

110-112 Willowbank Road, Gisborne

Transport Impact Assessment – DPO Amendment



190536TIA001D-F

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1 INTRODUCTION

onemilegrid has been requested by Connect to undertake a Transport Impact Assessment of the proposed Development Plan Overlay amendment at 110-112 Willowbank Road, Gisborne.

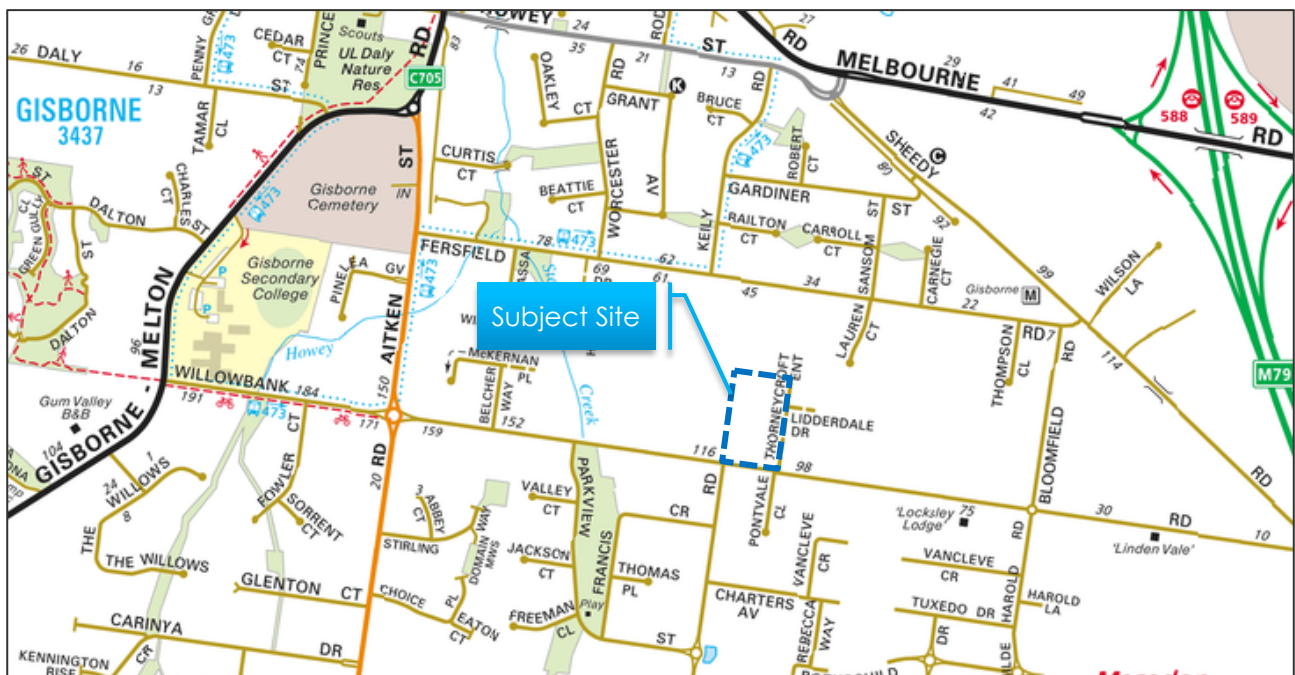
As part of this assessment the subject site has been inspected with due consideration of the development proposal, traffic data has been sourced and relevant background reports have been reviewed.

2 EXISTING CONDITIONS

2.1 Site Location

The subject site is located on the northern side of Willowbank Road, approximately midway between Aitken Street to the west and Bloomfield Road to the east, as shown in Figure 1.

Figure 1 Site Location



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The site is rectangular in shape and abuts Willowbank Road for approximately 140 metres along the site's southern boundary.

The site is largely made up of vacant land, with a single residential building located towards the southern boundary site.

The site is located within the Gisborne Outline Development Plan (Amendment C676 Part 1 – September 2012).

Land use in the immediate vicinity is mixed in nature, including an established residential area and township on the southern side of Willowbank Road and rural residential properties to the east and west, earmarked for residential development.

An aerial view of the subject site is provided in Figure 2.

Figure 2 Site Context (13 October 2019)



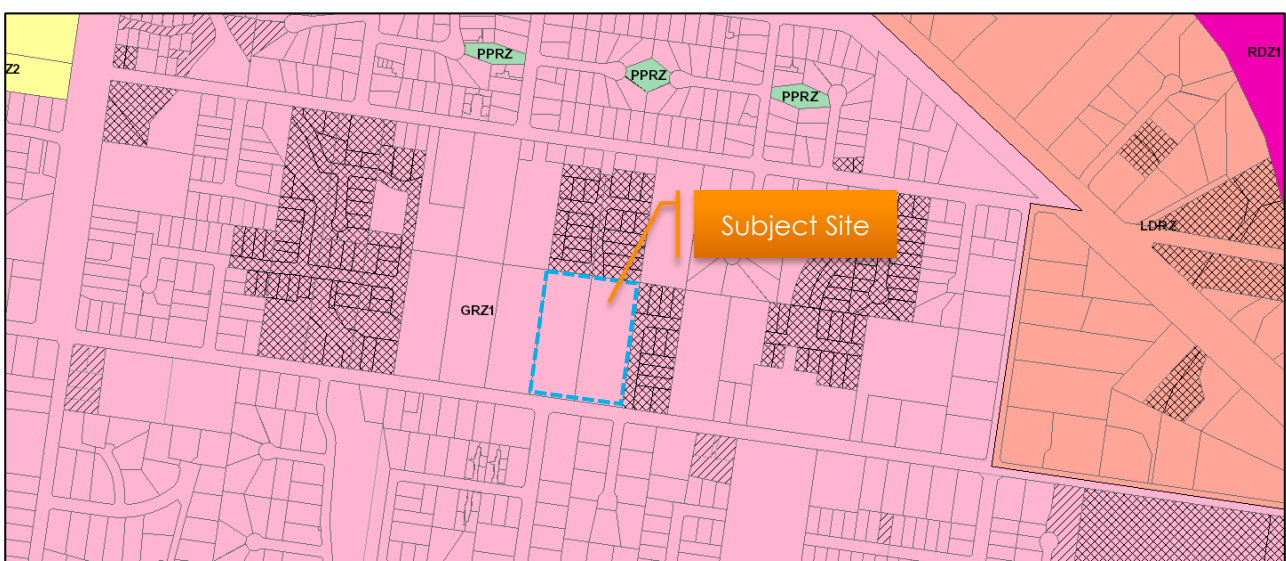
Copyright Nearmap

2.2 Planning Zones and Overlays

It is shown in Figure 3 that the site is located within a General Residential Zone (GRZ), for which permitted uses are listed in Clause 32.08 of the Macedon Ranges Planning Scheme. Furthermore, the site is subject to the following planning overlays:

- Development Contributions Plan Overlay – Schedule 2 (DCPO2)
- Development Plan Overlay – Schedule 4 (DPO4)

Figure 3 Planning Scheme Zones



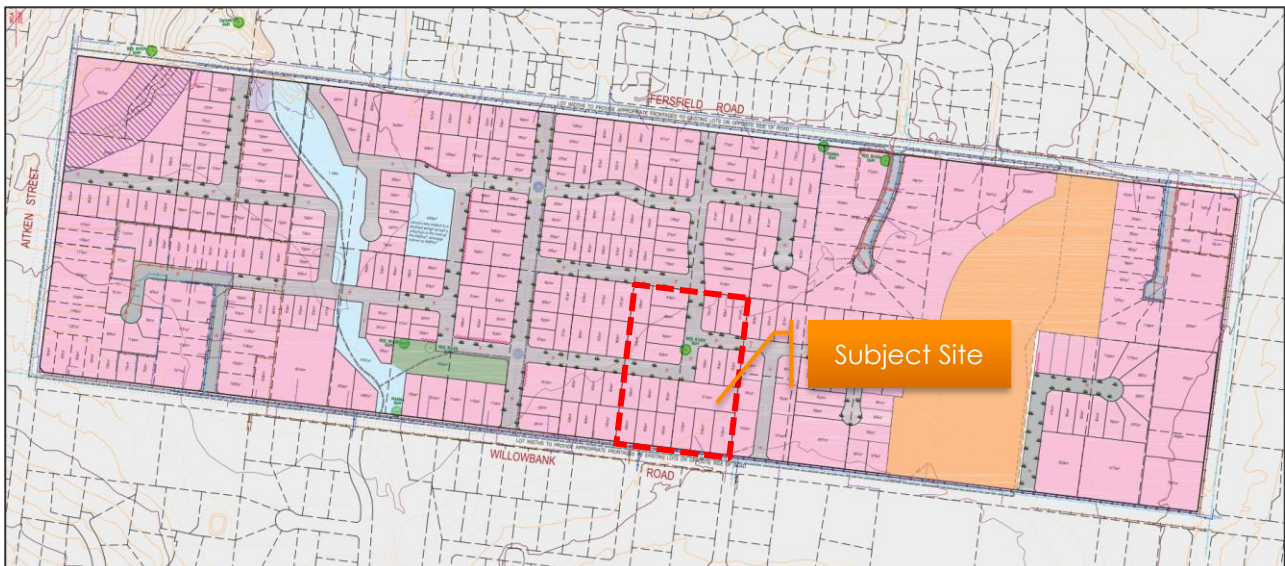
It is noted that DPO4 which applies to the subject site is required to provide the following for any proposed Development Plan's:

"A detailed traffic assessment and management plan addressing the impact of the development on the arterial and local road network, including mitigation works required on the road network in addition to funding responsibilities. The plan must show typical road cross sections and integration with the existing and proposed road, bicycle and pedestrian networks and public transport."

2.3 Fersfield Road Development Plan

As noted above, the subject site is subject to a Development Plan Overlay. As a result, a Development Plan has been prepared for the site, which is bound by Aitken Street to the west, Fersfield Road to the north, Willowbank Road to the south and Bloomfield Road to the east. The development plan has been prepared to allow for a connected internal road network to allow for future residential development which is proposed to yield approximately 327 residential lots. In regard to the subject site, access is proposed directly from Willowbank Road to all lots fronting Willowbank Road. Whilst all other residential lots are proposed with access from an internal road network running from the northern, eastern and western boundaries.

Figure 4 Fersfield Road Development Plan Layout



2.4 Road Network

2.4.1 Willowbank Road

Willowbank Road is a local road generally aligned east-west, running between Melton Road and Sheedy Road. Willowbank Road has a pavement width of approximately 6 metres and allows for traffic in both directions. The road has unsealed shoulders on the north side, whilst on the south side a kerb has been constructed.

A signed 80 km/h speed limit applies for the majority of the road, except for the last 300 metres when approaching Bloomfield Road where a 60km/h speed limit applies.

The cross-section of Willowbank Road at the frontage of the site is shown in Figure 5.

Figure 5 Willowbank Road, looking west from the subject site



2.5 Traffic Volumes

Traffic volume surveys were undertaken by Trans Traffic Survey on behalf of **onemilegrid** at the following intersection and times:

- Bloomfield Road / Willowbank Road - Wednesday 20th June 2018, between 6:00am and 10:00am, and between 3:00pm and 7:00pm;
- Melton-Gisborne Road / Aitken Street - Wednesday 5th December 2018, between 6:00am and 10:00am, and between 3:00pm and 7:00pm;
- Melton-Gisborne Road / Willowbank Road - Wednesday 5th December 2018, between 6:00am and 10:00am, and between 3:00pm and 7:00pm;
- Willowbank Road / Brady Road – Wednesday 4th March 2019, between 7:00am and 10:00am, and between 3:30pm and 7:00pm.

The peak hour results of the survey are shown below.

Figure 6 2018 Existing Traffic Volumes – Bloomfield Road/Willowbank Road

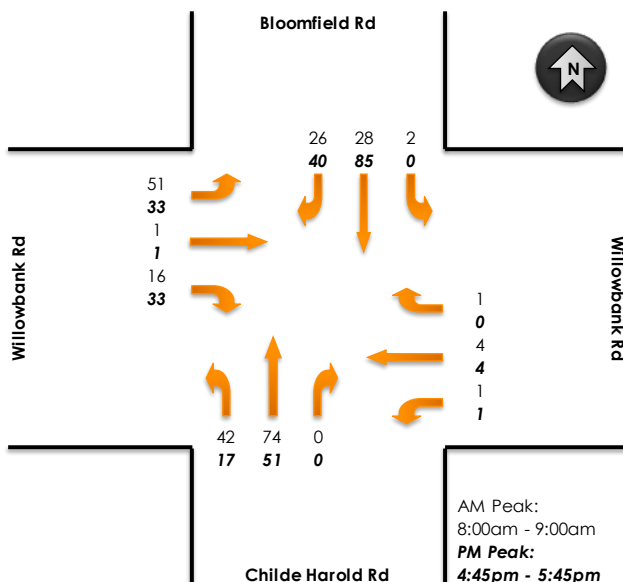


Figure 7 2018 Existing Traffic Volumes – Melton-Gisborne Road/Willowbank Road

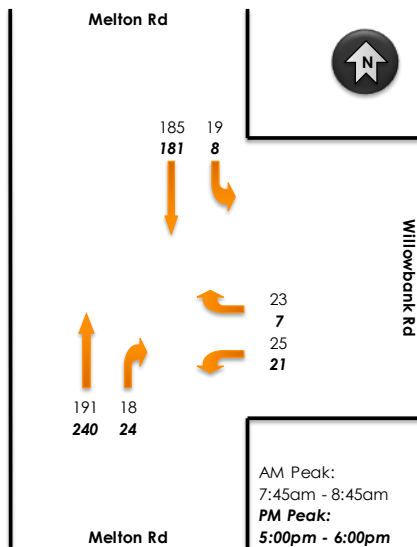


Figure 8 2018 Existing Traffic Volumes – Melton-Gisborne Road / Aitken Street

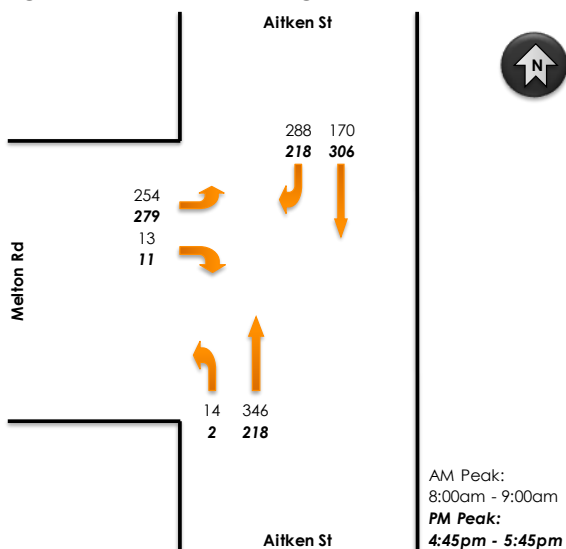
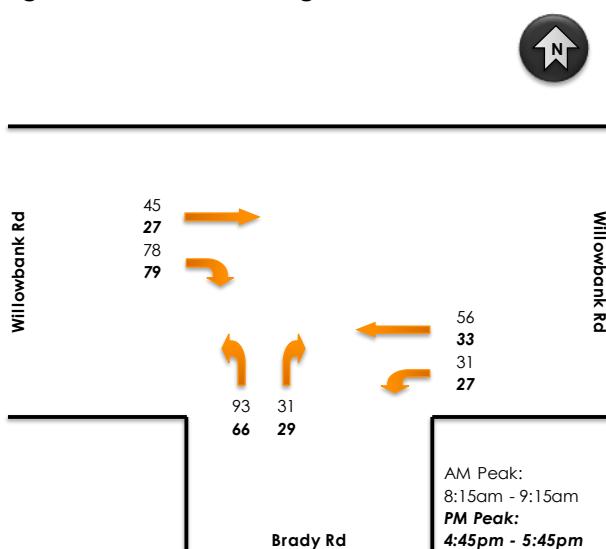


Figure 9 2020 Existing Traffic Volumes – Willowbank Road / Brady Road



2.6 Intersection Capacity Assessment

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

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

Table 1 SIDRA Intersection Parameters

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

The results of the analysis are provided in tables below.

Table 2 Willowbank Road / Bloomfield Road – AM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Childe Harold Road - South	Left	0.097	4.7	3.4
	Through	0.097	5	3.4
	Right	0.097	8.6	3.4
Willowbank Road - East	Left	0.036	4.7	1.2
	Through	0.036	4.9	1.2
	Right	0.036	8.6	1.2
Bloomfield Road - North	Left	0.043	4.4	1.5
	Through	0.043	4.7	1.5
	Right	0.043	8.4	1.5
Willowbank Road - West	Left	0.058	4.7	2
	Through	0.058	5	2
	Right	0.058	8.7	2

Table 3 Willowbank Road / Bloomfield Road – PM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Childe Harold Road - South	Left	0.056	4.6	1.9
	Through	0.056	4.8	1.9
	Right	0.056	8.5	1.9
Willowbank Road - East	Left	0.006	5.1	0.2
	Through	0.006	5.3	0.2
	Right	0.006	9.0	0.2
Bloomfield Road - North	Left	0.097	4.5	3.5
	Through	0.097	4.8	3.5
	Right	0.097	8.5	3.5
Willowbank Road - West	Left	0.056	4.6	1.9
	Through	0.056	4.9	1.9
	Right	0.056	8.6	1.9

Table 4 Willowbank Road / Melton Road – AM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Melton Road - South	Through	0.118	0.1	1
	Right	0.118	6.2	1
Willowbank Road - East	Left	0.048	6.2	1.2
	Right	0.048	7.2	1.2
Melton Road - North	Left	0.112	5.6	0
	Through	0.112	0	0

Table 5 Willowbank Road / Melton Road – PM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Melton Road - South	Through	0.149	0.1	1.4
	Right	0.149	6.2	1.4
Willowbank Road - East	Left	0.025	6.1	0.7
	Right	0.025	7.5	0.7
Melton Road - North	Left	0.104	5.6	0
	Through	0.104	0	0

Table 6 Aitken Street / Melton Road – AM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Aitken Street - South	Left	0.348	5.8	15.3
	Through	0.348	6	15.3
Aitken Street - North	Through	0.297	4.2	15.5
	Right	0.297	8.8	15.5
Melton Road - West	Left	0.281	6	12.7
	Right	0.281	10.9	12.7

Table 7 Aitken Street / Melton Road – PM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Aitken Street - South	Left	0.202	5.1	7.8
	Through	0.202	5.4	7.8
Aitken Street - North	Through	0.335	4.2	17.5
	Right	0.335	8.8	17.5
Melton Road - West	Left	0.268	5.2	11.8
	Right	0.268	10.	11.8

Table 8 Willowbank Road / Brady Road – AM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Brady Road - South	Left	0.094	5.7	2.6
	Right	0.094	6.3	2.6
Willowbank Road - East	Left	0.048	5.6	0
	Through	0.048	0	0
Willowbank Road - West	Through	0.075	0.2	2.5
	Right	0.075	5.8	2.5

Table 9 Willowbank Road / Brady Road – PM Peak Hour - Existing

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Brady Road - South	Left	0.072	5.7	2
	Right	0.072	6.1	2
Willowbank Road - East	Left	0.034	5.6	0
	Through	0.034	0	0
Willowbank Road - West	Through	0.065	0.2	2.2
	Right	0.065	5.7	2.2

As shown above, all intersections that were analysed are operating with a rating of 'excellent' during both the AM and PM peak periods, with negligible queues and delays on each approach.

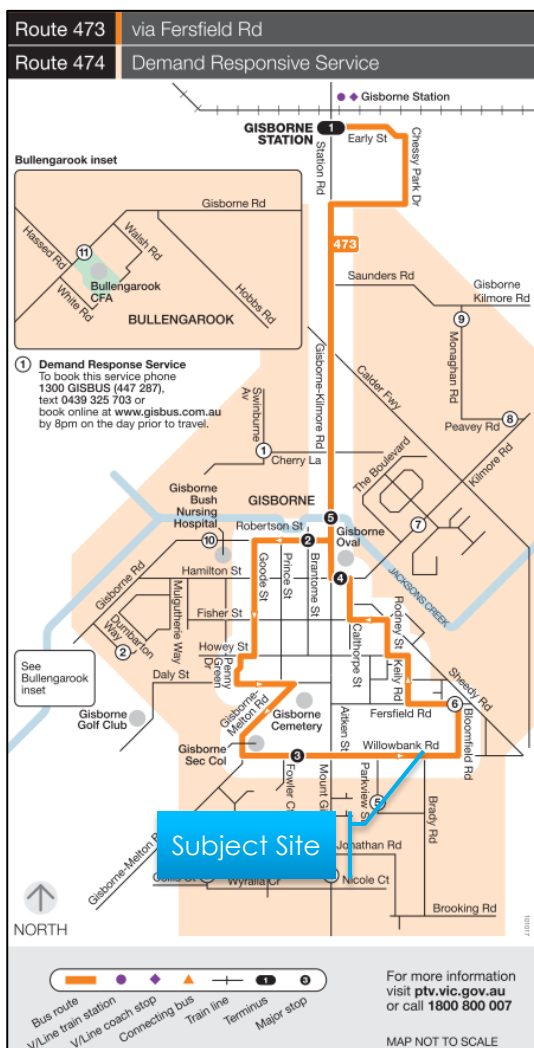
2.7 Sustainable Transport

Public transport in the immediate vicinity of the subject site is limited to bus services. The 473 Gisborne – Gisborne Station bus service provides access to Gisborne Train Station from Willowbank Road at the south-western corner of the subject site. Gisborne Train Station is located in 'New Gisborne', approximately 6km north of the subject site, and provides access to the Melbourne CBD, as well as other regional areas by train.

In addition, areas outside of the 473 bus route benefit from a Demand Responsive Service that operates in the shaded areas in Figure 10. To use this service, it is required to book by phone or online the day before travel.

The Gisborne bus network map has been provided in Figure 10.

Figure 10 Gisborne Bus Network



3 GISBORNE OUTLINE DEVELOPMENT PLAN (AMENDMENT C67 PART 1 – SEPTEMBER 2012)

3.1 Overview

The site is located within the Gisborne Outline Development Plan (Amendment C67 Part 1 – September 2012) for which an extract is shown in Figure 11.

The outline development plan provides a framework for future growth and development of Gisborne, including future land uses, transport networks, open space and environmental features. As shown in the below figure, the site is located towards the southern end of the development plan area.

The site is nominated in the structure plan largely as residential land, with a notation that the area towards the south-western corner of the site provide for a neighbourhood convenience store and community facility (i.e. community centre/kindergarten) to service local needs.

The Gisborne Outline Development Plan provided the guidelines for the preparation of the Fersfield Road Development Plan as previously discussed in Section 2.3.

The structure plan has also proposed for Willowbank Road to be upgraded, as well as the intersection of Willowbank Road and Brady Road, as shown in Figure 12.

Figure 11 Gisborne / New Gisborne Structure Plan

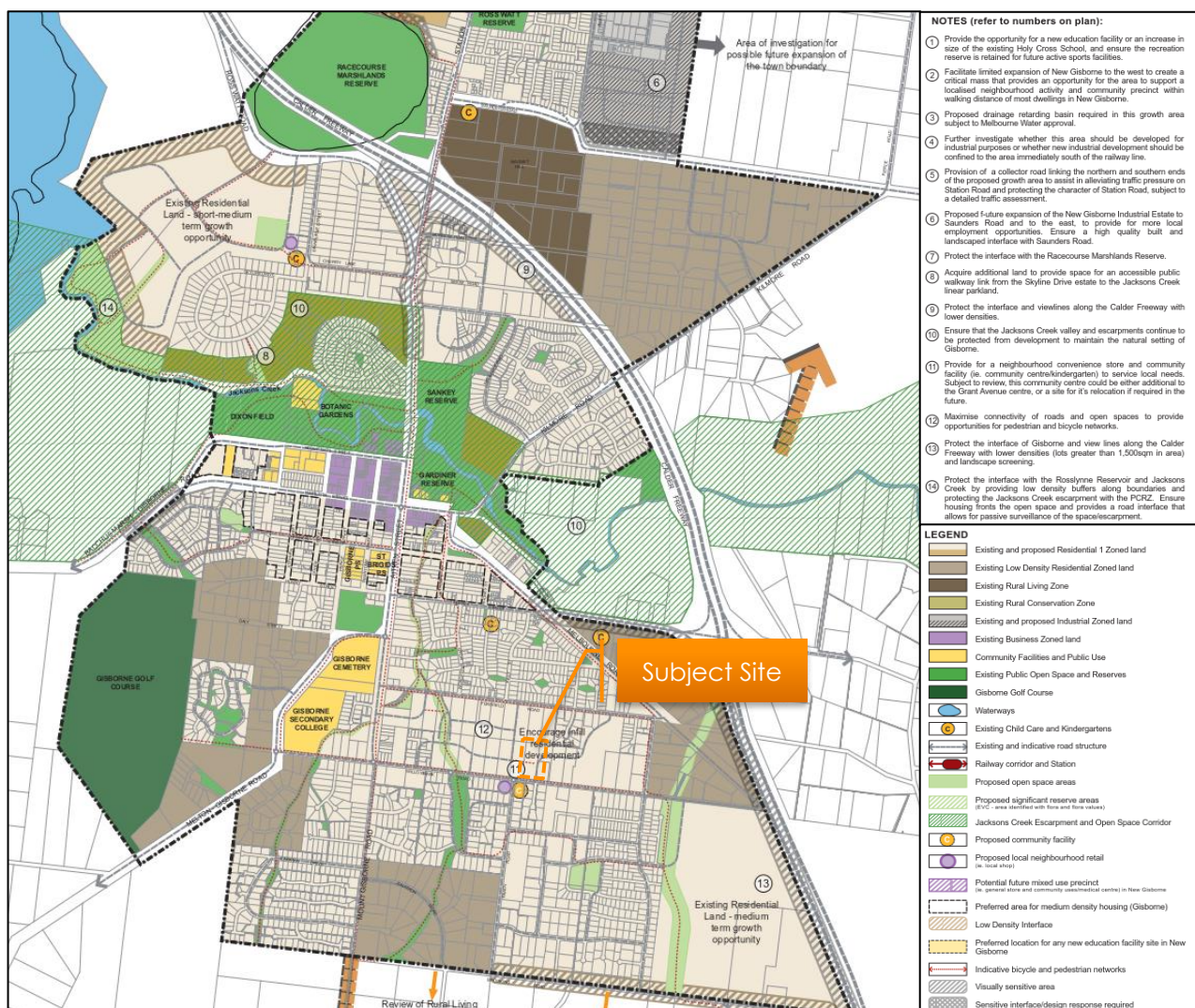
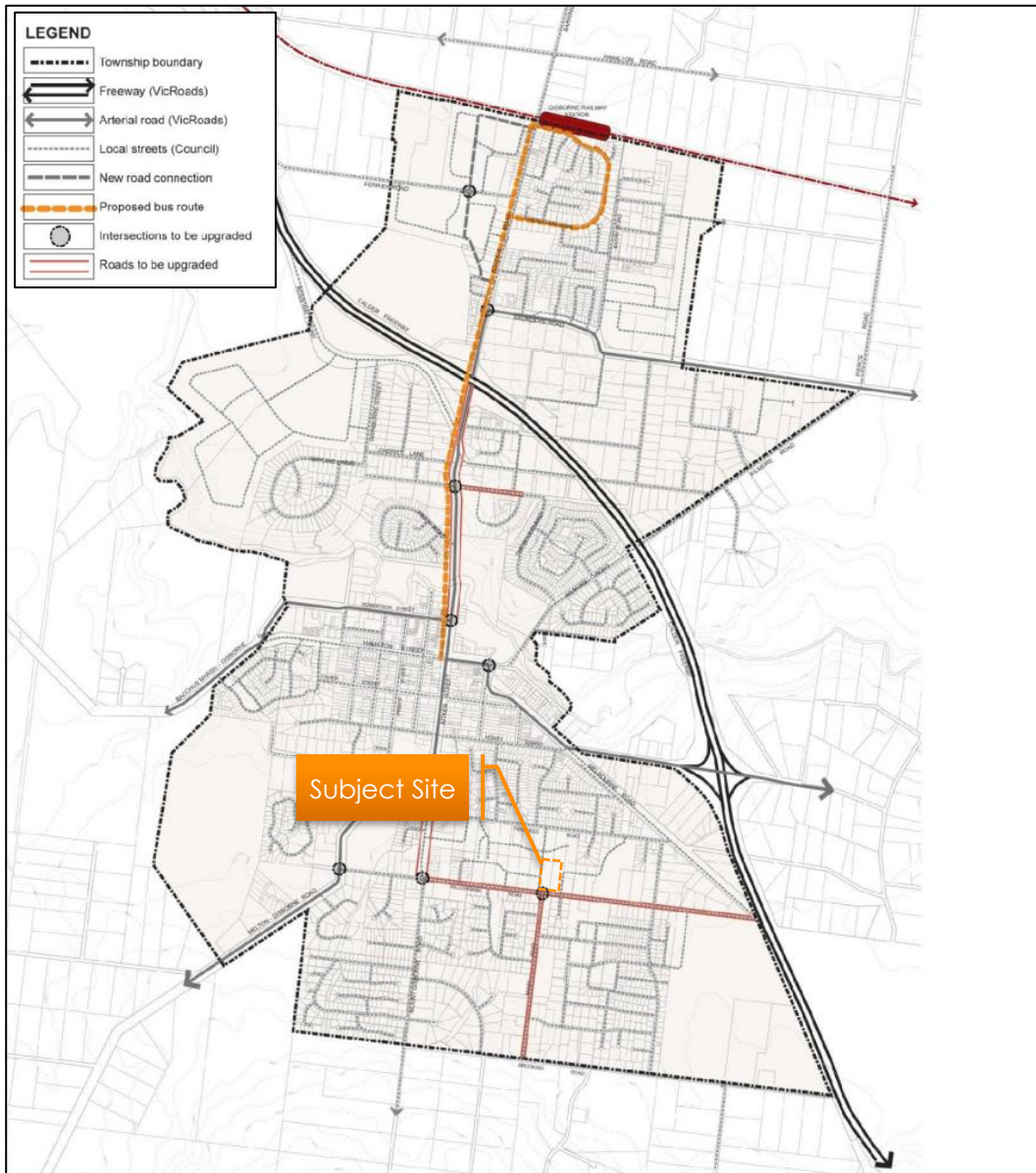


Figure 12 Structure Plan Road Network



3.2 Gisborne Movement Network Study

In 2016 a traffic study was prepared for Macedon Ranges Shire Council for the township of Gisborne. This study was to replace the 2009 traffic study which was adopted in the above Gisborne Outline Development Plan. The updated study is based on new information regarding yields for new developments within Gisborne. Although the majority of the network study generally remains the same, the study takes into account the subject sites development, whereas in 2009 future development potential for the subject site was relatively unknown.

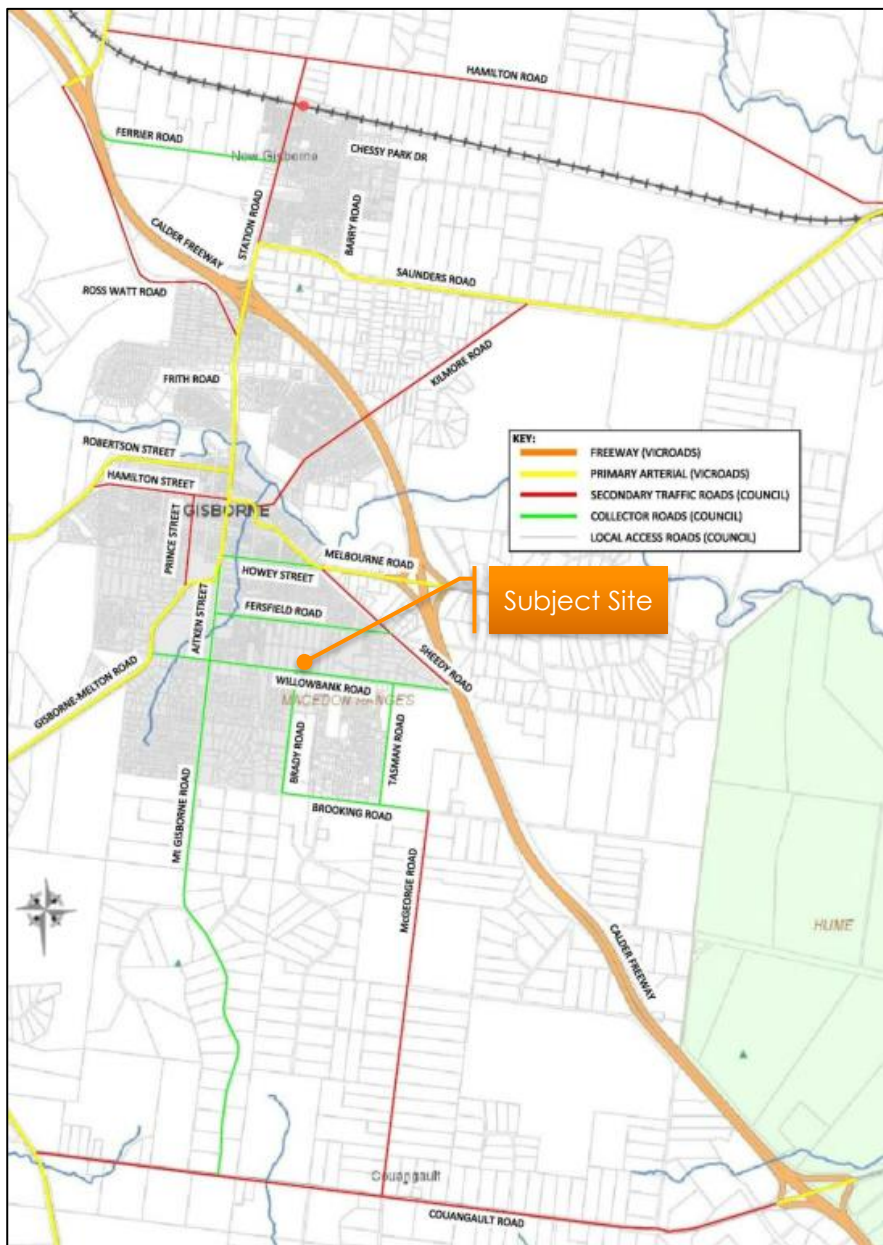
Extracts of the network study are shown below, indicating the road network, walking and cycling network proposed in the vicinity of the site.

Figure 13 Recommended Road Infrastructure Upgrades



As shown above, the intersection of Willowbank Road and Brady Road has been identified as a recommended intersection upgrade.

Figure 14 Recommended Future Road Hierarchy



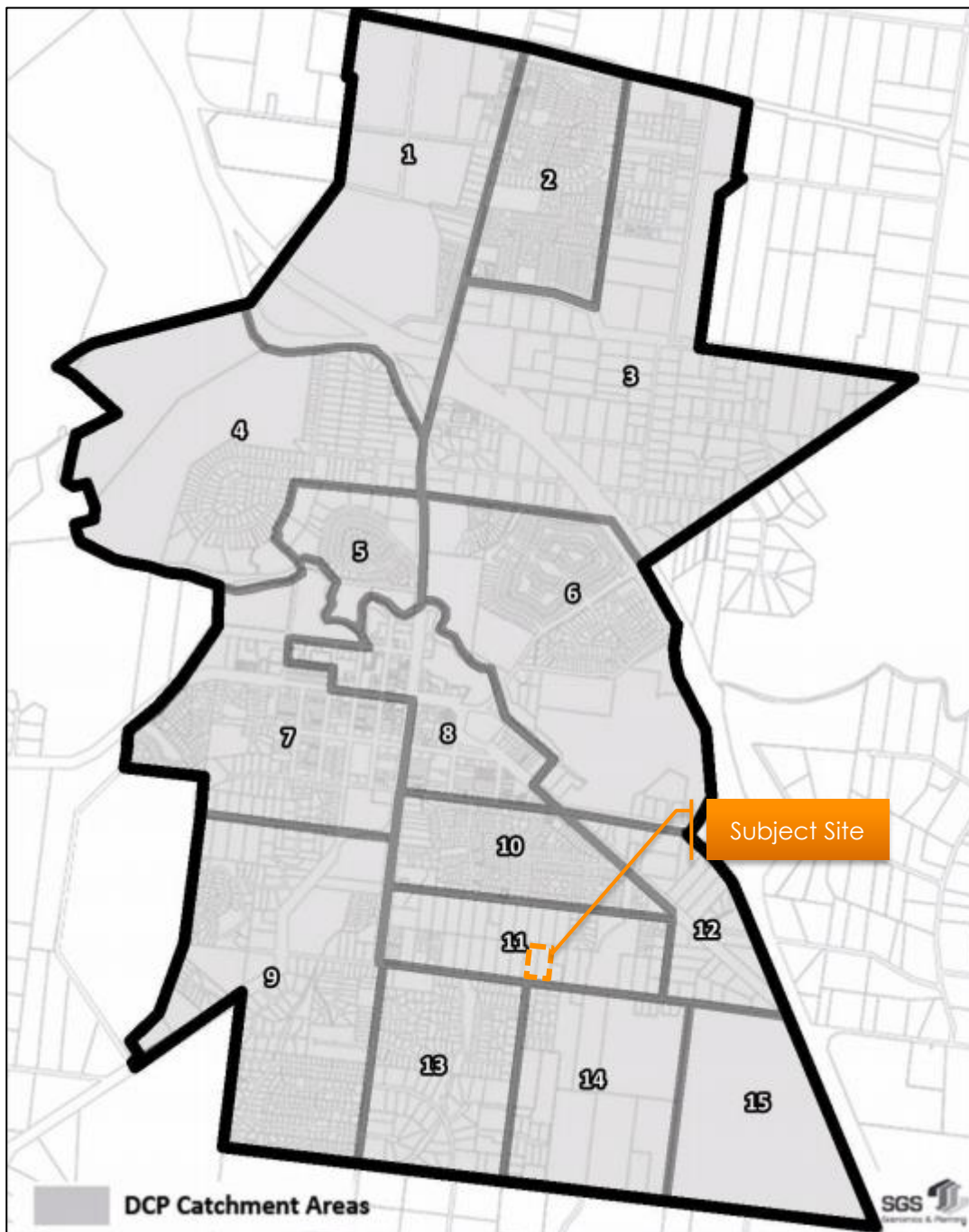
The recommended future road hierarchy above identifies Willowbank Road in the vicinity of the site as a 'Council Collector Road'.

3.3 Gisborne Development Contributions Plan (DCP)

The subject site is located within the Gisborne Development Contributions Plan which has been prepared by the MPA in partnership with the City of Macedon Ranges. The DCP has been prepared to outline the projects, framework and financial contribution required to deliver the infrastructure projects necessary for future residents. It includes the land and cost to fund road network upgrades, intersection construction and community facilities. The subject site is located within Area 11.

An extract of the Gisborne DCP is provided in Figure 16.

Figure 16 Gisborne DCP



4 DEVELOPMENT PROPOSAL

4.1 General

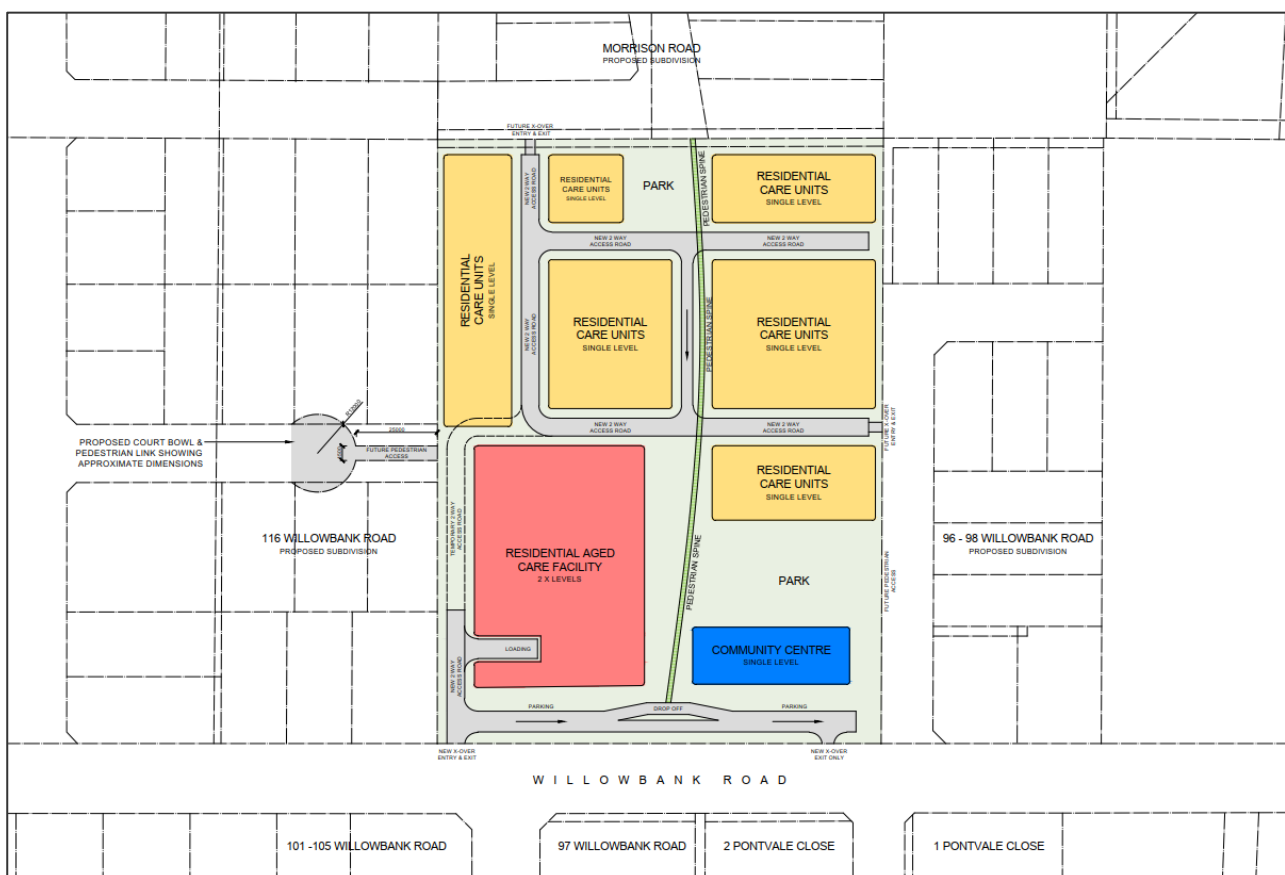
It is proposed to amend the existing Development Play Overlay that applies to the subject site and allow for an integrated residential care facility to operate on site.

The integrated residential care facility is to include a range of aged care living options dependant on the requirements of the residents.

It is expected that the proposed development will provide at least 107 units offering a variety of aged care living options, as well as a community centre.

The proposed Development Plan Overlay amendment is shown below in Figure 17.

Figure 17 Proposed Development Plan



4.2 Vehicle Access & Road Network Plan

Vehicle access to the external road network will ultimately be provided via four access points, as detailed below and shown in Figure 18.

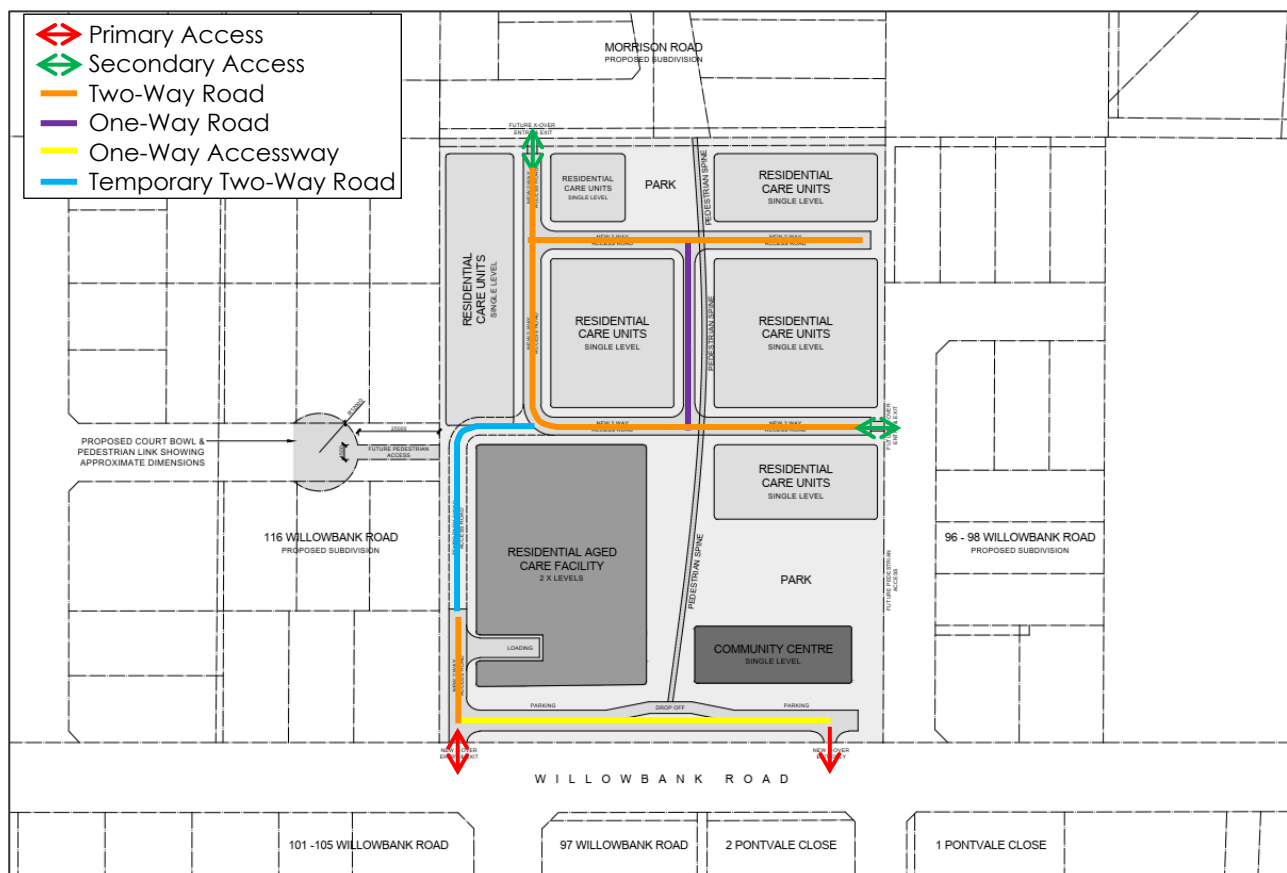
- Fully directional access to Willowbank Road at the south-western corner of the site;
- Exit only access to Willowbank Road at the south-eastern corner of the site;
- Fully directional access to the proposed Morrison Road at the north-western corner of the site; and
- Fully directional access to the proposed north-south aligned road located midpoint along the eastern boundary of the site.

Primary access is to be provided from fully directional access proposed along Willowbank Road, with secondary access to the site provided when the sites to the north and east develop as part of the Fersfield Road Development Plan.

The development is proposed to generally be serviced by roads with a 11.5-metre cross section which allow for a road width of 5.5 metres for two-way traffic and footpaths where required. In addition, a one-way road with a road width of 3.6 metres is proposed between in the northern portion of the site to allow for vehicle circulation.

It is noted that the two-way road to the north-west of the two-level residential aged care facility will be provided as a temporary access road which will be removed once access to the site is provided from Morrison Road and the north-south aligned road to the east of the site. Furthermore, construction of the southern portion of the residential care units located along the site's western boundary will not commence until the temporary access road is removed.

Figure 18 Proposed Vehicle Access and Internal Road Network



The proposed road cross-sections are shown in Figure 19 and Figure 20 below.

Figure 19 Proposed 11.5m Cross-Section

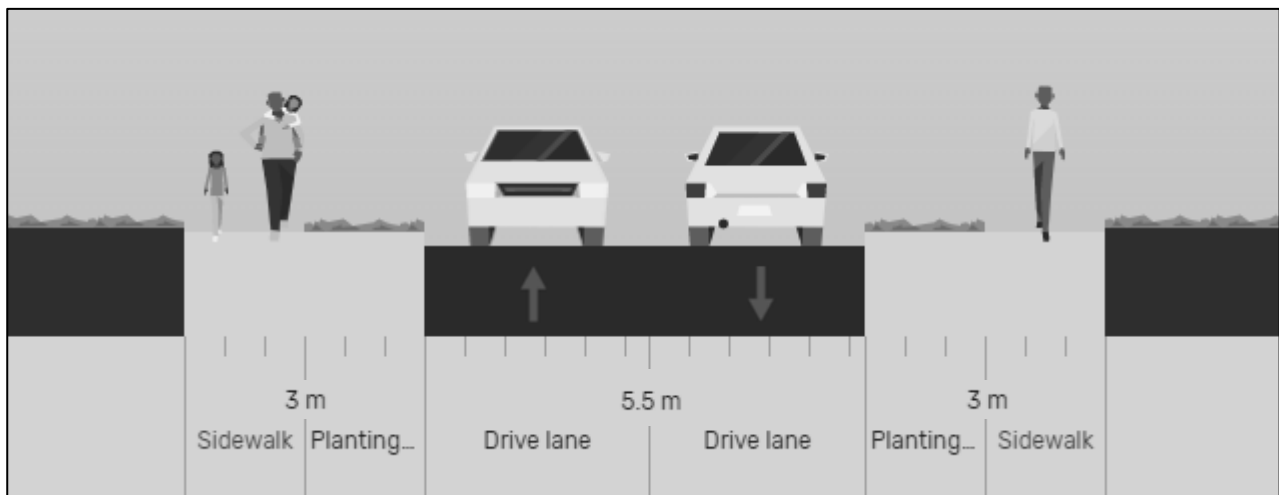
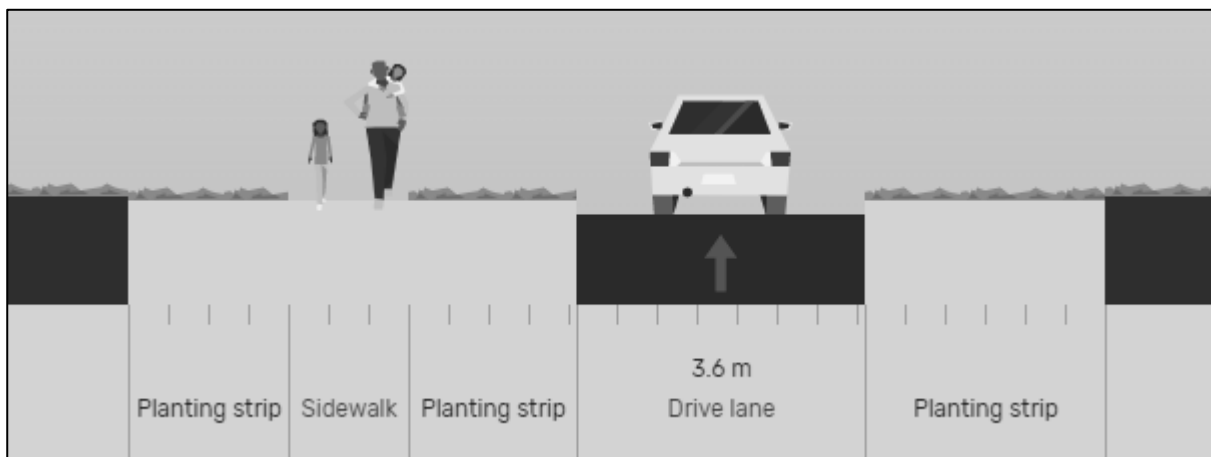


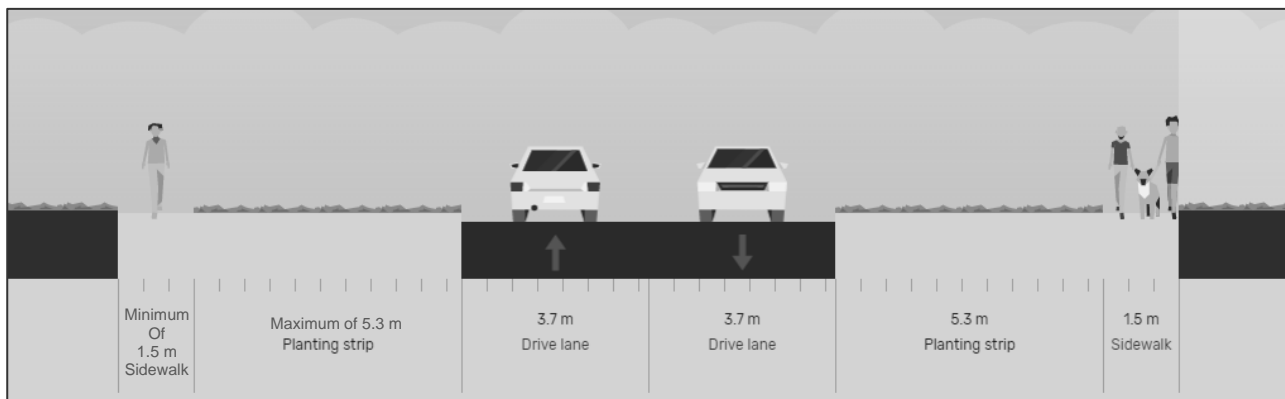
Figure 20 Proposed One-Way Road Cross-Section



4.3 External Road Upgrades

It is proposed to partially upgrade Willowbank Road which fronts the subject site. The upgrade will involve increasing the northern half of the Willowbank Road carriageway to have a sealed width of 3.7m with kerb and channel, and provide a 1.5m with footpath on the northern side of the road. These upgrades are in line with the recommendations of the development plan. The proposed cross-section of Willowbank Road at the frontage of the site is shown overleaf in Figure 21.

Figure 21 Proposed Willowbank Road Cross-section (21 metres)



4.4 Pedestrian Network Plan

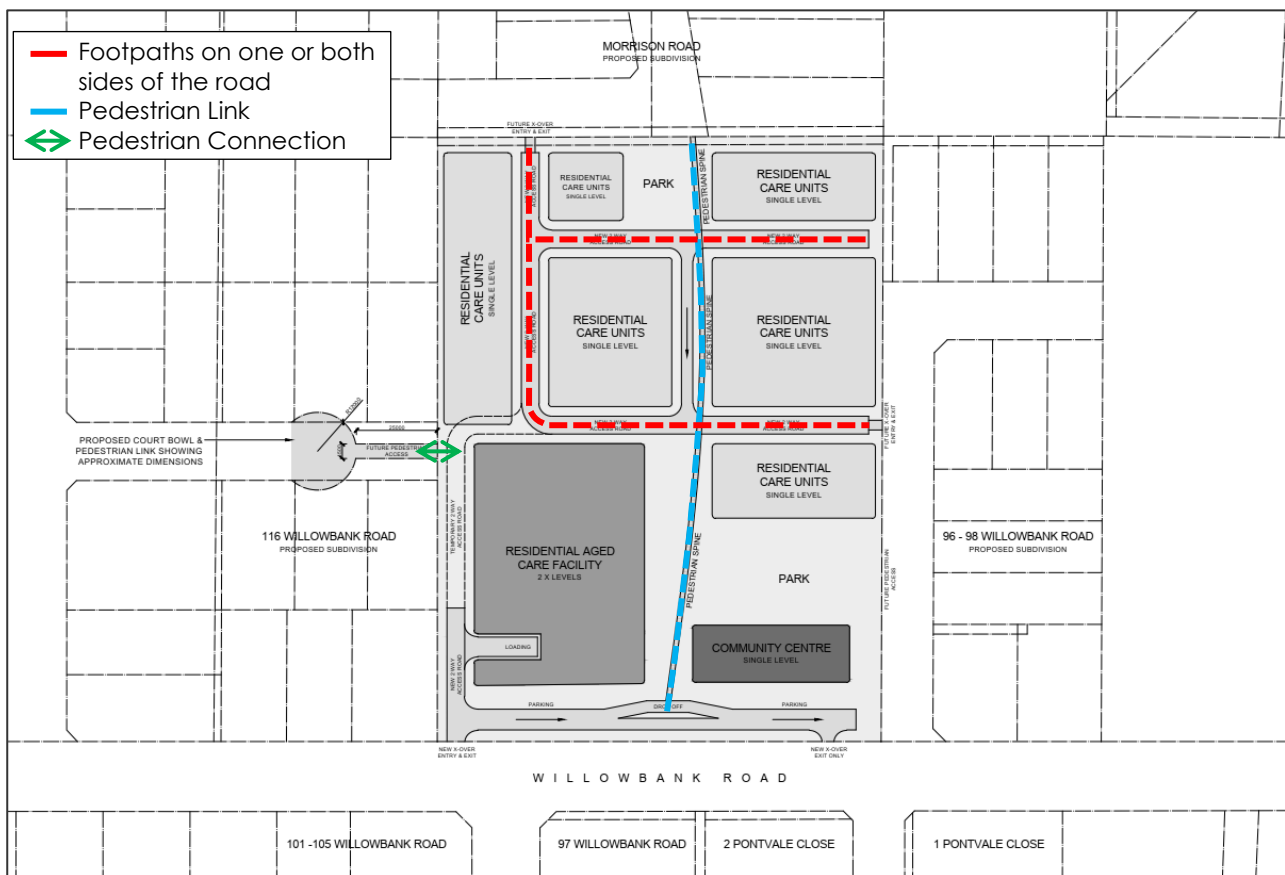
The proposed internal road network includes footpaths on one or both sides of all roads adjacent to the single-storey residential care units.

Furthermore, a north-south pedestrian link bisects the site to allow for pedestrian movements throughout the site.

In addition, a pedestrian connection is proposed to the west of the subject site once the neighbouring property undergoes residential development. It is noted that the length and design of this pedestrian connection is subject to the approval of the neighbouring property.

The proposed pedestrian network plan is shown in Figure 22 below.

Figure 22 Proposed Path Network



4.5 Bus Stop Relocation

It is proposed to relocate the existing bus stop located in the south-western corner of the site to allow for the proposed crossover. The bus stop is to be relocated within the site's property boundaries.

5 DESIGN ASSESSMENT

5.1 Macedon Ranges Planning Scheme – Clause 52.06

onemilegrid has undertaken an assessment of the site layout and access for the proposed Development Planning Overlay amendment with due consideration of the Design Standards detailed within Clause 52.06-9 of the Planning Scheme. A review of those relevant Design Standards is provided in the following section.

5.1.1 Design Standard 1 – Accessways

A summary of the assessment for Design Standard 1 is provided in Table 10.

Table 10 Clause 52.06-9 Design Assessment – Design Standard 1

Requirement	Comments
Be at least 3 metres wide	Satisfied – minimum width of access is 3.6 metres is provided for western access to Willowbank Road. Whilst eastern access is provided with a width of 6.1 metres.
Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide	Satisfied – swept paths provided in Appendix A demonstrating waste collection and service vehicle movement along accessway
Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre	N/A – car park not assessed as part of DPO amendment
Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8 metres	N/A – no overhead obstructions
If the accessway serves four or more car spaces or connects to a road in a Road Zone, the accessway must be designed so that cars can exit the site in a forward direction	Satisfied
Provide a passing area at the entrance at least 6.1 metres wide and 7 metres long if the accessway serves ten or more car parking spaces and is either more than 50 metres long or connects to a road in a Road Zone	Satisfied
Have a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.	Satisfied
If an accessway to four or more car parking spaces is from land in a Road Zone, the access to the car spaces must be at least 6 metres from the road carriageway.	Satisfied

5.2 Waste Collection

The internal road network has been designed to accommodate up to a 9.8 metre waste collection vehicle, as per the swept paths shown in Appendix A. The internal road network is therefore considered appropriate to accommodate the required waste collection.

Refer to the Waste Management Plan for further information.

5.3 Emergency Vehicles

The internal road network has been designed to allow for circulation of a CFA emergency vehicle (8.2 metres). Swept path diagrams have been provided in Appendix A showing a CFA vehicle circulating the internal road network without obstructing the CFA 300mm clearance envelope on circulation.

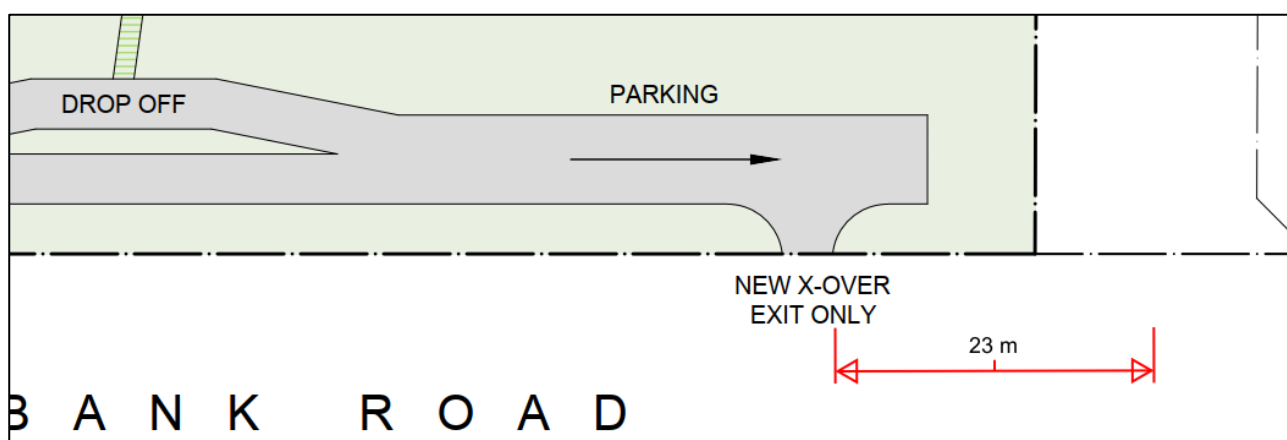
5.4 Vehicle Access Location

The proposed crossover locations along Willowbank Road have been offset 15 metres from Brady Road and Pontvale Close, measured from the centreline of the access and existing roads.

The proposed left-right staggers of 15 metres (measured from centreline and centreline) are in accordance with Austroads Guide to Traffic Management Part 6, Commentary 5 which specifies that 15 metres should be provided for roads which carry less than 2000 veh/day and with no significant curvature. Furthermore, the proposed 15 metres offset is in accordance with Austroads Guide to Road Design Part 4A, Section 7.2 which specifies a 15-metre offset for a staggered T-intersection on two-lane rural roads.

Furthermore, the western crossover to Willowbank Road is located approximately 28 metres from the drivers exit site of the future Thorneycroft Entrance (96-98 Willowbank Road) as shown below in Figure 23. Whilst it is acknowledged that the Minimum Gap Sight Distance (MGSD) of 28 metres is not in accordance with Austroads Guide to Road Design Part 4A, Table 3.6 which specifies a MGSD of 83 metres for a 60km/h road, it is not expected that vehicles exiting the subject site will be travelling over 10km/h when exiting the subject site. Therefore, the proposed distance of 23 metres between the western crossover and 96-98 Willowbank Road is in excess of 14 metres for 10km/hr as stipulated in Austroads Guide to Road Design Part 4A and is therefore appropriate.

Figure 23 Minimum Gap Sight Distance to 96-98 Willowbank Road



5.5 External Road Modifications

The neighbouring site (116 Willowbank Road) which shares the western boundary currently contemplates having a through road which continues through the subject site. The proposed DPO amendment will require the road to terminate before the subject site's western boundary and a court bowl (or similar treatment) will need to be constructed to allow for vehicles to turn around.

An indicative design and location of the court bowl is shown on the DPO plans, and a lot yield comparison for 116 Willowbank Road is attached Appendix B. The comparison shows that 116 Willowbank Road will have an increase in developable area due to the provision of a court bowl in lieu of a through road.

5.6 Pedestrian Access

Multiple pedestrian access points are located within the site, designed to cater for and encourage pedestrian trips throughout the surrounding area.

The northern pedestrian access point provides access from Morrison Road to a pedestrian spine which bisects the site in a north-south alignment.

The proposed development includes footpaths on one or both sides of all two-way roads which will provide access to the neighbouring properties when development occurs.

6 CAR PARKING

6.1 Statutory Car Parking Requirements

6.1.1 Car Parking Requirements – Clause 52.06

It is expected that the proposed integrated residential care facility is nestled within the residential aged care facility land use. Therefore, the car parking requirements for the subject site are identified in Clause 52.06 of the Macedon Ranges Planning Scheme, which specifies the following requirements for the proposed development.

Table 11 Clause 52.06 – Car Parking Requirements

Use	No	Rate	Car Parking Measure	Total
Residential aged care facility	107	0.3	to each lodging room	32
Total				32

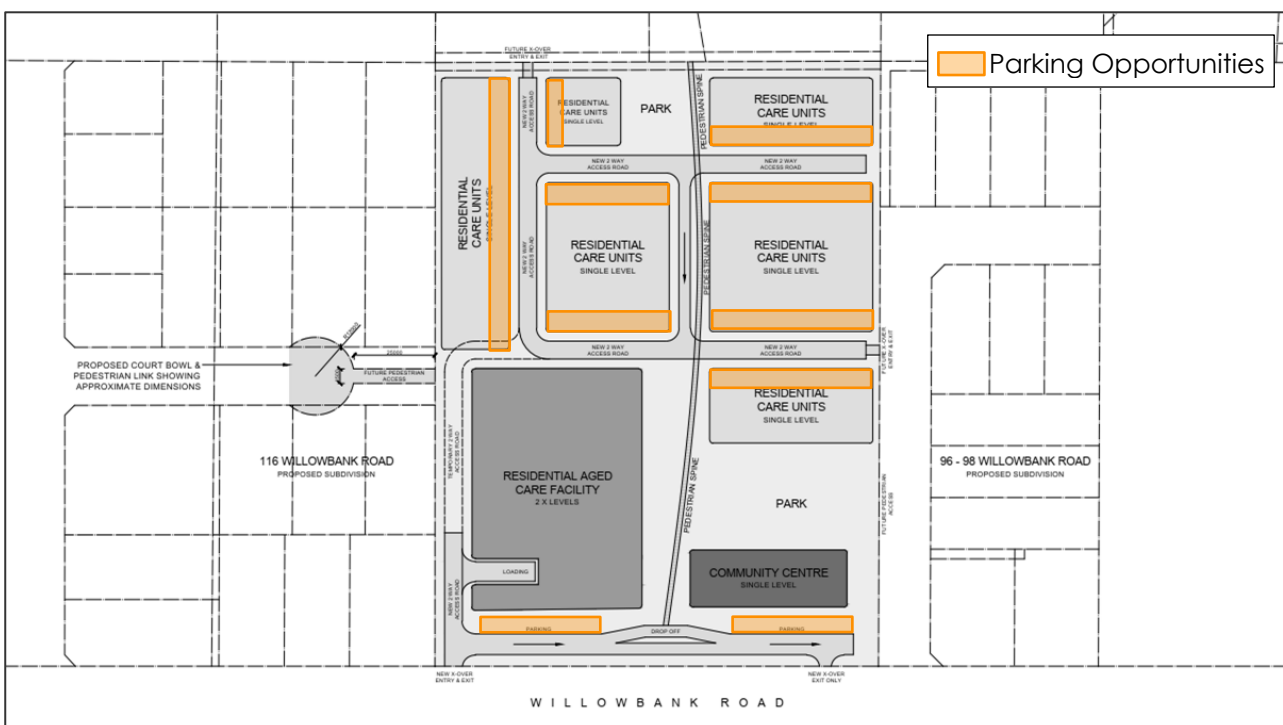
Based on the above calculations, a total of 32 parking spaces are required for the proposed development.

6.1.2 Proposed Car Parking Provision

It is proposed to provide at least 32 car parking spaces within development. The applicant is willing to include this requirement as a Clause in the Development Planning Overlay amendment.

Figure 24 below shows where parking will be provided on-site. It is noted that there will be a setback provided to garages of the single level residential care units which will allow for visitor parking if required.

Figure 24 On-Site Parking Opportunities



7 TRAFFIC

7.1 Traffic Growth

7.1.1 10 year Base Conditions

To ensure that the operation of surrounding intersections will operate appropriately into the future, it is considered appropriate to include future traffic volume growth to the existing traffic volumes.

For the purposes of a conservative analysis, growth rates of 1% per year (compound) have been applied to the existing traffic volumes for all local roads for a 10-year period, equivalent to a 10.5% increase in traffic volumes.

7.1.2 Approved Development at 39 Willowbank Road

A 615 lot residential subdivision has been approved to the east of the subject site at 39 Willowbank Road. The residential subdivision is expected to increase through volumes along Willowbank Road and as such should be included in the traffic analysis of the surrounding intersections.

7.1.3 Future Traffic Volumes

Based on the above, the expected traffic volumes as a result from future growth is shown in Figure 25 and Figure 26.

Figure 25 Future Traffic Conditions – Traffic Growth - AM Peak

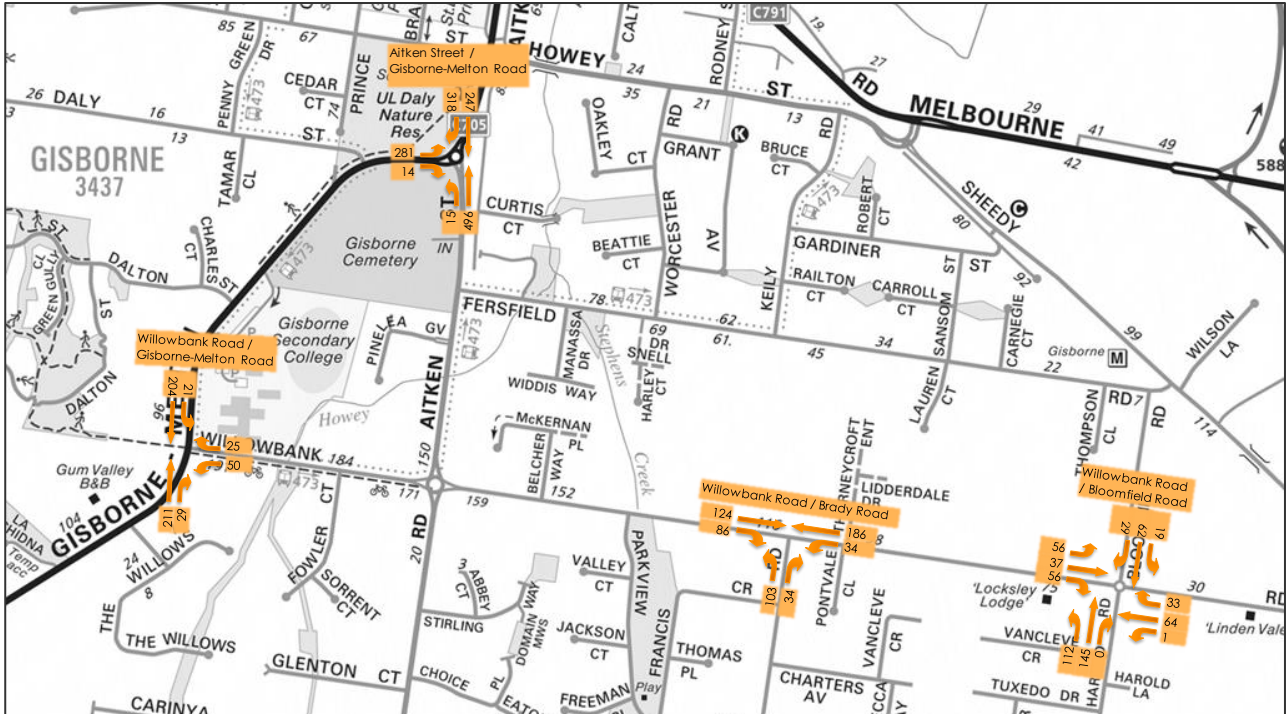
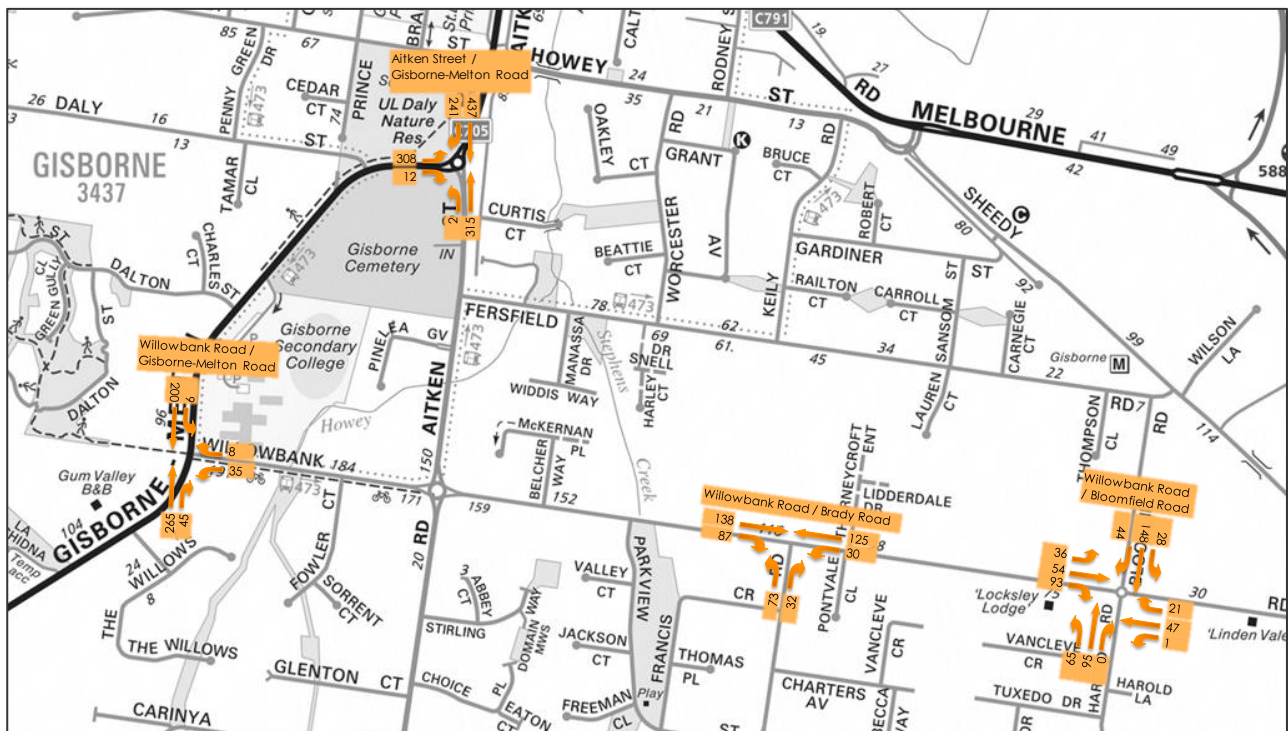


Figure 26 Future Traffic Conditions – Traffic Growth - PM Peak



7.1.3.1 Intersection Capacity Assessment

To assess the operation of the intersections surrounding the site the traffic volumes have been input into SIDRA Intersection. The results from the analysis are presented in the tables below.

Table 12 Willowbank Road / Bloomfield Road – AM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Childe Harold Road - South	Left	0.223	5.1	9.1
	Through	0.223	5.4	9.1
	Right	0.223	9	9.1
Willowbank Road - East	Left	0.089	5.1	3.2
	Through	0.089	5.4	3.2
	Right	0.089	9.1	3.2
Bloomfield Road - North	Left	0.095	4.8	3.6
	Through	0.095	5.1	3.6
	Right	0.095	8.8	3.6
Willowbank Road - West	Left	0.14	5.3	5.3
	Through	0.14	5.6	5.3
	Right	0.14	9.3	5.3

Table 13 Willowbank Road / Bloomfield Road – PM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (LOS)	Queue (m)
Childe Harold Road - South	Left	0.14	5	5.3
	Through	0.14	5.2	5.3
	Right	0.14	8.9	5.3
Willowbank Road - East	Left	0.071	5.8	2.6
	Through	0.071	6.1	2.6
	Right	0.071	9.8	2.6
Bloomfield Road - North	Left	0.198	5.2	8
	Through	0.198	5.5	8
	Right	0.198	9.2	8
Willowbank Road - West	Left	0.16	5	6.1
	Through	0.16	5.3	6.1
	Right	0.16	9	6.1

Table 14 Willowbank Road / Melton Road – AM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Melton Road - South	Through	0.137	0.2	1.7
	Right	0.137	6.4	1.7
Willowbank Road - East	Left	0.072	6.3	1.9
	Right	0.072	7.6	1.9
Melton Road - North	Left	0.124	5.6	0
	Through	0.124	0	0

Table 15 Willowbank Road / Melton Road – PM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Melton Road - South	Through	0.179	0.2	2.7
	Right	0.179	6.3	2.7
Willowbank Road - East	Left	0.039	6.2	1
	Right	0.039	7.9	1
Melton Road - North	Left	0.115	5.6	0
	Through	0.115	0	0

Table 16 Aitken Street / Melton Road – AM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Aitken Street - South	Left	0.501	6.4	25.4
	Through	0.501	6.6	25.4
Aitken Street - North	Through	0.365	4.2	21.7
	Right	0.365	8.8	21.7
Melton Road - West	Left	0.363	7.3	18
	Right	0.363	12.1	18

Table 17 Aitken Street / Melton Road – PM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Aitken Street - South	Left	0.295	5.4	12.4
	Through	0.295	5.6	12.4
Aitken Street - North	Through	0.431	4.2	26.7
	Right	0.431	8.8	26.7
Melton Road - West	Left	0.326	5.9	15.1
	Right	0.326	10.8	15.1

Table 18 Willowbank Road / Brady Road – AM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Brady Road - South	Left	0.122	6.2	3.4
	Right	0.122	7.5	3.4
Willowbank Road - East	Left	0.123	5.6	0
	Through	0.123	0	0
Willowbank Road - West	Through	0.132	0.6	4.1
	Right	0.132	6.3	4.1

Table 19 Willowbank Road / Brady Road – PM Peak Hour - Traffic Growth

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Brady Road - South	Left	0.091	6	2.5
	Right	0.091	7.2	2.5
Willowbank Road - East	Left	0.086	5.6	0
	Through	0.086	0	0
Willowbank Road - West	Through	0.138	0.3	4
	Right	0.138	6	4

As shown above, all intersections are expected to operate under excellent conditions during both the morning and afternoon peak hours with minimal queues and delays experienced by motorists.

7.2 Existing Development Plan

The subject site is located within the Fersfield Road Development Plan which contemplated having 22 low-density residential lots located within the subject site.

Furthermore, it is generally accepted that single dwellings on a lot in outer suburban areas may generate traffic at up to 10 vehicle trips per day, whilst in areas with good public transport, and for higher density dwellings, lower traffic generation rates are often recorded.

For the purpose of a conservative assessment, a traffic generation rate of 10 vehicle movements per day per dwelling will be adopted.

Application of the above traffic generation rates to the 22 low-density lots is expected to generate up to 220 vehicle trips per day, with approximately 22 vehicle movements occurring during the AM and PM peak periods.

7.3 Traffic Generation

onemilegrid and various other traffic consultants have undertaken a number of traffic generation surveys of aged care developments, summarised in Table 20.

Table 20 Aged Care Traffic Generation

Location	Level of Care	No. Beds	Traffic Generation (trips/bed)		
			Site Peak	Commuter Peak	Daily
Arcare, Caulfield North	High Care, Low Care	110	0.37	0.18	2.15
Broughtonlea, Surrey Hills	High Care, Low Care, Supported Residential	109	0.34	0.15 (avg.)	2.14
Regis Lake Park, Blackburn	High Care, Low Care, Respite Care, Dementia Care	202	0.39		2.32
Canterbury Nursing Home, Canterbury			0.39	0.21	
Lorikeet Lodge, Frankston		106	0.40	0.14	
Newmans on the Park, Templestowe	High Care, Low Care	109	0.47	0.09	3.2
47-49 Belgrave Road, Belgrave	High Care, Low Care	60	0.52	0.22	
Average			0.41	0.17	2.45

It is noted that typically, the peak traffic generation of an aged care facility coincides with the staff changeover period, which typically occurs between approximately 2:00pm and 3:00pm. During the typical commuter peak period, traffic generation is typically considerably lower, as demonstrated above.

In order to provide a conservative assessment, traffic generation rates of 2.5 and 0.20 movements per dwelling will be adopted for daily and commuter peak hour periods respectively.

An inbound/outbound split of 60%/40% will be adopted for the AM peak, and 50%/50% for the PM peak.

Application of the above rates applied to the expected yield of 107 units results in the following additional traffic movements.

Table 21 Traffic Generation

AM Peak			PM Peak			Daily		
In	Out	Total	In	Out	Total	In	Out	Total
13	9	22	11	11	22	134	134	268

As noted previously, the Fersfield Development Plan had contemplated low-density residential development for the site which would have generated a similar number of traffic movements during the AM peak and PM peak. Notwithstanding, an analysis of the traffic generated by the development is provided below.

7.4 Traffic Distribution

It is noted that a number of alternative access points will be provided as the area develops including multiple access points to the neighbouring developments located to the north and west of the site. Nevertheless, to provide a conservative assessment and considering the location of the site in relation to the arterial road network, recreational and retail precincts, the directional distribution is shown below in Table 22.

Table 22 Adopted Directional Traffic Distribution

Origin/Destination	Percentage
Willowbank Road - West	50%
Willowbank Road - East	50%

Furthermore, it is expected that 50% of vehicles will use the eastern site access and 50% of vehicles will use the western site entrance for exit movements. Applying this distribution percentage to the projected traffic movements to be generated by the proposed development produces the following traffic movements as shown below in Figure 27.

Figure 27 Anticipated Traffic Generation



7.5 Resultant Traffic Volumes

Based on the above, the future intersection volumes at the intersections in the vicinity of the site can be calculated by combining the anticipated future volumes with the traffic expected to be generated by the proposed development.

The resultant peak hour traffic volumes are shown in Figure 28 and Figure 29.

Figure 28 Resultant Traffic Volumes – AM Peak

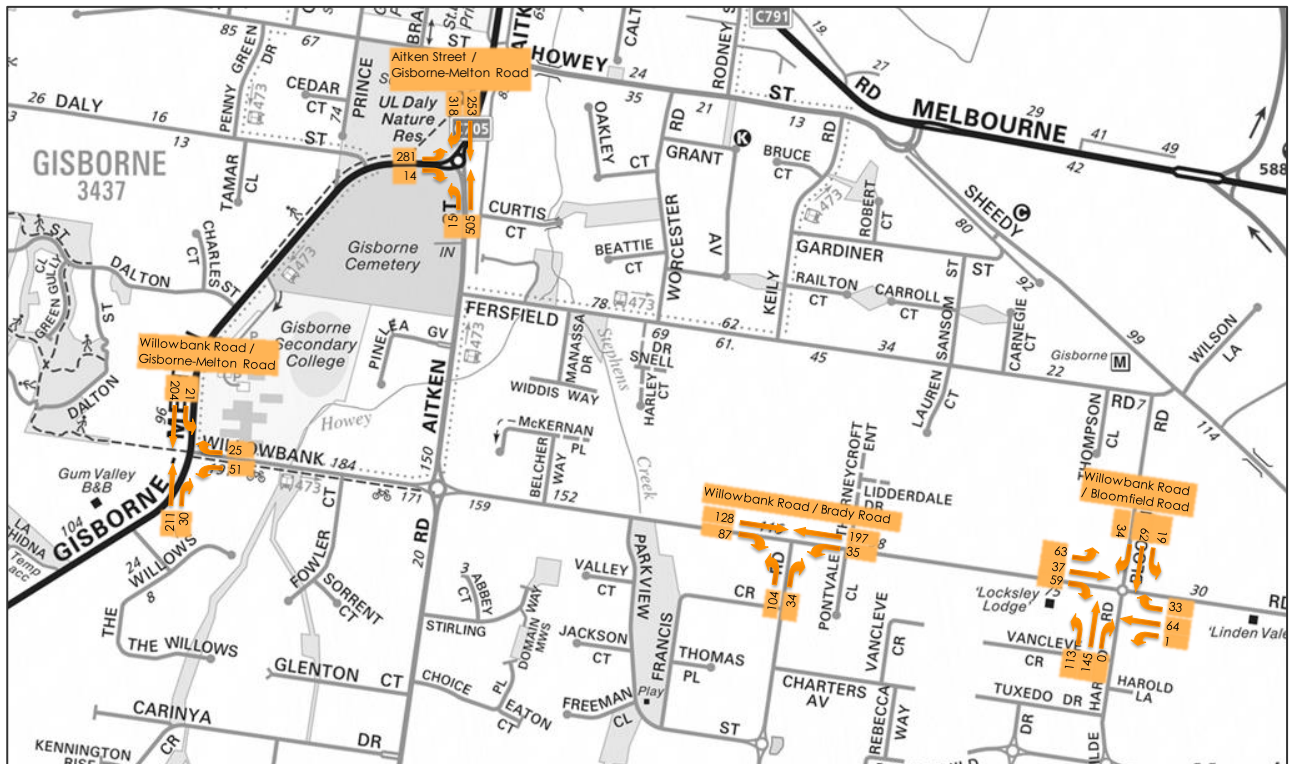
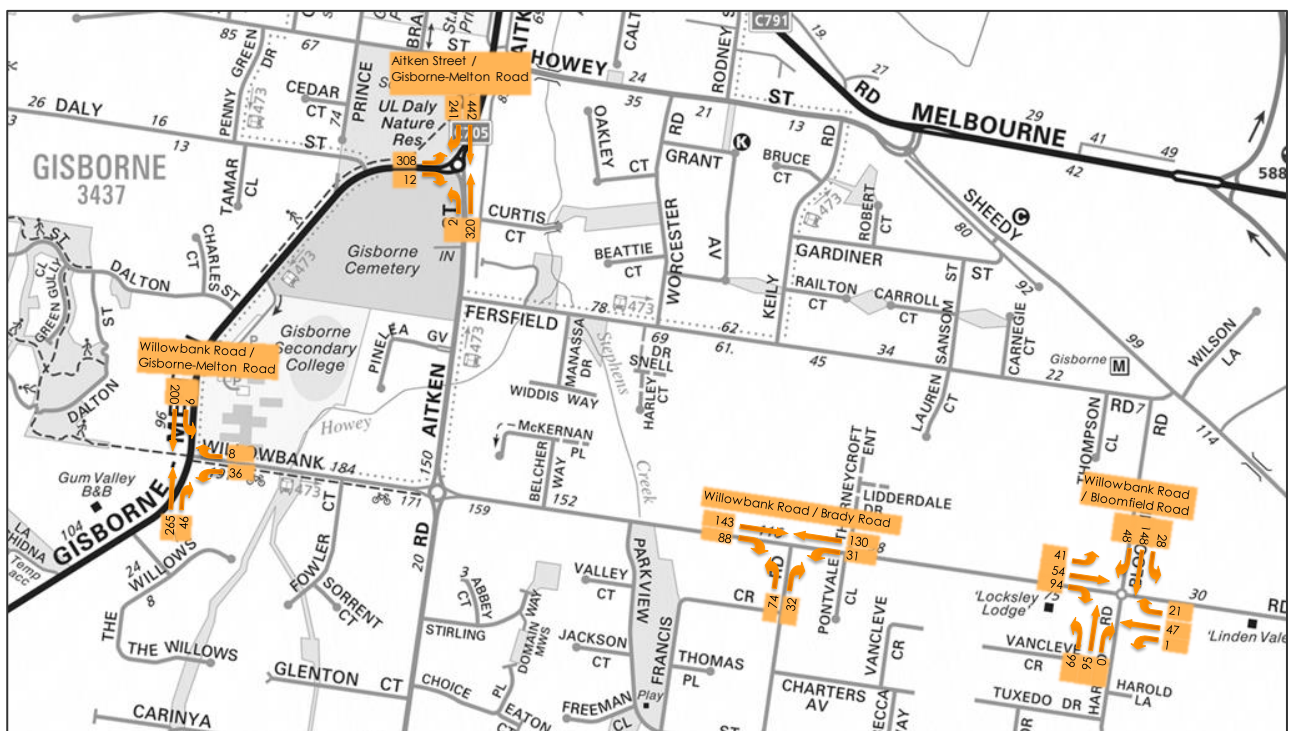


Figure 29 Resultant Traffic Volumes – PM Peak



7.6 Traffic Impact

Reviewing the volumes above, it is noted that a maximum of 7 vehicle movements per hour are expected for any one movement, equivalent to approximately one vehicle trip every 9 minutes. This amount of traffic is considered to be very low, and is expected to be easily absorbed into the surrounding road network.

Nevertheless, an analysis follows to understand the impact of the proposed development on intersections in the vicinity of the site to ensure they are to operate satisfactorily.

7.6.1 Intersection Capacity Assessment

To assess the operation of the intersection post-development the traffic volumes have been input into SIDRA Intersection. The results from the analysis are presented in the tables below.

Table 23 Willowbank Road / Bloomfield Road – AM Peak Hour - Future

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Childe Harold Road - South	Left	0.225	5.1	9.2
	Through	0.225	5.4	9.2
	Right	0.225	9.1	9.2
Willowbank Road - East	Left	0.09	5.2	3.2
	Through	0.09	5.4	3.2
	Right	0.09	9.1	3.2
Bloomfield Road - North	Left	0.1	4.9	3.8
	Through	0.1	5.1	3.8
	Right	0.1	8.8	3.8
Willowbank Road - West	Left	0.149	5.4	5.7
	Through	0.149	5.6	5.7
	Right	0.149	9.3	5.7

Table 24 Willowbank Road / Bloomfield Road – PM Peak Hour - Future

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Childe Harold Road - South	Left	0.142	5	5.4
	Through	0.142	5.3	5.4
	Right	0.142	8.9	5.4
Willowbank Road - East	Left	0.071	5.9	2.6
	Through	0.071	6.2	2.6
	Right	0.071	9.8	2.6
Bloomfield Road - North	Left	0.202	5.2	8.2
	Through	0.202	5.5	8.2
	Right	0.202	9.2	8.2
Willowbank Road - West	Left	0.164	5	6.4
	Through	0.164	5.3	6.4
	Right	0.164	9	6.4

Table 25 Willowbank Road / Melton Road – AM Peak Hour - Future

<i>Approach</i>	<i>Movement</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
Melton Road - South	Through	0.138	0.2	1.8
	Right	0.138	6.4	1.8
Willowbank Road - East	Left	0.073	6.3	1.9
	Right	0.073	7.6	1.9
Melton Road - North	Left	0.124	5.6	0
	Through	0.124	0	0

Table 26 Willowbank Road / Melton Road – PM Peak Hour - Future

<i>Approach</i>	<i>Movement</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
Melton Road - South	Through	0.179	0.2	2.7
	Right	0.179	6.3	2.7
Willowbank Road - East	Left	0.039	6.2	1
	Right	0.039	7.9	1
Melton Road - North	Left	0.115	5.6	0
	Through	0.115	0	0

Table 27 Aitken Street / Melton Road – AM Peak Hour - Future

<i>Approach</i>	<i>Movement</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
Aitken Street - South	Left	0.509	6.4	26
	Through	0.509	6.6	26
Aitken Street - North	Through	0.368	4.2	22.1
	Right	0.368	8.8	22.1
Melton Road - West	Left	0.366	7.4	18.2
	Right	0.366	12.2	18.2

Table 28 Aitken Street / Melton Road – PM Peak Hour - Future

<i>Approach</i>	<i>Movement</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
Aitken Street - South	Left	0.3	5.4	12.7
	Through	0.3	5.6	12.7
Aitken Street - North	Through	0.434	4.2	27.1
	Right	0.434	8.8	27.1
Melton Road - West	Left	0.328	6	15.2
	Right	0.328	10.8	15.2

Table 29 Willowbank Road / Brady Road – AM Peak Hour - Future

<i>Approach</i>	<i>Movement</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
Brady Road - South	Left	0.124	6.3	3.4
	Right	0.124	7.6	3.4
Willowbank Road - East	Left	0.128	5.6	0
	Through	0.128	0	0
Willowbank Road - West	Through	0.136	0.6	4.2
	Right	0.136	6.4	4.2

Table 30 Willowbank Road / Brady Road – PM Peak Hour - Future

Approach	Movement	D.o.S.	Avg Delay (sec)	Queue (m)
Brady Road - South	Left	0.092	6	2.5
	Right	0.092	7.2	2.5
Willowbank Road - East	Left	0.089	5.6	0
	Through	0.089	0	0
Willowbank Road - West	Through	0.140	0.4	4.1
	Right	0.140	6.1	4.1

As shown above, all intersections are expected to operate under excellent conditions during both the morning and afternoon peak hours. All intersections that were analysed in the vicinity of the subject site are expected to have negligible increases to average delays and queues in comparison to the base case due to the minimal amount of traffic generated by the proposed development.

In regard to the intersection of Brady Road / Willowbank Road, it is understood that Macedon Ranges Shire Council has a preference for the intersection to be upgraded to a roundabout. The SIDRA analysis shows that the existing intersection will operate well within its capacity with the critical period being the AM peak. The AM peak is expected to have an average delay of 7.6 seconds and queue of 3.4 metres on the southern approach, and an average delay of 6.4 metres and queue of 4.2 metres on the western approach. These delays and queues are unlikely to be an inconvenience to motorists during the day-to-day operation of the intersection. Furthermore, it is expected that a significant portion of the turning movements at the intersection of Brady Road / Willowbank Road is due to the existing childcare centre at the south-eastern corner of the intersection. Therefore, it is expected that turning movements at this intersection will not increase significantly in the future.

Based on the above, it is expected that the intersections in the vicinity of the site are appropriate to accommodate the expected traffic growth within the area and the proposed development.

8 CONCLUSIONS

It is proposed to amend the existing Development Plan Overlay that applies to the subject site and allow for an integrated residential care facility to operate on site. For the purposes of this analysis, a yield of 107 aged care living options has been adopted.

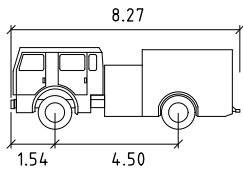
Considering the analysis presented above, it is concluded that:

- The site is located within the Development Plan Overlay (Schedule 4 – DPO4) which requires a Transport Impact Assessment to be prepared for the site;
- The Fersfield Road Development Plan has been prepared for the surrounding area which is proposed to yield approximately 327 residential lots and includes an internal road network;
- The subject site was anticipated to yield approximately 22 low-density residential lots;
- The proposed access and internal road network for the integrated residential care facility is in accordance with the Macedon Ranges Planning Scheme;
- The anticipated traffic volumes generated by the development is not expected to have an impact on the operation of the surrounding road network; and
- There are no traffic engineering reasons which would preclude the Development Plan Overlay to be amended.

Appendix A Swept Paths

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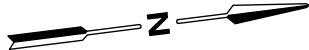
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Lock to Lock Time : 6.0
Steering Angle : 40.2

Legend
----- DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
..... 300mm CLEARANCE ENVELOPE SHOWN DOTTED

LEGEND

----- DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
..... 300mm CLEARANCE ENVELOPE SHOWN DOTTED

Aerial Photography
Aerial photography provided by Nearmap





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Scale
1:500 @ A3

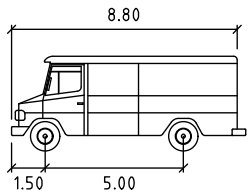
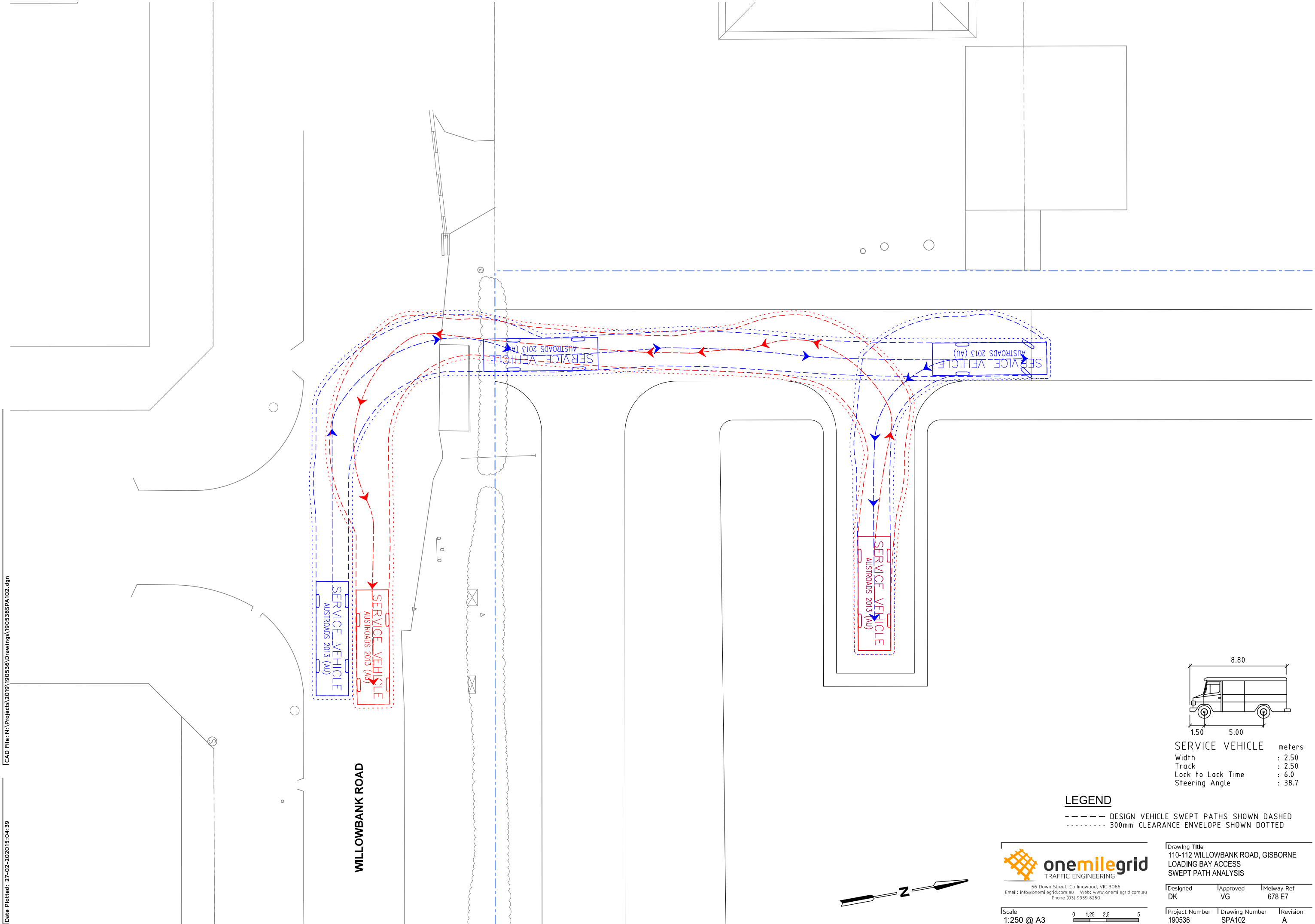
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10

Drawing Title 110-112 WILLOWBANK ROAD, GISBORNE CFA TRUCK ACCESS SWEEP PATH ANALYSIS		
Designed DK	Approved VG	Metway Ref 678 E7
Project Number 190536	Drawing Number SPA101	Revision A



SERVICE VEHICLE		metres
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Track	: 2.50	
Lock to Lock Time	: 6.0	
Steering Angle	: 38.7	

LEGEND

- DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED



onemilegrid
TRAFFIC ENGINEERING

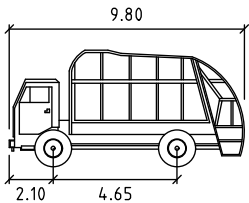
56 Down Street, Collingwood, VIC 3066
Email: info@onemilegrid.com.au Web: www.onemilegrid.com.au
Phone (03) 9939 8250

Scale	1:250 @ A3
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Drawing Title 110-112 WILLOWBANK ROAD, GISBORNE LOADING BAY ACCESS SWEEP PATH ANALYSIS		
Designed DK	Approved VG	Metway Ref 678 E7
Project Number 190536	Drawing Number SPA102	Revision A

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Date Plotted: 27-02-2020 15:24:29



BCC GARBAGE 9.8m meters
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Track : 2.50
Lock to Lock Time : 4.0
Steering Angle : 35.8

LEGEND

- DESIGN VEHICLE SWEEP PATHS SHOWN DASHED
- 300mm CLEARANCE ENVELOPE SHOWN DOTTED

Aerial Photography
Aerial photography provided by Nearmap

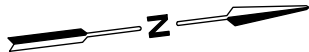
WILLOWBANK ROAD

TEMPORARY ROAD TO BE REMOVED PRIOR TO
CONSTRUCTION OF RESIDENTIAL CARE UNITS BUILDING

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Scale
1:500 @ A3

0 2.5 5 10



Drawing Title
110-112 WILLOWBANK ROAD, GISBORNE
WASTE TRUCK ACCESS
SWEEP PATH ANALYSIS

Designed DK	Approved VG	Metway Ref 678 E7
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Project Number 190536	Drawing Number SPA100	Revision A
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Appendix B 116 Willowbank Road Yield Comparison

