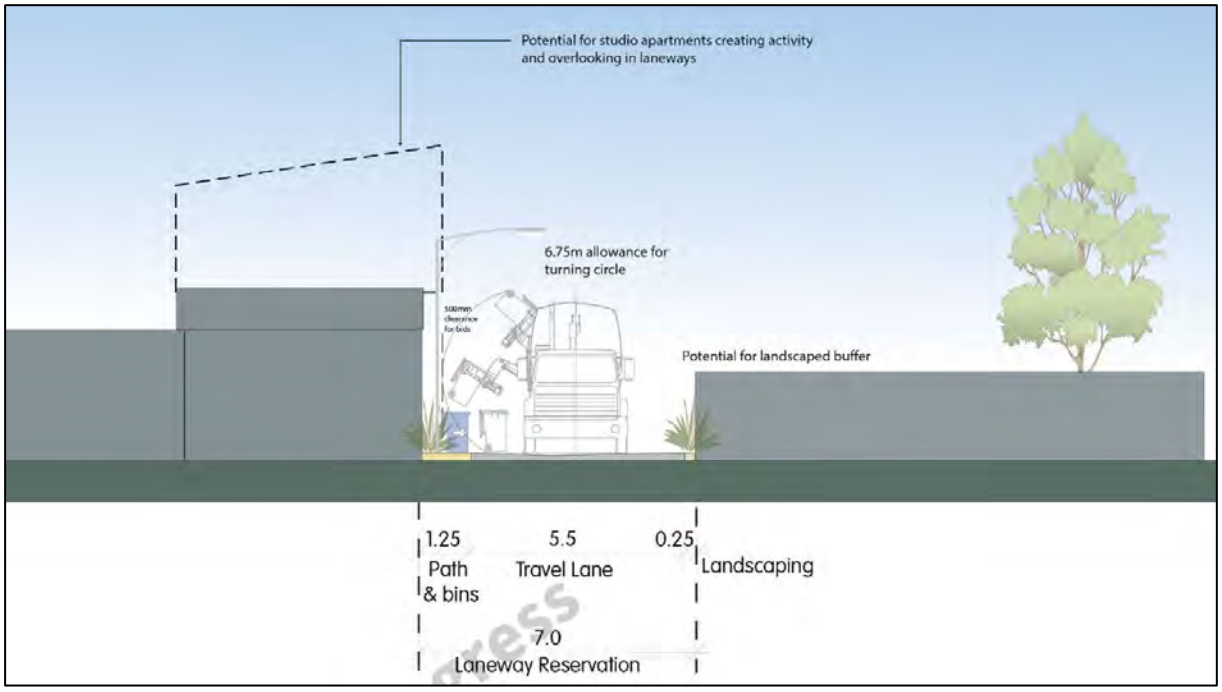


Figure 69: Single Sided Laneway Cross-Section

Double Sided Laneway (8.0m Reservation)

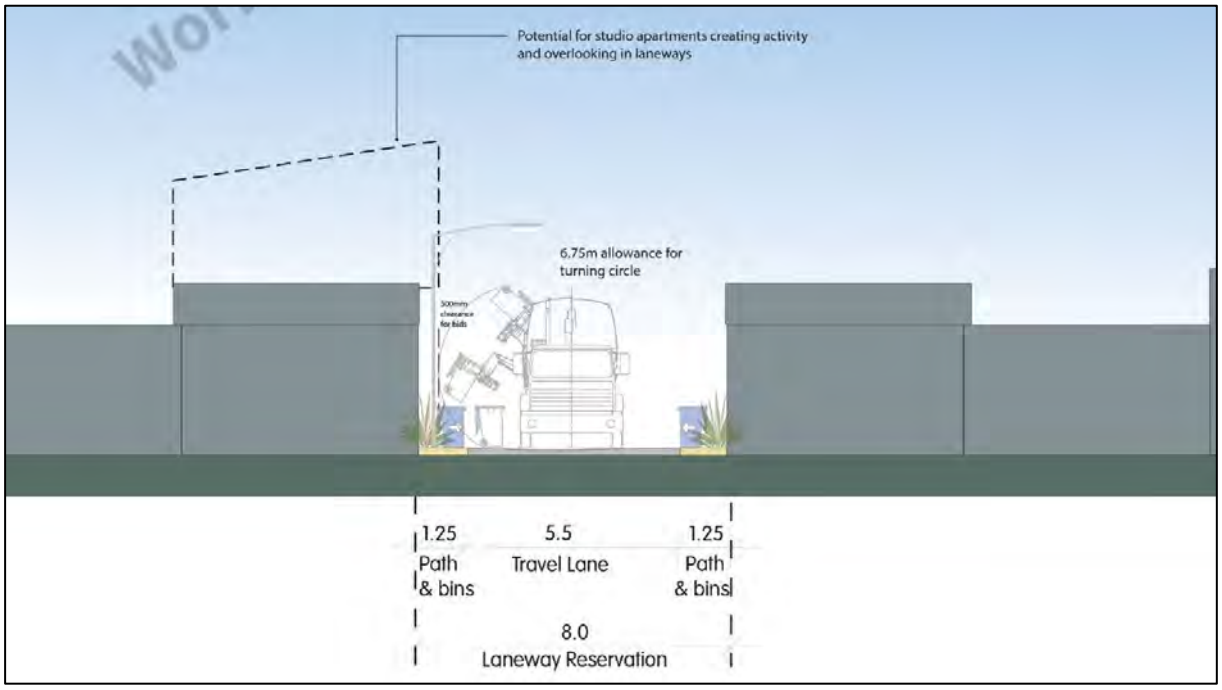


Figure 70: Double Sided Laneway Cross-Section

In some instances, the two-way daily traffic volumes on the connector roads will exceed the typical range for this street classification. Notably, the traffic generation and distribution assessments have been based on the full development of the Merrimu PSP without the Eastern Link Road (ELR) being in place due to the uncertainty in timing of the ELR construction.

In the ultimate, when the ELR is constructed, traffic volumes on the connector roads within the Merrimu PSP will be expected to significantly decrease. Accordingly, the proposed "connector" classification is appropriate for these internal routes.

Having regard to the ultimate ELR alignment and Gisborne Road as the preferred north-south arterial routes as well as the environmental restrictions on any future urban expansion to the east with the PSP abutting Long Forest Nature Conservation Reserve, the PSP higher order road network has been intentionally designed as connector roads with a number of 90-degree bends to discourage any external through traffic.

In order to accommodate the interim (no ELR) traffic volumes on the central connector road between Flanagans Drive and Buckleys Road, it is recommended that abutting properties be rear-loaded. Additionally, in the vicinity of local access street/connector street intersections, localised removal of kerbside parallel parking will allow for the provision of central auxiliary right turn lanes within the road carriageway to minimise delays to through traffic.

Limiting access to the rear of properties will ensure that the connector road can operate well in the absence of the ELR and will also be beneficial to the proposed two-way cycle path along one side of the connector road, minimising the number of car/cycle conflict points.

Court Bowls and T-Heads

The IDM requires that court bowls have a minimum radius of 10 metres, and a minimum reserve width of 28 metres. The VPA standard drawings allow a number of variations, with a desirable radius of 10.5 metres for a court bowl, as shown below, with these dimensions suitable to accommodate typical waste collection vehicles and emergency services.

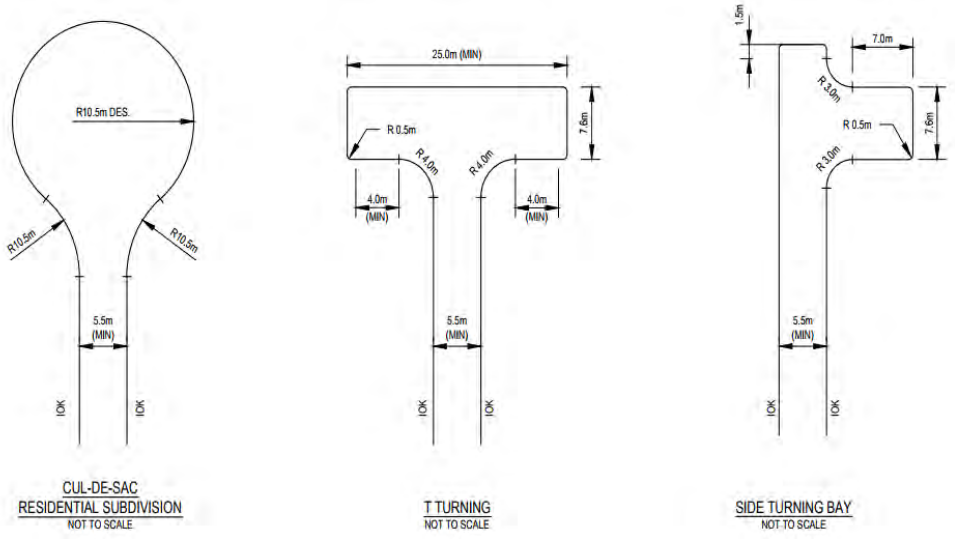


Figure 71: Dead-End Turn Around Treatments

9 Pedestrian and Bicycle Routes

Clause 56.06-2 of the Moorabool Planning Scheme sets out the following walking and cycling network objectives:

- *To contribute to community health and wellbeing by encouraging walking and cycling as part of the daily lives of residents, employees and visitors.*
- *To provide safe and direct movement through and between neighbourhoods by pedestrians and cyclists.*
- *To reduce car use, greenhouse gas emissions and air pollution.*

Standard C15 requires the walking and cycling network to 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 IDM allows an access place carrying less than 300 vehicle movements per day (i.e. a maximum of 30 dwellings) to have a 1.5m wide footpath on one side only.

The cross-sections shown at Section 7.3 include the following pedestrian and cycling facilities:

- footpaths on one side of front-loaded “suburban shade streets”,
- footpaths on both sides of all other local access streets, with the exception of streets which abut open space/waterway reserves, and
- two-way cycle paths on all connector streets, with separate pedestrian footpaths provided on both sides.

It is recommended that the “suburban shade street” cross-section only be applied to low volume local access streets expected to carry less than 300vpd.

In addition to the pedestrian and cycle facilities within the road cross-sections, a number of recreational trails are proposed to be provided throughout the PSP area, including along the eastern edge of the ELR corridor and within open space areas.

Having regard to the proposed network of connector streets shown in the road hierarchy plan at Figure 48, these provisions provide excellent connectivity throughout the precinct for pedestrians and cyclists and meet or exceed the objectives and standards of Clause 56.06-2.

The substantial network of escarpment regional parkland with shared paths joining between connector road routes positively contribute to the community health and wellbeing by encouraging walking and cycling as part of the daily lives of residents for recreational purposes.

The bicycle network plan is shown in Figure 72 and is combined with the bus capable network plan.

10 Public Transport

The Public Transport Guidelines for Land Use and Development states that 95% of residential land uses in growth areas are to be designed to allow access to public transport services within 400m safe walking distance.

All of the connector roads within the PSP area will be bus-capable. It is expected that bus services will be developed and routes augmented to meet community needs as the PSP develops.

Additionally, the PSP will include early delivery of a developer-sponsored bus link to Bacchus Marsh town centre and railway station during stages 1 and 2 to minimise the external traffic impacts of the Merrimu PSP and establish travel habits for future Merrimu residents from day one.

From stage 3 onwards it is anticipated that there will be an adequate population base to support PTV bus services.

Figure 72 demonstrates that at least 95% of the PSP land earmarked for residential development is located within 400m of a bus-capable road, in accordance with best-practice.

The proposed bus-capable network is well connected to the surrounding road network via a series of controlled intersections, which will allow for the provision of a high quality and effective public transport network through the PSP area in the future.

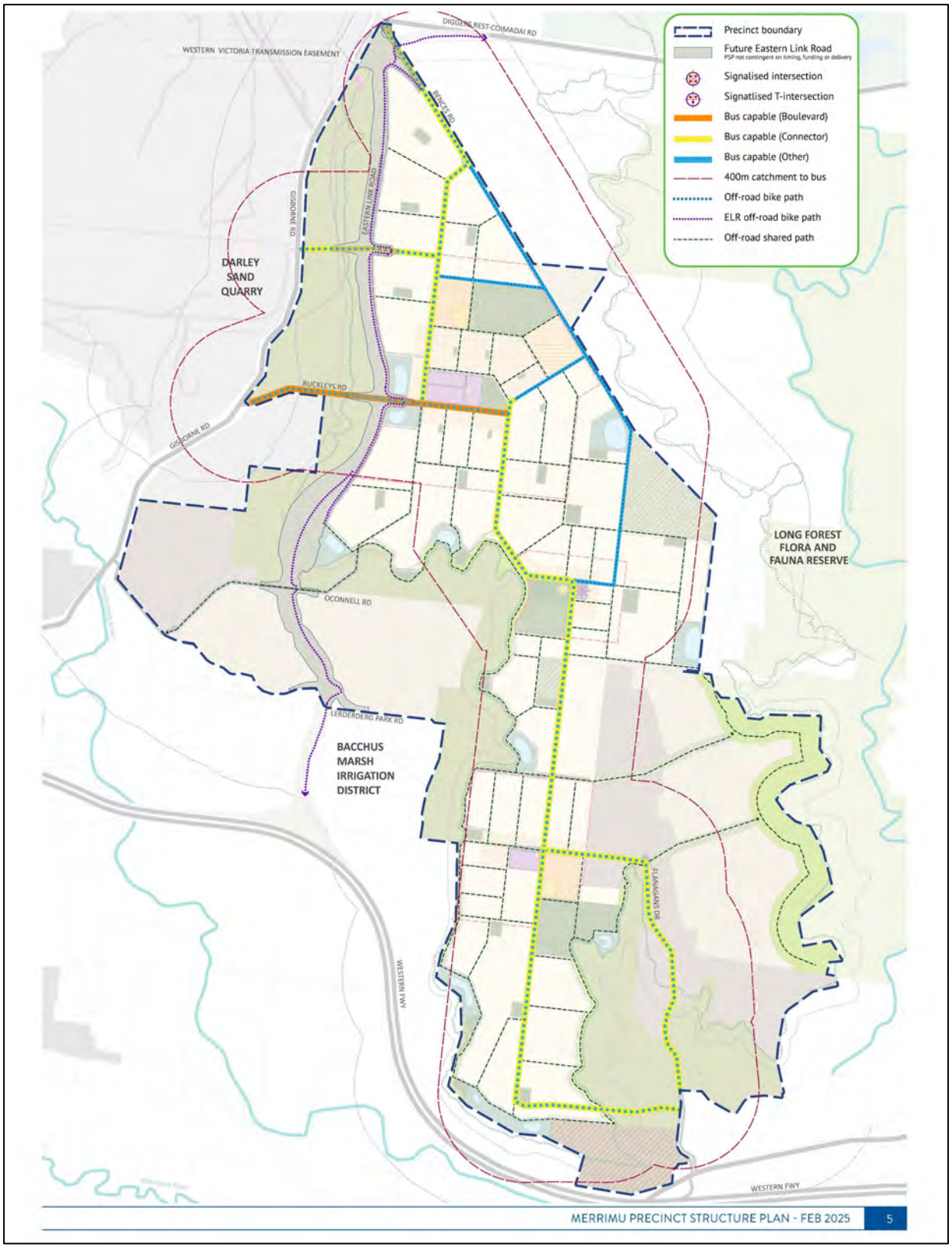


Figure 72: Transport and Paths Plan

11 Summary of Works

Figure 73 below summarises the road and intersection infrastructure projects for the PSP area.

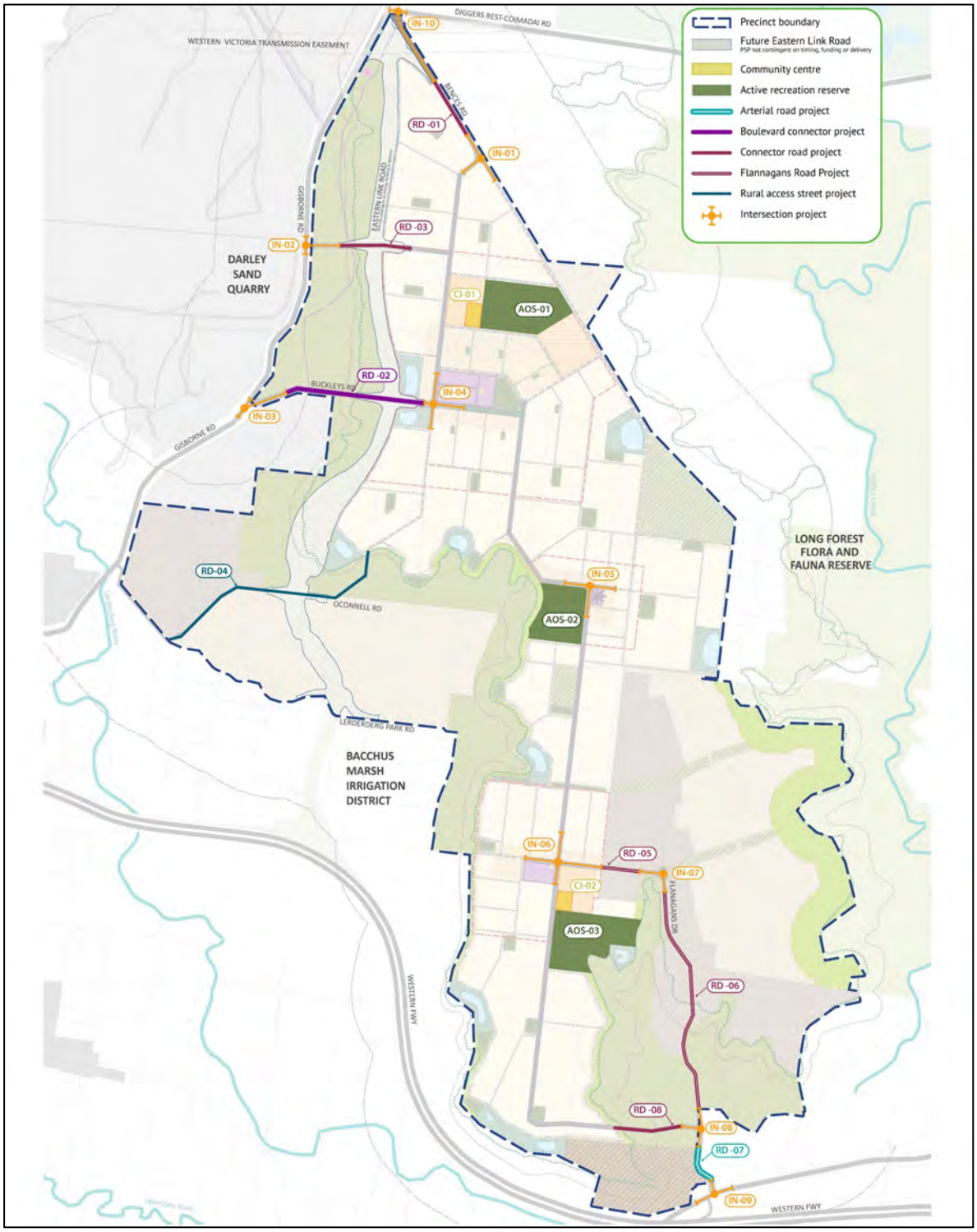


Figure 73: Road & Intersection Infrastructure Projects

Where road projects cross the ELR reservation, these road segments are proposed to be included in the relevant road project as an "interim" road noting that it is likely that the PSP will be developed prior to the ELR construction.

The interim treatments funded by the PSP should be consistent with the proposed road classification, except that parking (on-road or indented bays) may not be required on the section which is subject to the future ELR Public Acquisition Overlay (PAO) because there will not be any abutting properties generating a parking demand.

Table 34 below summarises the road and intersection infrastructure projects for the PSP area.

Table 34: Summary of Works

Project Number	Location	Treatment	Timing
Road Projects			
RD-01	Bences Road between IN-01 and IN-10	Land and construction – 25.5m standard connector road.	Stage 2
RD-02	Buckleys Road	Land and construction – 31.5m wide boulevard connector road.	Stage 1
RD-03	Northern connection across ELR reservation to Gisborne Road (IN-02)	Land and construction –connector road without indented parking (21.3m reservation).	Stage 2
RD-04	Oconnell Road	Construction – Access Level 2 with shared path (one side) within existing reservation.	Stage 6
RD-05 & RD-06	Lindsay Avenue and Flanagans Drive	Construction – rural connector (7m carriageway, 3m shared path within existing 20m reservation).	Stage 4
RD-07	Flanagans Drive between IN-08 and IN-09	Land and construction – divided arterial road (31m reservation).	Stage 5
RD-08	Southern "escarpment connector" between Stage 5 developable land and Flanagans Drive	Land and construction – 25.5m standard connector road.	Stage 5

Project Number	Location	Treatment	Timing
Intersection Projects			
IN-01	Bences Road/N-S Connector 1	Roundabout (land and construction).	Stage 2
IN-02	Gisborne Road/E-W Connector	Roundabout (land and construction).	Stage 2
IN-03	Buckleys Road/ Gisborne Road	Upgraded T-intersection with AUL and CHR.	Stage 1
IN-04	Buckleys Road/N-S Connector 1	Signalised cross-intersection (land and construction).	Stage 1
IN-05	Internal N-S Connector 2/Level 2 Access	Signalised T-intersection (land and construction).	Stage 4
IN-06	Internal N-S Connector 2/Lindsay Avenue	Signalised cross-intersection (land and construction).	Stage 4
IN-07	Lindsay Avenue/ Flanagans Drive	Reverse Priority T-intersection within existing reservation (construction).	Stage 4
IN-08	Flanagans Drive/ Escarpment Connector	Signalised T-intersection (land and construction).	Stage 5
IN-09 interim	Bacchus Marsh Road/ Flanagans Drive	Signalised T-intersection (land and construction).	Stage 4
IN-09 ultimate	Bacchus Marsh Road/ Flanagans Drive	Additional turn lanes for signalised T-intersection (land and construction).	Stage 5
IN-10	Bences Road/Diggers Rest-Coimadai Road	Reverse Priority T-intersection (land and construction).	Stage 2

11.1 Funding

The primary funding mechanism for the identified infrastructure works will be through a Development Contributions Plan (DCP).

Infrastructure items included in a DCP:

- are essential to the health, safety and wellbeing of the community,
- will be used by a broad cross-section of the community,
- reflect the vision and strategic aspirations expressed in the PSP,
- are not recurrent items, and
- are the basis for the future development of an integrated network.

Before inclusion of items in the DCP, all items have been assessed to ensure they have a relationship or nexus to the proposed development in the PSP. This report provides justification for the transport-related infrastructure inclusions.

12 Conclusions

Having provided design advice and undertaken a detailed traffic engineering assessment of the of the Merrimu PSP, we are of the opinion that:

a) the proposed road layout will appropriately provide for the traffic volumes anticipated to be generated by the PSP area,

b) the restriction of property access to rear-loaded along the central connector will ensure the internal road network will operate satisfactorily in the interim prior to the construction of the ELR with full build-out of the Merrimu PSP,

c) the proposed road cross-sections are in accordance with Council and VPA requirements, the IDM and current practice,

d) the proposed network of footpaths and shared paths meet or exceed the objectives and standards of Clause 56.06-2,

e) the substantial network of shared paths will positively contribute to the community health and wellbeing by encouraging walking and cycling as part of the daily lives of residents for recreational purposes,

f) the proposed bus-capable network is in accordance with the Public Transport Guidelines for Land Use and Development and is well connected to the surrounding road network via a series of controlled intersections, which will allow for the provision of a high quality and effective public transport network through the PSP area in the future,

g) the proposed up-front early delivery of a developer-funded shuttle service between the PSP, Bacchus Marsh town centre and the railway station will assist in establishing sustainable travel habits from day one and will reduce the external traffic impacts of the PSP,

h) the proposed external intersection upgrades and connections will adequately cater for the PSP traffic, and

i) there are no traffic engineering reasons why the Merrimu PSP should not proceed generally as shown in the Merrimu PSP Future Urban Structure Plan.

Appendix A

SIDRA Output

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - AM Peak (Give Way) - Stage 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
AM Peak (Give Way)
Stage 1
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	325	10.0	325	10.0	0.178	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	73	2.0	73	2.0	0.081	7.7	LOS A	0.3	2.2	0.47	0.68	0.47	51.1
Approach			398	8.5	398	8.5	0.178	1.4	NA	0.3	2.2	0.09	0.12	0.09	58.1
East: Buckleys Road (E)															
4	L2	All MCs	178	2.0	178	2.0	0.195	7.5	LOS A	0.7	5.3	0.44	0.68	0.44	51.4
6	R2	All MCs	195	2.0	195	2.0	0.576	21.9	LOS C	3.2	22.6	0.84	1.09	1.39	42.6
Approach			373	2.0	373	2.0	0.576	15.0	LOS C	3.2	22.6	0.65	0.89	0.94	46.4
North: Gisborne Road (N)															
7	L2	All MCs	79	2.0	79	2.0	0.043	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	340	10.0	340	10.0	0.186	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			419	8.5	419	8.5	0.186	1.1	NA	0.0	0.0	0.00	0.11	0.00	58.4
All Vehicles			1189	6.5	1189	6.5	0.576	5.6	NA	3.2	22.6	0.23	0.36	0.32	53.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - PM Peak (Give Way) - Stage 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
PM Peak (Give Way)
Stage 1
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	327	10.0	327	10.0	0.179	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	161	2.0	161	2.0	0.274	11.3	LOS B	1.2	8.2	0.66	0.89	0.75	48.6
Approach			488	7.4	488	7.4	0.274	3.8	NA	1.2	8.2	0.22	0.29	0.25	55.7
East: Buckleys Road (E)															
4	L2	All MCs	95	2.0	95	2.0	0.139	9.0	LOS A	0.5	3.4	0.53	0.78	0.53	50.3
6	R2	All MCs	103	2.0	103	2.0	0.613	40.4	LOS E	2.6	18.7	0.93	1.11	1.47	35.0
Approach			198	2.0	198	2.0	0.613	25.4	LOS D	2.6	18.7	0.74	0.95	1.02	41.0
North: Gisborne Road (N)															
7	L2	All MCs	176	2.0	176	2.0	0.096	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	543	10.0	543	10.0	0.297	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			719	8.0	719	8.0	0.297	1.4	NA	0.0	0.0	0.00	0.14	0.00	57.9
All Vehicles			1405	7.0	1405	7.0	0.613	5.6	NA	2.6	18.7	0.18	0.31	0.23	54.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - AM Peak (Give Way) - Stage 2 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
AM Peak (Give Way)
Stage 2
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	398	10.0	398	10.0	0.217	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	75	2.0	75	2.0	0.099	8.7	LOS A	0.4	2.6	0.54	0.75	0.54	50.4
Approach			473	8.7	473	8.7	0.217	1.4	NA	0.4	2.6	0.08	0.12	0.08	58.2
East: Buckleys Road (E)															
4	L2	All MCs	183	2.0	183	2.0	0.259	9.3	LOS A	1.0	7.2	0.56	0.80	0.60	50.1
6	R2	All MCs	18	2.0	18	2.0	0.084	21.4	LOS C	0.3	1.9	0.81	0.92	0.81	42.9
Approach			201	2.0	201	2.0	0.259	10.4	LOS B	1.0	7.2	0.58	0.81	0.62	49.4
North: Gisborne Road (N)															
7	L2	All MCs	7	2.0	7	2.0	0.004	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	521	10.0	521	10.0	0.285	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			528	9.9	528	9.9	0.285	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
All Vehicles			1202	8.1	1202	8.1	0.285	2.4	NA	1.0	7.2	0.13	0.19	0.14	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - PM Peak (Give Way) - Stage 2 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
PM Peak (Give Way)
Stage 2
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	494	10.0	494	10.0	0.270	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	167	2.0	167	2.0	0.272	10.9	LOS B	1.1	8.1	0.64	0.88	0.72	48.9
Approach			661	8.0	661	8.0	0.272	2.8	NA	1.1	8.1	0.16	0.22	0.18	56.6
East: Buckleys Road (E)															
4	L2	All MCs	98	2.0	98	2.0	0.168	10.2	LOS B	0.6	4.1	0.60	0.83	0.60	49.5
6	R2	All MCs	9	2.0	9	2.0	0.086	37.4	LOS E	0.2	1.8	0.90	0.96	0.90	36.1
Approach			107	2.0	107	2.0	0.168	12.6	LOS B	0.6	4.1	0.63	0.84	0.63	47.9
North: Gisborne Road (N)															
7	L2	All MCs	17	2.0	17	2.0	0.009	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	640	10.0	640	10.0	0.350	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			657	9.8	657	9.8	0.350	0.3	NA	0.0	0.0	0.00	0.01	0.00	59.6
All Vehicles			1425	8.4	1425	8.4	0.350	2.4	NA	1.1	8.1	0.12	0.17	0.13	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Northern Connector - Stage 2 (AM Peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Northern Connector
Stage 2
(AM Peak)
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
1	L2	All MCs	21	90.0	21	90.0	0.266	4.9	LOS A	1.8	13.9	0.13	0.45	0.13	51.0
2	T1	All MCs	302	10.0	302	10.0	0.266	4.3	LOS A	1.8	13.9	0.13	0.45	0.13	53.7
3	R2	All MCs	75	2.0	75	2.0	0.266	8.8	LOS A	1.8	13.9	0.13	0.45	0.13	53.0
Approach			398	12.7	398	12.7	0.266	5.2	LOS A	1.8	13.9	0.13	0.45	0.13	53.4
East: Northern Connector (E)															
4	L2	All MCs	183	2.0	183	2.0	0.197	5.9	LOS A	1.1	8.0	0.53	0.59	0.53	52.8
5	T1	All MCs	1	0.0	1	0.0	0.197	6.0	LOS A	1.1	8.0	0.53	0.59	0.53	53.2
6	R2	All MCs	18	2.0	18	2.0	0.197	10.7	LOS B	1.1	8.0	0.53	0.59	0.53	52.3
Approach			202	2.0	202	2.0	0.197	6.3	LOS A	1.1	8.0	0.53	0.59	0.53	52.8
North: Gisborne Road (N)															
7	L2	All MCs	7	2.0	7	2.0	0.257	4.4	LOS A	1.5	11.3	0.30	0.42	0.30	53.4
8	T1	All MCs	319	10.0	319	10.0	0.257	4.8	LOS A	1.5	11.3	0.30	0.42	0.30	53.6
9	R2	All MCs	1	90.0	1	90.0	0.257	10.8	LOS B	1.5	11.3	0.30	0.42	0.30	49.7
Approach			327	10.1	327	10.1	0.257	4.8	LOS A	1.5	11.3	0.30	0.42	0.30	53.6
West: Quarry Access															
10	L2	All MCs	2	90.0	2	90.0	0.037	8.4	LOS A	0.2	2.1	0.54	0.67	0.54	48.0
11	T1	All MCs	1	0.0	1	0.0	0.037	6.0	LOS A	0.2	2.1	0.54	0.67	0.54	50.5
12	R2	All MCs	20	90.0	20	90.0	0.037	13.4	LOS B	0.2	2.1	0.54	0.67	0.54	46.9
Approach			23	85.9	23	85.9	0.037	12.6	LOS B	0.2	2.1	0.54	0.67	0.54	47.1
All Vehicles			951	11.3	951	11.3	0.266	5.5	LOS A	1.8	13.9	0.28	0.47	0.28	53.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Northern Connector - Stage 2 (PM Peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Northern Connector
Stage 2
(PM Peak)
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
1	L2	All MCs	14	90.0	14	90.0	0.312	4.8	LOS A	2.3	17.5	0.10	0.49	0.10	50.7
2	T1	All MCs	313	10.0	313	10.0	0.312	4.2	LOS A	2.3	17.5	0.10	0.49	0.10	53.3
3	R2	All MCs	167	2.0	167	2.0	0.312	8.8	LOS A	2.3	17.5	0.10	0.49	0.10	52.6
Approach			494	9.5	494	9.5	0.312	5.8	LOS A	2.3	17.5	0.10	0.49	0.10	53.0
East: Northern Connector (E)															
4	L2	All MCs	98	2.0	98	2.0	0.129	7.1	LOS A	0.8	5.5	0.66	0.66	0.66	52.1
5	T1	All MCs	1	0.0	1	0.0	0.129	7.2	LOS A	0.8	5.5	0.66	0.66	0.66	52.5
6	R2	All MCs	9	2.0	9	2.0	0.129	11.9	LOS B	0.8	5.5	0.66	0.66	0.66	51.6
Approach			108	2.0	108	2.0	0.129	7.5	LOS A	0.8	5.5	0.66	0.66	0.66	52.1
North: Gisborne Road (N)															
7	L2	All MCs	17	2.0	17	2.0	0.460	5.2	LOS A	3.2	24.3	0.49	0.49	0.49	52.6
8	T1	All MCs	523	10.0	523	10.0	0.460	5.6	LOS A	3.2	24.3	0.49	0.49	0.49	52.7
9	R2	All MCs	1	90.0	1	90.0	0.460	12.4	LOS B	3.2	24.3	0.49	0.49	0.49	48.9
Approach			541	9.9	541	9.9	0.460	5.6	LOS A	3.2	24.3	0.49	0.49	0.49	52.7
West: Quarry Access															
10	L2	All MCs	1	90.0	1	90.0	0.035	9.3	LOS A	0.2	1.9	0.58	0.69	0.58	47.4
11	T1	All MCs	1	0.0	1	0.0	0.035	6.5	LOS A	0.2	1.9	0.58	0.69	0.58	50.0
12	R2	All MCs	18	90.0	18	90.0	0.035	14.3	LOS B	0.2	1.9	0.58	0.69	0.58	46.4
Approach			20	85.3	20	85.3	0.035	13.6	LOS B	0.2	1.9	0.58	0.69	0.58	46.6
All Vehicles			1163	10.3	1163	10.3	0.460	6.0	LOS A	3.2	24.3	0.34	0.51	0.34	52.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bences Road/Diggers Rest-Coimadai Rd - AM Peak Stage 2 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
AM Peak
Stage 2
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	40	2.0	40	2.0	0.576	8.4	LOS A	5.0	35.6	0.67	0.90	1.04	48.6
3	R2	All MCs	399	2.0	399	2.0	0.576	11.9	LOS B	5.0	35.6	0.67	0.90	1.04	48.5
Approach			439	2.0	439	2.0	0.576	11.6	LOS B	5.0	35.6	0.67	0.90	1.04	48.5
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	163	2.0	163	2.0	0.089	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
5	T1	All MCs	168	5.0	168	5.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			332	3.5	332	3.5	0.089	2.8	NA	0.0	0.0	0.00	0.28	0.00	56.2
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	140	5.0	140	5.0	0.091	0.3	LOS A	0.2	1.2	0.12	0.14	0.12	58.9
12	R2	All MCs	17	2.0	17	2.0	0.091	7.0	LOS A	0.2	1.2	0.12	0.14	0.12	56.2
Approach			157	4.7	157	4.7	0.091	1.0	NA	0.2	1.2	0.12	0.14	0.12	58.6
All Vehicles			927	3.0	927	3.0	0.576	6.6	NA	5.0	35.6	0.34	0.55	0.51	52.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bences Road/Diggers Rest-Coimadai Rd - PM Peak Stage 2 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
PM Peak
Stage 2
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	21	2.0	21	2.0	0.425	8.1	LOS A	2.3	16.7	0.68	0.93	0.94	47.7
3	R2	All MCs	215	2.0	215	2.0	0.425	13.5	LOS B	2.3	16.7	0.68	0.93	0.94	47.6
Approach			236	2.0	236	2.0	0.425	13.0	LOS B	2.3	16.7	0.68	0.93	0.94	47.6
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	365	2.0	365	2.0	0.199	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.7
5	T1	All MCs	269	5.0	269	5.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			635	3.3	635	3.3	0.199	3.2	NA	0.0	0.0	0.00	0.33	0.00	55.6
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	158	5.0	158	5.0	0.137	1.5	LOS A	0.5	3.9	0.31	0.35	0.31	57.2
12	R2	All MCs	37	2.0	37	2.0	0.137	9.3	LOS A	0.5	3.9	0.31	0.35	0.31	54.6
Approach			195	4.4	195	4.4	0.137	3.0	NA	0.5	3.9	0.31	0.35	0.31	56.7
All Vehicles			1065	3.2	1065	3.2	0.425	5.3	NA	2.3	16.7	0.21	0.47	0.27	53.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - AM Peak (Give Way) - Stage 3 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
AM Peak (Give Way)
Stage 3
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	404	10.0	404	10.0	0.221	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	121	2.0	121	2.0	0.165	9.0	LOS A	0.6	4.5	0.56	0.79	0.56	50.2
Approach			525	8.2	525	8.2	0.221	2.1	NA	0.6	4.5	0.13	0.18	0.13	57.3
East: Buckleys Road (E)															
4	L2	All MCs	296	2.0	296	2.0	0.428	10.7	LOS B	2.2	15.7	0.62	0.91	0.86	49.2
6	R2	All MCs	29	2.0	29	2.0	0.157	24.4	LOS C	0.5	3.5	0.85	0.94	0.85	41.4
Approach			325	2.0	325	2.0	0.428	12.0	LOS B	2.2	15.7	0.64	0.91	0.85	48.3
North: Gisborne Road (N)															
7	L2	All MCs	13	2.0	13	2.0	0.007	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	536	10.0	536	10.0	0.293	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			548	9.8	548	9.8	0.293	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.6
All Vehicles			1399	7.4	1399	7.4	0.428	3.7	NA	2.2	15.7	0.20	0.28	0.25	55.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - PM Peak (Give Way) - Stage 3 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
PM Peak (Give Way)
Stage 3
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	507	10.0	507	10.0	0.277	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	272	2.0	272	2.0	0.453	12.8	LOS B	2.4	17.2	0.71	0.98	1.03	47.7
Approach			779	7.2	779	7.2	0.453	4.5	NA	2.4	17.2	0.25	0.34	0.36	55.0
East: Buckleys Road (E)															
4	L2	All MCs	160	2.0	160	2.0	0.279	11.0	LOS B	1.1	7.7	0.64	0.88	0.73	48.9
6	R2	All MCs	16	2.0	16	2.0	0.187	49.4	LOS E	0.5	3.8	0.93	0.98	0.97	32.3
Approach			176	2.0	176	2.0	0.279	14.5	LOS B	1.1	7.7	0.67	0.89	0.76	46.8
North: Gisborne Road (N)															
7	L2	All MCs	27	2.0	27	2.0	0.015	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	647	10.0	647	10.0	0.354	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			675	9.7	675	9.7	0.354	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.4
All Vehicles			1629	7.7	1629	7.7	0.453	3.9	NA	2.4	17.2	0.19	0.27	0.25	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Northern Connector - Stage 3 (AM Peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Northern Connector
Stage 3
(AM Peak)
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
1	L2	All MCs	21	90.0	21	90.0	0.272	4.9	LOS A	1.8	14.3	0.14	0.45	0.14	50.9
2	T1	All MCs	302	10.0	302	10.0	0.272	4.3	LOS A	1.8	14.3	0.14	0.45	0.14	53.6
3	R2	All MCs	81	2.0	81	2.0	0.272	8.8	LOS A	1.8	14.3	0.14	0.45	0.14	52.9
Approach			404	12.6	404	12.6	0.272	5.2	LOS A	1.8	14.3	0.14	0.45	0.14	53.3
East: Northern Connector (E)															
4	L2	All MCs	197	2.0	197	2.0	0.213	5.9	LOS A	1.2	8.7	0.54	0.59	0.54	52.8
5	T1	All MCs	1	0.0	1	0.0	0.213	6.1	LOS A	1.2	8.7	0.54	0.59	0.54	53.2
6	R2	All MCs	20	2.0	20	2.0	0.213	10.8	LOS B	1.2	8.7	0.54	0.59	0.54	52.3
Approach			218	2.0	218	2.0	0.213	6.3	LOS A	1.2	8.7	0.54	0.59	0.54	52.8
North: Gisborne Road (N)															
7	L2	All MCs	8	2.0	8	2.0	0.260	4.5	LOS A	1.5	11.5	0.31	0.43	0.31	53.4
8	T1	All MCs	319	10.0	319	10.0	0.260	4.8	LOS A	1.5	11.5	0.31	0.43	0.31	53.6
9	R2	All MCs	1	90.0	1	90.0	0.260	10.9	LOS B	1.5	11.5	0.31	0.43	0.31	49.6
Approach			328	10.1	328	10.1	0.260	4.8	LOS A	1.5	11.5	0.31	0.43	0.31	53.5
West: Quarry Access															
10	L2	All MCs	2	90.0	2	90.0	0.038	8.5	LOS A	0.2	2.1	0.55	0.67	0.55	47.9
11	T1	All MCs	1	0.0	1	0.0	0.038	6.0	LOS A	0.2	2.1	0.55	0.67	0.55	50.5
12	R2	All MCs	20	90.0	20	90.0	0.038	13.4	LOS B	0.2	2.1	0.55	0.67	0.55	46.8
Approach			23	85.9	23	85.9	0.038	12.6	LOS B	0.2	2.1	0.55	0.67	0.55	47.1
All Vehicles			974	11.1	974	11.1	0.272	5.5	LOS A	1.8	14.3	0.29	0.48	0.29	53.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Northern Connector - Stage 3 (PM Peak) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Northern Connector
Stage 3
(PM Peak)
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
1	L2	All MCs	14	90.0	14	90.0	0.322	4.8	LOS A	2.4	18.2	0.11	0.49	0.11	50.6
2	T1	All MCs	313	10.0	313	10.0	0.322	4.2	LOS A	2.4	18.2	0.11	0.49	0.11	53.2
3	R2	All MCs	181	2.0	181	2.0	0.322	8.8	LOS A	2.4	18.2	0.11	0.49	0.11	52.5
Approach			507	9.3	507	9.3	0.322	5.9	LOS A	2.4	18.2	0.11	0.49	0.11	52.9
East: Northern Connector (E)															
4	L2	All MCs	106	2.0	106	2.0	0.141	7.1	LOS A	0.8	6.0	0.66	0.66	0.66	52.1
5	T1	All MCs	1	0.0	1	0.0	0.141	7.2	LOS A	0.8	6.0	0.66	0.66	0.66	52.5
6	R2	All MCs	11	2.0	11	2.0	0.141	11.9	LOS B	0.8	6.0	0.66	0.66	0.66	51.6
Approach			118	2.0	118	2.0	0.141	7.5	LOS A	0.8	6.0	0.66	0.66	0.66	52.0
North: Gisborne Road (N)															
7	L2	All MCs	18	2.0	18	2.0	0.468	5.3	LOS A	3.3	24.9	0.51	0.50	0.51	52.5
8	T1	All MCs	523	10.0	523	10.0	0.468	5.8	LOS A	3.3	24.9	0.51	0.50	0.51	52.7
9	R2	All MCs	1	90.0	1	90.0	0.468	12.6	LOS B	3.3	24.9	0.51	0.50	0.51	48.9
Approach			542	9.9	542	9.9	0.468	5.8	LOS A	3.3	24.9	0.51	0.50	0.51	52.6
West: Quarry Access															
10	L2	All MCs	1	90.0	1	90.0	0.035	9.4	LOS A	0.2	2.0	0.59	0.70	0.59	47.4
11	T1	All MCs	1	0.0	1	0.0	0.035	6.6	LOS A	0.2	2.0	0.59	0.70	0.59	49.9
12	R2	All MCs	18	90.0	18	90.0	0.035	14.4	LOS B	0.2	2.0	0.59	0.70	0.59	46.3
Approach			20	85.3	20	85.3	0.035	13.8	LOS B	0.2	2.0	0.59	0.70	0.59	46.5
All Vehicles			1187	10.1	1187	10.1	0.468	6.1	LOS A	3.3	24.9	0.35	0.52	0.35	52.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bences Road/Diggers Rest-Coimadai Rd - AM Peak Stage 3 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
AM Peak
Stage 3
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	54	2.0	54	2.0	0.808	13.2	LOS B	12.5	88.7	0.85	1.27	2.02	44.8
3	R2	All MCs	538	2.0	538	2.0	0.808	18.3	LOS C	12.5	88.7	0.85	1.27	2.02	44.7
Approach			592	2.0	592	2.0	0.808	17.9	LOS C	12.5	88.7	0.85	1.27	2.02	44.7
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	220	2.0	220	2.0	0.120	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
5	T1	All MCs	168	5.0	168	5.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			388	3.3	388	3.3	0.120	3.2	NA	0.0	0.0	0.00	0.33	0.00	55.7
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	140	5.0	140	5.0	0.098	0.5	LOS A	0.2	1.7	0.17	0.19	0.17	58.5
12	R2	All MCs	22	2.0	22	2.0	0.098	7.4	LOS A	0.2	1.7	0.17	0.19	0.17	55.9
Approach			162	4.6	162	4.6	0.098	1.4	NA	0.2	1.7	0.17	0.19	0.17	58.2
All Vehicles			1142	2.8	1142	2.8	0.808	10.5	NA	12.5	88.7	0.47	0.80	1.07	49.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bences Road/Diggers Rest-Coimadai Rd - PM Peak Stage 3 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
PM Peak
Stage 3
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	29	2.0	29	2.0	0.638	11.0	LOS B	4.7	33.3	0.78	1.13	1.48	44.9
3	R2	All MCs	291	2.0	291	2.0	0.638	18.3	LOS C	4.7	33.3	0.78	1.13	1.48	44.8
Approach			320	2.0	320	2.0	0.638	17.7	LOS C	4.7	33.3	0.78	1.13	1.48	44.9
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	495	2.0	495	2.0	0.270	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	52.7
5	T1	All MCs	269	5.0	269	5.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			764	3.1	764	3.1	0.270	3.7	NA	0.0	0.0	0.00	0.37	0.00	55.0
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	158	5.0	158	5.0	0.170	2.8	LOS A	0.8	6.1	0.43	0.49	0.43	55.7
12	R2	All MCs	49	2.0	49	2.0	0.170	10.8	LOS B	0.8	6.1	0.43	0.49	0.43	53.2
Approach			207	4.3	207	4.3	0.170	4.7	NA	0.8	6.1	0.43	0.49	0.43	55.1
All Vehicles			1292	3.0	1292	3.0	0.638	7.3	NA	4.7	33.3	0.26	0.58	0.44	52.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bences Road/Diggers Rest-Coimadai Rd - AM Peak Stage 3 - Reverse priority (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
AM Peak
Stage 3
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	54	2.0	54	2.0	0.045	6.2	LOS A	0.2	1.2	0.28	0.56	0.28	52.0
3	R2	All MCs	538	2.0	538	2.0	0.353	6.3	LOS A	2.1	14.7	0.36	0.58	0.36	51.7
Approach			592	2.0	592	2.0	0.353	6.3	NA	2.1	14.7	0.35	0.58	0.35	51.7
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	220	2.0	220	2.0	0.120	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
5	T1	All MCs	168	5.0	168	5.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			388	3.3	388	3.3	0.120	3.2	NA	0.0	0.0	0.00	0.33	0.00	55.7
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	140	5.0	140	5.0	0.411	14.5	LOS B	2.1	15.0	0.74	0.96	1.02	46.2
12	R2	All MCs	22	2.0	22	2.0	0.411	24.1	LOS C	2.1	15.0	0.74	0.96	1.02	45.9
Approach			162	4.6	162	4.6	0.411	15.8	LOS C	2.1	15.0	0.74	0.96	1.02	46.2
All Vehicles			1142	2.8	1142	2.8	0.411	6.6	NA	2.1	15.0	0.29	0.55	0.33	52.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bences Road/Diggers Rest-Coimadai Rd - PM Peak Stage 3 - Reverse priority (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bences Road/Diggers Rest-Coimadai Rd
PM Peak
Stage 3
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Rd (S)															
1	L2	All MCs	29	2.0	29	2.0	0.027	6.7	LOS A	0.1	0.7	0.36	0.58	0.36	51.7
3	R2	All MCs	291	2.0	291	2.0	0.211	6.6	LOS A	1.0	7.4	0.41	0.62	0.41	51.5
Approach			320	2.0	320	2.0	0.211	6.6	NA	1.0	7.4	0.41	0.61	0.41	51.5
East: Diggers Rest-Coimadai Rd (E)															
4	L2	All MCs	495	2.0	495	2.0	0.270	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	52.7
5	T1	All MCs	269	5.0	269	5.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			764	3.1	764	3.1	0.270	3.7	NA	0.0	0.0	0.00	0.37	0.00	55.0
West: Diggers Rest-Coimadai Rd (W)															
11	T1	All MCs	158	5.0	158	5.0	0.461	10.2	LOS B	2.8	20.6	0.73	0.90	1.06	46.7
12	R2	All MCs	49	2.0	49	2.0	0.461	30.6	LOS D	2.8	20.6	0.73	0.90	1.06	46.4
Approach			207	4.3	207	4.3	0.461	15.1	LOS C	2.8	20.6	0.73	0.90	1.06	46.6
All Vehicles			1292	3.0	1292	3.0	0.461	6.2	NA	2.8	20.6	0.22	0.52	0.27	52.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - AM Peak (Give Way) - Stage 4 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
AM Peak (Give Way)
Stage 4
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	404	10.0	404	10.0	0.221	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	All MCs	132	2.0	132	2.0	0.180	9.1	LOS A	0.7	4.9	0.57	0.79	0.57	50.1
Approach			536	8.0	536	8.0	0.221	2.3	NA	0.7	4.9	0.14	0.19	0.14	57.2
East: Buckleys Road (E)															
4	L2	All MCs	322	2.0	322	2.0	0.466	11.0	LOS B	2.5	18.1	0.63	0.93	0.92	48.9
6	R2	All MCs	29	2.0	29	2.0	0.160	24.8	LOS C	0.5	3.6	0.85	0.94	0.85	41.2
Approach			352	2.0	352	2.0	0.466	12.2	LOS B	2.5	18.1	0.65	0.93	0.91	48.2
North: Gisborne Road (N)															
7	L2	All MCs	13	2.0	13	2.0	0.007	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	536	10.0	536	10.0	0.293	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			548	9.8	548	9.8	0.293	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.6
All Vehicles			1436	7.2	1436	7.2	0.466	3.9	NA	2.5	18.1	0.21	0.31	0.28	55.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Road/Buckleys Road - PM Peak (Give Way) - Stage 4 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Road/Buckleys Road
PM Peak (Give Way)
Stage 4
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Road (S)															
2	T1	All MCs	507	10.0	507	10.0	0.277	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	296	2.0	296	2.0	0.493	13.2	LOS B	2.8	19.7	0.73	1.01	1.11	47.4
Approach			803	7.1	803	7.1	0.493	4.9	NA	2.8	19.7	0.27	0.37	0.41	54.6
East: Buckleys Road (E)															
4	L2	All MCs	174	2.0	174	2.0	0.303	11.2	LOS B	1.2	8.7	0.65	0.89	0.77	48.8
6	R2	All MCs	16	2.0	16	2.0	0.196	51.8	LOS F	0.6	3.9	0.94	0.98	0.98	31.6
Approach			189	2.0	189	2.0	0.303	14.6	LOS B	1.2	8.7	0.67	0.90	0.79	46.7
North: Gisborne Road (N)															
7	L2	All MCs	27	2.0	27	2.0	0.015	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
8	T1	All MCs	647	10.0	647	10.0	0.354	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			675	9.7	675	9.7	0.354	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.4
All Vehicles			1667	7.5	1667	7.5	0.493	4.2	NA	2.8	19.7	0.21	0.29	0.29	55.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bacchus Marsh Road/Flanagans Drive - AM Peak - Stage 4 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
AM Peak
Stage 4
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bacchus Marsh Road (E)															
5	T1	All MCs	402	5.0	402	5.0	0.419	3.6	LOS A	3.0	21.7	0.47	0.58	0.67	54.8
6	R2	All MCs	154	2.0	154	2.0	0.419	11.3	LOS B	3.0	21.7	0.47	0.58	0.67	52.4
Approach			556	4.2	556	4.2	0.419	5.7	NA	3.0	21.7	0.47	0.58	0.67	54.1
North: Flanagans Drive															
7	L2	All MCs	719	2.0	719	2.0	1.457	428.8	LOS F	172.0	1224.8	1.00	8.39	23.23	7.4
9	R2	All MCs	118	2.0	118	2.0	1.457	450.8	LOS F	172.0	1224.8	1.00	8.39	23.23	7.4
Approach			837	2.0	837	2.0	1.457	431.9	LOS F	172.0	1224.8	1.00	8.39	23.23	7.4
West: Bacchus Marsh Road (W)															
10	L2	All MCs	199	2.0	199	2.0	0.386	5.7	LOS A	0.0	0.0	0.00	0.16	0.00	55.8
11	T1	All MCs	523	5.0	523	5.0	0.386	0.1	LOS A	0.0	0.0	0.00	0.16	0.00	58.3
Approach			722	4.2	722	4.2	0.386	1.7	NA	0.0	0.0	0.00	0.16	0.00	57.6
All Vehicles			2115	3.3	2115	3.3	1.457	173.0	NA	172.0	1224.8	0.52	3.53	9.37	15.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Bacchus Marsh Road/Flanagans Drive - PM Peak - Stage 4 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
PM Peak
Stage 4
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bacchus Marsh Road (E)															
5	T1	All MCs	403	5.0	403	5.0	1.457	442.3	LOS F	156.5	1129.6	1.00	3.16	19.19	7.2
6	R2	All MCs	338	2.0	338	2.0	1.457	449.4	LOS F	156.5	1129.6	1.00	3.16	19.19	7.1
Approach			741	3.6	741	3.6	1.457	445.5	NA	156.5	1129.6	1.00	3.16	19.19	7.2
North: Flanagans Drive															
7	L2	All MCs	400	2.0	400	2.0	1.788	727.4	LOS F	132.2	941.1	1.00	7.71	24.29	4.6
9	R2	All MCs	66	2.0	66	2.0	1.788	793.6	LOS F	132.2	941.1	1.00	7.71	24.29	4.6
Approach			466	2.0	466	2.0	1.788	736.8	LOS F	132.2	941.1	1.00	7.71	24.29	4.6
West: Bacchus Marsh Road (W)															
10	L2	All MCs	448	2.0	448	2.0	0.629	5.9	LOS A	0.0	0.0	0.00	0.23	0.00	55.0
11	T1	All MCs	725	5.0	725	5.0	0.629	0.4	LOS A	0.0	0.0	0.00	0.23	0.00	57.3
Approach			1174	3.9	1174	3.9	0.629	2.5	NA	0.0	0.0	0.00	0.23	0.00	56.4
All Vehicles			2381	3.4	2381	3.4	1.788	284.2	NA	156.5	1129.6	0.51	2.60	10.73	10.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101v [Bacchus Marsh Road/Flanagans Drive - AM Peak - Stage 4 - Signals - 4 leg (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
AM Peak
Stage 4
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: FWY exit ramp															
2	T1	All MCs	11	2.0	11	2.0	*0.462	64.2	LOS E	2.6	18.7	1.00	0.74	1.00	28.3
3	R2	All MCs	32	5.0	32	5.0	0.462	69.7	LOS E	2.6	18.7	1.00	0.74	1.00	27.6
Approach			42	4.3	42	4.3	0.462	68.3	LOS E	2.6	18.7	1.00	0.74	1.00	27.7
East: Bacchus Marsh Road (E)															
5	T1	All MCs	402	5.0	402	5.0	0.491	26.1	LOS C	16.8	122.5	0.77	0.68	0.77	42.0
6	R2	All MCs	154	2.0	154	2.0	*0.592	59.0	LOS E	8.7	61.7	0.99	0.81	0.99	29.9
Approach			556	4.2	556	4.2	0.592	35.2	LOS D	16.8	122.5	0.83	0.71	0.83	37.8
North: Flanagans Drive															
7	L2	All MCs	719	2.0	719	2.0	*0.591	39.3	LOS D	18.7	133.4	0.85	0.82	0.85	36.0
9	R2	All MCs	118	2.0	118	2.0	0.176	32.9	LOS C	4.6	32.9	0.71	0.74	0.71	37.9
Approach			837	2.0	837	2.0	0.591	38.4	LOS D	18.7	133.4	0.83	0.81	0.83	36.3
West: Bacchus Marsh Road (W)															
10	L2	All MCs	181	2.0	181	2.0	0.163	11.4	LOS B	2.9	20.4	0.46	0.69	0.46	48.7
11	T1	All MCs	492	5.0	492	5.0	*0.593	44.6	LOS D	14.1	103.3	0.93	0.78	0.93	35.2
Approach			673	4.2	673	4.2	0.593	35.6	LOS D	14.1	103.3	0.80	0.76	0.80	38.0
All Vehicles			2107	3.3	2107	3.3	0.593	37.3	LOS D	18.7	133.4	0.82	0.77	0.82	37.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: FWY exit ramp												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [Bacchus Marsh Road/Flanagans Drive - PM Peak - Stage 4 - Signals - 4 leg (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
PM Peak
Stage 4
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: FWY exit ramp															
2	T1	All MCs	23	2.0	23	2.0	* 0.551	36.1	LOS D	3.1	22.4	1.00	0.78	1.04	36.2
3	R2	All MCs	63	5.0	63	5.0	0.551	41.6	LOS D	3.1	22.4	1.00	0.78	1.04	35.1
Approach			86	4.2	86	4.2	0.551	40.1	LOS D	3.1	22.4	1.00	0.78	1.04	35.3
East: Bacchus Marsh Road (E)															
5	T1	All MCs	403	5.0	403	5.0	0.415	11.3	LOS B	8.5	62.2	0.66	0.57	0.66	50.6
6	R2	All MCs	338	2.0	338	2.0	* 0.861	42.7	LOS D	13.3	94.8	1.00	1.01	1.33	34.5
Approach			741	3.6	741	3.6	0.861	25.6	LOS C	13.3	94.8	0.82	0.77	0.96	41.7
North: Flanagans Drive															
7	L2	All MCs	400	2.0	400	2.0	* 0.845	43.3	LOS D	8.6	61.4	1.00	0.93	1.25	34.6
9	R2	All MCs	66	2.0	66	2.0	0.254	35.7	LOS D	2.1	15.0	0.93	0.75	0.93	36.8
Approach			466	2.0	466	2.0	0.845	42.2	LOS D	8.6	61.4	0.99	0.90	1.20	34.9
West: Bacchus Marsh Road (W)															
10	L2	All MCs	408	2.0	408	2.0	0.625	16.5	LOS B	7.2	51.5	0.88	0.82	0.88	45.6
11	T1	All MCs	662	5.0	662	5.0	* 0.902	37.7	LOS D	15.4	112.1	0.99	1.02	1.28	37.5
Approach			1071	3.9	1071	3.9	0.902	29.6	LOS C	15.4	112.1	0.95	0.94	1.13	40.3
All Vehicles			2364	3.4	2364	3.4	0.902	31.2	LOS C	15.4	112.1	0.92	0.88	1.09	39.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: FWY exit ramp												
P1	Full	50	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09
All Pedestrians		50	53	29.3	LOS C	0.1	0.1	0.92	0.92	183.2	200.0	1.09

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [Bacchus Marsh Road/Flanagans Drive - AM Peak - Stage 5 - Signals - 4 leg (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
PM Peak
Stage 5
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: FWY exit ramp															
2	T1	All MCs	12	2.0	12	2.0	*0.434	63.6	LOS E	2.6	19.0	1.00	0.74	1.00	28.5
3	R2	All MCs	32	5.0	32	5.0	0.434	69.3	LOS E	2.6	19.0	1.00	0.74	1.00	27.9
Approach			43	4.2	43	4.2	0.434	67.8	LOS E	2.6	19.0	1.00	0.74	1.00	28.0
East: Bacchus Marsh Road (E)															
5	T1	All MCs	402	5.0	402	5.0	0.710	40.3	LOS D	21.0	153.2	0.95	0.83	0.95	36.2
6	R2	All MCs	234	2.0	234	2.0	*0.766	69.2	LOS E	7.3	51.8	1.00	0.89	1.18	27.7
Approach			636	3.9	636	3.9	0.766	50.9	LOS D	21.0	153.2	0.97	0.85	1.04	32.5
North: Flanagans Drive															
7	L2	All MCs	1116	2.0	1116	2.0	*0.833	45.6	LOS D	31.8	226.2	0.87	0.87	0.91	37.3
9	R2	All MCs	183	2.0	183	2.0	0.200	28.2	LOS C	5.9	41.7	0.59	0.72	0.59	42.3
Approach			1299	2.0	1299	2.0	0.833	43.2	LOS D	31.8	226.2	0.83	0.85	0.86	35.9
West: Bacchus Marsh Road (W)															
10	L2	All MCs	289	2.0	289	2.0	0.237	9.9	LOS A	3.8	27.0	0.42	0.69	0.42	49.7
11	T1	All MCs	492	5.0	492	5.0	*0.847	62.4	LOS E	16.8	122.5	1.00	0.93	1.13	31.1
Approach			781	3.9	781	3.9	0.847	43.0	LOS D	16.8	122.5	0.79	0.84	0.87	36.1
All Vehicles			2759	3.0	2759	3.0	0.847	45.3	LOS D	31.8	226.2	0.85	0.85	0.91	35.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: FWY exit ramp												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101v [Bacchus Marsh Road/Flanagans Drive - PM Peak - Stage 5 - Signals - 4 leg (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bacchus Marsh Road/Flanagans Drive
PM Peak
Stage 5
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: FWY exit ramp															
2	T1	All MCs	27	2.0	27	2.0	*0.681	63.3	LOS E	5.6	40.3	1.00	0.83	1.11	28.6
3	R2	All MCs	63	5.0	63	5.0	0.681	68.9	LOS E	5.6	40.3	1.00	0.83	1.11	28.0
Approach			91	4.1	91	4.1	0.681	67.2	LOS E	5.6	40.3	1.00	0.83	1.11	28.2
East: Bacchus Marsh Road (E)															
5	T1	All MCs	403	5.0	403	5.0	0.394	17.0	LOS B	13.5	98.8	0.63	0.55	0.63	47.0
6	R2	All MCs	521	2.0	521	2.0	*0.742	57.4	LOS E	15.0	107.0	1.00	0.87	1.06	30.4
Approach			924	3.3	924	3.3	0.742	39.8	LOS D	15.0	107.0	0.84	0.73	0.87	35.9
North: Flanagans Drive															
7	L2	All MCs	616	2.0	616	2.0	*0.769	53.9	LOS D	19.4	138.0	0.97	0.86	1.01	31.6
9	R2	All MCs	101	2.0	101	2.0	0.228	45.0	LOS D	4.8	33.9	0.84	0.76	0.84	33.9
Approach			717	2.0	717	2.0	0.769	52.7	LOS D	19.4	138.0	0.95	0.85	0.98	31.9
West: Bacchus Marsh Road (W)															
10	L2	All MCs	653	2.0	653	2.0	*0.687	19.4	LOS B	18.3	130.1	0.79	0.84	0.79	45.1
11	T1	All MCs	662	5.0	662	5.0	0.641	41.4	LOS D	18.4	134.7	0.91	0.79	0.91	36.8
Approach			1315	3.5	1315	3.5	0.687	30.5	LOS C	18.4	134.7	0.85	0.81	0.85	39.9
All Vehicles			3046	3.1	3046	3.1	0.769	39.6	LOS D	19.4	138.0	0.87	0.80	0.90	36.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: FWY exit ramp												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-08 Ultimate - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-08 Ultimate
AM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
1	L2	All MCs	188	2.0	188	2.0	0.151	11.6	LOS B	3.2	22.9	0.38	0.68	0.38	48.6
2	T1	All MCs	353	2.0	353	2.0	0.269	6.6	LOS A	6.6	47.1	0.42	0.37	0.42	54.1
Approach			541	2.0	541	2.0	0.269	8.3	LOS A	6.6	47.1	0.41	0.47	0.41	52.1
North: Flanagans Drive															
8	T1	All MCs	837	2.0	837	2.0	0.641	9.6	LOS A	22.9	162.9	0.62	0.57	0.62	51.8
9	R2	All MCs	1	2.0	1	2.0	*0.641	19.9	LOS B	22.9	162.9	0.62	0.57	0.62	49.8
Approach			838	2.0	838	2.0	0.641	9.6	LOS A	22.9	162.9	0.62	0.57	0.62	51.8
West: Escarpment Connector															
10	L2	All MCs	1	2.0	1	2.0	0.632	45.9	LOS D	10.6	75.4	0.97	0.82	0.97	33.3
12	R2	All MCs	462	2.0	462	2.0	*0.632	45.9	LOS D	10.6	75.4	0.97	0.82	0.97	33.3
Approach			463	2.0	463	2.0	0.632	45.9	LOS D	10.6	75.4	0.97	0.82	0.97	33.3
All Vehicles			1842	2.0	1842	2.0	0.641	18.4	LOS B	22.9	162.9	0.64	0.60	0.64	45.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Flanagans Drive												
P3	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Escarpment Connector												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		100	105	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-08 Ultimate - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-08 Ultimate
PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
1	L2	All MCs	427	2.0	427	2.0	0.311	9.9	LOS A	6.7	47.5	0.35	0.68	0.35	49.7
2	T1	All MCs	785	2.0	785	2.0	* 0.544	5.6	LOS A	15.9	113.2	0.46	0.42	0.46	55.0
Approach			1213	2.0	1213	2.0	0.544	7.1	LOS A	15.9	113.2	0.42	0.51	0.42	53.0
North: Flanagans Drive															
8	T1	All MCs	466	2.0	466	2.0	0.327	4.4	LOS A	7.4	52.8	0.36	0.32	0.36	56.0
9	R2	All MCs	1	2.0	1	2.0	0.327	17.8	LOS B	7.4	52.8	0.36	0.32	0.36	53.7
Approach			467	2.0	467	2.0	0.327	4.4	LOS A	7.4	52.8	0.36	0.32	0.36	56.0
West: Escarpment Connector															
10	L2	All MCs	1	2.0	1	2.0	0.528	51.0	LOS D	6.0	42.4	0.98	0.79	0.98	31.9
12	R2	All MCs	251	2.0	251	2.0	* 0.528	51.0	LOS D	6.0	42.4	0.98	0.79	0.98	31.8
Approach			252	2.0	252	2.0	0.528	51.0	LOS D	6.0	42.4	0.98	0.79	0.98	31.8
All Vehicles			1932	2.0	1932	2.0	0.544	12.2	LOS B	15.9	113.2	0.48	0.50	0.48	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
North: Flanagans Drive												
P3	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Escarpment Connector												
P4	Full	50	53	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		100	105	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Gisborne Rd/Lerderderg Park Rd - AM Peak - Stage 6 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Rd/Lerderderk Park Rd
AM Peak
Ultimate
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Rd															
2	T1	All MCs	575	10.0	575	10.0	0.404	2.0	LOS A	1.5	11.6	0.20	0.24	0.26	57.3
3	R2	All MCs	45	2.0	45	2.0	0.404	13.9	LOS B	1.5	11.6	0.20	0.24	0.26	54.6
Approach			620	9.4	620	9.4	0.404	2.9	NA	1.5	11.6	0.20	0.24	0.26	57.0
East: Lerderderg Park Rd															
4	L2	All MCs	86	2.0	86	2.0	0.445	15.6	LOS C	1.6	11.4	0.87	1.03	1.17	42.8
6	R2	All MCs	35	2.0	35	2.0	0.445	37.0	LOS E	1.6	11.4	0.87	1.03	1.17	42.6
Approach			121	2.0	121	2.0	0.445	21.7	LOS C	1.6	11.4	0.87	1.03	1.17	42.8
North: Gisborne Rd															
7	L2	All MCs	15	2.0	15	2.0	0.497	5.7	LOS A	0.0	0.0	0.00	0.01	0.00	57.0
8	T1	All MCs	895	10.0	895	10.0	0.497	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.5
Approach			909	9.9	909	9.9	0.497	0.3	NA	0.0	0.0	0.00	0.01	0.00	59.4
All Vehicles			1651	9.1	1651	9.1	0.497	2.8	NA	1.6	11.6	0.14	0.17	0.18	56.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Gisborne Rd/Lerderderg Park Rd - PM Peak - Stage 6 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gisborne Rd/Lerderderk Park Rd
PM Peak
Ultimate
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Gisborne Rd															
2	T1	All MCs	842	10.0	842	10.0	0.608	3.6	LOS A	4.5	34.0	0.25	0.30	0.57	55.7
3	R2	All MCs	92	2.0	92	2.0	0.608	14.5	LOS B	4.5	34.0	0.25	0.30	0.57	53.1
Approach			934	9.2	934	9.2	0.608	4.7	NA	4.5	34.0	0.25	0.30	0.57	55.4
East: Lerderderg Park Rd															
4	L2	All MCs	60	2.0	60	2.0	0.338	12.4	LOS B	1.1	7.6	0.85	0.99	1.03	42.7
6	R2	All MCs	20	2.0	20	2.0	0.338	50.4	LOS F	1.1	7.6	0.85	0.99	1.03	42.5
Approach			80	2.0	80	2.0	0.338	21.9	LOS C	1.1	7.6	0.85	0.99	1.03	42.7
North: Gisborne Rd															
7	L2	All MCs	34	2.0	34	2.0	0.443	5.7	LOS A	0.0	0.0	0.00	0.02	0.00	56.9
8	T1	All MCs	778	10.0	778	10.0	0.443	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	59.4
Approach			812	9.7	812	9.7	0.443	0.4	NA	0.0	0.0	0.00	0.02	0.00	59.3
All Vehicles			1825	9.1	1825	9.1	0.608	3.5	NA	4.5	34.0	0.16	0.21	0.34	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-01 - Bences Rd/Dodemaide/N-S Connector - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-01 - Bences Rd/Dodemaide/N-S Connector
AM Peak
Design (ultimate)
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Road															
1	L2	All MCs	5	2.0	5	2.0	0.076	5.1	LOS A	0.4	2.7	0.39	0.50	0.39	52.9
2	T1	All MCs	75	2.0	75	2.0	0.076	5.3	LOS A	0.4	2.7	0.39	0.50	0.39	53.3
3	R2	All MCs	5	2.0	5	2.0	0.076	9.9	LOS A	0.4	2.7	0.39	0.50	0.39	52.4
Approach			85	2.0	85	2.0	0.076	5.5	LOS A	0.4	2.7	0.39	0.50	0.39	53.2
East: Dodemaide Circuit															
4	L2	All MCs	5	2.0	5	2.0	0.023	5.1	LOS A	0.1	0.8	0.39	0.58	0.39	51.6
5	T1	All MCs	5	2.0	5	2.0	0.023	5.2	LOS A	0.1	0.8	0.39	0.58	0.39	52.0
6	R2	All MCs	15	2.0	15	2.0	0.023	9.9	LOS A	0.1	0.8	0.39	0.58	0.39	51.1
Approach			25	2.0	25	2.0	0.023	7.9	LOS A	0.1	0.8	0.39	0.58	0.39	51.4
North: Bences Road															
7	L2	All MCs	6	2.0	6	2.0	0.169	3.9	LOS A	0.9	6.7	0.09	0.60	0.09	51.6
8	T1	All MCs	31	2.0	31	2.0	0.169	4.1	LOS A	0.9	6.7	0.09	0.60	0.09	52.0
9	R2	All MCs	226	3.0	226	3.0	0.169	8.8	LOS A	0.9	6.7	0.09	0.60	0.09	51.1
Approach			263	2.9	263	2.9	0.169	8.1	LOS A	0.9	6.7	0.09	0.60	0.09	51.2
West: North-South Connector															
10	L2	All MCs	554	3.0	554	3.0	0.413	4.5	LOS A	3.0	21.8	0.34	0.47	0.34	53.7
11	T1	All MCs	5	2.0	5	2.0	0.413	4.7	LOS A	3.0	21.8	0.34	0.47	0.34	54.1
12	R2	All MCs	5	2.0	5	2.0	0.413	9.3	LOS A	3.0	21.8	0.34	0.47	0.34	53.2
Approach			564	3.0	564	3.0	0.413	4.5	LOS A	3.0	21.8	0.34	0.47	0.34	53.7
All Vehicles			938	2.8	938	2.8	0.413	5.7	LOS A	3.0	21.8	0.28	0.51	0.28	52.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-01 - Bences Rd/Dodemaide/N-S Connector - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-01 - Bences Rd/Dodemaide/N-S Connector
PM Peak
Design (ultimate)
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bences Road															
1	L2	All MCs	5	2.0	5	2.0	0.053	6.5	LOS A	0.3	2.0	0.55	0.60	0.55	52.1
2	T1	All MCs	39	2.0	39	2.0	0.053	6.6	LOS A	0.3	2.0	0.55	0.60	0.55	52.4
3	R2	All MCs	5	2.0	5	2.0	0.053	11.3	LOS B	0.3	2.0	0.55	0.60	0.55	51.6
Approach			49	2.0	49	2.0	0.053	7.1	LOS A	0.3	2.0	0.55	0.60	0.55	52.3
East: Dodemaide Circuit															
4	L2	All MCs	5	2.0	5	2.0	0.020	6.7	LOS A	0.1	0.7	0.57	0.62	0.57	51.2
5	T1	All MCs	5	2.0	5	2.0	0.020	6.9	LOS A	0.1	0.7	0.57	0.62	0.57	51.5
6	R2	All MCs	7	2.0	7	2.0	0.020	11.5	LOS B	0.1	0.7	0.57	0.62	0.57	50.7
Approach			18	2.0	18	2.0	0.020	8.8	LOS A	0.1	0.7	0.57	0.62	0.57	51.1
North: Bences Road															
7	L2	All MCs	14	2.0	14	2.0	0.354	3.9	LOS A	2.4	17.2	0.11	0.60	0.11	51.6
8	T1	All MCs	66	2.0	66	2.0	0.354	4.1	LOS A	2.4	17.2	0.11	0.60	0.11	51.9
9	R2	All MCs	491	3.0	491	3.0	0.354	8.8	LOS A	2.4	17.2	0.11	0.60	0.11	51.0
Approach			571	2.9	571	2.9	0.354	8.1	LOS A	2.4	17.2	0.11	0.60	0.11	51.1
West: North-South Connector															
10	L2	All MCs	288	3.0	288	3.0	0.211	4.1	LOS A	1.3	9.4	0.21	0.46	0.21	54.1
11	T1	All MCs	5	2.0	5	2.0	0.211	4.3	LOS A	1.3	9.4	0.21	0.46	0.21	54.5
12	R2	All MCs	5	2.0	5	2.0	0.211	8.9	LOS A	1.3	9.4	0.21	0.46	0.21	53.6
Approach			299	3.0	299	3.0	0.211	4.2	LOS A	1.3	9.4	0.21	0.46	0.21	54.1
All Vehicles			937	2.8	937	2.8	0.354	6.8	LOS A	2.4	17.2	0.17	0.55	0.17	52.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-04 - Buckleys Rd/N-S Connector - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-04 - Buckleys/N-S Connector
AM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Oconnell Rd															
1	L2	All MCs	60	2.0	60	2.0	0.505	57.2	LOS E	8.2	58.2	0.96	0.79	0.96	31.1
2	T1	All MCs	60	2.0	60	2.0	* 0.505	50.8	LOS D	8.2	58.2	0.96	0.79	0.96	31.8
3	R2	All MCs	29	2.0	29	2.0	0.505	56.4	LOS E	8.2	58.2	0.96	0.79	0.96	31.1
Approach			149	2.0	149	2.0	0.505	54.5	LOS D	8.2	58.2	0.96	0.79	0.96	31.4
East: Buckleys Road															
4	L2	All MCs	13	2.0	13	2.0	0.151	52.9	LOS D	2.3	16.6	0.90	0.69	0.90	32.5
5	T1	All MCs	157	5.0	157	5.0	0.417	49.6	LOS D	6.7	48.9	0.94	0.74	0.94	33.0
6	R2	All MCs	263	5.0	263	5.0	* 0.734	56.4	LOS E	15.0	109.8	0.99	0.87	1.05	30.5
Approach			433	4.9	433	4.9	0.734	53.8	LOS D	15.0	109.8	0.97	0.82	1.00	31.4
North: N-S Connector															
7	L2	All MCs	368	5.0	368	5.0	* 0.725	48.7	LOS D	19.7	144.2	0.96	0.86	0.98	32.7
8	T1	All MCs	24	2.0	24	2.0	0.618	40.4	LOS D	16.1	117.6	0.93	0.83	0.93	34.4
9	R2	All MCs	292	5.0	292	5.0	0.618	46.0	LOS D	16.1	117.6	0.93	0.83	0.93	33.5
Approach			684	4.9	684	4.9	0.725	47.3	LOS D	19.7	144.2	0.95	0.85	0.95	33.1
West: Buckleys Road															
10	L2	All MCs	119	5.0	119	5.0	0.419	55.6	LOS E	6.4	46.8	0.95	0.79	0.95	30.6
11	T1	All MCs	221	5.0	221	5.0	* 0.739	54.8	LOS D	13.0	94.6	1.00	0.88	1.08	31.6
12	R2	All MCs	24	2.0	24	2.0	0.066	47.4	LOS D	1.1	8.2	0.84	0.71	0.84	32.9
Approach			364	4.8	364	4.8	0.739	54.6	LOS D	13.0	94.6	0.97	0.84	1.02	31.3
All Vehicles			1631	4.6	1631	4.6	0.739	51.3	LOS D	19.7	144.2	0.96	0.83	0.98	32.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Oconnell Rd												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

East: Buckleys Road												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
North: N-S Connector												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
West: Buckleys Road												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-04 - Buckleys Rd/N-S Connector - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-04 - Buckleys/N-S Connector
PM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Oconnell Rd															
1	L2	All MCs	32	2.0	32	2.0	0.267	54.5	LOS D	4.1	29.4	0.92	0.74	0.92	31.7
2	T1	All MCs	32	2.0	32	2.0	*0.267	48.5	LOS D	4.1	29.4	0.92	0.74	0.92	32.5
3	R2	All MCs	16	2.0	16	2.0	0.267	54.1	LOS D	4.1	29.4	0.92	0.74	0.92	31.7
Approach			79	2.0	79	2.0	0.267	52.0	LOS D	4.1	29.4	0.92	0.74	0.92	32.0
East: Buckleys Road															
4	L2	All MCs	26	2.0	26	2.0	0.084	49.4	LOS D	1.4	9.8	0.86	0.71	0.86	32.4
5	T1	All MCs	82	5.0	82	5.0	0.231	55.8	LOS E	4.0	29.5	0.89	0.70	0.89	34.4
6	R2	All MCs	368	5.0	368	5.0	*0.788	63.1	LOS E	21.1	153.8	0.99	0.89	1.06	31.6
Approach			477	4.8	477	4.8	0.788	61.1	LOS E	21.1	153.8	0.96	0.85	1.02	29.5
North: N-S Connector															
7	L2	All MCs	263	5.0	263	5.0	*0.800	61.4	LOS E	15.9	116.0	1.00	0.91	1.13	29.3
8	T1	All MCs	53	2.0	53	2.0	0.610	49.4	LOS D	11.2	81.2	0.97	0.82	0.97	32.0
9	R2	All MCs	152	5.0	152	5.0	0.610	55.0	LOS E	11.2	81.2	0.97	0.82	0.97	31.3
Approach			467	4.7	467	4.7	0.800	58.0	LOS E	15.9	116.0	0.99	0.87	1.06	30.2
West: Buckleys Road															
10	L2	All MCs	259	5.0	259	5.0	*0.789	60.6	LOS E	15.5	113.1	1.00	0.90	1.12	29.4
11	T1	All MCs	139	5.0	139	5.0	0.401	47.2	LOS D	7.3	53.1	0.93	0.75	0.93	33.8
12	R2	All MCs	53	2.0	53	2.0	0.105	40.3	LOS D	2.3	16.3	0.78	0.73	0.78	35.2
Approach			451	4.6	451	4.6	0.789	54.1	LOS D	15.5	113.1	0.95	0.83	1.02	31.3
All Vehicles			1474	4.6	1474	4.6	0.800	57.5	LOS E	21.1	153.8	0.97	0.84	1.03	30.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Oconnell Rd												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

East: Buckleys Road												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
North: N-S Connector												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
West: Buckleys Road												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-05 - Central NAC - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-05 - Central NAC
AM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: N-S Connector 2															
1	L2	All MCs	287	5.0	287	5.0	0.205	9.1	LOS A	4.2	30.9	0.28	0.66	0.28	50.1
3	R2	All MCs	53	3.0	53	3.0	* 0.248	58.8	LOS E	2.9	20.7	0.95	0.75	0.95	29.7
Approach			340	4.7	340	4.7	0.248	16.8	LOS B	4.2	30.9	0.38	0.67	0.38	45.3
East: Local Street															
4	L2	All MCs	53	3.0	53	3.0	0.484	60.7	LOS E	6.0	42.8	0.98	0.78	0.98	30.0
5	T1	All MCs	53	3.0	53	3.0	* 0.484	55.1	LOS E	6.0	42.8	0.98	0.78	0.98	30.8
Approach			105	3.0	105	3.0	0.484	57.9	LOS E	6.0	42.8	0.98	0.78	0.98	30.4
West: N-S Connector 2															
11	T1	All MCs	53	3.0	53	3.0	0.236	58.0	LOS E	2.9	20.6	0.95	0.71	0.95	32.1
12	R2	All MCs	641	5.0	641	5.0	* 0.595	25.3	LOS C	22.4	163.3	0.65	0.79	0.65	43.5
Approach			694	4.8	694	4.8	0.595	27.8	LOS C	22.4	163.3	0.68	0.79	0.68	40.0
All Vehicles			1139	4.6	1139	4.6	0.595	27.3	LOS C	22.4	163.3	0.62	0.75	0.62	40.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: N-S Connector 2												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
East: Local Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
West: N-S Connector 2												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		150	158	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-05 - Central NAC - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-05 - Central NAC
PM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: N-S Connector 2															
1	L2	All MCs	574	5.0	574	5.0	0.422	11.0	LOS B	11.7	85.2	0.38	0.70	0.38	48.9
3	R2	All MCs	53	3.0	53	3.0	* 0.204	55.4	LOS E	2.8	19.9	0.92	0.75	0.92	30.6
Approach			626	4.8	626	4.8	0.422	14.8	LOS B	11.7	85.2	0.43	0.71	0.43	46.5
East: Local Street															
4	L2	All MCs	53	3.0	53	3.0	0.399	57.2	LOS E	5.7	41.2	0.95	0.77	0.95	31.0
5	T1	All MCs	53	3.0	53	3.0	* 0.399	51.6	LOS D	5.7	41.2	0.95	0.77	0.95	31.7
Approach			105	3.0	105	3.0	0.399	54.4	LOS D	5.7	41.2	0.95	0.77	0.95	31.3
West: N-S Connector 2															
11	T1	All MCs	53	3.0	53	3.0	0.194	49.7	LOS D	2.8	19.8	0.92	0.70	0.92	33.0
12	R2	All MCs	355	5.0	355	5.0	* 0.349	20.5	LOS C	11.0	80.5	0.58	0.75	0.58	43.4
Approach			407	4.7	407	4.7	0.349	24.2	LOS C	11.0	80.5	0.62	0.74	0.62	41.7
All Vehicles			1139	4.6	1139	4.6	0.422	21.8	LOS C	11.7	85.2	0.55	0.72	0.55	42.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: N-S Connector 2												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
East: Local Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
West: N-S Connector 2												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		150	158	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-06 - Lindsay Ave/N-S Connector 2 - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-06 - Lindsay Ave/N-S Connector 2
AM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: N-S Connector 2															
1	L2	All MCs	18	3.0	18	3.0	0.215	46.4	LOS D	4.4	31.4	0.85	0.69	0.85	34.6
2	T1	All MCs	74	3.0	74	3.0	0.215	40.8	LOS D	4.4	31.4	0.85	0.69	0.85	35.5
3	R2	All MCs	53	3.0	53	3.0	* 0.579	70.6	LOS E	3.3	23.4	1.00	0.78	1.06	27.2
Approach			144	3.0	144	3.0	0.579	52.4	LOS D	4.4	31.4	0.91	0.72	0.93	31.9
East: Lindsay Ave															
4	L2	All MCs	53	3.0	53	3.0	0.106	30.1	LOS C	2.8	20.2	0.67	0.66	0.67	39.7
5	T1	All MCs	24	3.0	24	3.0	0.106	24.5	LOS C	2.8	20.2	0.67	0.66	0.67	41.0
6	R2	All MCs	293	5.0	293	5.0	0.417	34.0	LOS C	12.4	90.3	0.78	0.79	0.78	37.5
Approach			369	4.6	369	4.6	0.417	32.8	LOS C	12.4	90.3	0.75	0.77	0.75	38.0
North: N-S Connector 2															
7	L2	All MCs	718	5.0	718	5.0	* 0.601	17.4	LOS B	23.0	167.6	0.60	0.78	0.60	45.1
8	T1	All MCs	179	3.0	179	3.0	0.416	43.1	LOS D	9.0	64.7	0.90	0.74	0.90	35.1
9	R2	All MCs	18	3.0	18	3.0	0.197	68.1	LOS E	1.1	7.7	0.99	0.70	0.99	27.6
Approach			915	4.6	915	4.6	0.601	23.4	LOS C	23.0	167.6	0.67	0.77	0.67	42.2
West: Lindsay Ave Extn.															
10	L2	All MCs	45	3.0	45	3.0	0.609	59.9	LOS E	8.6	61.5	0.99	0.80	0.99	30.1
11	T1	All MCs	60	3.0	60	3.0	* 0.609	54.4	LOS D	8.6	61.5	0.99	0.80	0.99	30.8
12	R2	All MCs	45	3.0	45	3.0	0.609	59.9	LOS E	8.6	61.5	0.99	0.80	0.99	30.1
Approach			151	3.0	151	3.0	0.609	57.7	LOS E	8.6	61.5	0.99	0.80	0.99	30.4
All Vehicles			1579	4.3	1579	4.3	0.609	31.5	LOS C	23.0	167.6	0.74	0.77	0.74	38.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: N-S Connector 2												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

East: Lindsay Ave												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
North: N-S Connector 2												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
West: Lindsay Ave Extn.												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-06 - Lindsay Ave/N-S Connector 2 - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-06 - Lindsay Ave/N-S Connector 2
PM Peak
Design (Ultimate)
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: N-S Connector 2															
1	L2	All MCs	40	3.0	40	3.0	0.742	62.1	LOS E	11.8	84.7	1.00	0.88	1.09	30.1
2	T1	All MCs	159	3.0	159	3.0	* 0.742	56.5	LOS E	11.8	84.7	1.00	0.88	1.09	30.8
3	R2	All MCs	53	3.0	53	3.0	* 0.579	70.6	LOS E	3.3	23.4	1.00	0.78	1.06	27.2
Approach			252	3.0	252	3.0	0.742	60.4	LOS E	11.8	84.7	1.00	0.86	1.08	29.9
East: Lindsay Ave															
4	L2	All MCs	53	3.0	53	3.0	0.119	29.5	LOS C	3.4	24.1	0.59	0.60	0.59	43.0
5	T1	All MCs	53	3.0	53	3.0	0.119	23.9	LOS C	3.4	24.1	0.59	0.60	0.59	44.5
6	R2	All MCs	637	5.0	637	5.0	* 0.774	39.0	LOS D	30.7	224.2	0.90	0.87	0.90	37.7
Approach			742	4.7	742	4.7	0.774	37.2	LOS D	30.7	224.2	0.85	0.83	0.85	36.4
North: N-S Connector 2															
7	L2	All MCs	374	5.0	374	5.0	0.313	14.5	LOS B	9.0	65.9	0.45	0.71	0.45	46.7
8	T1	All MCs	94	3.0	94	3.0	0.346	51.1	LOS D	5.1	36.3	0.95	0.74	0.95	32.6
9	R2	All MCs	40	3.0	40	3.0	0.440	69.6	LOS E	2.4	17.6	1.00	0.74	1.00	27.3
Approach			507	4.5	507	4.5	0.440	25.6	LOS C	9.0	65.9	0.59	0.72	0.59	41.1
West: Lindsay Ave Extn.															
10	L2	All MCs	23	3.0	23	3.0	0.315	57.4	LOS E	4.2	30.3	0.95	0.75	0.95	30.8
11	T1	All MCs	32	3.0	32	3.0	* 0.315	51.8	LOS D	4.2	30.3	0.95	0.75	0.95	31.5
12	R2	All MCs	23	3.0	23	3.0	0.315	57.4	LOS E	4.2	30.3	0.95	0.75	0.95	30.8
Approach			78	3.0	78	3.0	0.315	55.1	LOS E	4.2	30.3	0.95	0.75	0.95	31.1
All Vehicles			1579	4.3	1579	4.3	0.774	38.1	LOS D	30.7	224.2	0.80	0.80	0.81	36.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: N-S Connector 2												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

East: Lindsay Ave												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
North: N-S Connector 2												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
West: Lindsay Ave Extn.												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [IN-07 - Flanagans Dr/Linsday Ave - AM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-07 - Flanagans Dr/Linsday Ave
AM Peak
Ultimate (Design)
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
1	L2	All MCs	353	5.0	353	5.0	0.197	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	52.6
2	T1	All MCs	6	2.0	6	2.0	0.011	9.1	LOS A	0.0	0.3	0.62	0.72	0.62	50.6
Approach			359	4.9	359	4.9	0.197	5.7	LOS A	0.0	0.3	0.01	0.58	0.01	52.6
North: Flanagans Drive															
8	T1	All MCs	15	2.0	15	2.0	0.048	9.4	LOS A	0.1	1.0	0.70	0.86	0.70	48.9
9	R2	All MCs	5	2.0	5	2.0	0.048	18.1	LOS C	0.1	1.0	0.70	0.86	0.70	48.4
Approach			20	2.0	20	2.0	0.048	11.7	LOS B	0.1	1.0	0.70	0.86	0.70	48.8
West: Lindsay Avenue															
10	L2	All MCs	5	2.0	5	2.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
12	R2	All MCs	837	5.0	837	5.0	0.467	5.7	LOS A	0.0	0.0	0.00	0.58	0.00	52.3
Approach			842	5.0	842	5.0	0.467	5.7	NA	0.0	0.0	0.00	0.58	0.00	52.3
All Vehicles			1221	4.9	1221	4.9	0.467	5.8	NA	0.1	1.0	0.01	0.59	0.01	52.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [IN-07 - Flanagans Dr/Linsday Ave - PM Peak (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

IN-07 - Flanagans Dr/Linsday Ave
PM Peak
Ultimate (Design)
Site Category: (None)
Stop (Two-Way)

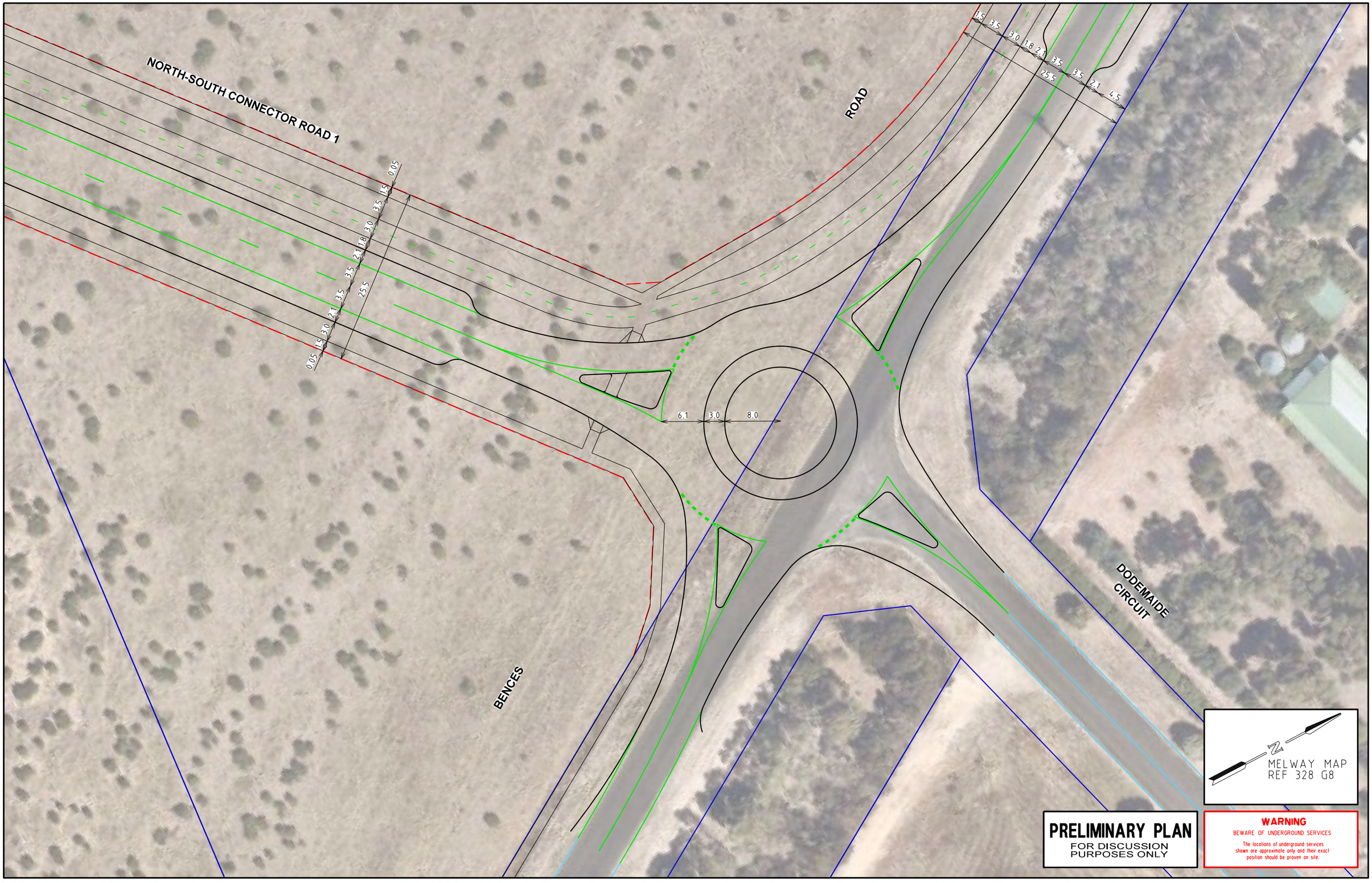
Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Flanagans Drive															
1	L2	All MCs	785	5.0	785	5.0	0.438	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.5
2	T1	All MCs	14	2.0	14	2.0	0.015	6.2	LOS A	0.0	0.4	0.43	0.59	0.43	52.7
Approach			799	4.9	799	4.9	0.438	5.8	LOS A	0.0	0.4	0.01	0.57	0.01	52.5
North: Flanagans Drive															
8	T1	All MCs	7	2.0	7	2.0	0.031	6.2	LOS A	0.1	0.6	0.62	0.74	0.62	48.9
9	R2	All MCs	5	2.0	5	2.0	0.031	19.1	LOS C	0.1	0.6	0.62	0.74	0.62	48.5
Approach			13	2.0	13	2.0	0.031	11.6	LOS B	0.1	0.6	0.62	0.74	0.62	48.7
West: Lindsay Avenue															
10	L2	All MCs	5	2.0	5	2.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	52.8
12	R2	All MCs	466	5.0	466	5.0	0.260	5.6	LOS A	0.0	0.0	0.00	0.59	0.00	52.5
Approach			472	5.0	472	5.0	0.260	5.6	NA	0.0	0.0	0.00	0.59	0.00	52.5
All Vehicles			1283	4.9	1283	4.9	0.438	5.8	NA	0.1	0.6	0.01	0.58	0.01	52.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Appendix B

Indicative Intersection Layout Plans



ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	05 FEB 2025

GENERAL NOTES
1 AERIAL PHOTOGRAPH (SOURCE NEARMAP JAN 2025)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 LOCAL ROAD - BENCES ROAD (SPEED ZONE 50km/h)

DESIGNED: G. RAKITA
CHECKED/APPROVED: H. TURNBULL
FILE NAME: G23398-02-00.dgn

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BENCES ROAD / DODEMAIDE CIRCUIT / NORTH-SOUTH CONNECTOR ROAD 1

MOORABOOL SHIRE CITY COUNCIL

IN-01 CONCEPT LAYOUT PLAN

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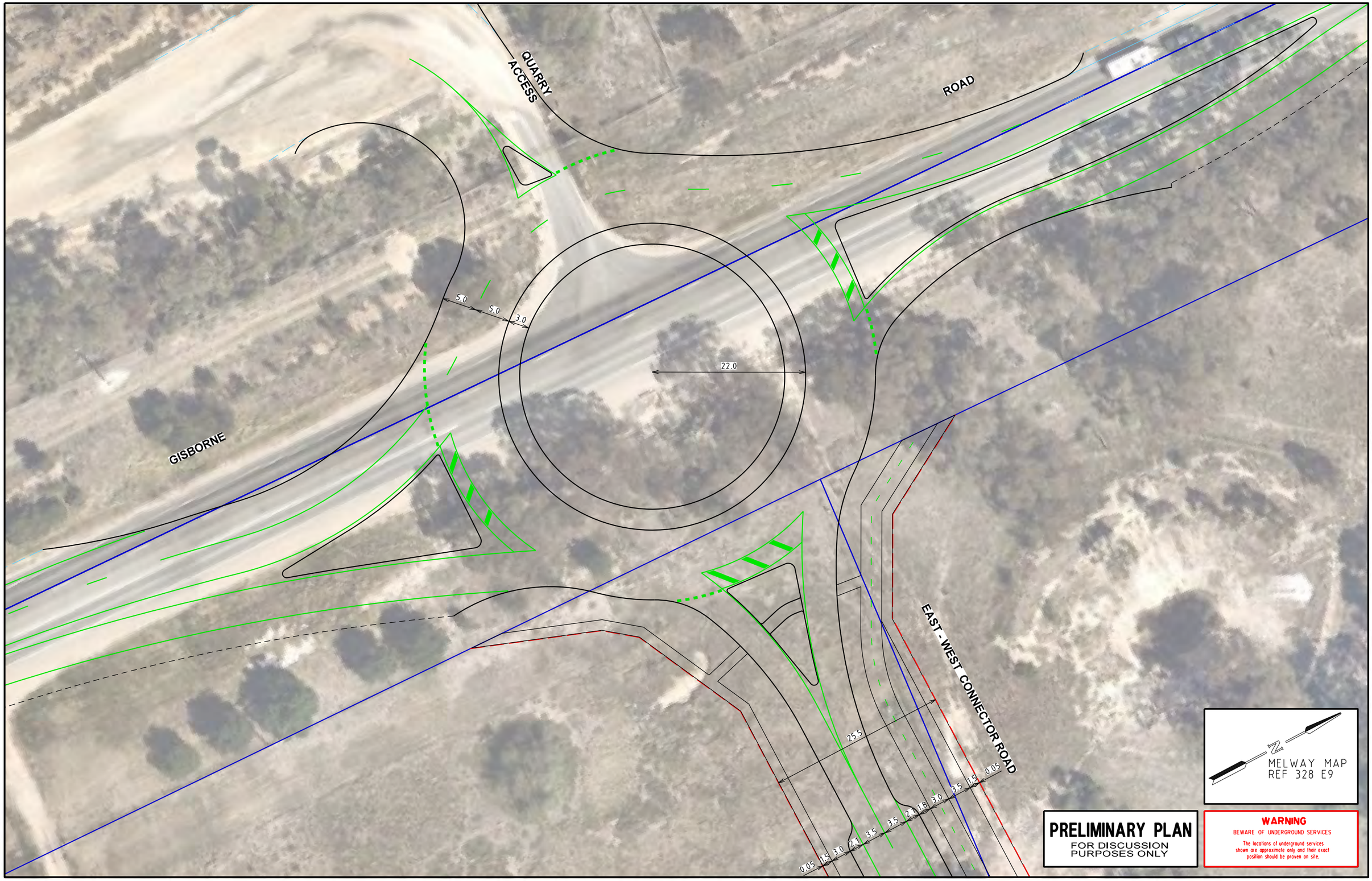

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	05 FEB 2025

GENERAL NOTES

1 AERIAL PHOTOGRAPH (SOURCE:NEARMAP JAN 2025)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 MAIN ROAD - GISBORNE ROAD (SPEED ZONE 80km/h)

DESIGNED
G. RAKITA

CHECKED/APPROVED
H. TURNBULL

FILE NAME
G23398-02-00.dgn

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GISBORNE ROAD / QUARRY ACCESS / EAST-WEST CONNECTOR ROAD

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IN-02 CONCEPT LAYOUT PLAN

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SHEET No. 1/3

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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	H.T (RPE6312)	4 FEB 2025

GENERAL NOTES

1 AERIAL PHOTOGRAPH (SOURCE: NEARMAP DEC 2024)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 MAIN ROAD - GISBOURNE ROAD (SPEED ZONE 80km/h)

DESIGNED
T. HO

CHECKED/APPROVED
H. TURNBULL

FILE NAME
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GISBORNE ROAD / BUCKLEYS ROAD
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IN-03 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10
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DWG No. G23398-01-01

DATE: 02/04/25
MODEL: G23398-01-01
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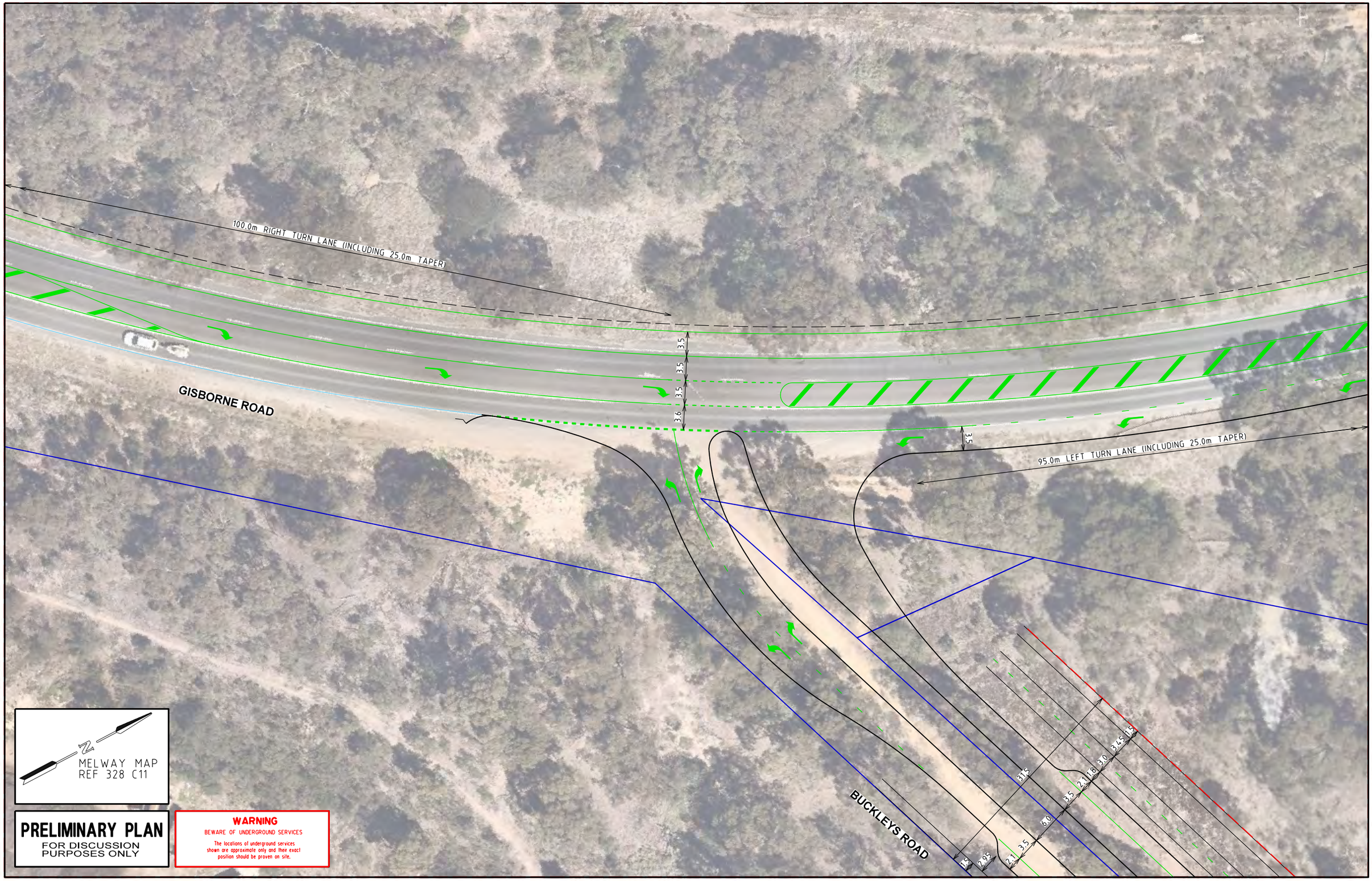
FOR CONTINUATION REFER TO SHEET 1

FOR CONTINUATION REFER TO SHEET 3



N

MELWAY MAP
REF 328 C11

PRELIMINARY PLAN
FOR DISCUSSION
PURPOSES ONLY

WARNING
BEWARE OF UNDERGROUND SERVICES
The locations of underground services shown are approximate only and their exact position should be proven on site.

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	H.T (RPE6312)	4 FEB 2025

GENERAL NOTES
1 AERIAL PHOTOGRAPH (SOURCE: NEARMAP DEC 2024)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 MAIN ROAD - GISBOURNE ROAD (SPEED ZONE 80km/h)

DESIGNED
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IN-03 CONCEPT LAYOUT PLAN

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DWG No. G23398-01-02

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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	H.T (RPE6312)	4 FEB 2025

GENERAL NOTES
1 AERIAL PHOTOGRAPH (SOURCE: NEARMAP DEC 2024)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 MAIN ROAD - GISBOURNE ROAD (SPEED ZONE 80km/h)

DESIGNED: T. HO
CHECKED/APPROVED: H. TURNBULL
FILE NAME: G23398-01-00.dgn

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IN-03 CONCEPT LAYOUT PLAN

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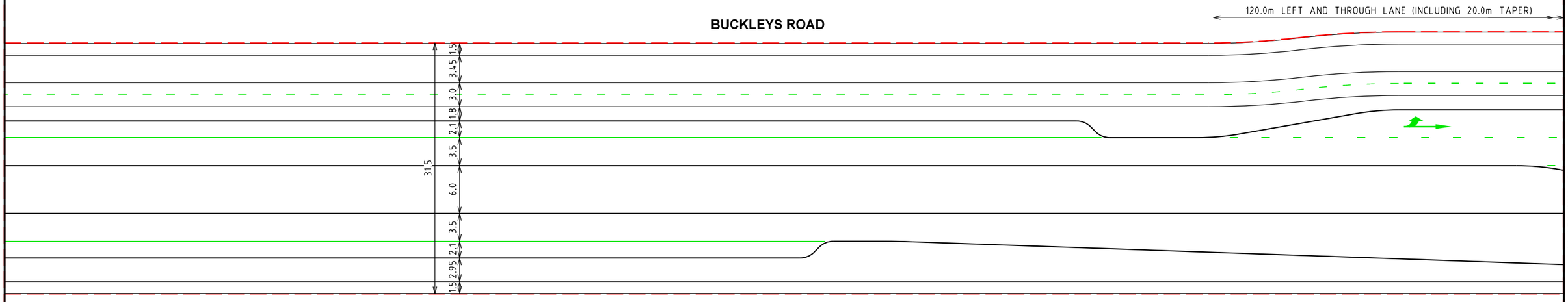

N

MELWAY MAP
REF 328 F11

PRELIMINARY PLAN
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WARNING
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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	DD/MM/YY

GENERAL NOTES
1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 BUCKELYS ROAD (PROPOSED SPEED ZONE 60km/h)
CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/h)
3 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4-2009

DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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BUCKLEYS ROAD / PROPOSED CONNECTOR
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IN-04 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 1/4 | DWG No. G23398-01-04

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MODEL: G23398-01-04
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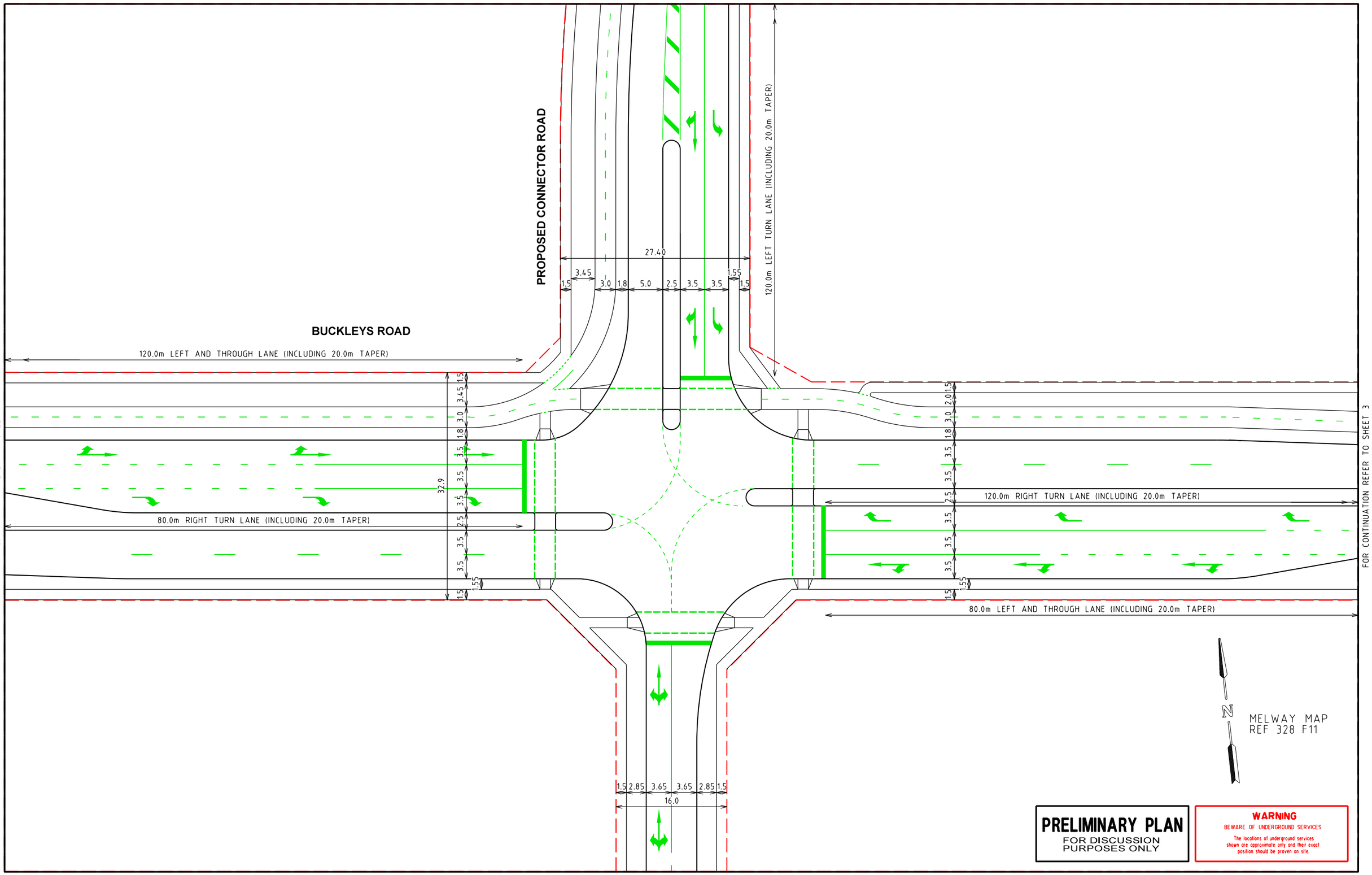
FOR CONTINUATION REFER TO SHEET 4



FOR CONTINUATION REFER TO SHEET 1

FOR CONTINUATION REFER TO SHEET 3

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

WARNING
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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	DD/MM/YY

GENERAL NOTES

1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 BUCKELYS ROAD (PROPOSED SPEED ZONE 60km/h)
CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/h)
3 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4-2009

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IN-04 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10
SHEET No. 2/4
DWG No. G23398-01-05

DATE: 5/02/2025
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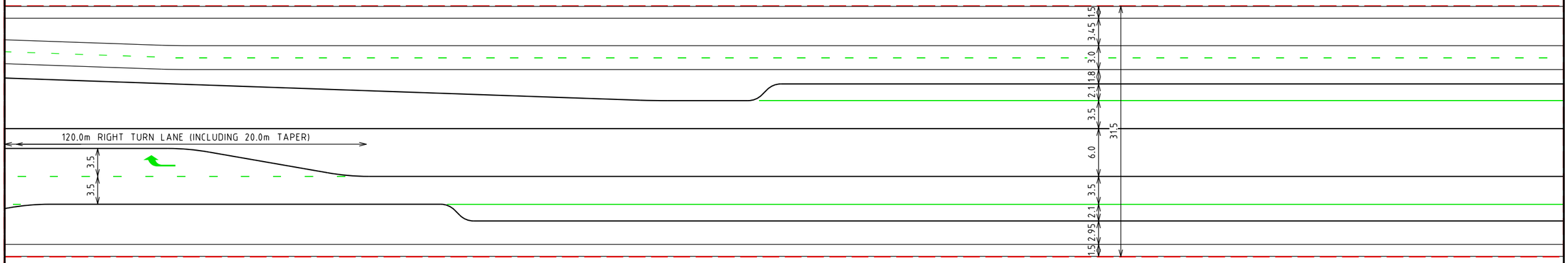
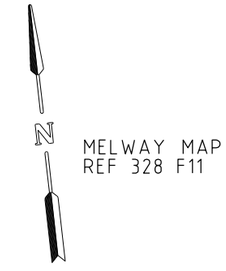
BUCKLEYS ROAD





PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

WARNING
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The locations of underground services shown are approximate only and their exact position should be proven on site.

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	DD/MM/YY

GENERAL NOTES
1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 BUCKELYS ROAD (PROPOSED SPEED ZONE 60km/h)
CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/h)
3 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4-2009

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IN-04 CONCEPT LAYOUT PLAN

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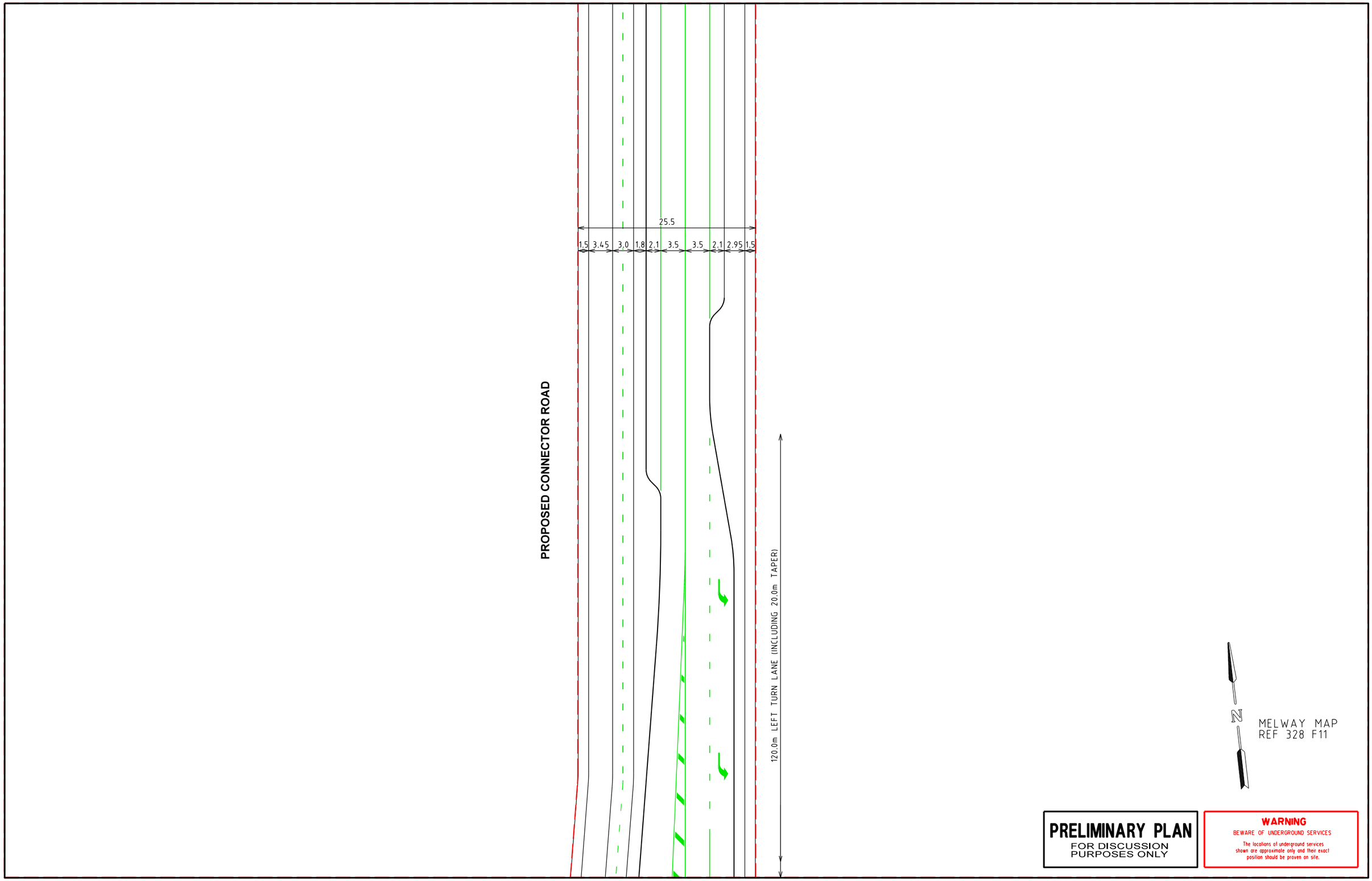

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

WARNING
BEWARE OF UNDERGROUND SERVICES
The locations of underground services shown are approximate only and their exact position should be proven on site.

FOR CONTINUATION REFER TO SHEET 2

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	DD/MM/YY

GENERAL NOTES

1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 BUCKELYS ROAD (PROPOSED SPEED ZONE 60km/h)
CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/h)
3 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4-2009

DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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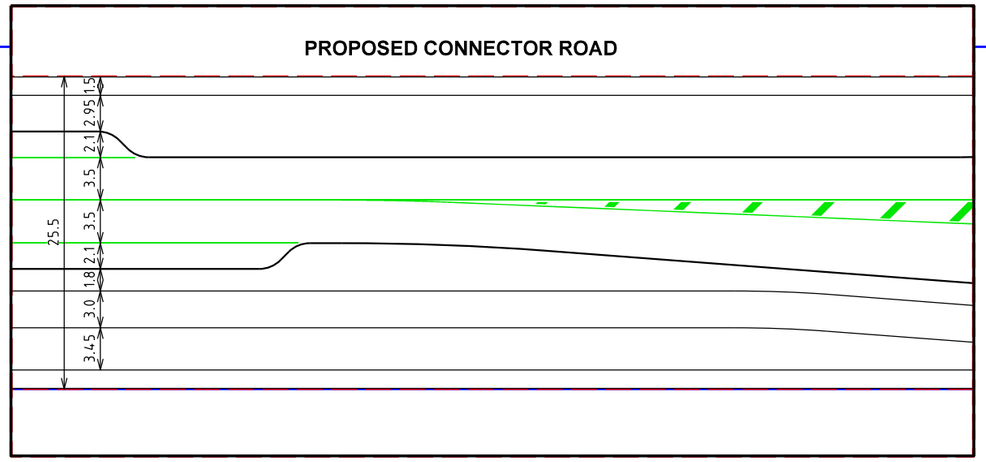
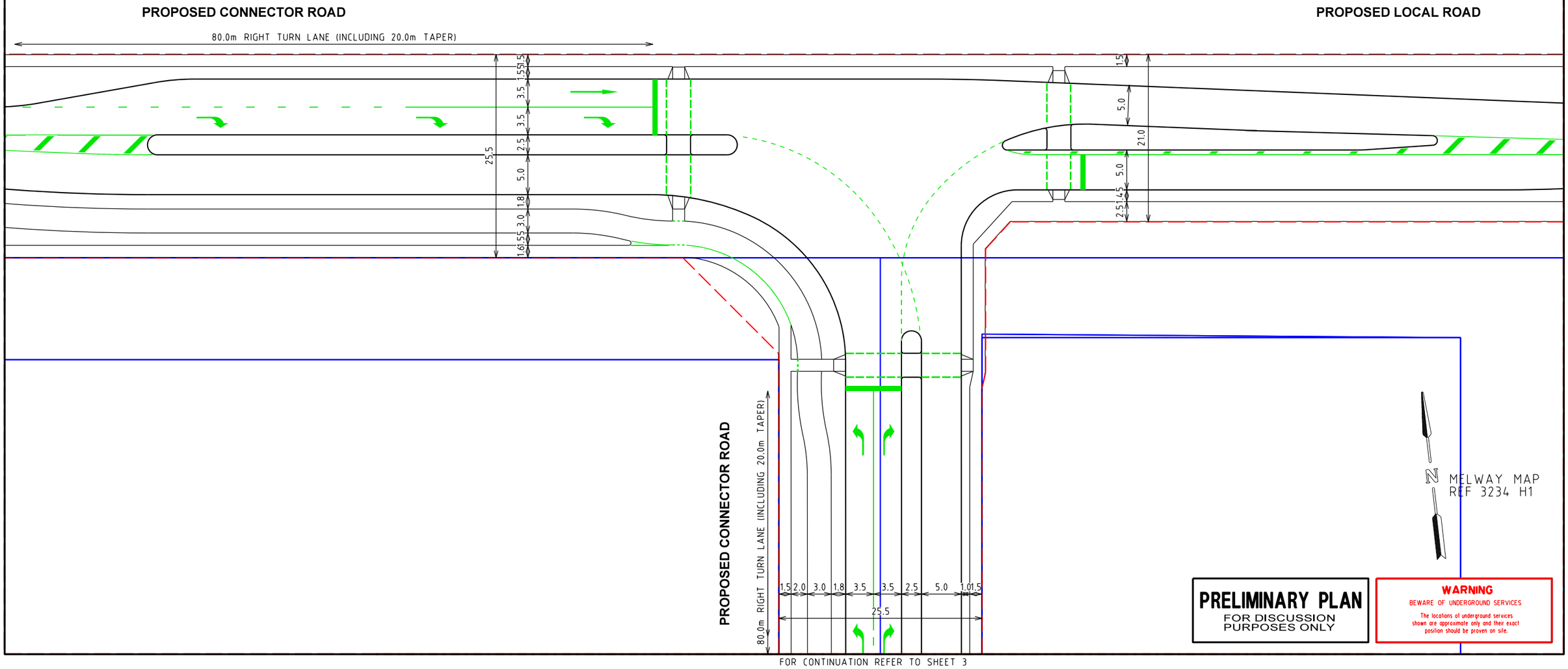
BUCKLEYS ROAD / PROPOSED CONNECTOR
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-04 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 4/4 | DWG No. G23398-01-07

DATE: 5/02/2025
MODEL: G23398-01-07
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn

INSET 1





PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

WARNING
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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	13 FEB 2025

GENERAL NOTES
1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 PROPOSED CONNECTOR ROAD (SPEED ZONE 60km/h)
PROPOSED LOCAL ROAD (SPEED ZONE 60km/h)
3 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4:2009

DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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PROPOSED CONNECTOR/ CONNECTOR / LOCAL ROAD
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-05 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10
SHEET No. 1/3
DWG No. G23398-01-08

DATE: 02/13/25
MODEL: G23398-01-08
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn

PROPOSED LOCAL ROAD

FOR CONTINUATION REFER TO SHEET 1

2.5 3.15 2.3 3.0 3.0 21.0

MELWAY MAP
REF 3234 H1

PRELIMINARY PLAN
FOR DISCUSSION
PURPOSES ONLY

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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	12 FEB 2025

GENERAL NOTES

1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 PROPOSED CONNECTOR ROAD (SPEED ZONE 60km/h)
PROPOSED LOCAL ROAD (SPEED ZONE 60km/h)
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DESIGNED
T. HO

CHECKED/APPROVED
J. PLACE

FILE NAME
G23398-01-00.dgn

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PROPOSED CONNECTOR/ CONNECTOR / LOCAL ROAD
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-05 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10
SHEET No. 2/3
DWG No. G23398-01-09

DATE: 02/13/25
MODEL: G23398-01-09
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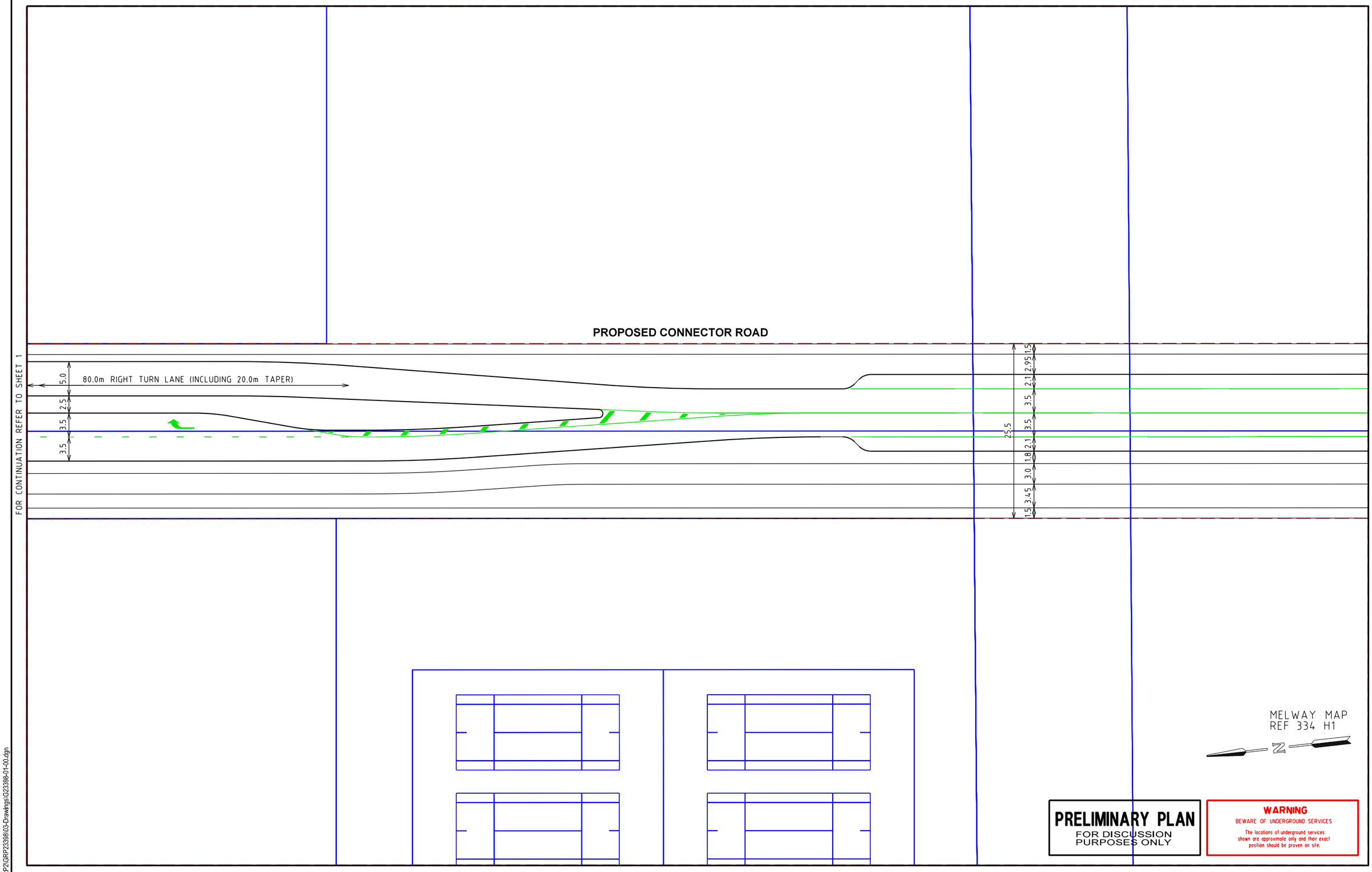

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	13 FEB 2025

GENERAL NOTES

1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
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PROPOSED LOCAL ROAD (SPEED ZONE 60km/h)
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DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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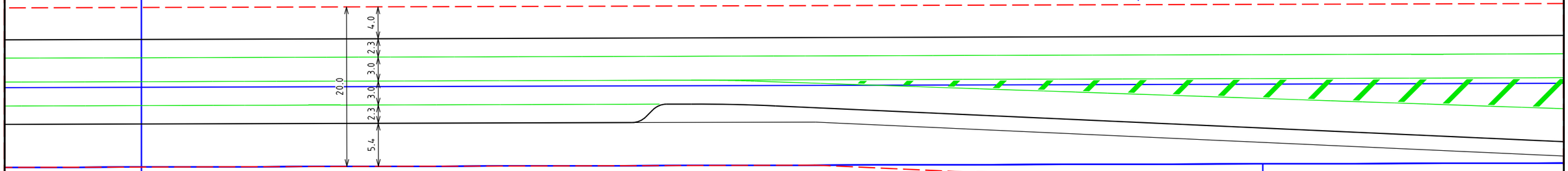
PROPOSED CONNECTOR/ CONNECTOR / LOCAL ROAD
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-05 CONCEPT LAYOUT PLAN

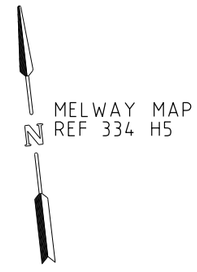
SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 3/3 | DWG No. G23398-01-10

DATE: 02/13/25
MODEL: G23398-01-10
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn

LINDSAY AVENUE EXTENSION



FOR CONTINUATION REFER TO SHEET 2



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	13 FEB 2025

GENERAL NOTES
1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 LINDSAY AVENUE EXTENSION (PROPOSED SPEED ZONE 60km/h)
PROPOSED CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/hr
3 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4-2009

DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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LINDSAY AVENUE/ PROPOSED CONNECTOR ROAD
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-06 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 1/4 | DWG No. G23398-01-11

DATE: 02/13/25
MODEL: G23398-01-11
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn

FOR CONTINUATION REFER TO SHEET 3

FOR CONTINUATION REFER TO SHEET 1

FOR CONTINUATION REFER TO SHEET 4

PROPOSED CONNECTOR ROAD

80.0m RIGHT TURN LANE (INCLUDING 20.0m TAPER)

120.0m LEFT TURN LANE (INCLUDING 20.0m TAPER)

25.95

1.55

3.0 1.8 5.0 2.5 3.5 3.5 3.5 1.5

LINDSAY AVENUE EXTENSION

80.0 RIGHT TURN LANE (INCLUDING 20.0m TAPER)

2.4 3.0 3.0 3.9 5.0 1.8 5.4

LINDSAY AVENUE

1.5 1.05 5.0 2.5 3.5 3.5 1.8 3.0 1.5 25.50

1.5 2.9 3.5 2.2 3.5 1.8 3.0 1.5 1.5

120.0m LEFT AND THROUGH LANE (INCLUDING 20.0m TAPER)

3.0 1.8 3.5 3.5 2.5 5.0 3.5 1.5

24.5

80.0m RIGHT TURN LANE (INCLUDING 20.0m TAPER)

PROPOSED CONNECTOR ROAD

MELWAY MAP
N REF 334 H5

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	13 FEB 2025

GENERAL NOTES
1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
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PROPOSED CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/hr
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DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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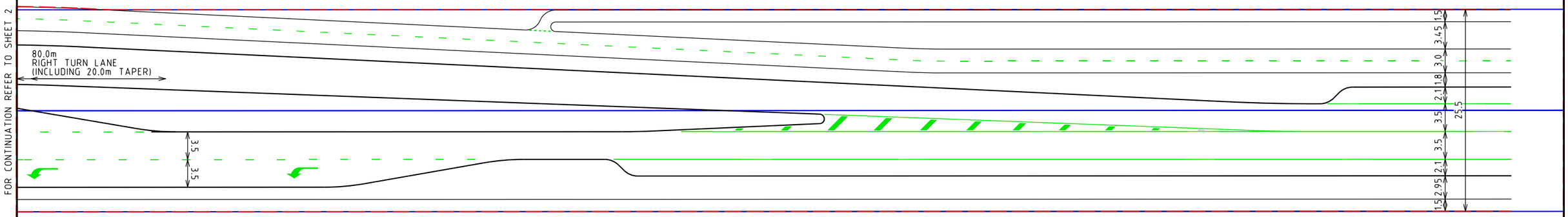
LINDSAY AVENUE/ PROPOSED CONNECTOR ROAD
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-06 CONCEPT LAYOUT PLAN

SCALE 1:750 (A3) 0 3.75 7.5 11.25 15 | SHEET No. 2/4 | DWG No. G23398-01-12

DATE: 02/13/25
MODEL: G23398-01-12
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn

PROPOSED CONNECTOR ROAD



MELWAY MAP
REF 334 H5

N

PRELIMINARY PLAN
FOR DISCUSSION
PURPOSES ONLY

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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	13 FEB 2025

GENERAL NOTES

1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 LINDSAY AVENUE EXTENSION (PROPOSED SPEED ZONE 60km/h)
PROPOSED CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/hr
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DESIGNED
T. HO

CHECKED/APPROVED
J. PLACE

FILE NAME
G23398-01-00.dgn

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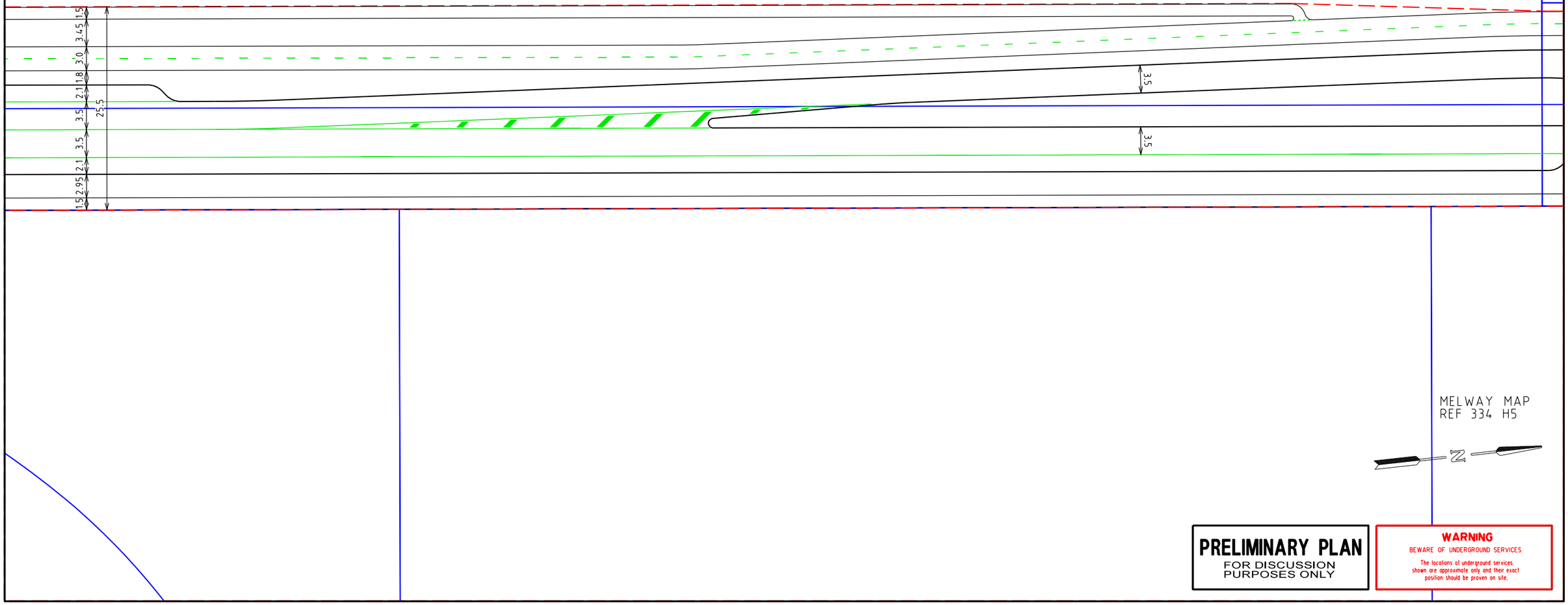
LINDSAY AVENUE/ PROPOSED CONNECTOR ROAD
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-06 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10
SHEET No. 3/4
DWG No. G23398-01-13

DATE: 02/13/25
MODEL: G23398-01-13
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn

PROPOSED CONNECTOR ROAD



ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.P (RPE7856)	13 FEB 2025

GENERAL NOTES

1 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
2 LINDSAY AVENUE EXTENSION (PROPOSED SPEED ZONE 60km/h)
PROPOSED CONNECTOR ROAD (PROPOSED SPEED ZONE 60km/hr
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DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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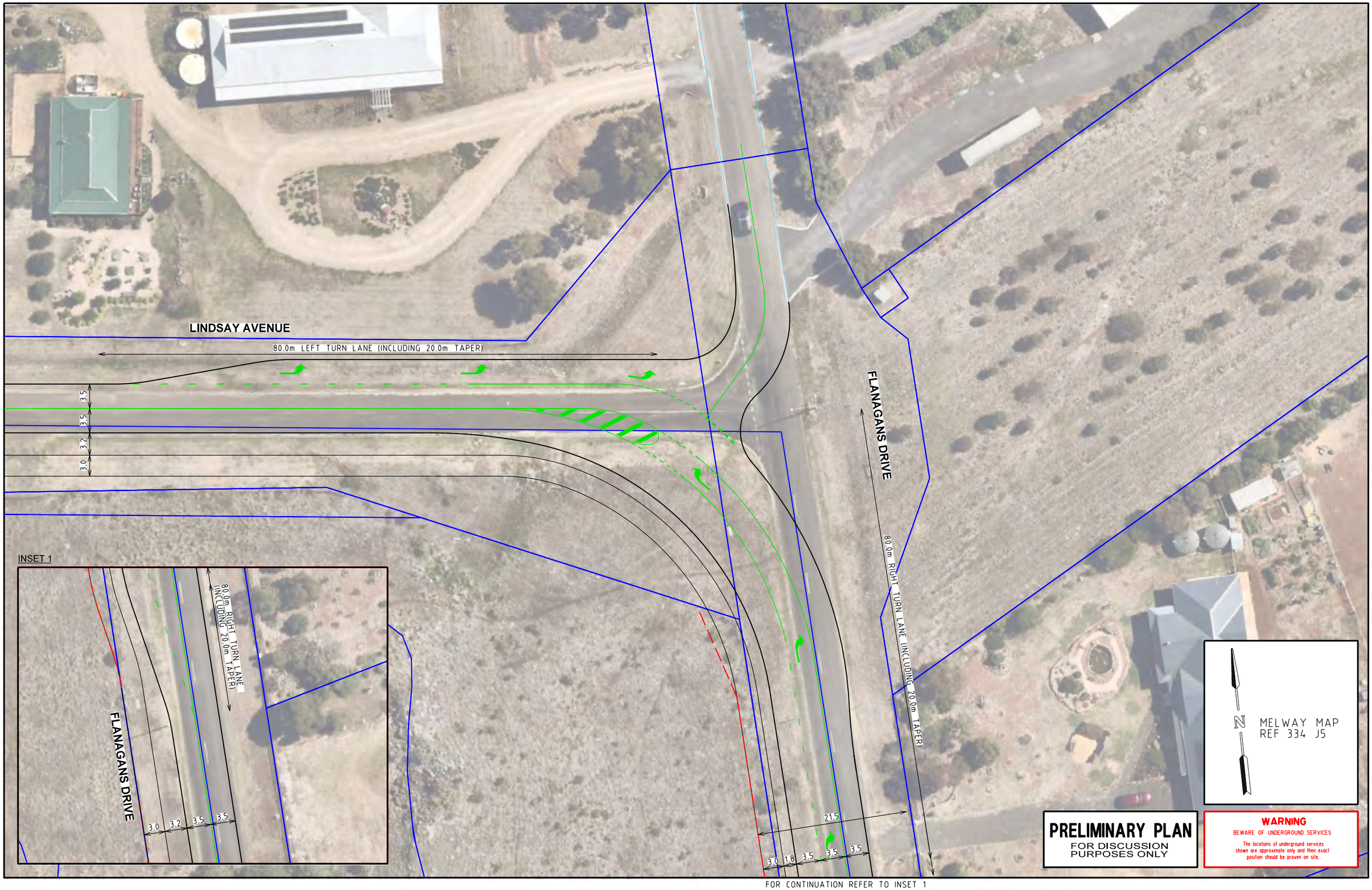
LINDSAY AVENUE/ PROPOSED CONNECTOR ROAD
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-06 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 4/4 | DWG No. G23398-01-14

DATE: 02/13/25
MODEL: G23398-01-14
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn



FOR CONTINUATION REFER TO INSET 1

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	T. HO	J.D (RPE7856)	14 FEB 2025

GENERAL NOTES

1 AERIAL PHOTOGRAPH (SOURCE:NEARMAP JAN 2025)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 LINSDAY AVENUE (SPEED ZONE 60km/h)
4 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4:2009

DESIGNED: T. HO
CHECKED/APPROVED: J. PLACE
FILE NAME: G23398-01-00.dgn

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LINDSAY AVENUE / FLANAGANS DRIVE
MERRIMU
MOORABOOL SHIRE CITY COUNCIL
IN-07 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 1/1 | DWG No. G23398-01-15

DATE: 02/14/25
MODEL: G23398-01-15
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-01-00.dgn

FOR CONTINUATION REFER TO DRAWING No G23398-02-08B

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	13 FEB 2025

GENERAL NOTES

DESIGNED: G. RAKITA
CHECKED/APPROVED: H. TURNBULL
FILE NAME: G23398-02-00.dgn

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FLANAGANS DRIVE / ESCARPMENT CONNECTOR

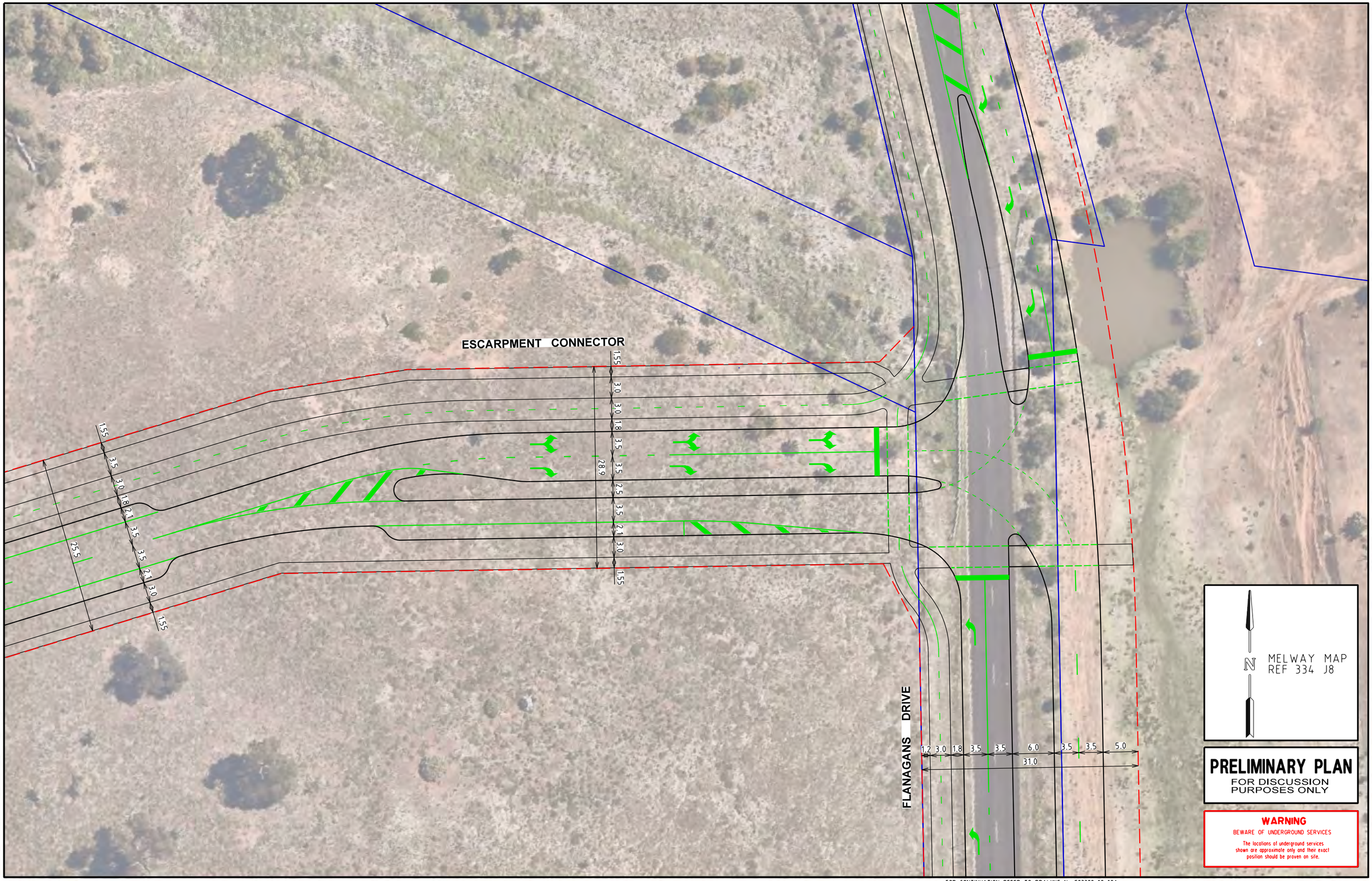
MOORABOOL SHIRE CITY COUNCIL

IN-08 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 1/2 | DWG No. G23398-02-08A

DATE: 14/02/2025
MODEL: G23398-02-08A
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-02-00.dgn

FOR CONTINUATION REFER TO DRAWING No G23398-02-08A



FOR CONTINUATION REFER TO DRAWING No G23398-02-09A

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	13 FEB 2025

GENERAL NOTES

DESIGNED
G. RAKITA

CHECKED/APPROVED
H. TURNBULL

FILE NAME
G23398-02-00.dgn

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FLANAGANS DRIVE / ESCARPMENT CONNECTOR

MOORABOOL SHIRE CITY COUNCIL

IN-08 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10

SHEET No. 2/2

DWG No. G23398-02-08B

DATE: 14/02/2025
MODEL: G23398-02-08B
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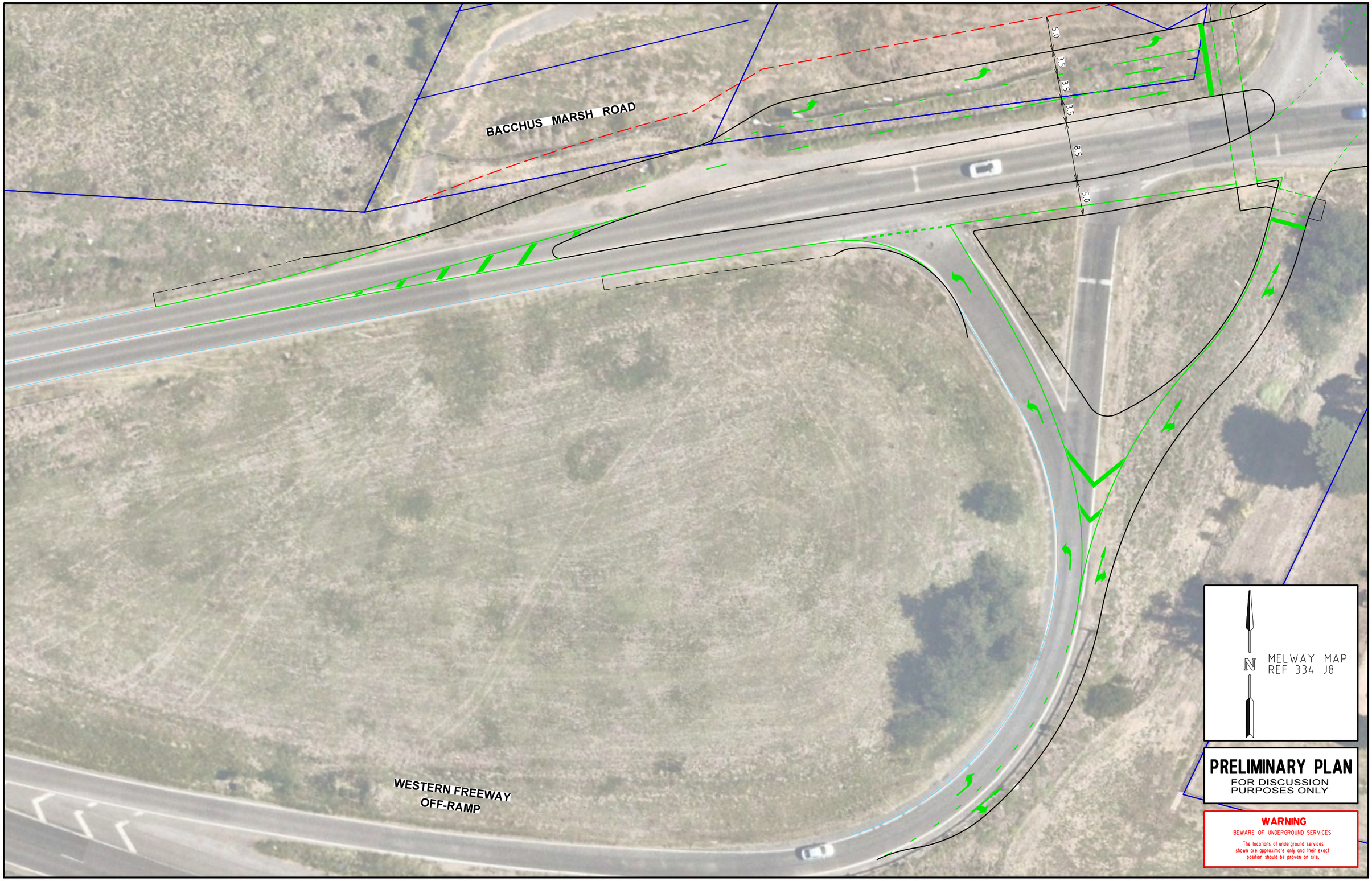

FOR CONTINUATION REFER TO DRAWING No G23398-02-09B

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	13 FEB 2025

GENERAL NOTES

DESIGNED: G. RAKITA
CHECKED/APPROVED: H. TURNBULL
FILE NAME: G23398-02-00.dgn

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BACCHUS MARSH ROAD / FLANAGANS ROAD / WESTERN FREEWAY OFF-RAMPS

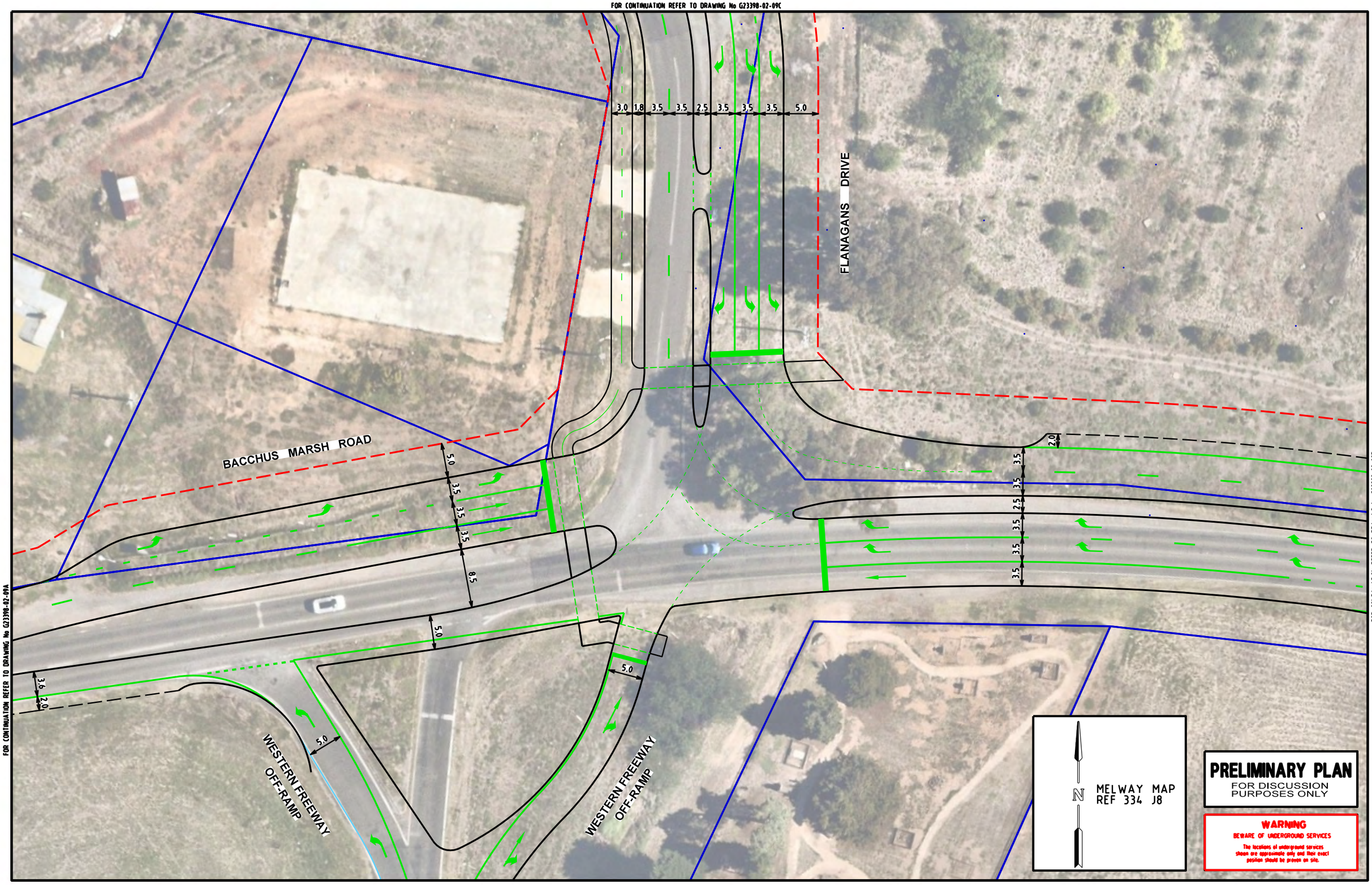
MOORABOOL SHIRE CITY COUNCIL

IN-09 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 1/4 | DWG No. G23398-02-09A

DATE: 17/02/2025
MODEL: G23398-02-09A
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-02-00.dgn

FOR CONTINUATION REFER TO DRAWING No G23398-02-09C



FOR CONTINUATION REFER TO DRAWING No G23398-02-09A

FOR CONTINUATION REFER TO DRAWING No G23398-02-09D

N

MELWAY MAP
REF 334 J8

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

WARNING
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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	13 FEB 2025

GENERAL NOTES

DESIGNED: G. RAKITA
CHECKED/APPROVED: H. TURNBULL
FILE NAME: $FILE$

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BACCHUS MARSH ROAD / FLANAGANS ROAD / WESTERN FREEWAY OFF-RAMPS

MOORABOOL SHIRE CITY COUNCIL

IN-09 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 25 5 75 10 | SHEET No. 2/4 | DWG No. G23398-02-09B

DATE: $DATE$
MODEL: $MODELNAME$
FILE: $FILE$

FOR CONTINUATION REFER TO DRAWING No G23398-02-08A

FOR CONTINUATION REFER TO DRAWING No G23398-02-09B

N

MELWAY MAP
REF 334 J8

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY

WARNING
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ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	13 FEB 2025

GENERAL NOTES

DESIGNED: G. RAKITA
CHECKED/APPROVED: H. TURNBULL
FILE NAME: G23398-02-00.dgn

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BACCHUS MARSH ROAD / FLANAGANS ROAD / WESTERN FREEWAY OFF-RAMPS

MOORABOOL SHIRE CITY COUNCIL

IN-09 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. 3/4 | DWG No. G23398-02-09C

DATE: 14/02/2025
MODEL: G23398-02-09C
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-02-00.dgn

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	13 FEB 2025

GENERAL NOTES

DESIGNED
G. RAKITA

CHECKED/APPROVED
H. TURNBULL

FILE NAME
G23398-02-00.dgn

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BACCHUS MARSH ROAD / FLANAGANS ROAD / WESTERN FREEWAY OFF-RAMPS

MOORABOOL SHIRE CITY COUNCIL

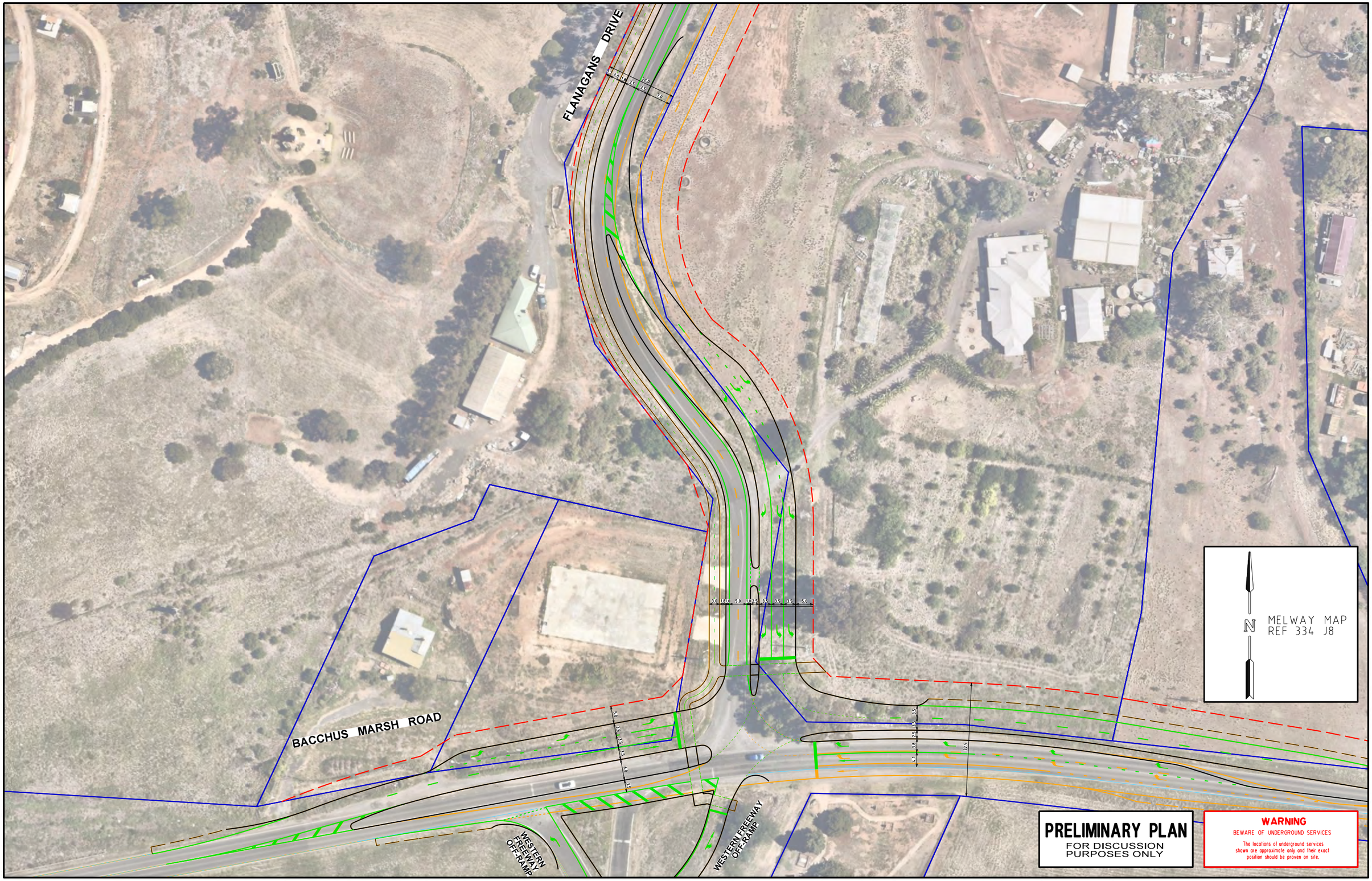
IN-09 CONCEPT LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10

SHEET No. 4/4

DWG No. G23398-02-09D

DATE: 14/02/2025
MODEL: G23398-02-09D
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-02-00.dgn



ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	19 FEB 2025

GENERAL NOTES

ULTIMATE LAYOUT

DESIGNED: G. RAKITA

CHECKED/APPROVED: H. TURNBULL

FILE NAME: G23398-02-00.dgn

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Melbourne, Victoria 3000
+61 3 9822 2888
www.traffixgroup.com.au

BACCHUS MARSH ROAD / FLANAGANS ROAD / WESTERN FREEWAY OFF-RAMPS

MOORABOOL SHIRE CITY COUNCIL

IN-09 INTERIM CONCEPT PLAN

SCALE 1:1000 (A3) 0 5 10 15 20

SHEET No. 1/1

DWG No. G23398-02-09E

DATE: 25/02/2025
MODEL: G23398-02-09E
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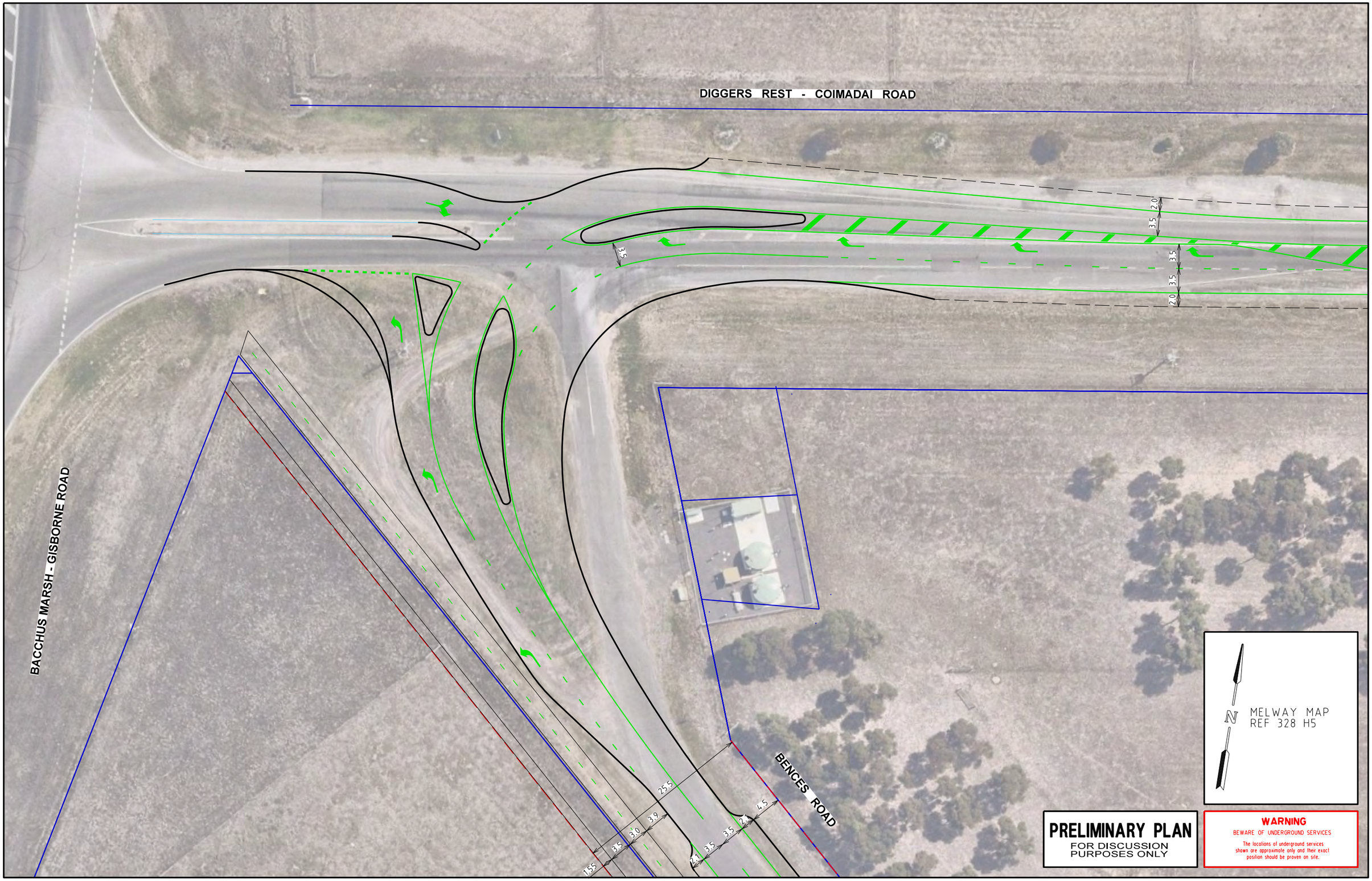

ISSUE	ISSUE DESCRIPTION	DESIGNER	CHECKED/APPROVED	ISSUE DATE
A	INITIAL ISSUE	G.R	H.T (RPE6312)	14 FEB 2025

GENERAL NOTES
1 AERIAL PHOTOGRAPH (SOURCE NEARMAP JAN 2025)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 LOCAL ROAD - BENCES ROAD (SPEED ZONE 50km/h)

DESIGNED
G. RAKITA

CHECKED/APPROVED
H. TURNBULL

FILE NAME
G23398-02-00.dgn

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DIGGERS REST-COIMADAI ROAD / BENCES ROAD

MOORABOOL SHIRE CITY COUNCIL

IN-10 CONCEPT LAYOUT PLAN

SCALE 1500 (A3) 0 25 5 75 10

SHEET No. 1/1

DWG No. G23398-02-10

DATE: 02/14/25
MODEL: G23398-02-10
FILE: P:\Synergy\Projects\GRP2\GRP23398\03-Drawings\G23398-02-00.dgn