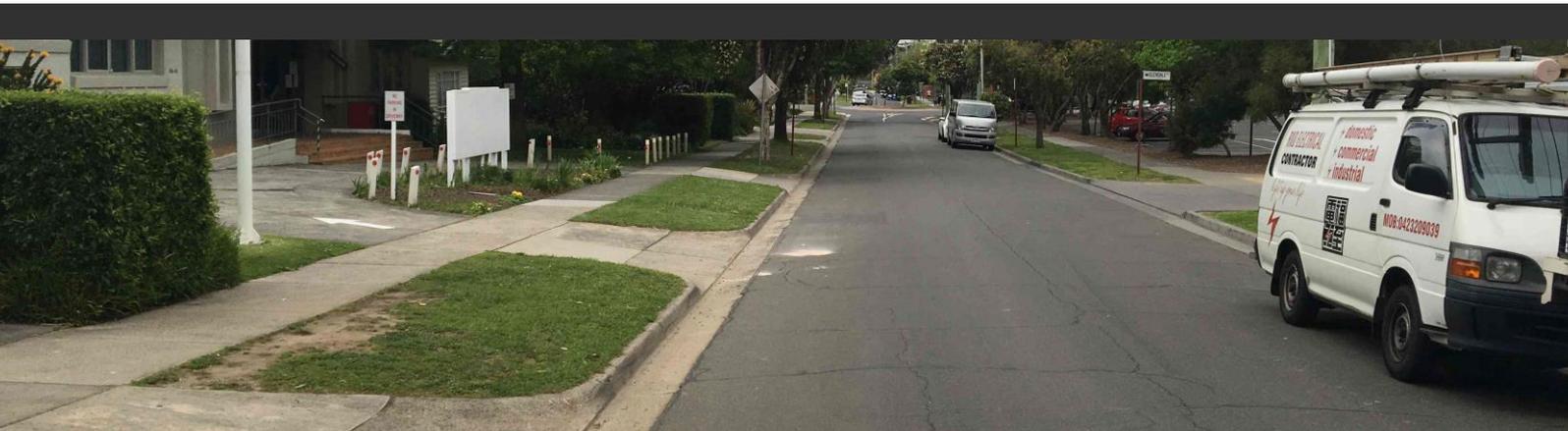


# ***50 Montclair Avenue – Mixed-Use Development***

## Transport Impact Assessment



16503TIA002B-F  
24 January 2017

## onemilegrid

ABN: 79 168 115 679

(03) 9939 8250  
1/59 Keele Street

**COLLINGWOOD, VIC 3066**

[www.onemilegrid.com.au](http://www.onemilegrid.com.au)

### DOCUMENT INFORMATION

<b>Prepared for</b>	Life Design Architecture	<b>Report Date</b>	24 January 2017
<b>File Name</b>	16503TIA002B-F	<b>Reviewed by</b>	Ross Hill
<b>Prepared by</b>	Julian Stone		
<b>Signature</b>		<b>Signature</b>	

© One Mile Grid Pty Ltd. This document has been prepared by **onemilegrid** for the sole use and benefit of the client as per the terms of engagement. It may not be modified or altered, copied, reproduced, sold or transferred in whole or in part in any format to any person other than by agreement. **onemilegrid** does not assume responsibility or liability to any third party arising out of use or misuse of this document.

## CONTENTS

1	INTRODUCTION.....	5
2	EXISTING CONDITIONS .....	5
2.1	Site Location.....	5
2.2	Glen Waverley Activity Centre.....	6
2.3	Planning Zones .....	8
2.4	Road Network.....	8
2.5	Traffic Volumes.....	10
2.6	Sustainable Transport.....	11
2.6.1	Public Transport.....	11
2.6.2	Bicycle Facilities.....	12
3	DEVELOPMENT PROPOSAL.....	14
3.1	General.....	14
3.2	Car Parking and Vehicular Access.....	14
3.3	Bicycle Parking .....	14
4	DESIGN CONSIDERATIONS .....	15
4.1	General.....	15
4.2	Design Standard 1 – Accessways .....	15
4.3	Design Standard 2 – Car Parking Spaces .....	16
4.4	Design Standard 3 – Gradients.....	16
4.5	Waste Collection.....	17
4.6	Bicycle Parking .....	17
5	LOADING CONSIDERATIONS .....	18
6	BICYCLE PARKING CONSIDERATIONS .....	19
7	CAR PARKING CONSIDERATIONS.....	20
7.1	Statutory Car Parking Requirements .....	20
7.1.1	Proposed Car Parking Provision.....	20
7.2	Schedule 1 to the Parking Overlay Permit Requirement.....	21
7.3	Car Parking Demand Assessment.....	21
8	TRAFFIC CONSIDERATIONS.....	23
8.1	Traffic Generation .....	23
8.1.1	Residential.....	23
8.1.2	Staff Traffic .....	23
8.1.3	Anticipated Traffic Generation .....	24
8.2	Generated Traffic Volumes.....	24
8.3	One-Lane Probability Assessment .....	24
9	CONCLUSIONS.....	25

## TABLES

Table 1	Traffic Volume and Speed Surveys .....	10
Table 2	Public Transport Provision.....	12
Table 3	Proposed Development.....	14
Table 4	Clause 52.06-8 Design Assessment – Design Standard 1 .....	15
Table 5	Clause 52.34 – Bicycle Parking Requirements .....	19
Table 6	Clause 52.34 – Bicycle Facility Requirements .....	19
Table 7	Clause 52.06 – Car Parking Requirements.....	20
Table 8	Varying Anticipated Additional Parking Demand .....	22
Table 9	Resident Anticipated Traffic Generation.....	23
Table 10	Anticipated Traffic Generation .....	24

## FIGURES

Figure 1	Site Location.....	5
Figure 2	Glen Waverley Activity Centre Masterplan – Access and Movement Strategy .....	7
Figure 3	Planning Scheme Zones.....	8
Figure 4	Montclair Avenue looking east beyond the subject site .....	9
Figure 5	Montclair Avenue looking west beyond the subject site .....	9
Figure 6	Public Transport Provision.....	11
Figure 7	City of Monash SmartRoads Priority Map .....	13

## APPENDICES

APPENDIX A	SWEPT PATH ASSESSMENT .....	26
------------	-----------------------------	----

# 1 INTRODUCTION

onemilegrid has been requested by Life Design Architecture to undertake a Transport Impact Assessment of the proposed mixed use development at 50 Montclair Avenue.

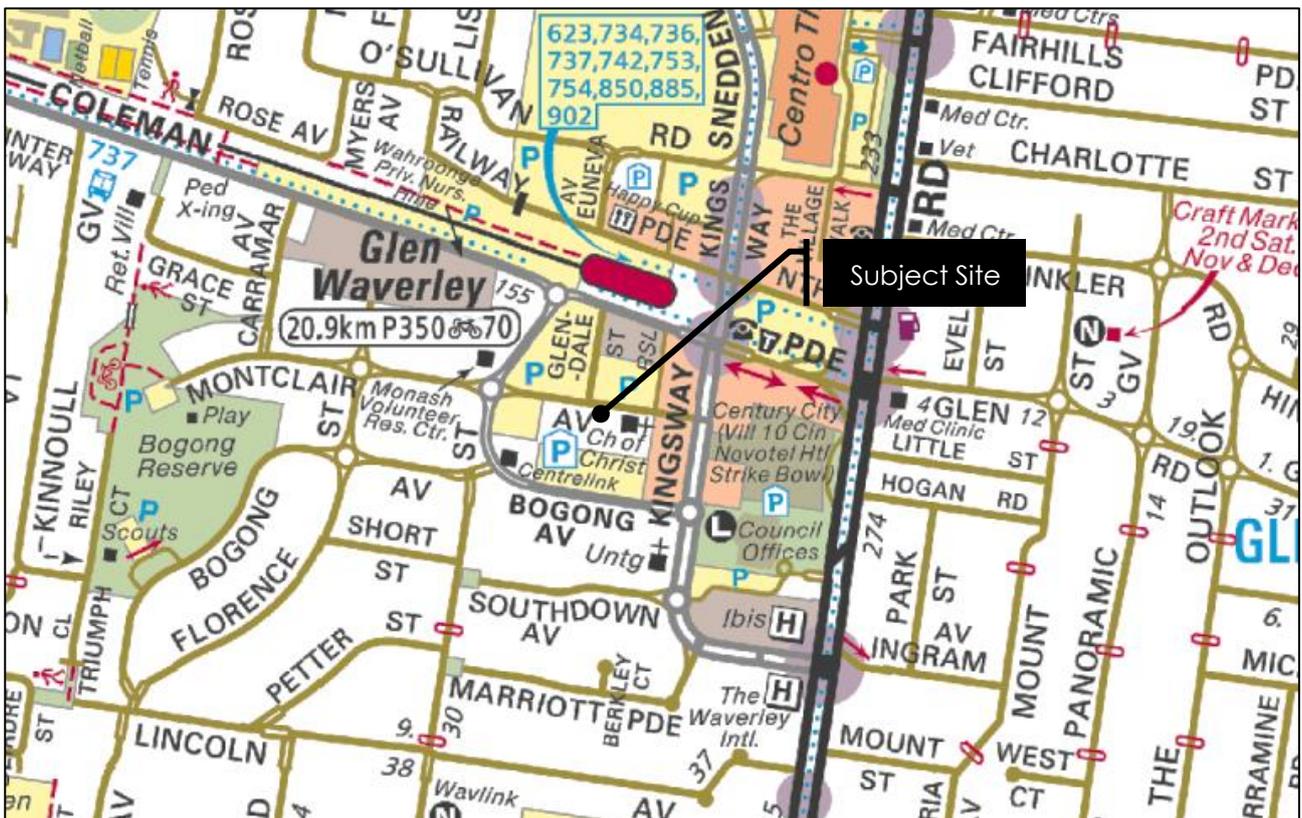
As part of this assessment the subject site has been inspected with due consideration of the development proposal, traffic data has been sourced and relevant background reports have been reviewed.

## 2 EXISTING CONDITIONS

### 2.1 Site Location

The subject site is located on the south side of Montclair Avenue between Kingsway in the east and Glendale Street in the west, as shown in Figure 1. The site has a frontage of approximately 18 metres to Montclair Avenue and is approximately 80 metres west of Kingsway.

**Figure 1 Site Location**



Copyright Melway Publishing

The site is currently occupied by a single storey dwelling.

The subject site is part of the Glen Waverley Activity Centre which contains commercial and retail uses. Further south-west of the site is predominantly utilised for residential use. It is noted that Glen Waverley Train Station is located approximately 150m north of the site and The Glen shopping centre is located approximately 150m east of the site.

There are several public car parks in the immediate vicinity of the site, including:

- Two at-grade car parks to the north of Montclair Avenue; and
- A multi-deck car park to the south of the site, accessed from Bogong Avenue.

## 2.2 Glen Waverley Activity Centre

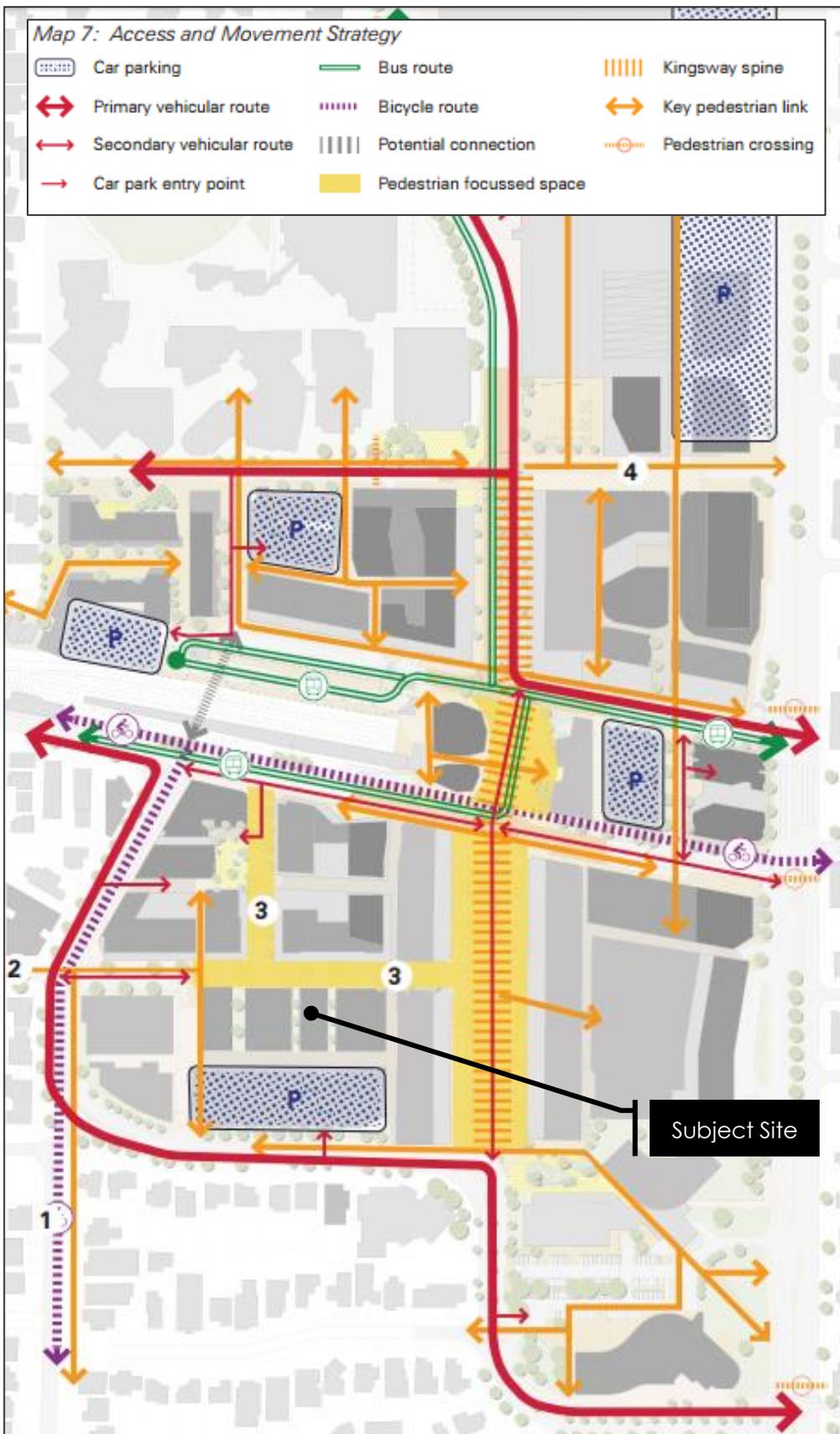
The subject site is located within the south-west corner of the Glen Waverley Activity Centre, for which MGS Architects have prepared a Masterplan for the City of Monash in August 2013. The Masterplan was prepared with consideration to the following factors:

- Financial feasibility and economic benefit;
- Social / community benefit;
- Environmental sustainability;
- Accessibility, parking and traffic; and
- Optimal governance arrangements.

The Masterplan provides guidance to consolidate car parking in highly accessible locations only and move major traffic routes towards the perimeter away from a calmed core.

The subject site location in context of the Access and Movement Strategy from the Masterplan is shown in Figure 2.

Figure 2 Glen Waverley Activity Centre Masterplan – Access and Movement Strategy



## 2.3 Planning Zones

It is shown in Figure 3 that the site is located within a Commercial 1 Zone (C1Z), for which permitted uses are listed in Clause 34.01 of the Monash Planning Scheme.

It is noted that the location of the site is subject to the Monash Planning Scheme, where Schedule 1 of the parking overlay will be considered.

**Figure 3 Planning Scheme Zones**



## 2.4 Road Network

Montclair Avenue is a local road generally aligned east-west, running from Kingsway in the east to a carpark in the west for Bogong Reserve. In the vicinity of the site, Montclair Avenue provides an unmarked roadway with two-way traffic and kerbside parking on the north side. The parking is restricted to 2-hours between 8:00am and 6:00pm, Monday to Saturday, with the south side of Montclair Avenue a permanent 'No Standing' zone.

The intersection between Montclair Avenue and Kingsway is an unsignalised T-intersection (with allowance for a staged right turn from Montclair Avenue) and the intersection between Montclair Avenue and Myrtle Street is a roundabout.

The cross-section of Montclair Avenue at the frontage of the site is shown in Figure 4.

Figure 4 Montclair Avenue looking east beyond the subject site



Figure 5 Montclair Avenue looking west beyond the subject site



The default 50km/h speed limit applies to Montclair Avenue in the vicinity of the site.

## 2.5 Traffic Volumes

Traffic volume and speed surveys were undertaken by Trans Traffic Survey on behalf of **onemilegrid** outside the subject site on Montclair Avenue for a one-week period. The dates of the testing ran from Saturday 15<sup>th</sup> October 2016 until 22<sup>nd</sup> October 2016.

The total and peak traffic volumes as well as speed results of the surveys are shown in Table 1 for both the weekday average and 7-day average.

**Table 1 Traffic Volume and Speed Surveys**

<i>Time Period</i>	<i>Direction</i>	<i>Eastbound</i>	<i>Westbound</i>	<i>Both Directions</i>
Weekday Average	Traffic Volume (vpd)	1049	541	1590
	Average Speed (km/h)	29.5	31.3	30.5
	85 <sup>th</sup> Percentile Speed (km/h)	36.5	37.8	37.4
	AM Peak Hour Volume (11:00am)	52	35	86
	PM Peak Hour Volume (5:00pm)	99	32	128
7 Day Average	Traffic Volume (vpd)	1030	548	1579
	Average Speed (km/h)	29.9	31.5	30.7
	85 <sup>th</sup> Percentile Speed (km/h)	36.4	37.6	37
	AM Peak Hour Volume (11:00am)	53	35	87
	PM Peak Hour Volume (6:00pm)	86	39	124

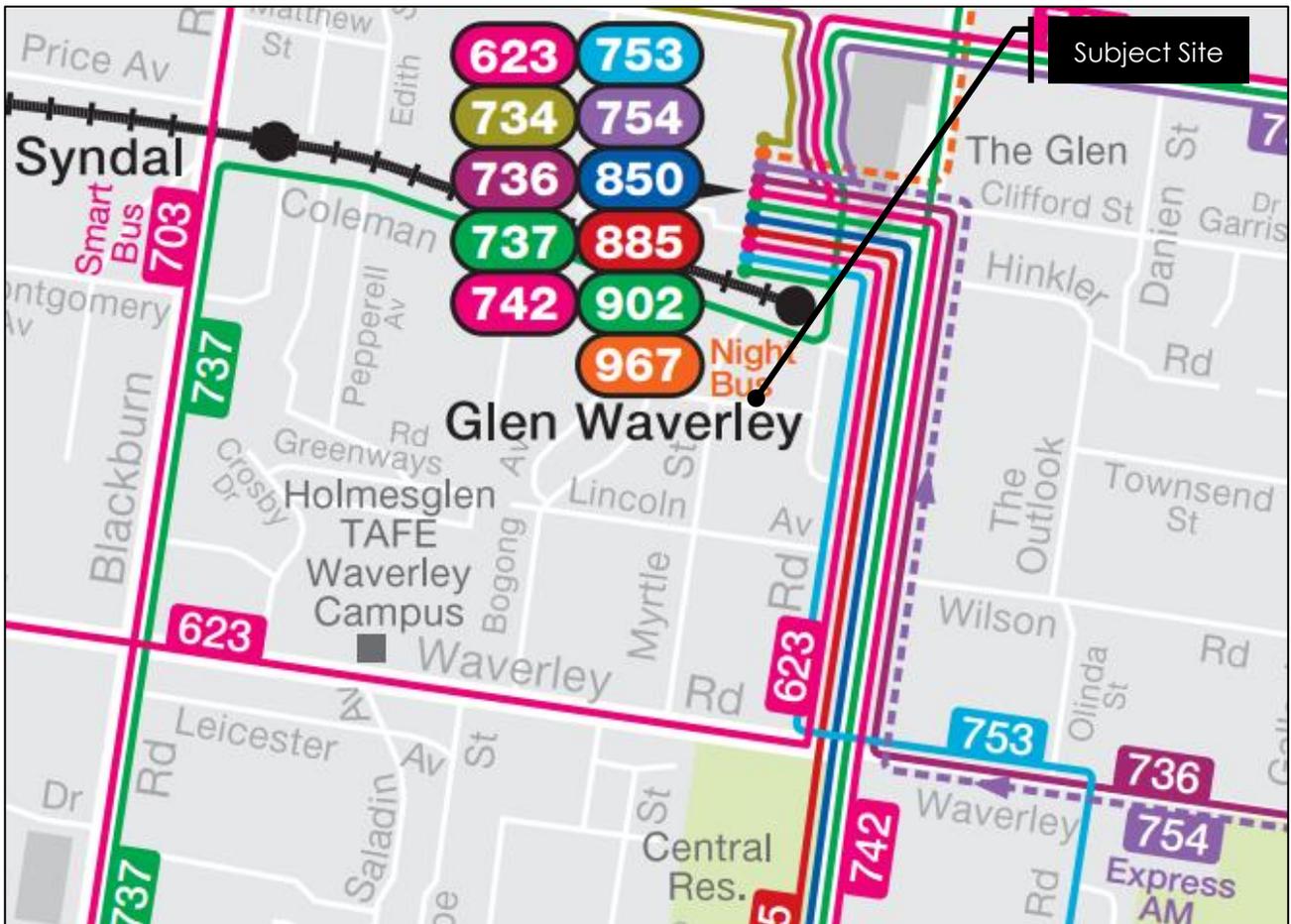
## 2.6 Sustainable Transport

### 2.6.1 Public Transport

The subject site is well located to make use of existing public transport services in the area, particularly with the Glen Waverley Train Station located approximately 150m north of the site.

The full public transport provision in the area is shown in Figure 6 and detailed in Table 2.

**Figure 6 Public Transport Provision**



**Table 2 Public Transport Provision**

<b>Mode</b>	<b>Route No</b>	<b>Route Description</b>	<b>Nearest Stop/Station</b>
Train		Glen Waverley Line	Glen Waverley Station
Bus	623	Glen Waverley - St Kilda via Mount Waverley, Chadstone, Carnegie	Glen Waverley Station
	734	Glen Iris - Glen Waverley	
	736	Mitcham - Blackburn via Vermont South, Glen Waverley, Forest Hill	
	737	Croydon - Monash University via Boronia, Knox City Shopping Centre, Glen Waverley	
	742	Eastland - Chadstone via Vermont South, Glen Waverley, Oakleigh	
	753	Glen Waverley - Bayswater via Wheelers Hill, Knoxfield, Boronia	
	754	Rowville - Glen Waverley via Caulfield Grammar, Wheelers Hill	
	850	Dandenong - Glen Waverley via Mulgrave, Brandon Park	
	885	Glen Waverley - Springvale via Wanda Street	
	902	Chelsea - Airport West (SMARTBUS Service)	
	967	Night Bus – Glen Waverley – Burwood Hwy - Bayswater	

It is shown that the site has excellent public transport accessibility, with a wide variety of transport modes and services servicing the immediate vicinity of the site.

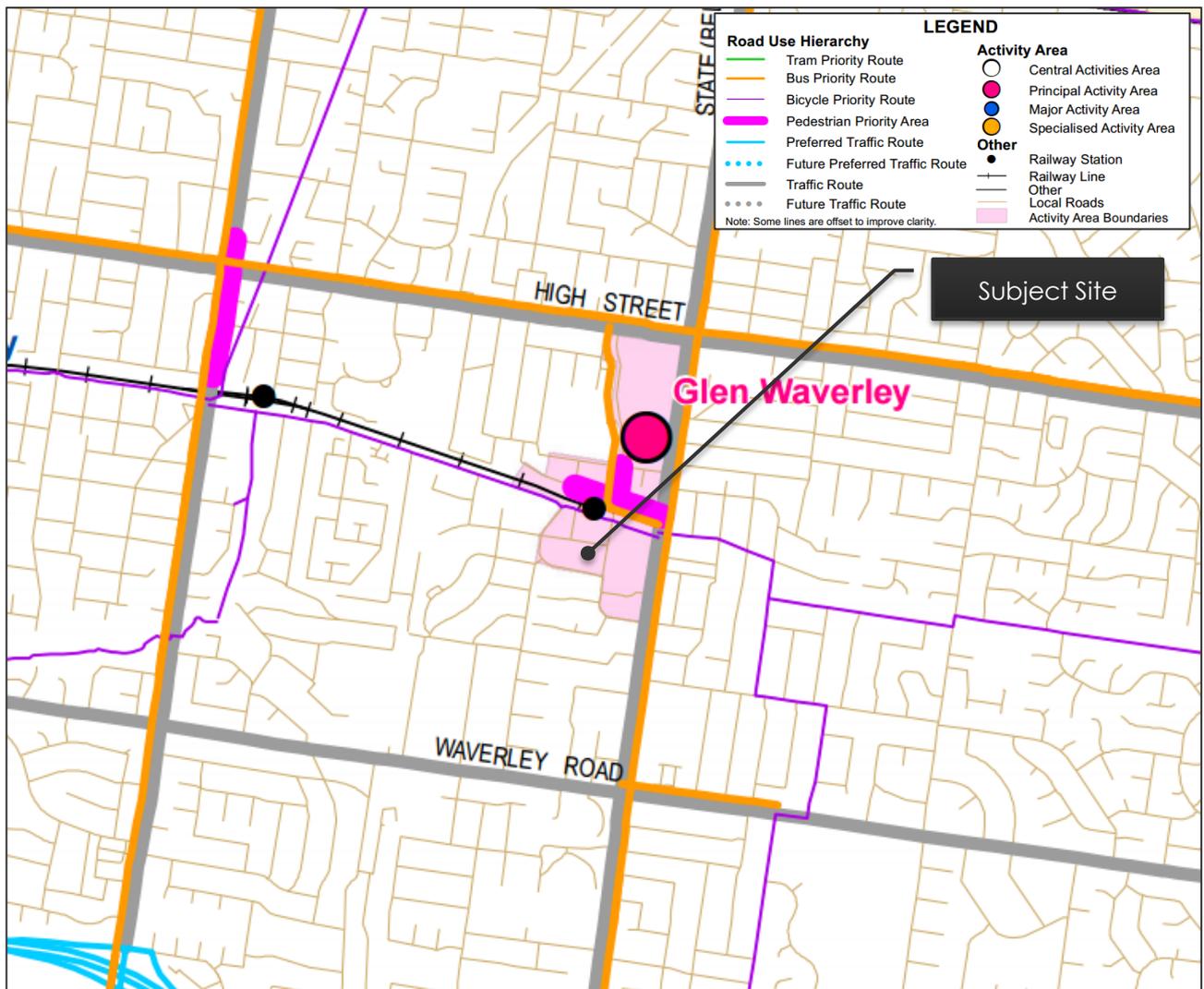
### 2.6.2 Bicycle Facilities

Melbourne's Principal Bicycle Network (PBN) was originally established in 1994. VicRoads undertook an extensive review of the PBN between 2009 and 2012 and identified numerous improvements.

The Principal Bicycle Network is now included on the SmartRoads Road User Hierarchy plans, as shown in Figure 7.

The Road User Hierarchy plans indicate that a bicycle priority route is almost directly accessible from the subject site on Coleman Parade (to the north of the site). Coleman Parade gives access to a much wider network with options to travel in all directions and in some cases on bicycle specific paths away from road traffic.

Figure 7 City of Monash SmartRoads Priority Map



## 3 DEVELOPMENT PROPOSAL

### 3.1 General

It is proposed to develop the subject site for the purposes of a mixed-use development, containing apartments, office spaces, restaurants and cafe, as summarised in Table 3.

**Table 3 Proposed Development**

<i>Component</i>	<i>No/Area</i>
2 Bedroom Apartment	30
3 Bedroom Apartment	8
<b>Total Apartments</b>	<b>38</b>
Restaurant / Café	2 tenancies 683 m <sup>2</sup> (192 seats)
Office	2,547 m <sup>2</sup>

The development has seventeen levels including; four levels of basement carparking, the ground level for a café / restaurant, the first floor split between a restaurant and office, the next four floors are proposed office spaces and the top six levels are for apartments.

### 3.2 Car Parking and Vehicular Access

A total of 55 car spaces are proposed in the basement levels inclusive of one accessible space accompanied with an adjacent shared area.

Vehicle access to the basement levels is proposed via a crossover to Montclair Avenue in the same location as the existing crossover being the north-west corner of the site. The site access includes a passing area at the access to Montclair Avenue and within the first basement level. To assist with this access arrangement, it is proposed to install a traffic light system which will warn drivers of vehicles approaching from the opposite direction.

The first basement level includes a bin storage area and provision for a van and mini waste collection vehicle to undertake loading activities.

### 3.3 Bicycle Parking

It is proposed to provide 24 bicycle parking spaces within the first basement level in the form of vertically hung bike racks and 12 bicycle parking spaces on the ground level in the form of vertically hung bike racks, for use by visitors.

## 4 DESIGN CONSIDERATIONS

### 4.1 General

onemilegrid has undertaken an assessment of the car parking layout and access for the proposed development with due consideration of the Design Standards detailed with Clause 52.06-8 of the Planning Scheme. A review of those relevant Design Standards is provided in the following section.

### 4.2 Design Standard 1 – Accessways

A summary of the assessment for Design Standard 1 is provided in Table 4.

**Table 4** Clause 52.06-8 Design Assessment – Design Standard 1

<i>Requirement</i>	<i>Comments</i>
Be at least 3 metres wide	Satisfied – minimum width of ramp is 3.6m and includes an increased width at the site frontage of 5m
Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide	N/a – no change in direction 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 – private car park
Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8 metres	Satisfied – a minimum height clearance of 2.2 metres is to be achieved
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 5 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.	Generally Satisfied – the site to the west currently includes low landscaping which will allow for the required sight line however if this were to be redeveloped and built up to the frontage it would obstruct the required sight lines. It is recommended that a pedestrian warning light be installed to assist with pedestrian safety
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.	N/A – does not connect to a Road Zone

The curved ramps between basement levels have been assessed for circulation of the B99 design vehicle as part of the swept path assessment included as Appendix A. The swept paths include the required 300mm clearance to the B99 vehicle.

At the Basement 1 Level the swept paths show the position for the B99 vehicle to stop as a B85 vehicle is entering the site, as the B85 vehicle positions itself adjacent to the exiting vehicle, the B99 vehicle is then able to leave. The swept paths then show that the B85 vehicle is then able to move on and travel down the curved ramp without the use of a corrective movement. It is recommended that line marking be provided in this area to assist with positioning these vehicles.

As noted previously, the basement parking spaces are to be allocated to residents and staff only who will be aware and comfortable with the proposed access arrangements.

### **4.3 Design Standard 2 – Car Parking Spaces**

All car spaces on-site are proposed with a minimum width of 2.6m, length of 4.9m and are accessed from aisles of no less than 6.4 m, in accordance with Clause 52.06 of the Planning Scheme.

The parking spaces at the end of the aisle are provide with an aisle extension of at least 1.0m to assist with access to these spaces.

The two parking spaces on each side of the core on each basement level are provided with a clear width of 2.7m between the wall and the adjacent column which is acknowledged to not strictly be in accordance with the parking clearance envelope provided in Clause 52.06 (with the adjacent wall obstructing the door opening area).

The obstructions are clear of the open end of the space and the additional 100mm clearance is in accordance with the width required in AS/NZS 2890.1:2004. Given that these parking spaces are all allocated to residents or staff of the proposal, it is anticipated that residents and staff will become accustomed to the reduced door opening envelope, and will be able to park their vehicles appropriately to make use of these spaces.

Considering the above, the proposed design, whilst varying from the requirements of the Planning Scheme, are considered to provide safe and comfortable access to and from all car spaces.

The first basement level includes an accessible parking space with a length of 5.4m, width of 2.4m and adjacent shared area of the same dimensions, in accordance with AS 2890-6. The accessible parking space is to have a minimum height clearance of 2.2m is to be maintained via the access to this space and clearance of 2.5m above the DDA space and adjacent shared area.

### **4.4 Design Standard 3 – Gradients**

The ramp gradients throughout the development are to be designed in accordance with the requirements of Design Standard 3 of Clause 52.06 of the Planning Scheme. This includes ensuring transitions are provided where changes of grade exceed 12.5%, transition lengths designed to prevent potential scraping and a maximum grade of 1:4 given it is a private car park.

The ramps each have a maximum grade of 1:4 with transitions of 1:8 provided at each end. The grade of the curved ramp is to be measured around the inside curve of the ramp.

A grade of 1:16 is provided within the basement levels at some of the parking spaces and the access aisle, measured perpendicular to the angle of the spaces. This grade is in accordance with AS/NZS 2890.1:2004.

The plans show an initial incline grade into the site and then a transition before grading down at 1:8. It is recommended that this transition (currently shown at 1:10) be provided as flat to avoid vehicles potentially scraping in this area.

## 4.5 Waste Collection

Two bin storage areas are located within the first basement level. All of the bins on-site will be collected by a private waste collection service from the first basement level through the use of a mini-loader with a nominal length of 6.4m. Access for the mini waste loader has been assessed as part of the swept path analysis included as Appendix A.

Refer to the Waste Management Plan for further information.

## 4.6 Bicycle Parking

It is proposed to provide 24 bicycle parking spaces within the first basement level in the form of vertically hung bike racks and 12 bicycle parking spaces on the ground level in the form of vertically hung bike racks, for use by visitors.

The vertical bike racks are provided with a length of 1.2m, access aisle of 1.5m and a separation of 0.5m between racks, which effectively provides 1m between bikes when they are staggered in height. These dimensions are more than the Planning Scheme requirements and in accordance with typical advice from Bicycle Network Victoria.

## 5 LOADING CONSIDERATIONS

---

Clause 52.07 of the Monash Planning Scheme, specifies the loading requirements for "*building or works . . . constructed for the manufacture, servicing, storage or sale of goods or materials*". As the proposed development does not contemplate the above, specific loading facilities are not required.

The proposed restaurant and café tenancies therefore generate a requirement for an on-site loading area.

The proposed development includes an area on the first basement level which is to be utilised for loading activities of the restaurant, café and offices, as well as waste collection. The loading area can cater for service vehicles to the size of the 6.4m waste collection vehicle and has a height clearance of 2.5m.

It is expected that the restaurant component of the proposed development would typically utilise van sized vehicles for deliveries which will be able to utilise this area.

Access to this area has been assessed for the 6.4m waste mini loader vehicle, as demonstrated in Appendix A.

The proposed basement level loading area is considered appropriate for the development.

## 6 BICYCLE PARKING CONSIDERATIONS

The bicycle parking requirements for the subject site are identified in Clause 52.34 of the Monash Planning Scheme, as outlined in Table 5. The ground floor café component has been assessed below as a 'Restaurant' tenancy.

**Table 5 Clause 52.34 – Bicycle Parking Requirements**

Component	No/Area	Requirement	Total
Dwelling (four or more storeys)	38 dwellings	1 per 5 dwellings for residents	8
		1 per 10 dwellings for visitors	4
Office (greater than 1000m <sup>2</sup> )	2,547 m <sup>2</sup>	1 per 300m <sup>2</sup> for employees	8
		1 per 1000m <sup>2</sup> for visitors	3
Restaurant	683 m <sup>2</sup>	1 per 100m <sup>2</sup> of floor area available to the public for employees	7
		2 + 1 per 200m <sup>2</sup> of floor area available to the public for visitors if the floor area exceeds 400m <sup>2</sup>	5
<b>Total</b>		<b>Residents</b>	<b>8</b>
		<b>Employees</b>	<b>15</b>
		<b>Visitors</b>	<b>12</b>

Furthermore, where 5 or more employee bicycle spaces are provided, employee facilities are required in accordance with Clause 52.34 of the Monash Planning Scheme, as identified below.

**Table 6 Clause 52.34 – Bicycle Facility Requirements**

Facility	Employee Bicycle Spaces	Requirement	Total
Showers	15 spaces	1 shower for the first 5 employee bicycle spaces; plus 1 to each 10 employee bicycle spaces thereafter	2

Showers must have access to a communal change room, or combined shower and change room

It is proposed to provide a total of 24 bicycle parking spaces within the basement car park, available for both resident and employee use and exceeding the requirements of Clause 52.34 of the Planning Scheme.

The ground floor area includes 12 bicycle parking spaces which meet the requirements of Clause 52.34 of the Planning Scheme for visitors.

It is recommended that two showers and associated change rooms be provided to meet the requirements of Clause 52.34 of the Planning Scheme.

## 7 CAR PARKING CONSIDERATIONS

### 7.1 Statutory Car Parking Requirements

The car parking requirements for a development are typically identified in Clause 52.06 of the Monash Planning Scheme, though where parking requirements are specified under another provision of the planning scheme, the requirements of Clause 52.06 do not apply.

In this case, Parking Overlay (PO1) provides parking requirements for the restaurant component of the proposal and states that the rates of Clause 52.06 are to be utilised for the other proposed uses. The ground floor café component has been assessed as a 'Restaurant' tenancy.

The Planning Scheme parking rates are calculated in Table 7.

**Table 7 Clause 52.06 – Car Parking Requirements**

Use	No/Area	Rate	Car Parking Measure	Total
Dwelling	30	1	to each one or two-bedroom dwelling, plus	30
	8	2	to each three or more-bedroom dwelling (with studies or studios that are separate rooms counted as bedrooms), plus	16
	38	1	for visitors to every 5 dwellings for developments of 5 or more dwellings	7
Office other than listed in this table	2,547 m <sup>2</sup>	3.5	to each 100m <sup>2</sup> of net floor area	89
Restaurant	192 seats	0.45	To each seat available to the public (Parking Overlay rate)	86
<b>Total</b>				<b>228</b>

Based on the above calculations, a total of 228 parking spaces are required for the proposed development.

#### 7.1.1 Proposed Car Parking Provision

The basement level parking will be allocated as follows:

- 46 for residential parking (in accordance with Planning Scheme rates);
- 3 spaces for restaurant staff; and
- 6 spaces for office staff.

The proposed provision of 55 parking spaces within the basement levels reflects a shortfall of 173 spaces from the Planning Scheme and Parking Overlay requirements.

## 7.2 Schedule 1 to the Parking Overlay Permit Requirement

Schedule 1 to the Parking Overlay states the following:

*'A permit cannot be granted to reduce the car parking requirement for any other use, except dwelling, on the basis of:*

- *The availability of car parking in the locality;*
- *The availability of public transport in the locality;*
- *Any reduction in car parking demand due to the sharing of car spaces by multiple uses, either because of variation of car parking demand over time or because of efficiencies gained from the consolidation of shared car parking spaces;*
- *Any empirical assessment; or*
- *Any other relevant consideration.'*

It is then stated within Schedule 1 to the Parking Overlay that:

*'A financial contribution in the amount of \$11,000 (plus GST) in respect of each car parking space or part thereof which is required under this Scheme and which is not provided on the land (but net of car parking credits) must be paid to the Responsible Authority.'*

The proposed development has a shortfall of 173 parking spaces from the rates listed within Schedule 1 to the Parking Overlay and Clause 52.06 of the Planning Scheme and thus requires a financial contribution for these spaces.

It is understood that the financial contribution applied under the schedule to the Parking Overlay is to go towards the sharing of parking facilities for uses in the activity centre. The proposed provision of 55 on-site parking spaces is considered to be in-line with the intentions of the Parking Overlay and thus appropriate for the proposed development.

## 7.3 Car Parking Demand Assessment

It is acknowledged that Schedule 1 to the Parking Overlay does not allow for a permit to be granted to reduce the parking requirements of the Planning Scheme, however based on previous experience and case study data it is expected that these parking requirements are overly conservative. The proposed development includes a mixture of uses which would be anticipated to produce peak parking demands at different times of the day.

For the office component of the proposal it is expected that the parking demand will be driven by the provision of on-site parking and the availability for on-site parking in the area. Given that the parking in the area is generally time or ticket restricted, it is expected that staff who are not allocated a parking space will be encouraged to use alternative transport modes to travel to and from the site, such as the numerous public transport services in the area.

The subject site is located within an activity centre and it would therefore be expected that trips and parking for the café and restaurants will be combined with other uses in the area and therefore may not generate such a parking rate in their own right.

The peak parking demands for each of the additional uses have been conservatively adopted using the Planning Scheme rates, deducting the on-site parking provided for each of the respective uses.

An assessment of the varying parking demands (over and above the provision of parking on-site) for each of the respective development components is summarised in Table 8.

**Table 8 Varying Anticipated Additional Parking Demand**

<i>Component</i>	<i>Peak Additional Demand</i>	<i>Weekday Business Hours</i>	<i>Weekday Evening</i>	<i>Saturday Business Hours</i>	<i>Saturday Evenings</i>
Resident Visitors	7 spaces	4 (60%)	7 (100%)	7 (100%)	7 (100%)
Office	89 spaces	89 (100%)	- (0%)	- (0%)	- (0%)
Restaurant	86 spaces	43 (50%)	86 (100%)	43 (50%)	86 (100%)
<b>Total</b>		<b>136 spaces</b>	<b>93 spaces</b>	<b>50 spaces</b>	<b>93 spaces</b>

Based on the varying parking demands detailed in Table 8, it is anticipated that the proposed development will generate an additional demand for up to 136 parking spaces.

It is the opinion of **onemilegrid** that the financial contribution to be paid for the shortfall of parking by the proposed development should be applied to the anticipated demand for 136 additional parking spaces, detailed above, rather than the rates listed within the Planning Scheme. This would be expected to be more reflective of the proposed developments impact to the parking facilities in the vicinity of the site.

## 8 TRAFFIC CONSIDERATIONS

### 8.1 Traffic Generation

#### 8.1.1 Residential

Surveys undertaken by other traffic engineering firms at residential dwellings have shown that the daily traffic generation rates vary depending on the size, location and type of the dwelling, the parking provision and proximity to local facilities and public transport.

Medium to high density dwelling in inner areas generate traffic with rates between 3.0 and 6.0 movements per dwelling. Considering the location of the subject site and moreover the excellent access to public transport it is anticipated that the dwellings will generate traffic at the following rates for the respective apartment sizes:

- Two-bedroom apartments – 5 movements per dwelling per day and 0.5 movements per dwelling in the peak hours; and
- Three-bedroom apartments – 6 movements per dwelling per day and 0.6 movements per dwelling in the peak hours.

Furthermore, during the morning peak it is estimated that 80% of the residential traffic will be outbound and 20% inbound, while during the afternoon peak 60% of the residential traffic will be inbound and 40% outbound.

Application of the above rates equates to a peak hour traffic generation of 20 movements (15 movements generated by the 2-bedroom apartments and 5 movements generated by the 3-bedroom apartments) equates to the anticipated traffic volumes detailed in Table 9.

**Table 9 Resident Anticipated Traffic Generation**

<i>Period</i>	<i>Inbound</i>	<i>Outbound</i>	<i>Total</i>
AM Peak	4	16	20
PM Peak	12	8	20

#### 8.1.2 Staff Traffic

The other components of the proposed development are expected to generate traffic movements reflective of staff arriving at the start of shifts and departing at the end of shifts. It is expected that one of the restaurant staff spaces will generate an inbound movement in the AM peak and an outbound movement in the PM peak (reflective of café staff arrival movements) the other two restaurant spaces are expected to generate up to two inbound movements during the PM peak hour, and that 80% of the office staff will arrive in the morning and depart in the evening (the percentage allows for some staff to arrive and depart outside of these peak periods).

The anticipated traffic movements generated by staff, taking into consideration the proposed parking allocation, is summarised below:

- 1 space for café / restaurant staff – 1 inbound movement in the AM peak hour and 1 outbound movement in the PM peak hour;
- 2 spaces for restaurant staff – 2 inbound movements in the PM peak hour; and
- 6 spaces for office staff – 5 inbound movements in the AM peak hour and 5 outbound movements in the PM peak hour.

### 8.1.3 Anticipated Traffic Generation

Based on the above traffic generation rates, the proposed development is anticipated to generate vehicle movements is shown in Table 10.

**Table 10 Anticipated Traffic Generation**

<i>Period</i>	<i>Inbound</i>	<i>Outbound</i>	<i>Total</i>
AM Peak	10	16	26
PM Peak	14	14	28

## 8.2 Generated Traffic Volumes

The subject site is anticipated to generate up to 28 vehicle movements during the peak hour periods which equates to an average of less than one movement per two minutes.

Given the existing low traffic volumes on Montclair Avenue at the frontage of the site (the tube counter identifying a weekday PM peak hour average of 128 movements in combined directions) it is anticipated that this level of traffic generation can be catered for by the existing road network and nearby intersections.

## 8.3 One-Lane Probability Assessment

A one-lane probability assessment has been undertaken to assess the impact of the proposed site access. The assessment included the following parameters:

- Peak hour traffic volumes detailed above in Table 10;
- A one-lane length of 25m;
- Vehicle speeds of 10 km/h; and
- An additional delay of 5 seconds added for the vehicles leaving the site.

During both the AM and PM peak hours there is a 0.08% chance that at any point in time during the peak hour there will be vehicles travelling in both directions on the one-lane section of the site access.

Based on this probability assessment there is a very low chance for a vehicle to be required to wait at the frontage of the site while another vehicle is leaving and therefore the proposed single lane access is considered appropriate for the proposal and will have minimal impacts to traffic on Montclair Avenue.

As identified previously, it is proposed to install a traffic light system to assist with movements on the one-lane sections within the site.

## 9 CONCLUSIONS

---

It is proposed to develop the subject site for the purposes of mixed use development, comprising four basement levels and on-site parking provision for 55 spaces.

Considering the analysis presented above, it is concluded that:

- The layout of the site access and basement parking areas has been assessed against the relevant design standards of the Planning Scheme;
- The first basement level is to cater for waste collection and loading activities of the restaurant / café, utilising vans or similar sized vehicles;
- The proposed provision of 24 bicycle parking spaces in the first basement level and 12 bicycle parking spaces on the ground floor exceeds the requirements of Clause 52.34 of the Planning Scheme for residents, staff and visitors;
- The proposed provision of 55 on-site parking spaces reflects a shortfall of 173 spaces from the Planning Scheme requirements;
- The Parking Overlay requires a financial contribution for this Planning Scheme shortfall of parking;
- Undertaken a Parking Demand Assessment identifies an anticipated shortfall of 136 parking spaces and a financial contribution to this parking shortfall is considered to be more appropriate by **onemilegrid**;
- The proposed development is anticipated to generate up to 26 vehicle movements during the AM peak hour and 28 vehicle movements during the PM peak hour;
- It is anticipated that this level of traffic generation can be catered for by the existing road network and nearby intersections; and
- A one-lane probability assessment has been undertaken for the site access which identified that there is a 0.08% of opposing vehicles meeting within the one-lane section of the site access.