

Kingswood Dingley Village

City of Kingston Amendment C151
Transport Impact Assessment



15162TIA001H-F.docx



8 September 2017

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DOCUMENT INFORMATION

Prepared For	AS Residential Property No.1 Pty Ltd (ASRP1)		
File Name	15162TIA001H-F.docx	Report Date	8 September 2017
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1 INTRODUCTION

onemilegrid has been requested by AS Residential Property No.1 Pty Ltd (ASRP1) to prepare a Transport Impact Assessment of the proposed rezoning associated with the redevelopment of the Kingswood Golf Club to residential at 179 – 217 Centre Dandenong Road, Dingley Village.

As part of the application process the applicant has engaged with the community to understand and gauge community expectations with regard to the proposal. A number of the outcomes from these discussions have been addressed within the design response for the proposal.

This report has been prepared to assess the traffic engineering matters relevant to the proposed rezoning as a consequence of development for a residential use. 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.

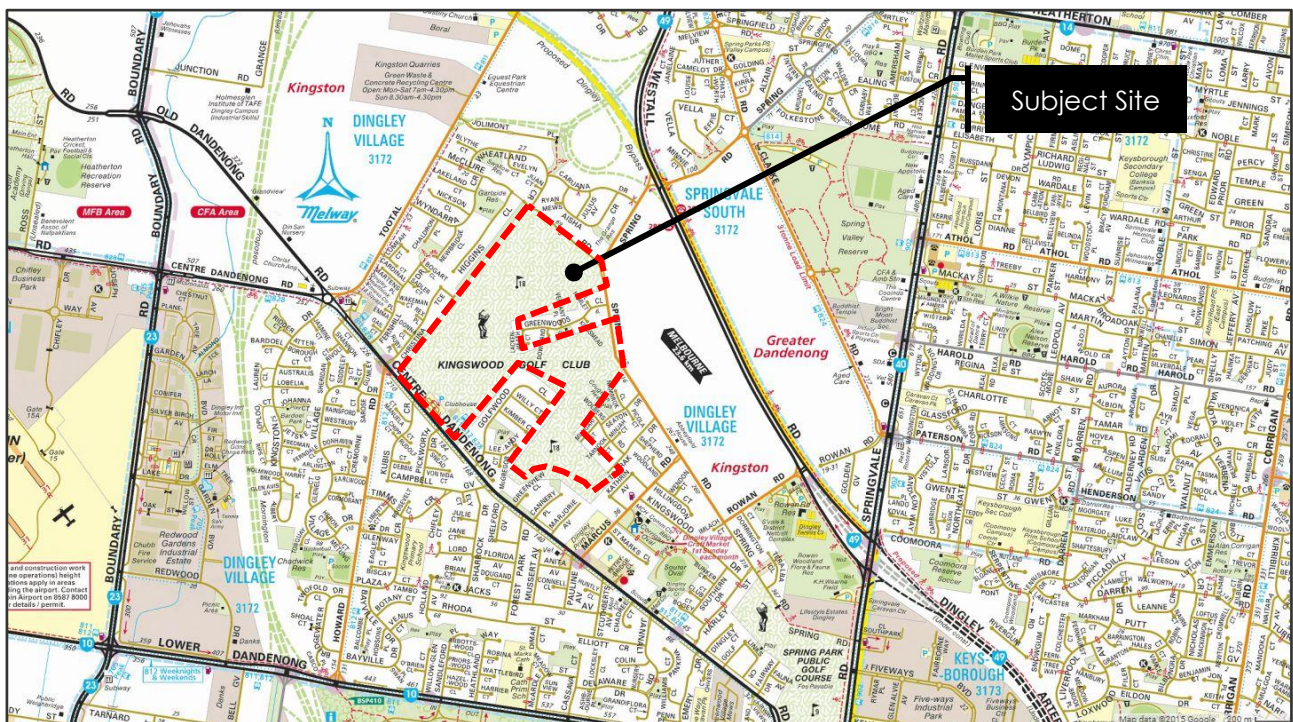
2 BACKGROUND AND EXISTING CONDITIONS

2.1 Site Location

The subject site is located on the north side of Centre Dandenong Road as shown in Figure 1. The site is irregular in shape with partial frontages to Centre Dandenong Road to the south, extends to the north with partial frontages to Spring Road and McClure Road, and abuts residential properties to the east and west.

The Peninsula Kingswood Golf Club currently occupies the site, with facilities including an 18-hole golf course, clubhouse and parking facilities. The site covers a total area of approximately 53 hectares.

Figure 1 Site Location



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Access to the site is available from three points to Centre Dandenong Road, providing access to a maintenance shed towards the north western end of the site, the main car parking area and

clubhouse generally central to the site frontage and another maintenance access to the south eastern end of the Centre Dandenong Road frontage. There are no other formal access points to the site with the exception of a single access to a dwelling from Spring Road and a set of gates in the north-west corner of the site to McClure Road.

Land use in the surrounding area is predominately residential, with the exception of disused landfills located to the northeast, a small strip shopping centre which includes a primary school to the southeast fronting Marcus Road, and the future Hawthorn Football Club site to the northwest. Further afield is the Braeside employment area and the Moorabbin Airport which is currently being developed for a variety of uses.

The existing residential land in the vicinity of the site comprises relatively disconnected groupings of residential development largely segregated from each other with limited through vehicular, pedestrian or cycle connections.

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

Figure 2 Aerial View of the Subject Site

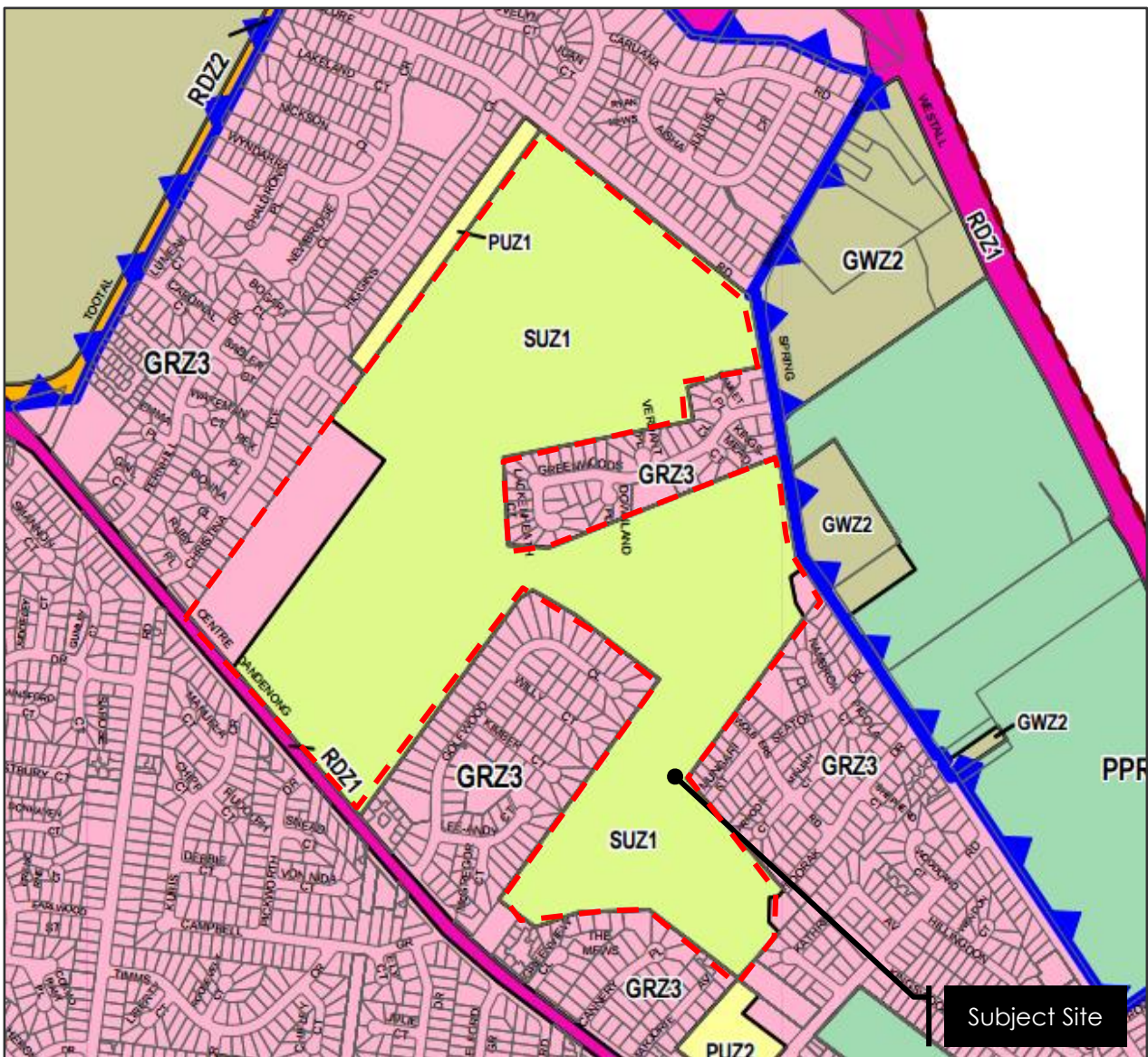


2.2 Planning Zones

The majority of the site is classified as a Special Use Zone with the western corner and two small areas in the southeast being classified as General Residential Zone – Schedule 3.

To the east of the site, a decommissioned tip has been rezoned to a Public Parks and Recreation Zone. To the north-west of the site the land is classified as Green Wedge Zone – Schedule 2. The subject site is within the urban growth boundary.

Figure 3 Planning Scheme Zones



2.3 Road Network

2.3.1 Centre Dandenong Road

Centre Dandenong Road is a Declared Main Road under the control of VicRoads generally aligned northwest to southeast, running between the Nepean Highway in Cheltenham and Lower Dandenong Road in Dingley Village.

In the vicinity of the subject site, Centre Dandenong Road operates with a single carriageway providing sufficient width for two cars to travel side by side in each direction, in addition to a service road where residential dwellings front Centre Dandenong Road. The service road provides direct access to dwellings. Parking is available within the service road only and is generally unrestricted. Parking within the main carriageway of Centre Dandenong Road is not permitted.

At T-intersections in the vicinity of the site, no intersection treatments are provided, with direct uncontrolled access available to side roads. At cross intersections, such as Christina Terrace and Howard Road, traffic signals are installed to control turning movements as shown in Figure 4.

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

Figure 4 Christina Terrace / Howard Road / Centre Dandenong Road



Figure 5 Centre Dandenong Road, looking southeast from the subject site



2.3.2 Spring Road

Spring Road is a major Council controlled road that runs generally north to south from Westall Road through to Springvale Road. It is noted that to the south of the intersection with Rowan Road that Spring Road downgrades to a local road, and there is no vehicular connection to Springvale Road.

In the vicinity of the site, Spring Road operates within a single carriageway and provides a wide pavement allowing two-way traffic. Each lane is of sufficient width to accommodate two cars in each direction with the kerbside lane shared with parallel parking. No parking restrictions are in place along Spring Road.

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

Figure 6 Spring Road, looking north towards the subject site



2.3.3 McClure Road

McClure Road is a local road running east-west between Spring Road and Tootal Road. McClure Road generally provides for a single traffic lane in each direction with the exception of a slow point provided generally half way along McClure Road. Speed humps are dispersed along the length of McClure Road.

An indented parallel parking lane is provided on the south side of McClure Road along the frontage of the golf course, whilst kerbside parking is generally permitted along the remainder of McClure Road.

The cross-section of McClure Road in the vicinity of the site is shown in Figure 7.

Figure 7 McClure Road, looking north from the subject site



2.3.4 Greenwood Close

Greenwood Close is local court which serves approximately 25 dwellings and is aligned east to west from Spring Road through to its court bowl termination in the west.

It has a carriageway width of 9 metres with a footpath on both sides of the road.

The intersection of Greenwood Close and Spring Road is orientated as a standard T-intersection.

A view of the existing cross-section of Greenwood Close is provided in Figure 8.

Figure 8 Greenwood Close looking west

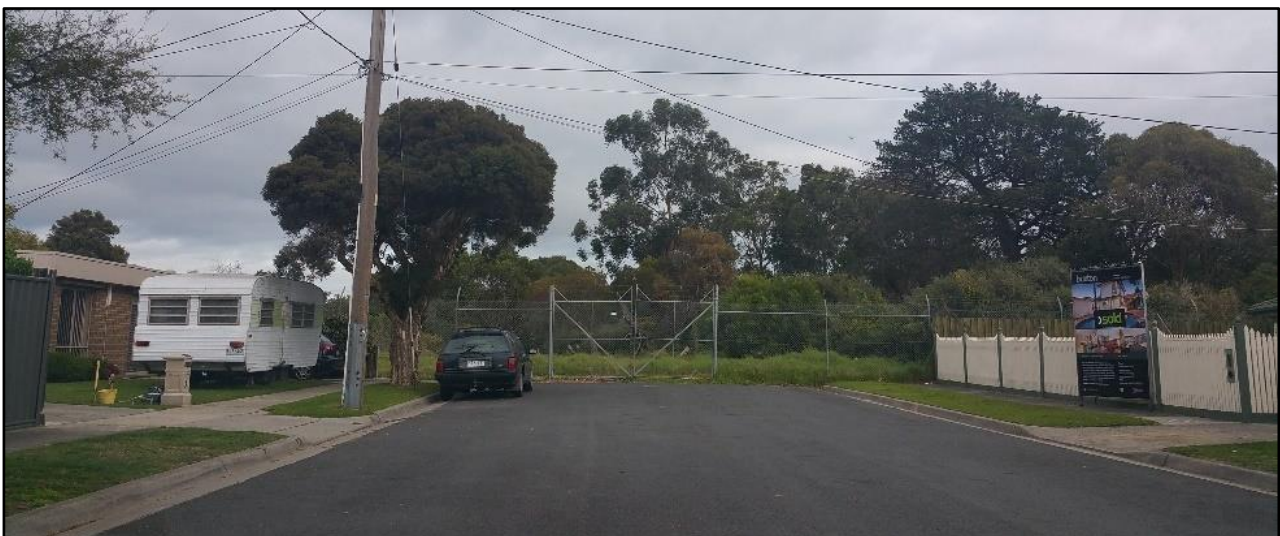


2.3.5 Toorak Drive

Toorak Drive is a local road aligned northeast to southwest from Spring Road through to its termination adjacent to the Kingswood Golf Course. The termination of Toorak Drive is not treated with a turnaround area and is fenced off only as shown in Figure 9, which highlights the intention of a through connection into the future.

Toorak Drive operates with a wide pavement of 9 metres with footpaths on both sides of the road. Parking is permitted against both kerbs and is unrestricted.

Figure 9 Toorak Drive Termination looking southwest



2.3.6 Wolbers Road

Wolbers Road is a local road that is generally aligned north to south from Toorak Drive through to its termination adjacent to the Kingswood Golf Course.

Similar to Toorak Drive, the termination of Wolbers Road is not treated with a turnaround area and is fenced off only as shown in Figure 10, highlighting the intention of a through connection into the future.

Wolbers Road operates with a wide pavement of 9 metres with footpaths on both sides of the road. Parking is permitted against both kerbs and is unrestricted.

Figure 10 Wolbers Road looking north at Mungari Street



2.3.7 Mungari Street

Mungari Street is a local road aligned northeast to southwest from Wolbers Road through to its termination adjacent to the Kingswood Golf Course. At its termination adjacent to the subject site, no turnaround area is provided with a fence provided along the boundary as shown in Figure 11, highlighting the intention of a through connection into the future.

Mungari Street operates with a carriageway of 7.5 metres and footpaths on both sides of the road. Parking is permitted against both kerbs and is unrestricted.

Figure 11 Mungari Street looking southeast



2.3.8 Seaton Drive

Seaton Drive is a local road aligned northeast to southwest from Spring Road through to Wolbers Road.

Seaton Drive operates with a wide pavement of 9 metres with footpaths on both sides of the road. Parking is permitted against both kerbs and is unrestricted.

A view of Seaton Drive looking northeast is provided in Figure 9.

Figure 12 Seaton Drive Termination looking southwest



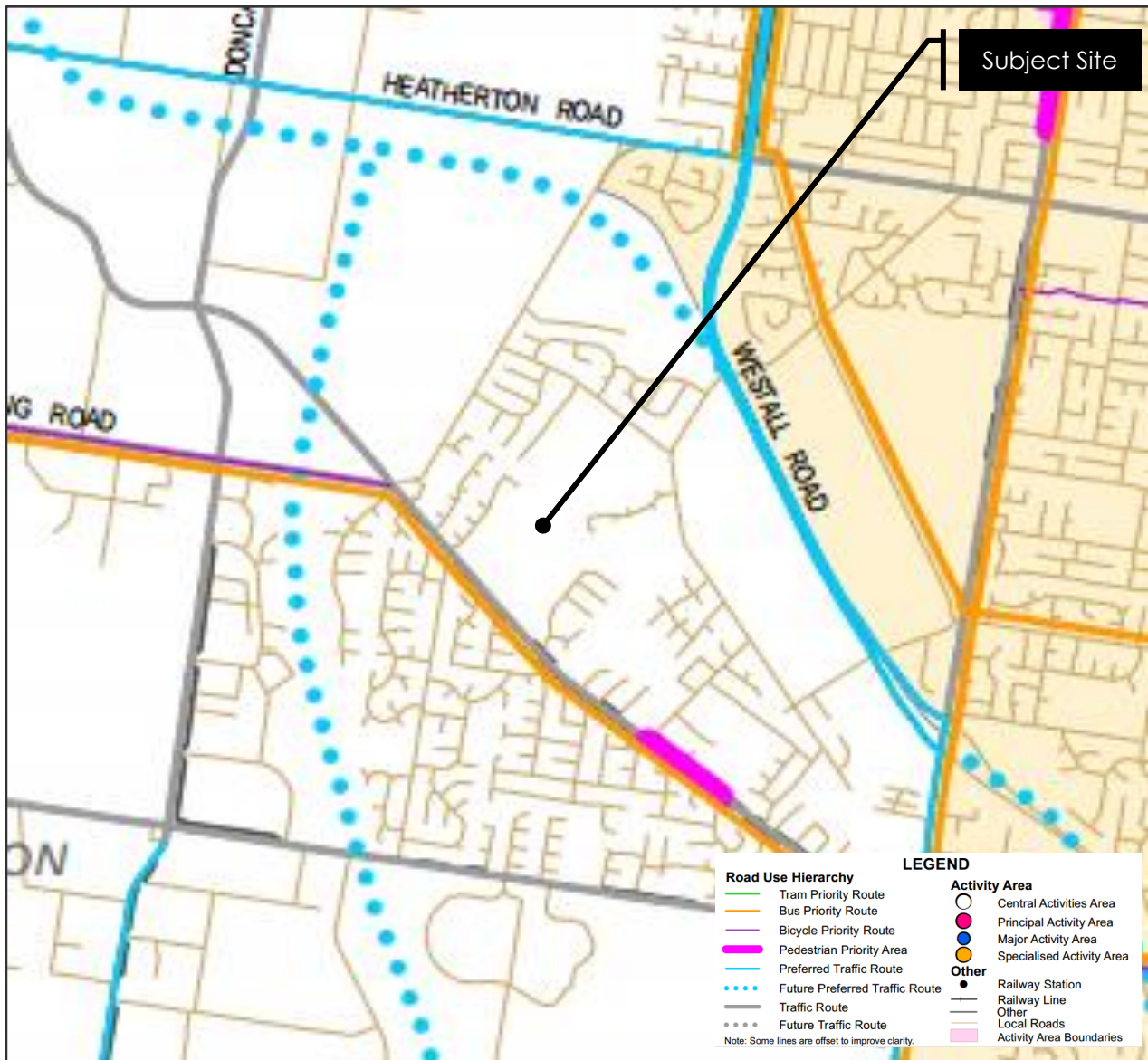
2.4 SmartRoads Road User Hierarchy Map

In mid-2011 VicRoads developed the SmartRoads Road User Hierarchy Maps which aim to 'manage competing interests for limited road space by giving priority use of the road to different transport modes at particular times of the day.'

The SmartRoads map, reproduced in Figure 13, identifies the priority modes on each arterial road in the vicinity of the site, and indicates that Centre Dandenong Road is a Bus Priority Route and a Pedestrian Priority Area exists to the south of the site at the Marcus Road shops.

The Preferred Traffic Route in the area is Westall Road, and Dingley Bypass.

Figure 13 SmartRoads Road User Hierarchy Map



3.2 Public Transport

The subject site is connected by public transport, by means of bus services operating along the site's frontage to Centre Dandenong Road. Three services operate along Centre Dandenong Road and provide access to and from metropolitan train services. The full public transport provision in the vicinity of the site is shown in Figure 15 and detailed in Table 1.

Figure 15 Public Transport Provision

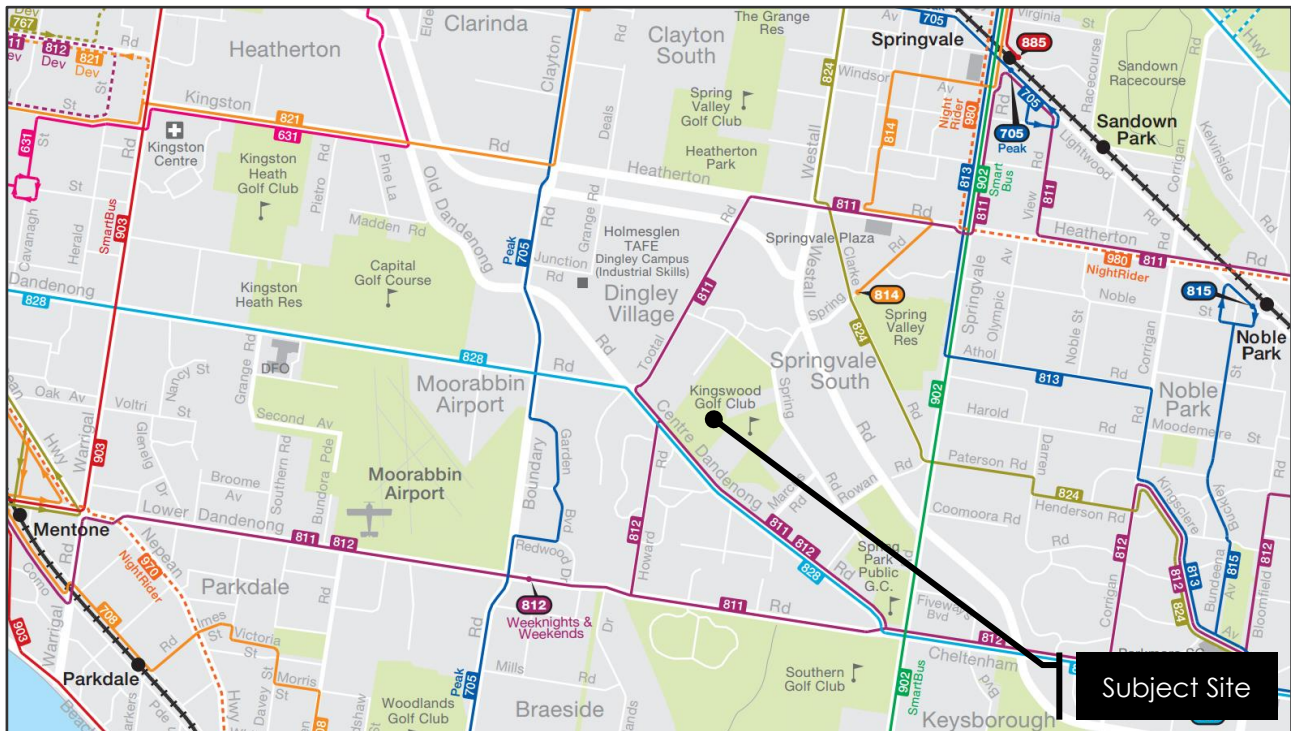


Table 1 Public Transport Provision

Mode	Route No.	Route Description	Nearest Stop
Bus	811	Dandenong - Brighton via Heatherton Road, Springvale	Centre Dandenong Road
	812	Dandenong - Brighton via Parkmore Shopping Centre	Centre Dandenong Road
	828	Hampton - Berwick Station via Southland SC, Dandenong	Centre Dandenong Road

3.3 Bicycle Facilities

The site is well connected with regard to bicycle facilities, with Centre Dandenong Road designated as an informal route along the frontage of the site, improving to provide an off-road shared path to the west of Tootal Road. In addition, Westall Road is provided with formal paths adjacent to the reservation.

These routes and paths provide further connection to a wider bicycle network.

4 THE DINGLEY BYPASS

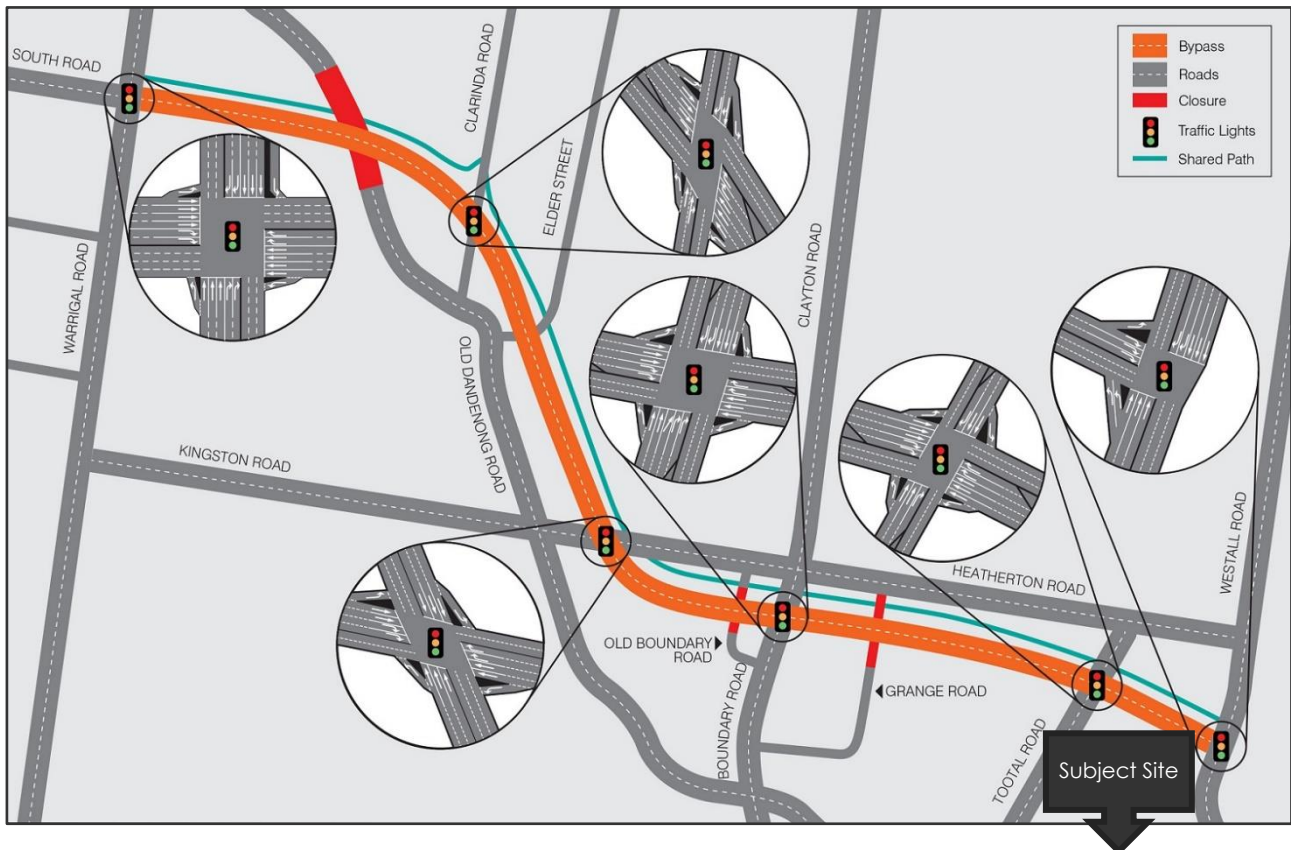
4.1 Background

The Dingley Bypass is a newly constructed road which links Warrigal Road in Moorabbin with Westall Road in Springvale South. The bypass is fully divided and provides 3 traffic lanes in both directions and a shared bicycle and pedestrian path along the bypass alignment.

The Dingley Bypass is the final section of the Dingley Corridor Project, which comprises of the Westall Road Extension, South Road Extension and the Dandenong Bypass. The 6.4km bypass was completed in March 2016 and a detailed map of the route can be seen in Figure 16.

The bypass crosses 8 existing roads, with signalised intersections at Clarinda Road, Kingston Road, Boundary Road and Tootal Road. The remaining intersecting roads have been terminated at the bypass, having no access across the bypass, with the exception of Elder Street, for which an underpass has been constructed.

Figure 16 Dingley Bypass – Warrigal Road to Westall Road



4.2 Future Plans

It is the overall intention of VicRoads to convert the Dingley Bypass and associated connections (Westall Road) into a freeway. The freeway designation is to include the extension of the Mornington Peninsula Freeway (which has recently been announced), albeit this is not critical to the overall designation.

At this stage, the timing of a freeway designation of the Dingley Bypass is unknown however it is expected that it would be a medium to long term proposition due to a number of factors including but not limited to the following: -

- Intersections with a freeway standard road would need to be upgraded to a grade separated interchange rather than at-grade traffic signals (as currently being constructed on the bypass). The construction of an interchange at each intersecting road requires a significant level of works, as mooted within the Melway Street Directory shown in Figure 17. Furthermore, Figure 18 shows the likely layout of the Westall Road / Springvale Road interchange.
- As a result of the above the requirement to construct a grade separated interchange, a significant level of funding would be required from not only state level but more importantly federal level.

Grade separated interchanges will allow the Dingley Bypass to link with Springvale Road, the proposed Mornington Peninsula Freeway (Mordialloc Bypass) as well as connect to the South Gippsland Freeway. The link connecting the South Gippsland Highway with the South Gippsland Freeway is yet to proceed to the planning stage, with the Victorian government stating that the viability of both these projects will be taken into account at a future date.

VicRoads, however, has completed a feasibility study into the Mordialloc Bypass and has found that a freeway is not required along the Mordialloc Bypass to accommodate long term demands, although if the Dingley Bypass is upgraded to a freeway, the Mordialloc Bypass will be of a similar standard. VicRoads has deemed this project feasible, and the Government in May 2017 announced that the project would be funded. This is further discussed in Section 5.

Figure 17 Extent of Grade Separated Works

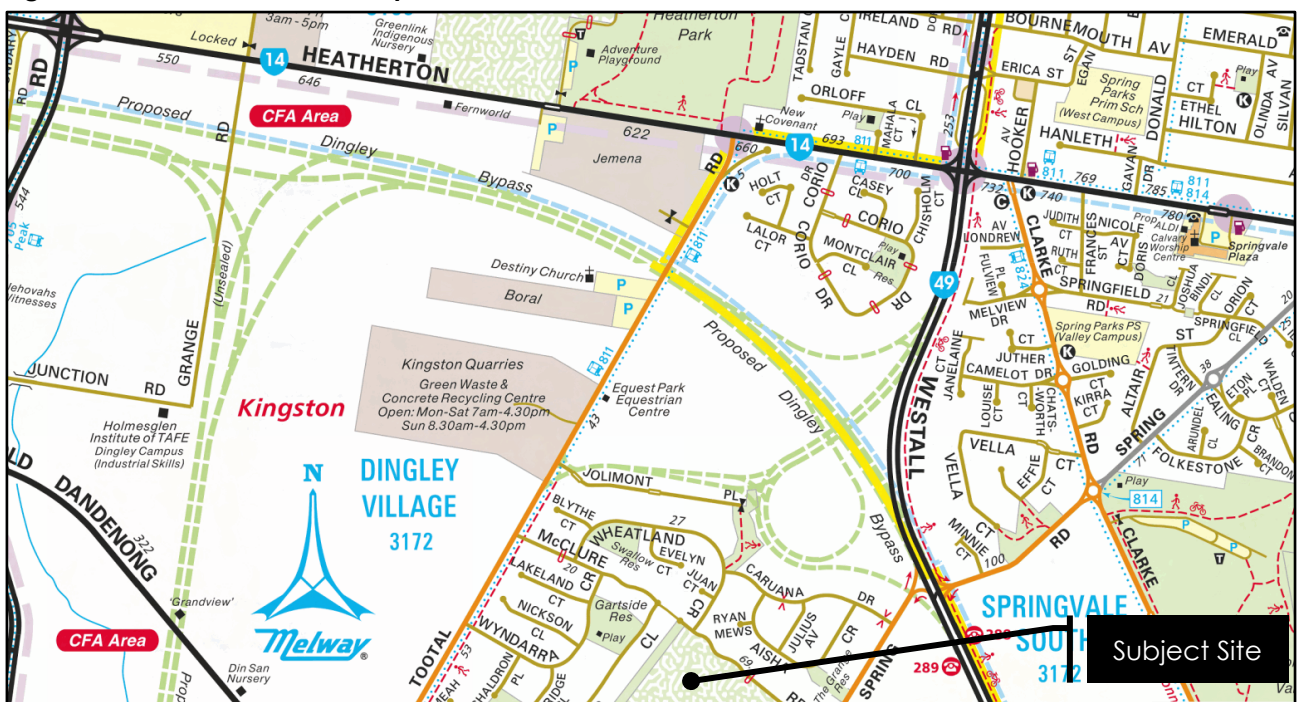


Figure 18 Likely Composition and Roadworks for Westall Road / Springvale Road



In the event that the Dingley Bypass and Westall Road is converted into a freeway standard road, Spring Road is likely to be closed at the freeway.

4.3 Impact on Traffic Volumes

The purpose of the Dingley Bypass, amongst other things, is to relieve lower order roads such as Centre Dandenong Road, Lower Dandenong Road and Old Dandenong Road of traffic. Anecdotally, the construction of a connective and relatively uninterrupted link from Dandenong through to Moorabbin with strategically located connections at key suburbs (including Dingley) will achieve this goal.

Discussions with VicRoads confirms this assertion with the expectation that the Dingley Bypass will relieve current congestion at the Tootal Road roundabout and on several arterial roads in the vicinity. Once complete, it is expected that more traffic would use the Dingley Bypass rather than Centre Dandenong / Old Dandenong Road and therefore lower traffic volumes.

5 MORDIALLOC BYPASS

The Mordialloc Bypass is a proposed new road link between the termination of the Mornington Peninsula Freeway at Springvale Road, Aspendale Gardens and the Dingley Bypass, Dingley.

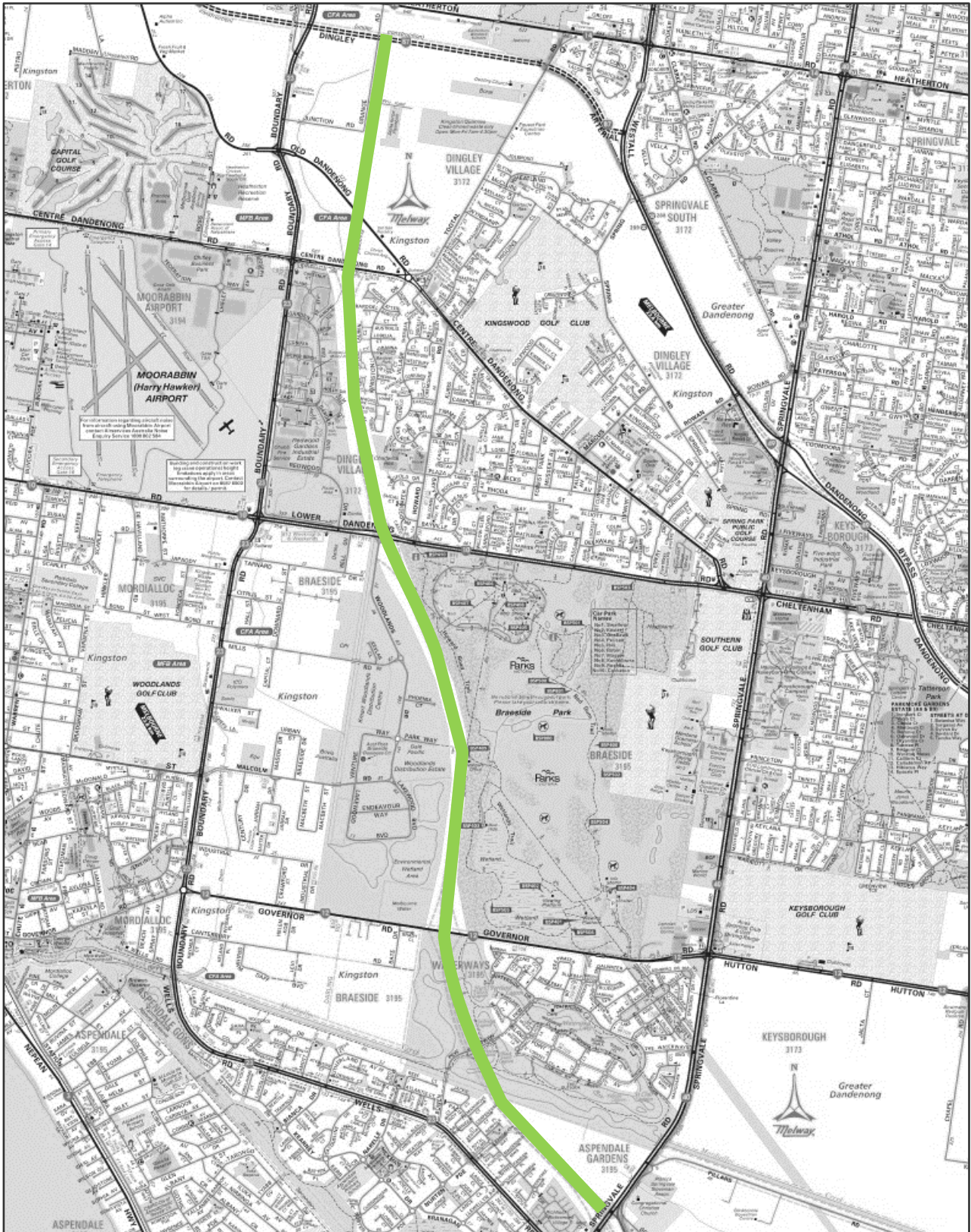
In May 2017, the Victorian Government committed \$300 million in funding to build the Mordialloc Bypass by late 2021. The bypass will stretch for 9 kilometres from end to end although the final design and alignment has not been finalised.

A view of the bypass route is provided in Figure 19 and Figure 20.

Figure 19 Mordialloc Bypass Route



Figure 20 Mordialloc Bypass Route - Melway



It is expected that the delivery of the Mordialloc Bypass will reduce the level of traffic carried in the vicinity of the site particularly on Westall Road, Centre Dandenong Road and Springvale Road.

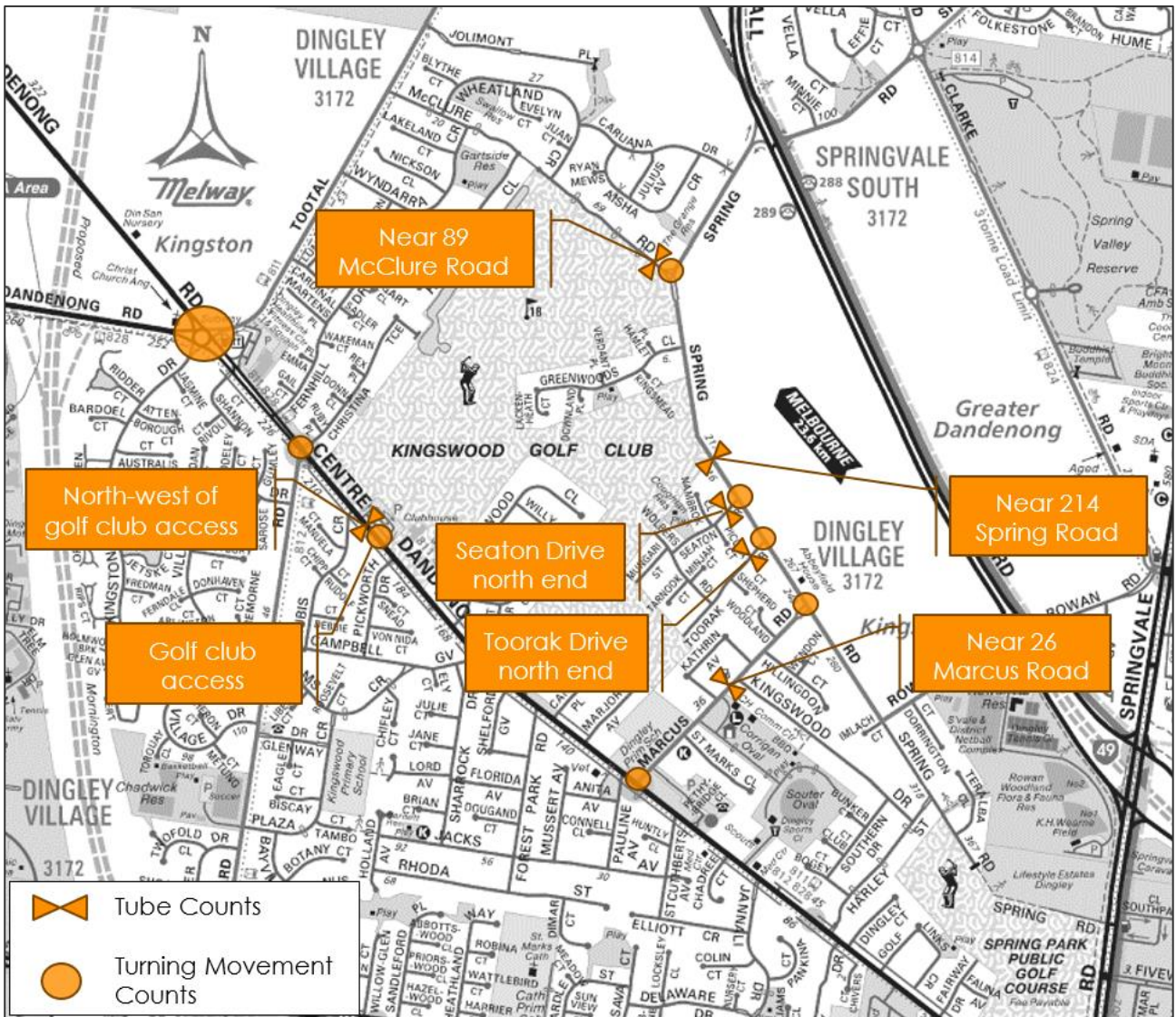
6 EXISTING TRAFFIC CONDITIONS

6.1 Traffic Surveys

To understand existing traffic conditions in the vicinity of the site, a combination of peak hour and daily traffic volume surveys were undertaken on behalf of **onemilegrid**. Peak hour surveys were undertaken at key intersections in the vicinity of the site on Thursday 17th August 2017, between 6:30am - 9:00am, and 3:00pm - 7:00pm, whilst daily counts were undertaken for a week from 17 – 24 August 2017.

The survey locations are shown in Figure 21, whilst a summary of the traffic volumes follows.

Figure 21 Traffic Survey Locations



6.2 Peak Hour Traffic Volumes

The peak hour was found to occur from 8:00am – 9:00am during the morning peak and 4:45pm – 5:45pm during the afternoon peak. A summary of the peak hour results of the surveys are shown in Figure 23.

The afternoon peak hour differed for Centre Dandenong Road / Tootal Road with the afternoon peak occurring 3:15pm – 4:15pm. A summary of the traffic counts for Centre Dandenong Road / Tootal Road is provided in Figure 22.

Figure 22 Existing Traffic Volumes - Centre Dandenong Rd / Tootal Rd – August 2017

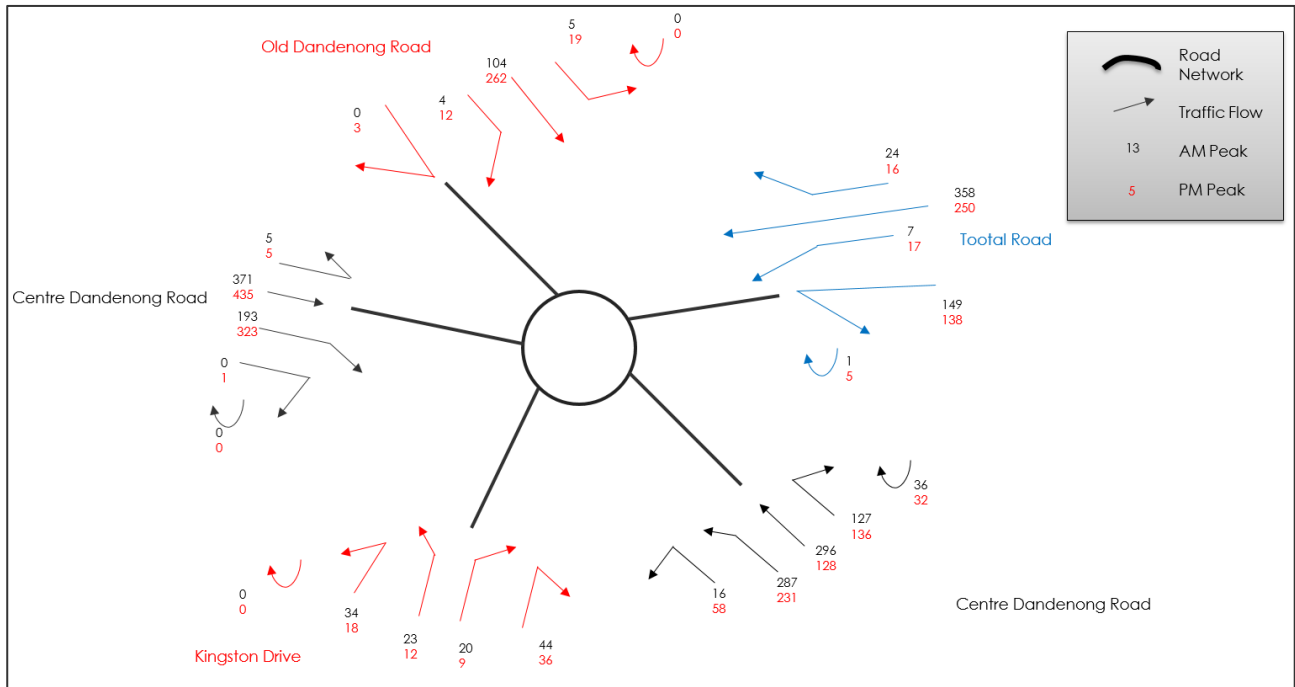
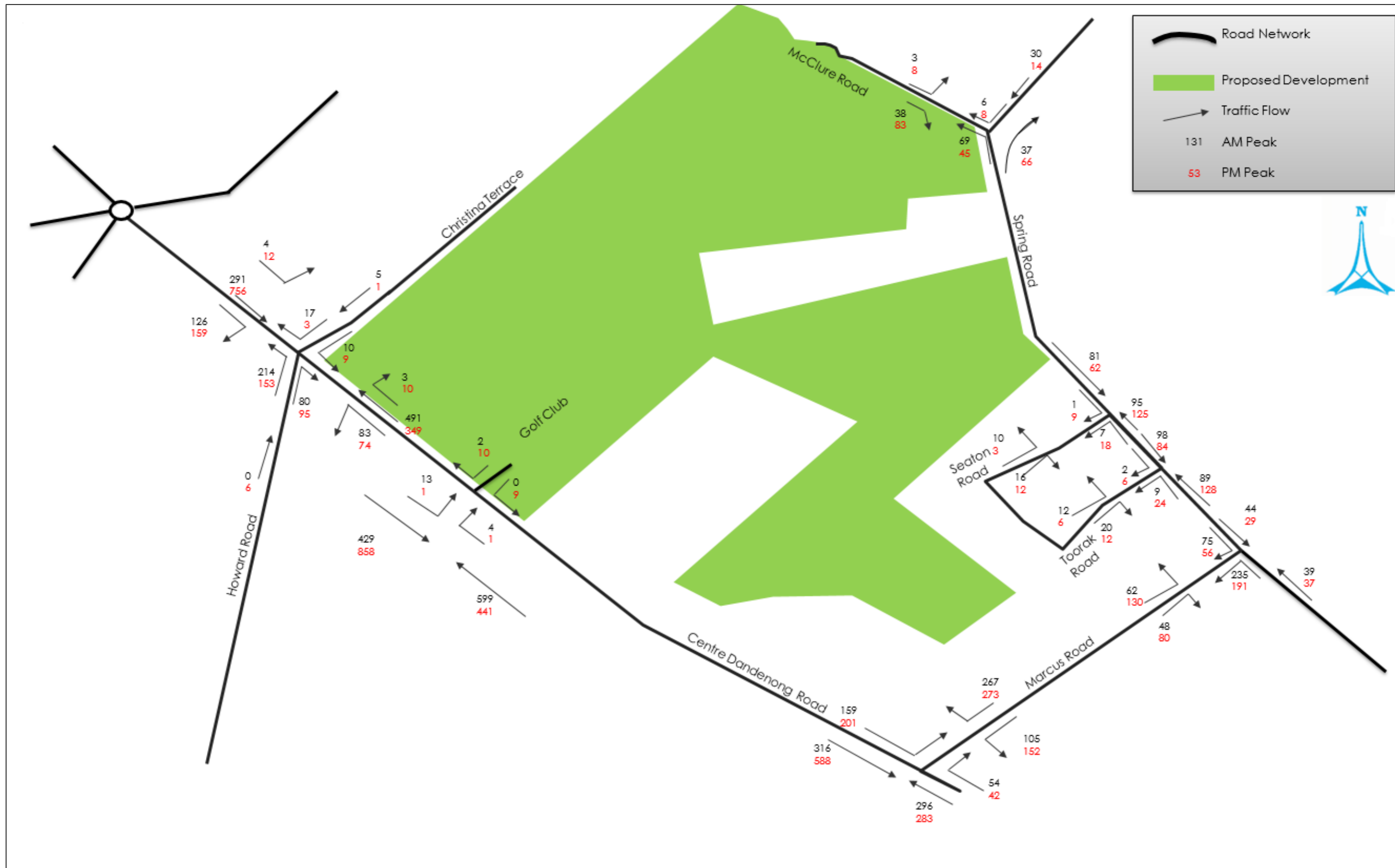


Figure 23 Existing Traffic Volumes – August 2017



6.3 Existing Peak Hour Capacity Assessment

To assess the operation of the intersection the surveyed peak hour 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 2 SIDRA Intersection Parameters

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

The results of the analysis are provided in Table 3 through to Table 9.

Table 3 Centre Dandenong Road / Tootal Road Intersection Operation (Existing)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Centre Dandenong Road (SE)	0.659	8.9	49.1
Tootal Road	0.439	8.5	22.2
Old Dandenong Road	0.094	7.4	3.9
Centre Dandenong Road (NW)	0.394	8.5	23.4
Intersection	0.659	9.3	49.1
PM Peak			
Centre Dandenong Road (SE)	0.455	7	23.7
Tootal Road	0.437	10	22.1
Old Dandenong Road	0.254	8.1	10.6
Centre Dandenong Road (NW)	0.304	7.4	16
Intersection	0.455	8.1	23.7

As shown above, the intersection of Centre Dandenong Road and Tootal Road is currently operating under 'very good' and 'excellent' conditions in the morning and afternoon peak hours respectively, with reasonable queues and delays being experienced by motorists.

Table 4 Centre Dandenong Rd/Howard Rd/Christina Tce Intersection Operation (Existing)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Centre Dandenong Road</i>	0.415	19.7	74.1
<i>Christina Terrace</i>	0.043	22.8	3.8
<i>Centre Dandenong Road</i>	0.455	23.1	67.4
<i>Howard Road</i>	0.437	24.8	69.8
Intersection	0.455	22	74.1
PM Peak			
<i>Centre Dandenong Road</i>	0.256	12.1	41.1
<i>Christina Terrace</i>	0.019	29.1	2.3
<i>Centre Dandenong Road</i>	0.545	15.2	116.1
<i>Howard Road</i>	0.536	33.5	72.1
Intersection	0.545	17.4	116.1

As shown above, the intersection of Centre Dandenong Road / Howard Road / Christina Terrace is currently operating under 'excellent' conditions with manageable queues and delays experienced by motorists.

Table 5 Centre Dandenong Rd / Marcus Road (Existing)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Centre Dandenong Road</i>	0.305	22.1	50.5
<i>Marcus Road</i>	0.336	21.4	56.8
<i>Centre Dandenong Road</i>	0.337	22	56.5
Intersection	0.337	21.8	56.8
PM Peak			
<i>Centre Dandenong Road</i>	0.25	16.3	42.9
<i>Marcus Road</i>	0.437	28.2	69.9
<i>Centre Dandenong Road</i>	0.446	16.9	86.4
Intersection	0.446	19.9	86.4

As shown above, the intersection of Centre Dandenong Road and Marcus Road is currently operating under 'excellent' conditions with limited queues and delays experienced by motorists.

Table 6 Marcus Road / Spring Road (Existing)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road</i>	0.138	4.8	0
<i>Spring Road</i>	0.059	4.2	1.9
<i>Marcus Road</i>	0.05	6	1.1
Intersection	0.138	4.9	1.9
PM Peak			
<i>Spring Road</i>	0.112	4.7	0
<i>Spring Road</i>	0.042	3.6	1.4
<i>Marcus Road</i>	0.05	5.9	1
Intersection	0.112	4.7	1.4

As shown above, the intersection of Marcus Road and Spring Road is currently operating under 'excellent' conditions with limited queues and delays experienced by motorists.

Table 7 Spring Road / Toorak Drive (Existing)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road</i>	0.027	0.5	0
<i>Spring Road</i>	0.028	0.1	0.1
<i>Toorak Drive</i>	0.016	6	0.4
Intersection	0.028	1.1	0.4
PM Peak			
<i>Spring Road</i>	0.043	0.9	0
<i>Spring Road</i>	0.026	0.4	0.3
<i>Toorak Drive</i>	0.01	6.1	0.3
Intersection	0.043	1.1	0.3

As shown above, the intersection of Spring Road and Toorak Drive is currently operating under 'excellent' conditions with negligible queues and delays experienced by motorists.

Table 8 Spring Road / Seaton Drive (Existing)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road</i>	0.029	0.4	0
<i>Spring Road</i>	0.023	0.1	0.1
<i>Seaton</i>	0.013	6	0.3
Intersection	0.029	1	0.3
PM Peak			
<i>Spring Road</i>	0.04	0.7	0
<i>Spring Road</i>	0.02	0.8	0.4
<i>Seaton</i>	0.01	6.1	0.2
Intersection	0.04	1.1	0.4

As shown above, the intersection of Spring Road and Seaton Drive is currently operating under 'excellent' conditions with negligible queues and delays experienced by motorists.

Table 9 Spring Road / McClure Road (Existing)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road (S)</i>	0.046	5.4	1.4
<i>Spring Road (NE)</i>	0.017	5	0.1
<i>McClure Road (W)</i>	0.038	5.9	0.9
Intersection	0.046	5.4	1.4
PM Peak			
<i>Spring Road (S)</i>	0.038	5.1	0.9
<i>Spring Road (NE)</i>	0.008	5.1	0.1
<i>McClure Road (W)</i>	0.084	5.9	2.1
Intersection	0.084	5.5	2.1

As shown above, the intersection of Spring Road and McClure Road is currently operating under 'excellent' conditions with limited queues and delays experienced by motorists.

6.4 Daily Traffic Volumes

A summary of the daily traffic volumes is provided in Table 10 to Table 15 below.

Table 10 Existing Daily Traffic Volumes - McClure Road

<i>Time Period</i>	<i>Direction</i>	<i>Traffic Volume (vpd)</i>	<i>Average Speed (km/h)</i>	<i>85th Percentile Speed (km/h)</i>
Weekday Average	Eastbound	553	38.0	43.5
	Westbound	588	40.6	45.7
	Both Directions	1,141	39.0	44.2
7 Day Average	Eastbound	543	38.8	43.8
	Westbound	566	39.9	44.7
	Both Directions	1,109	39.2	44.1

Table 11 Existing Daily Traffic Volumes - Spring Road

<i>Time Period</i>	<i>Direction</i>	<i>Traffic Volume (vpd)</i>	<i>Average Speed (km/h)</i>	<i>85th Percentile Speed (km/h)</i>
Weekday Average	Northbound	1,245	53.3	59.2
	Southbound	741	53.9	59.9
	Both Directions	1,986	53.5	59.7
7 Day Average	Northbound	1,229	53.8	58.9
	Southbound	739	54.1	59.7
	Both Directions	1,968	53.9	59.3

Table 12 Existing Daily Traffic Volumes - Seaton Drive

<i>Time Period</i>	<i>Direction</i>	<i>Traffic Volume (vpd)</i>	<i>Average Speed (km/h)</i>	<i>85th Percentile Speed (km/h)</i>
Weekday Average	Eastbound	220	31.6	35.6
	Westbound	193	31.3	35.3
	Both Directions	413	31.4	35.4
7 Day Average	Eastbound	225	32.2	35.7
	Westbound	201	31.3	35.1
	Both Directions	426	31.7	35.3

Table 13 Existing Daily Traffic Volumes - Toorak Drive

<i>Time Period</i>	<i>Direction</i>	<i>Traffic Volume (vpd)</i>	<i>Average Speed (km/h)</i>	<i>85th Percentile Speed (km/h)</i>
Weekday Average	Eastbound	204	34.1	38.8
	Westbound	249	32.3	36.6
	Both Directions	453	32.9	37.5
7 Day Average	Eastbound	204	34.0	38.7
	Westbound	239	32.1	36.0
	Both Directions	443	33.0	37.3

Table 14 Existing Daily Traffic Volumes – Marcus Road

<i>Time Period</i>	<i>Direction</i>	<i>Traffic Volume (vpd)</i>	<i>Average Speed (km/h)</i>	<i>85th Percentile Speed (km/h)</i>
Weekday Average	Eastbound	2,075	49.2	57.7
	Westbound	2,919	50.0	58.1
	Both Directions	4,994	49.6	57.9
7 Day Average	Eastbound	2,116	50.0	58.0
	Westbound	2,860	50.0	58.4
	Both Directions	4,976	50.0	58.2

Table 15 Existing Daily Traffic Volumes - Centre Dandenong Road

<i>Time Period</i>	<i>Direction</i>	<i>Traffic Volume (vpd)</i>	<i>Average Speed (km/h)</i>	<i>85th Percentile Speed (km/h)</i>
Weekday Average	Northbound	6,113	58.2	64.4
	Southbound	6,92	58.3	65.3
	Both Directions	13,015	58.3	64.8
7 Day Average	Northbound	5,826	58.5	64.7
	Southbound	6,555	58.0	65.4
	Both Directions	12,381	58.2	65.0

6.5 Existing Traffic Capacities

Reference has been made to typical design guidelines for standard roads to provide an indication of the traffic capacities for various road types in the vicinity. A summary of those capacities in reference to existing roads is provided in Table 16.

Table 16 Traffic Capacities vs Existing Volumes

Road	Capacity (vpd)	Existing Volume (vpd)	%'age
Centre Dandenong Road	20,000	13,000	65%
Marcus Road	7,000	5,000	71.4%
Spring Road	7,000	2,000	28.6%
McClure Road	3,000	1,150	38.3%
Greenwoods Close	3,000	250*	8.3%
Toorak Drive	3,000	450	15%
Wolbers Road	3,000	300*	10%
Mungari Street	3,000	50*	1.6%
Seaton Drive	3,000	415	13.8%

* Projected Volume

6.6 Historical Traffic Volumes

6.6.1 Centre Dandenong Road

Historical data has been sourced from VicRoads for Centre Dandenong Road in the vicinity of the site. The data provides traffic volume profiles for the last 10 years (2005 – 2014) and indicates that traffic volumes on Centre Dandenong Road remained generally consistent between 2005 through to 2012 when there was a 20% decrease in volumes. Thereafter traffic has remained relatively consistent albeit with a level of growth.

It is noted that in 2012 that the likely reason for the reduction in volumes was the opening of the Dingley Bypass (first stage) which connected the Dandenong Bypass to Westall Road and Springvale Road thus providing Centre Dandenong Road through traffic an alternative route.

It is expected that the recent opening (16 months ago) of the Dingley Bypass will have a similar effect on Centre Dandenong Road traffic. To verify this assertion, **onemilegrid** commissioned traffic counts on Centre Dandenong Road following the opening of the Dingley Bypass. The counts indicate that there has been a reduction in traffic on Centre Dandenong Road.

A summary of the traffic counts undertaken by **onemilegrid** is summarised below.

Table 17 Centre Dandenong Road Traffic Volumes

Period	Traffic Volume	Change	%'age Change	Comments
July 2015	15,500	-		Dingley Bypass under construction
April 2016	14,000	-1,500	-10%	Dingley Bypass open (6 weeks)
August 2017	13,100	-900	-6%	Dingley Bypass open (15 months)

As shown above, it is clear that there has been a reduction in traffic on Centre Dandenong Road. Of particular note, comparing the 2017 counts to the July 2015 counts, there has been a reduction of 15% in daily volumes.

6.6.2 Local Roads

In addition to Centre Dandenong Road, traffic counts were conducted in July 2015 on several local roads in the area. A summary of the traffic counts undertaken by **onemilegrid** is summarised below.

Table 18 Local Streets Traffic Volumes

Street	Traffic Volume (vpd)		Change (vpd)	%age Change
	July 2015	August 2017		
McClure Road	1,387	1,141	- 246	- 17.7%
Seaton Drive	368	413	+ 45	+ 12.2%
Toorak Drive	435	453	+ 18	+ 4.1%

In general, traffic volumes have remained within the same scale in August 2017 compared to July 2015.

6.7 Existing Residential Traffic Generation

Existing residential land in the vicinity of the site is disconnected with limited through connections resulting in pockets of residential land that is accessed by a limited number of points to the external road network. As part of the traffic surveys, counts were undertaken at the intersection of Seaton Drive and Toorak Drive with Spring Road. Seaton Drive and Toorak Drive serve a pocket of approximately 98 dwellings providing an opportunity to derive a location specific traffic generation rate.

Based on the surveys, the following traffic generation rates for standard 'low density' residential blocks were recorded: -

- 8 vehicle movements per day per dwelling
- 0.67 vehicle movements per hour per dwelling during the AM Peak
- 0.87 vehicle movements per hour per dwelling during the PM Peak

The above existing traffic generation rates are consistent with expected rates for residential dwellings.

7 PROPOSAL

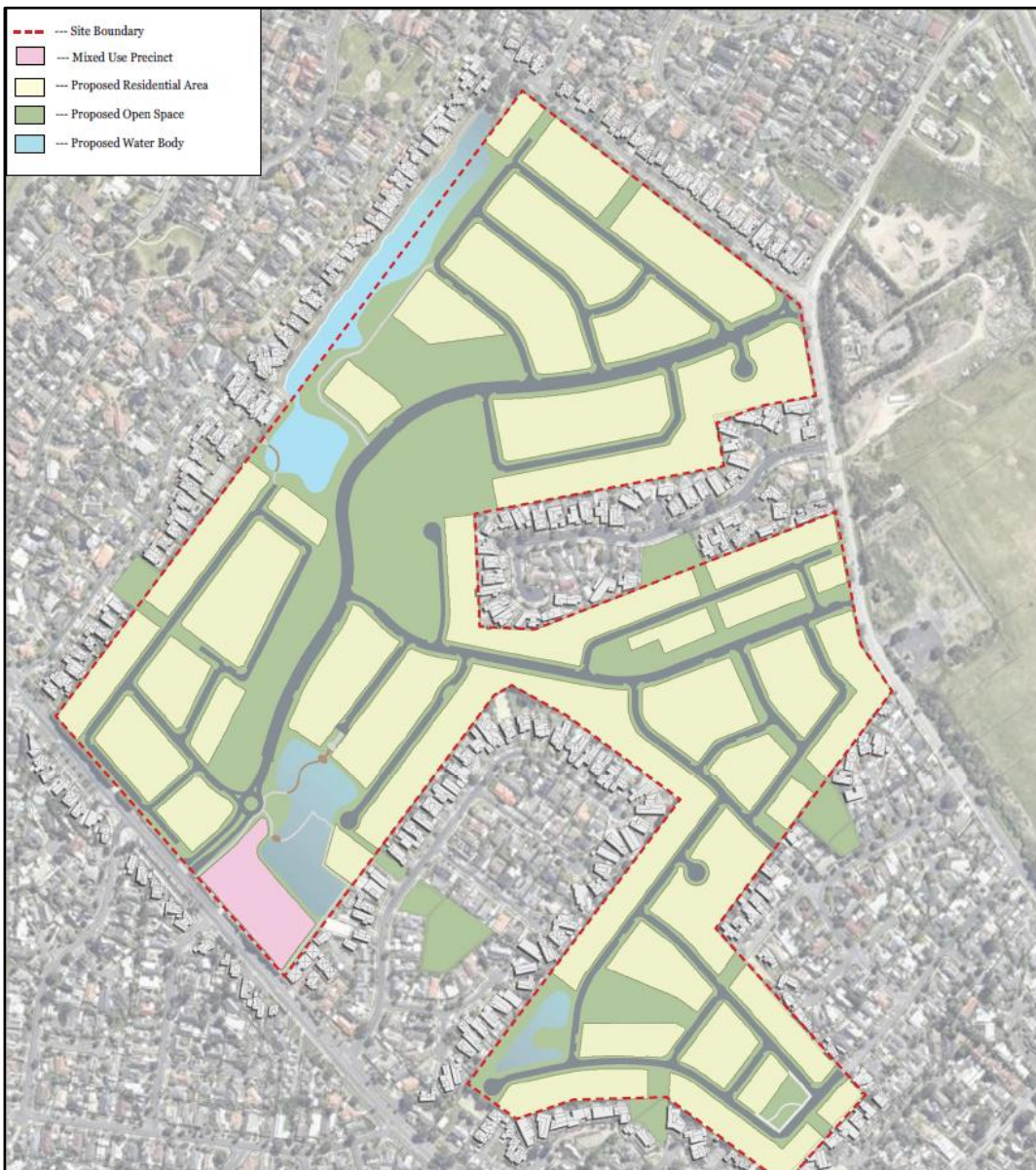
7.1 General

This application seeks to rezone the subject land from Special Use Zone and General Residential Zone (Schedule 3) to General Residential Zone (Schedule 2).

The rezoning will therefore facilitate the subdivision and ultimate development of the site for the purposes of a residential development comprising a mixture of low and medium density dwellings. The development of the site will occur in stages, with the first stage or precinct to occur towards the Centre Dandenong Road frontage. A Planning Permit application for 508 lots and 6 super lots will be submitted alongside the rezoning application.

It is envisaged that the development of the site would provide up to 800 dwellings comprising the standard residential lots and the potential yields on the 6 super lots and will include a mixed use precinct in the vicinity of the existing clubhouse. A view of the proposed Development Plan is provided in Figure 24.

Figure 24 Development Plan



7.2 Site Layout

7.2.1 General

The existing residential development surrounding the Kingswood site is currently fragmented, with several pockets of disconnected residential development created by the form of the existing golf course. With the creation of infill residential development as proposed, opportunity exists for the integration of the existing residential pockets into the community, predominantly through the creation of pedestrian and bicycle connections. With careful consideration of connections, the proposed development can minimise travel distances for walking or cycling trips from the existing residential areas, therefore encouraging the use of these sustainable transport modes, and improving amenity for existing residential areas.

Similarly, the existing connector road network surrounding the site is disconnected, with Spring Road and Centre Dandenong Road connected only at Marcus Road, and only local road connections between Spring Road and Tootal Road. The internal road network which will be constructed as part of the development will allow for additional connections between Spring Road and Centre Dandenong Road, providing improved connections for local residents, reducing circulation, and re-distributing existing traffic away from local roads.

7.2.2 Road Network

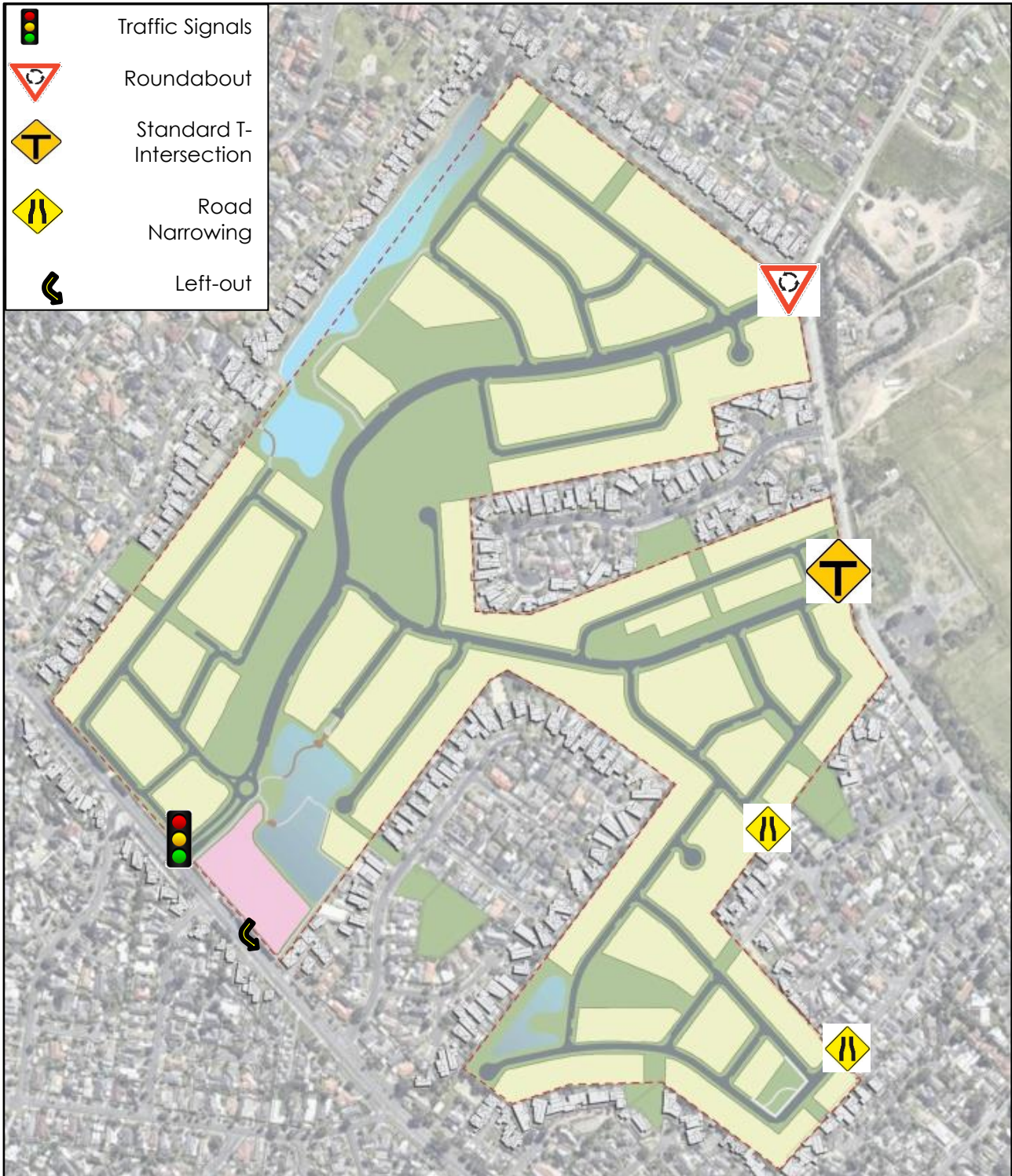
The internal road network has been designed with a collector road spine which will operate as a boulevard providing the main access to the site from Centre Dandenong Road through to the north at Spring Road where it will intersect with a roundabout. In addition, a secondary Access Street will link from the boulevard road through to Spring Road in the east whilst two minor road connections will be provided through the extension of Wolbers Road and Toorak Drive. A left out only will be provided to Centre Dandenong Road from the mixed-use precinct.

The proposed road network will provide for one formal road connection to Centre Dandenong Road, two to Spring Road and minor connections through the extension of Toorak Drive, Wolbers Road and Centre Dandenong Road. It is proposed to construct traffic signals at the main Centre Dandenong Road access point, a roundabout at the north-western Spring Road access to rationalise the existing McClure Road intersection and provide a standard T-intersection at the southern Spring Road access point. The minor connection to Centre Dandenong Road will be arranged as a left out access points only providing an offshoot for the mixed use precinct utilising the existing maintenance shed access points.

The main boulevard road will comprise a 25 metre reservation, the Access Street Level 2 will comprise a 20 metre reservation, whilst the local roads which will largely provide access to residential lots, will be designated as 'Access Street Level 1' within a 15 metre reservation. Laneways will also be provided to provide rear access to townhouse products within a 7 metre reservation.

A view of the proposed access point locations is provided in Figure 25.

Figure 25 Access Locations & Road Layout



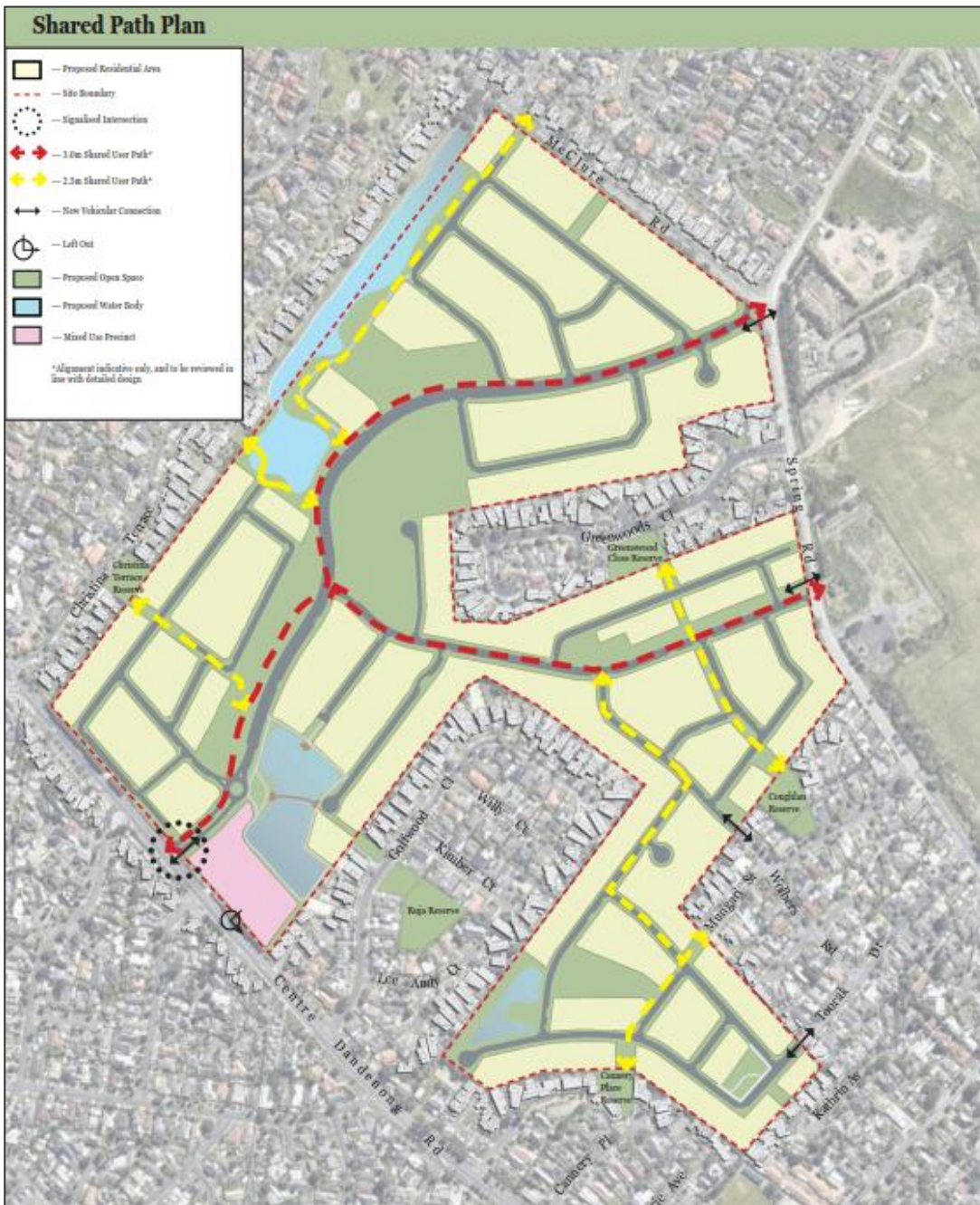
7.2.3 Pedestrian & Bicycle Network

The proposed road and pedestrian network has been designed to provide a number of pedestrian / cycle connections through existing neighbourhoods providing a net community benefit. Linkages between existing reserves will provide for significant improvements to walking and cycling opportunities for new and existing residents.

A combination of shared paths and formal footpaths will be provided on all roads to provide for a high level of pedestrian and cyclist amenity. Of particular note, the main connector road will include a 3-metre wide shared path in both directions. These connections and provision of shared paths will provide for both commuter and recreational cyclists.

A view of the proposed road, pedestrian and cycle network is provided in Figure 26.

Figure 26 Shared Path and Pedestrian Network



8 ROAD NETWORK REVIEW

8.1 General

It is considered that the provision of a number of connections to the existing road network will allow for a distribution of traffic across the road network without focussing on a particular roadway. Furthermore, connections to existing neighbourhoods have been limited and will be managed with regard to traffic.

The improved pedestrian and cyclist connections will provide new and existing residents access to the entire network and in particular public transport connections available on Centre Dandenong Road. These routes will now be more readily accessible and also open the potential for an additional service which would therefore provide improved public transport access for the surrounding community. It is noted that the main boulevard connector road through the site has been designed to accommodate future bus movements in accordance with PTV guidelines.

8.2 External Road Connections

A total of 3 main access points are proposed to the external road network including one to Centre Dandenong Road and 2 to Spring Road. In addition, lower order connections to Centre Dandenong Road, Toorak Drive and Wolbers Road are also proposed.

The proposed main external road connection to Centre Dandenong Road is to be treated with traffic signals and will be located approximately 300 metres southeast of the Howard Road / Christina Drive traffic signals and approximately 900 metres northwest of the Marcus Road traffic signals. The proposed intersection treatment will be designed to maintain priority to through traffic on Centre Dandenong Road and will be largely contained within the existing cross section of Centre Dandenong Road. The intersection signals will provide for gaps in the traffic for existing residential side roads and will provide for a safe crossing point across Centre Dandenong Road which is currently not provided based on feedback from the community.

Furthermore, bus priority operation will be included in the signal phasing operation to ensure bus movements are not unnecessarily delayed, given the status of Centre Dandenong Road as a Bus Priority Route. VicRoads has provided 'in-principle' support to the proposed traffic signals.

The Spring Road intersections have been selected to provide for a level of separation between existing intersections and to integrate with the existing road network. The northern access has been designed to connect to the existing Spring Road / McClure Road intersection and improve existing operational difficulties with the provision of a roundabout. The southern Spring Road access will be designed as a standard T-intersection.

Concept plans have been prepared by **onemilegrid** for the proposed traffic signals to Centre Dandenong Road and the roundabout at the intersection of Spring Road and McClure Road. These are included as Appendix A.

8.3 Road Upgrades

As part of the development it is proposed to make improvements to the existing roundabout at Centre Dandenong Road and Tootal Road. The improvements include the addition of a second lane on the southern approach to improve the capacity of the roundabout. These works will significantly improve the existing operation of the roundabout.

The proposed works are shown in Appendix A.

8.4 Road Hierarchy and Cross Sections

The site has been designed with a Collector Road supplemented by Access Streets and laneways.

The Main Connector Road is to be provided with a 25 metre road reservation and will provide for a single traffic lane, a bicycle lane and parking lane in each direction. A variant to this cross section will be provided at the site entry from Centre Dandenong Road with the introduction of a median to provide for a Boulevard feature entry treatment at the expense of the on-street parking lane.

Two types of Access Street are proposed on-site with the Level 1 Access Street to be provided within a 15 metre road reservation which will comprise a 5.5 metre wide pavement to allow for 2-way traffic and an indented parking lane on on-side. Parking will be permissible against both kerbs and still allow for a single traffic lane commensurate with typical local road cross sections. The Access Street Level 2 will be provided within a 20 metre cross section providing for a single traffic lane, and parking lane in each direction.

A series of laneways will provide access to rear loaded townhouse product. The laneways will be located within a 7 metre reservation and include a 6 metre wide pavement.

Variation to the proposed cross sections will be provided adjacent to open space as required to take into account the potential for shared paths within reserves.

Table 19 has been prepared to detail the proposed road cross sections, whilst a view of the road hierarchy through the site and the road cross sections are provided in Figure 27 through to Figure 34.

Table 19 Road Cross Sections

<i>Element</i>	<i>Access Lane</i>	<i>Access Street Level 1</i>	<i>Access Street Level 2</i>	<i>Connector Road</i>	<i>Connector Road (shared path)</i>
Reservation	7.0m	15.0m	26.9m	25.0m	25.0m
Traffic Volume Capacity	300 vpd	1,000 – 2,000 vpd	3,000 – 7,000vpd	3,000-7,000 vpd	3,000-7,000 vpd
Target Speed	10 km/h	30 – 40km/h	40km/h	50 km/h	50 km/h
Carriageway Width	6.0m	5.5m	6.0m	3.5m per lane	3.5m per lane
Parking Within Street	None	Indented on one side and kerbside on the other	Dedicated lane 2.3m wide	Dedicated lane 2.3m wide	Dedicated lane 2.3m wide
Verge Width	Not required	2.0 / 2.0m	11.6m on tree side / 4.7m on lot side	3.5 / 3.5m	4.2 / 4.2m
Footpath Provision	Shared Zone	2 x 1.5m	Shared path on tree side / 1.5m on lot side	2 x 1.5m	2 x 2.5m shared path on both sides
Cycle Path Provision	None	Shared Zone	Shared path	1.7m wide on-road bike lane on both sides	3m shared path on both sides

Figure 27 Road Hierarchy

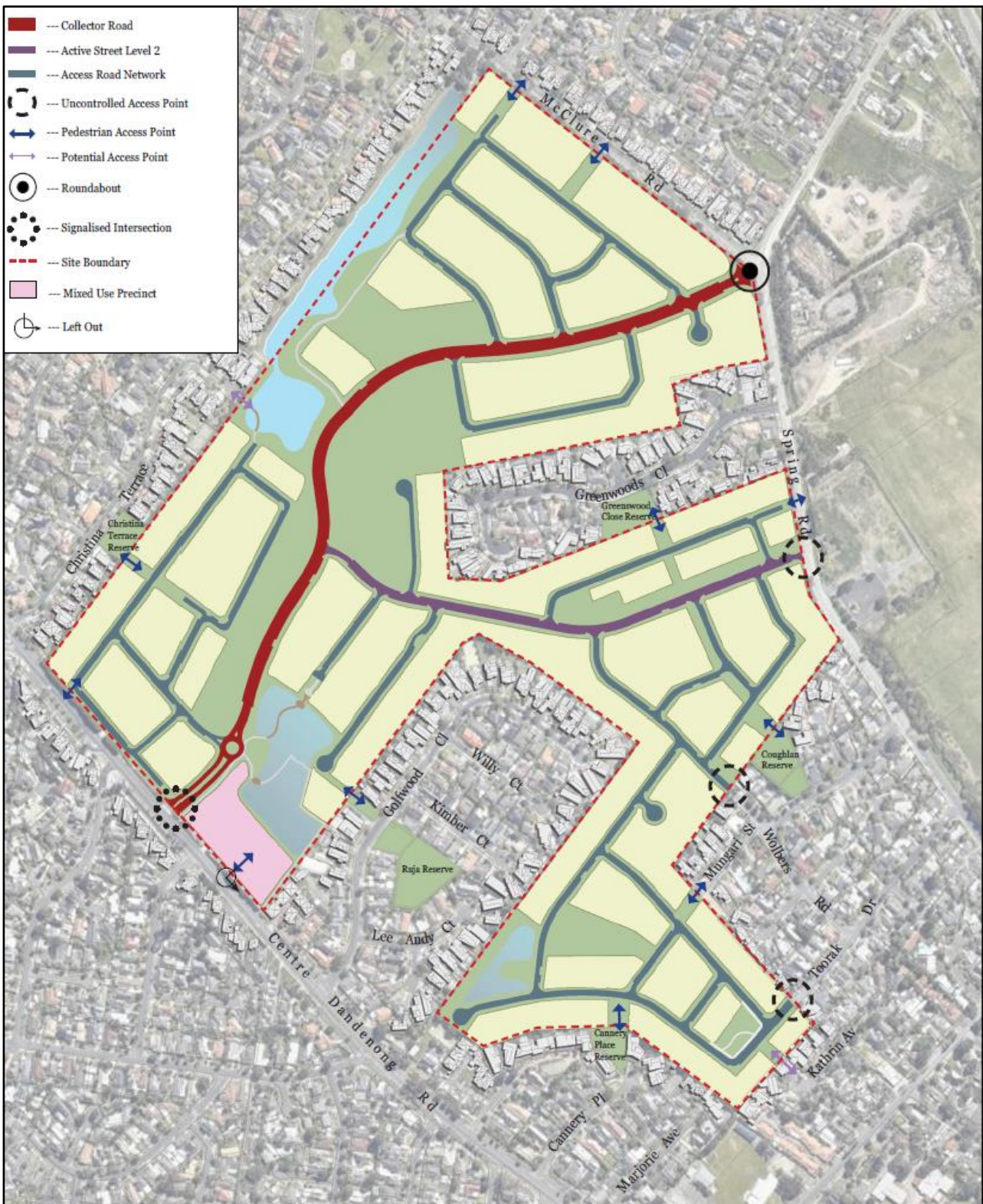


Figure 28 Main Boulevard Connector Road Cross Section (25m)

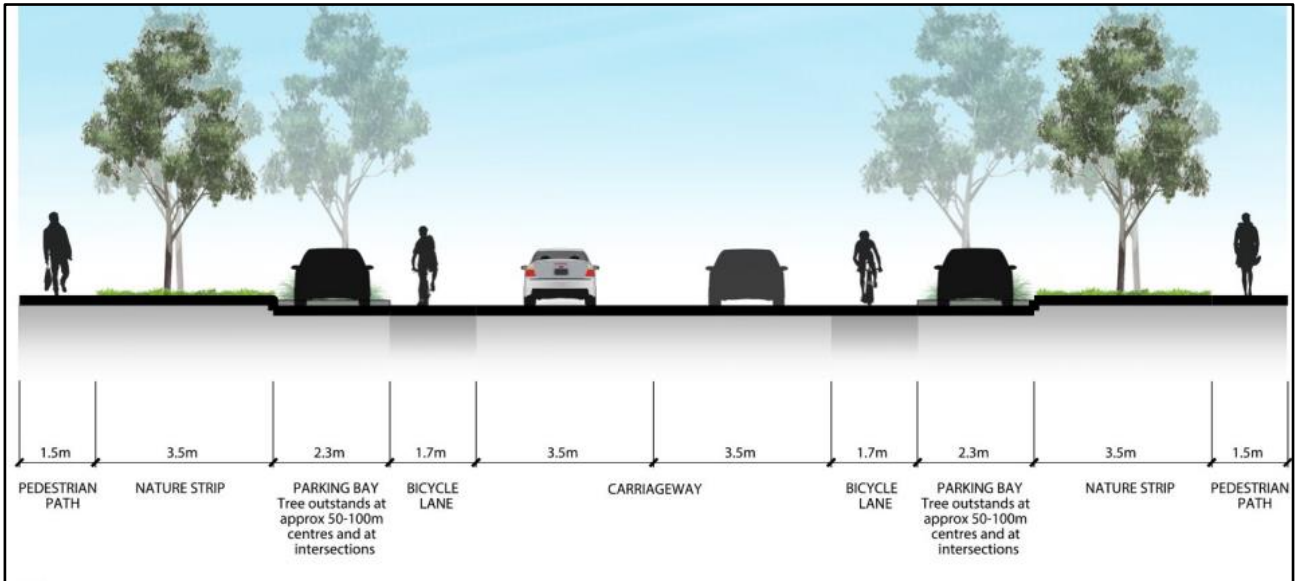


Figure 29 Main Boulevard Connector Road Cross Section (25m) – Shared Path Variation

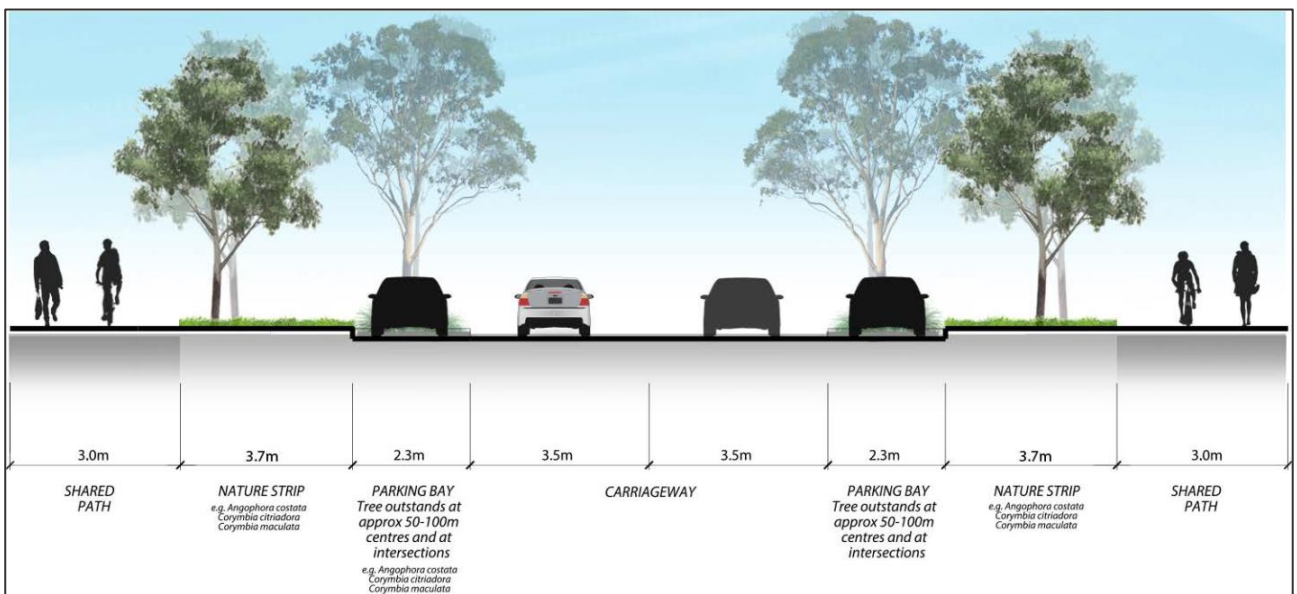


Figure 30 Access Street Level 2 Road Cross Section

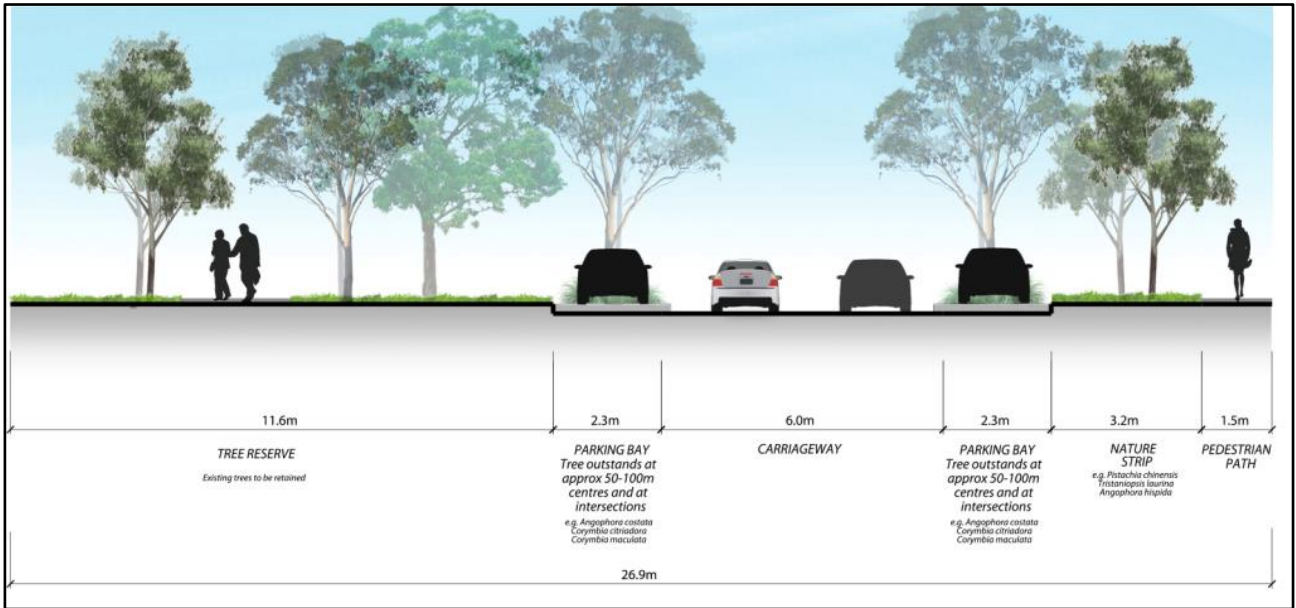


Figure 31 Access Street Cross Section (15m)

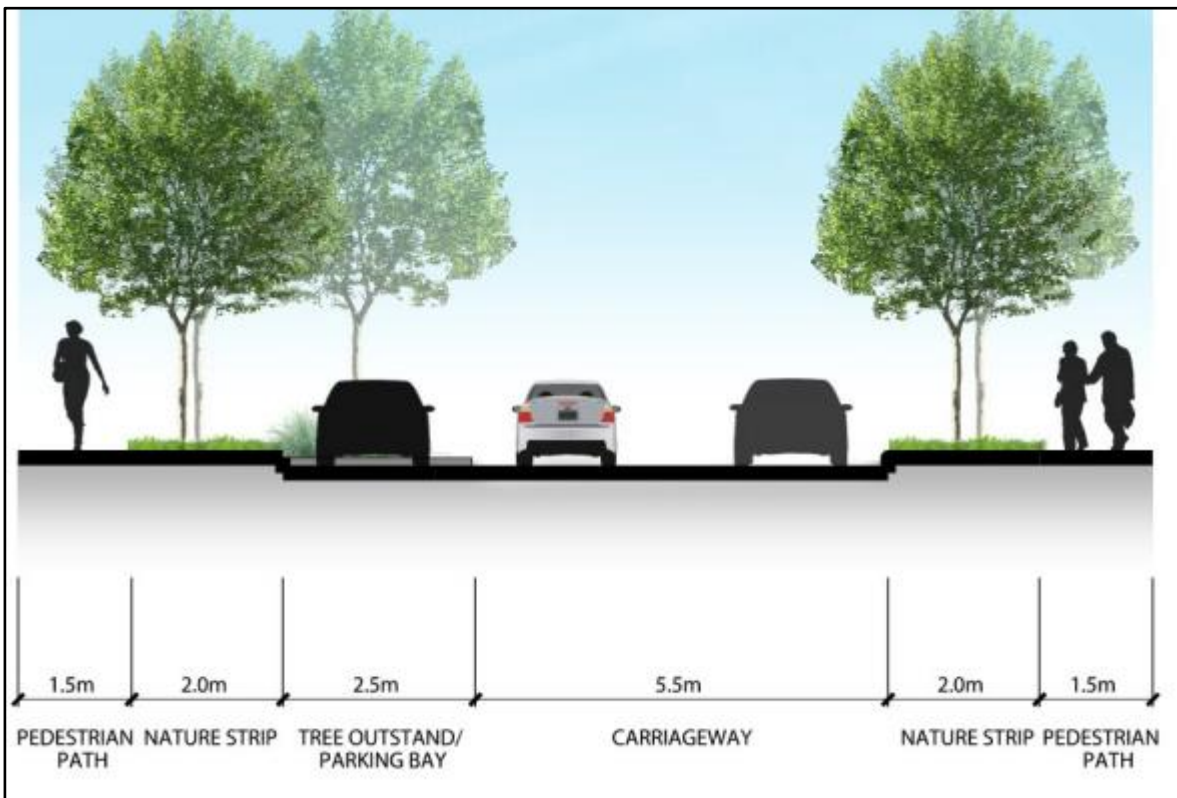


Figure 32 Access Street Cross Section (15m) – Shared Path Variation

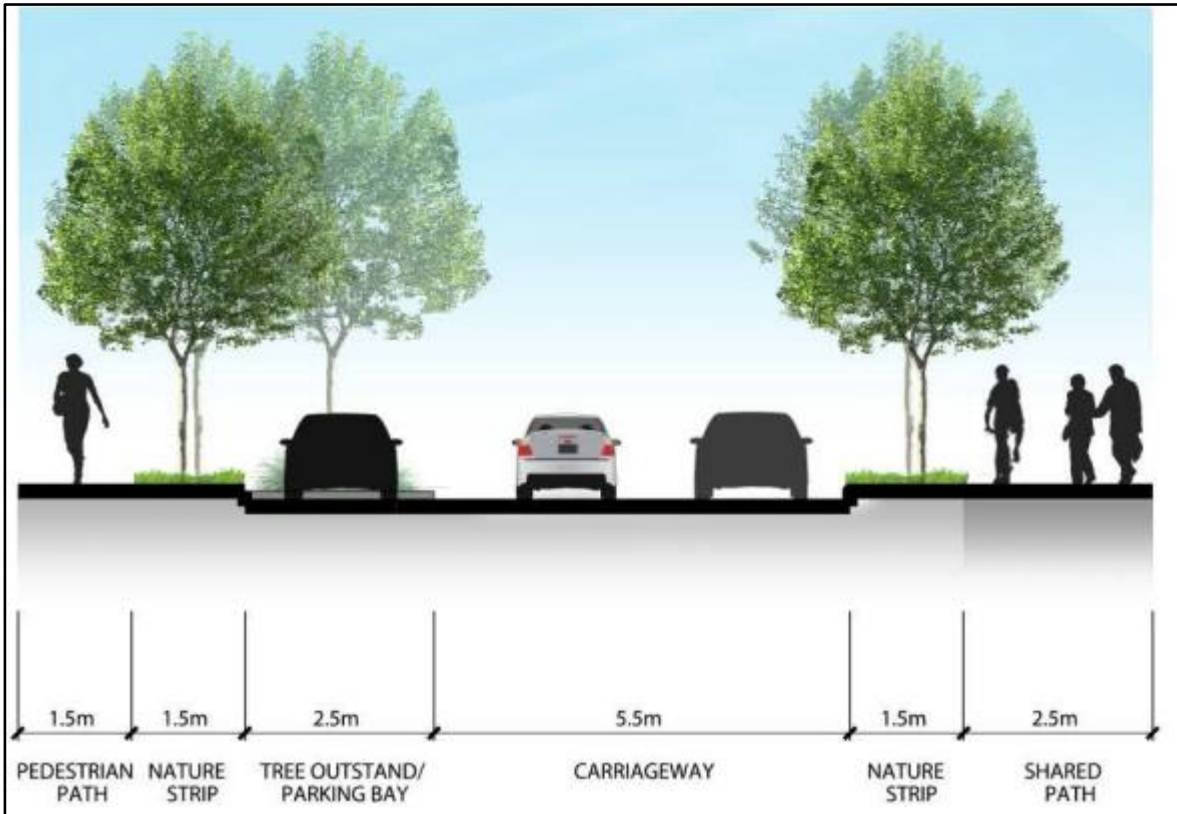


Figure 33 Access Street Cross Section Variation

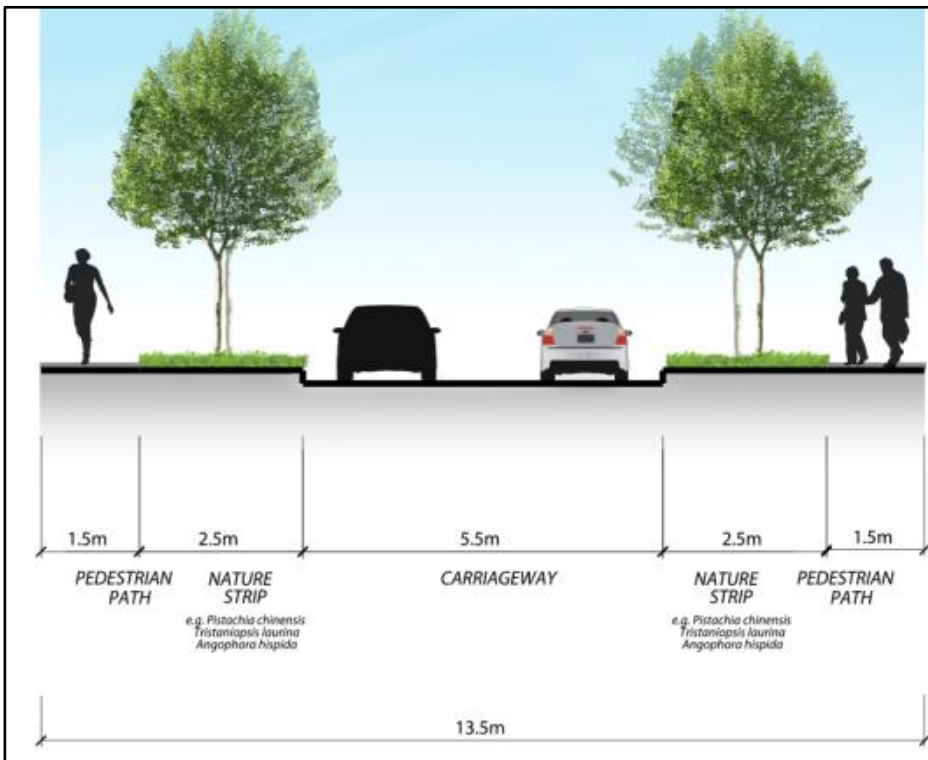
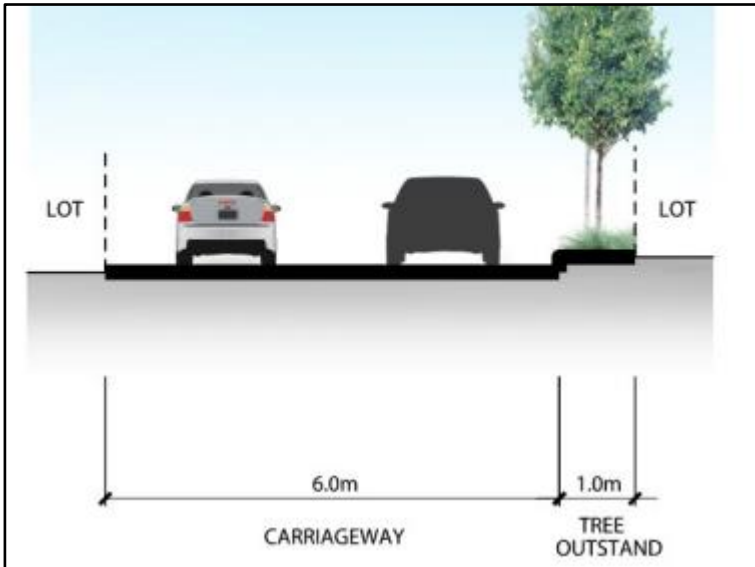


Figure 34 Laneway Cross Section (7m)



8.5 Road Cross Section Review

During the consultation process, Council and others raised concern with regard to the ability to achieve on-street parking within the development. Each road within the subdivision (except laneways) will allow for on-street car parking to occur on both sides of the road. This will be provided in the form of kerbside parking or indented bays in between landscaped tree outstands.

For comparative purposes, a review of similar constructed development within the City of Kingston has been undertaken.

8.5.1 Coast Banksia Drive – Comparison

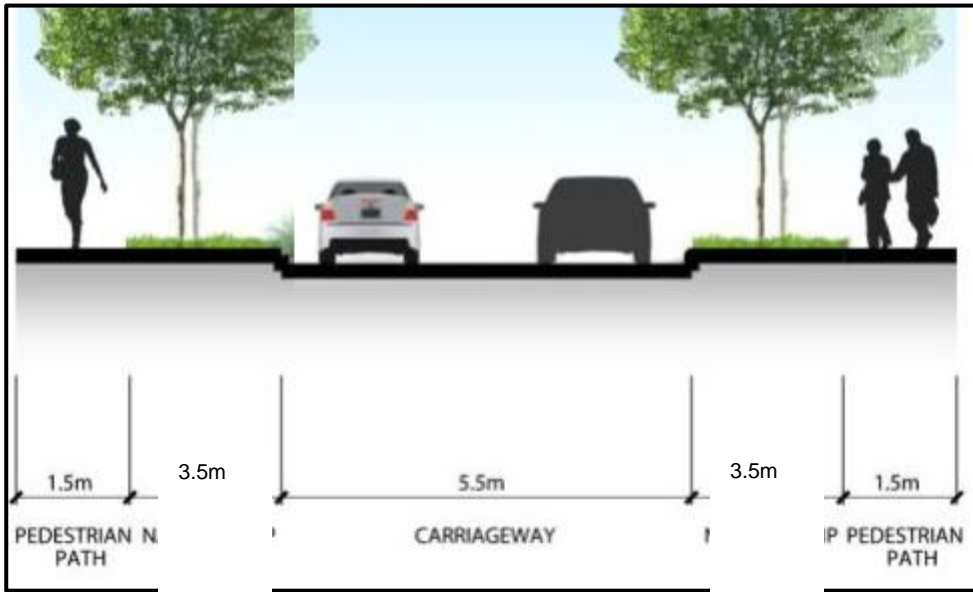
Coast Banksia Drive is located within the Bonbeach Primary School Site which was redeveloped in the last 10 years. Coast Banksia Drive is the 'typical' roadway within the subdivision and includes a road reservation of approximately 15.5 metres, which includes a 5.5m wide pavement with a 1.5m wide footpath on both sides and a 3.5m wide verge (grassed nature strip) on both sides. An aerial view of the road is provided in Figure 35.

Figure 35 Coast Banksia Drive – Road Cross Section Comparison



Diagrammatically, the Coast Banksia Drive cross section is shown in provided in Figure 36.

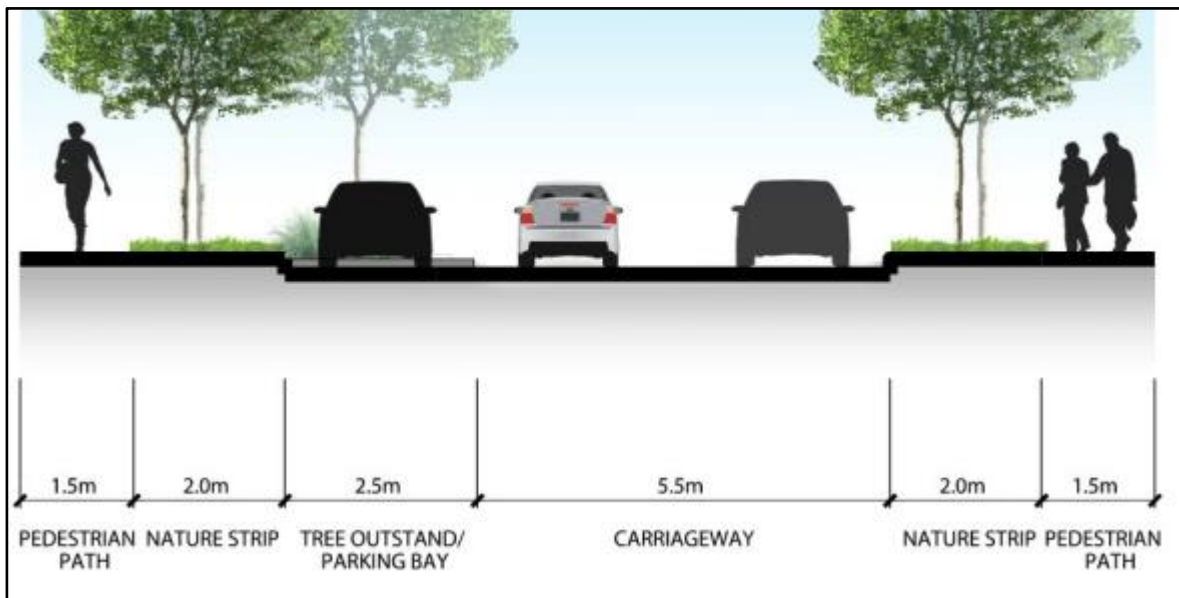
Figure 36 Coast Banksia Drive – Road Cross Section Comparison



8.5.2 Proposed Kingswood Access Road Cross Section

Within the proposed development, typical access roads are proposed with a reservation width of 15 metres which includes a 5.5m wide pavement, **plus a designated 2.5 metre wide parking lane on one side**, a 1.5m wide footpath on both sides and a 2m wide verge (landscaped nature strip) on both sides. This cross section is shown below and demonstrates that parking is available on both sides of the road, and in fact is a marked improvement to the Coast Banksia Drive example.

Figure 37 Access Street Cross Section (15m)



8.6 Internal Traffic Management

The internal road network has been designed to provide for a connective however not direct road network which will ensure that traffic volumes within the estate are managed across the site and will not promote through traffic movements.

Notwithstanding, as the road network will improve connections across the network, traffic management measures such as raised T-intersection treatments will be provided as required at intersections along straight sections of road. These will be provided across lengths of more than 200 metres.

The design of the local access roads within the subdivision are such that they will discourage high vehicle speeds on local roads with natural traffic calming resulting from on-street car parking commensurate with current road design standards.

9 RESIDENTIAL SUBDIVISION DESIGN REVIEW

9.1 General

The design of the residential subdivision has been assessed in relation to Clause 56 of the Kingston Planning Scheme (Residential Subdivision), with guidance from the VPA.

9.2 Kingston Planning Scheme Requirements

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

9.2.1 Clause 56.06-2, Walking and cycling network objectives

Standard C15

The walking and cycling network should be designed to:

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

The proposed development satisfies the objectives of Clause 56.06-2 and in fact will provide for an improvement to existing residential catchments.

9.2.2 Clause 56.06-3, Public transport network objectives

Standard C16

The public transport network should be designed to:

- *Implement any relevant public transport strategy, plan or policy for the area set out in this scheme.*
- *Connect new public transport routes to existing and proposed routes to the satisfaction of the relevant public transport authority.*
- *Provide for public transport links between activity centres and other locations that attract people using the Principal Public Transport Network in Metropolitan Melbourne and the regional public transport network outside Metropolitan Melbourne.*

- *Locate regional bus routes principally on arterial roads and locate local bus services principally on connector streets to provide:*
 - ✦ *Safe and direct movement between activity centres without complicated turning manoeuvres.*
 - ✦ *Direct travel between neighbourhoods and neighbourhood activity centres.*
 - ✦ *A short and safe walk to a public transport stop from most dwellings.*

The proposed road layout and pedestrian connectivity satisfies the objectives of Clause 56.06-3 and will provide for improved connectivity for existing residents through the shared path and green linkages. Furthermore, in the event that the PTV saw fit, the main connector road through the site has been designed to accommodate a bus service if it is required.

9.2.3 Clause 56.06-4, Neighbourhood street network objective

Standard C17

The neighbourhood street network must:

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

The neighbourhood street network should be designed to:

- *Implement any relevant transport strategy, plan or policy for the area set out in this scheme.*
- *Include arterial roads at intervals of approximately 1.6 kilometres that have adequate reservation widths to accommodate long term movement demand.*
- *Include connector streets approximately halfway between arterial roads and provide adequate reservation widths to accommodate long term movement demand.*
- *Ensure connector streets align between neighbourhoods for direct and efficient movement of pedestrians, cyclists, public transport and other motor vehicles.*
- *Provide an interconnected and continuous network of streets within and between neighbourhoods for use by pedestrians, cyclists, public transport and other vehicles.*
- *Provide an appropriate level of local traffic dispersal.*
- *Indicate the appropriate street type.*
- *Provide a speed environment that is appropriate to the street type.*
- *Provide a street environment that appropriately manages movement demand (volume, type and mix of pedestrians, cyclists, public transport and other motor vehicles).*
- *Encourage appropriate and safe pedestrian, cyclist and driver behaviour.*
- *Provide safe sharing of access lanes and access places by pedestrians, cyclists and vehicles.*
- *Minimise the provision of culs-de-sac.*
- *Provide for service and emergency vehicles to safely turn at the end of a dead-end street.*
- *Facilitate solar orientation of lots.*

- Facilitate the provision of the walking and cycling network, integrated water management systems, utilities and planting of trees.
- Contribute to the area's character and identity.
- Take account of any identified significant features.

It is considered that the proposed road network comfortably satisfies the objectives of Clause 56.06-4.

9.2.4 Clause 56.06-5, Walking and cycling detail network objectives

Standard C18

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

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

It is considered that the proposed road network comfortably the objectives of Clause 56.06-5.

9.2.5 Clause 56.06-6, Public transport network detail objectives

Standard C19

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

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

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

Bus and tram stops should have:

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

The road network has been designed to cater for a public transport route in the event that it is required, however as the provision of a route has not been proposed, the requirements of Clause 56.06-6 do not apply.

9.2.6 Clause 56.06-7, Neighbourhood street network detail objective

Standard C20

The design of streets and roads should:

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

- + Perform the required integrated water management functions.
- + Delineate the edge of the carriageway for all street users.
- + Provide efficient and comfortable access to abutting lots at appropriate locations.
- + Contribute to streetscape design.
- *Provide for the safe and efficient collection of waste and recycling materials from lots.*
- *Be accessible to people with disabilities.*
- *Meet the requirements of Table C1. Where the widths of access lanes, access places, and access streets do not comply with the requirements of Table C1, the requirements of the relevant fire authority and roads authority must be met. Where the widths of connector streets do not comply with the requirements of Table C1, the requirements of the relevant public transport authority must be met.*

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

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

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

9.2.7 Clause 56.06-8, Lot access objective

Standard C21

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

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

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

The proposed road layout achieves the above objectives of Clause 56.06-8.

10 CAR PARKING CONSIDERATIONS

10.1 Statutory Car Parking Requirements

The car parking requirements relevant to the subject site are identified in Clause 52.06 of the Kingston Planning Scheme.

For residential dwellings, the following car parking requirements are applicable.

Table 20 Clause 52.06 – Car Parking Requirements

<i>Use</i>	<i>Rate</i>	<i>Car Parking Measure</i>
Residential Dwelling	1	to each one or two bedroom dwelling, plus
	2	to each three or more bedroom dwelling (with studies or studios that are separate rooms counted as bedrooms), plus
	1	for visitors to every 5 dwellings for developments of 5 or more dwellings

10.2 Recommended Car Parking Provision

It is recommended that car parking for dwellings is provided at the above rates with 1 car space for 1 and 2 bedroom dwellings and 2 car spaces for 3 or more bedroom dwellings.

10.3 Visitor Parking Provision

In relation to visitor parking, the road network has been designed to provide for an indented parking lane on both sides of the Main Boulevard Road and on both sides of the local Access Streets which will provide for a level of formal and informal on-street parking for visitors to the site. This level of on-street car parking provision will sufficiently accommodate the likely demands for visitors and is in excess of the minimum requirements within Clause 56 of the Planning Scheme.

In relation to the superlots, these will be subject to future town planning applications, however based on the proposed road layout and significant on-street car parking opportunities, it is expected that sufficient on-street car parking will be available in the vicinity of the lots to accommodate those demands.

11 TRAFFIC CONSIDERATIONS

11.1 General

The proposed development is expected to be delivered over a period of 8 – 10 years from inception. Over the delivery of the project, a number of changes to the surrounding road network are contemplated, with the Mordialloc Bypass being prevalent.

Discussions with Council officers indicate that there was concern with regard to the potential closure of Spring Road at Westall Road. As noted in Section 4, the closure of Spring Road will occur at such time as Westall Road is designated as a freeway which would necessitate all intersections to be grade-separated interchanges. At this stage, the timeframe for such a road project is unknown and is subject to funding and other high level considerations and therefore it is not expected to occur within the medium term. Notwithstanding, two scenarios will be considered: -

- Scenario 1 – Existing Road Network
- Scenario 2 – No Spring Road connection to Westall Road

In view of this, to take into account the changes to the network an analysis of the impact of the proposed development on the external road network will therefore be undertaken considering a 10-year development scenario.

11.2 Traffic Generation

The development is expected to yield up to 800 dwellings. For the purposes of this assessment it will be assumed that of the 800 dwellings, 510 will comprise standard residential lots and the remaining 290 medium density lots.

Existing traffic volume surveys were undertaken at existing residential pockets in the vicinity of the site to determine a site specific traffic generation rate. Based on this data, Table 21 has been prepared to illustrate the recommended traffic generation rates for the development. It is noted that these rates are consistent with other studies undertaken at similar developments.

Table 21 Traffic Generation Rates

Type	Daily	Peak hours
Standard Low Density Dwellings	8 veh / day	0.8 veh / hr
Medium Dwellings	6 veh / day	0.6 veh / hr

Application of the above rates to the proposed development equates to a daily traffic generation of 5,820 vehicle movements and 582 vehicle movements per peak hour.

Table 22 Development Traffic Generation

Type	Number	Daily Generation	Peak Hour Generation
Standard Low Density Dwellings	510	4,080 veh / day	408 veh / hr
Medium Dwellings	290	1,740 veh / day	174 veh / hr
Total	800	5,820 veh / day	582 veh / hr

11.3 Scenario 1

11.3.1 Expected Traffic Growth

Centre Dandenong Road

It is expected that as a result of the proposed road network improvements in the vicinity of the site that a change to traffic conditions will occur. Review of historical data for Centre Dandenong Road suggests that traffic volumes have reduced since the opening of the Dingley Bypass. It is expected that further reductions are likely following the opening of the Mordialloc Bypass.

Typically, to ensure that the operation of surrounding intersection will operate appropriately into the future, it is considered appropriate to include future traffic volume growth on major roads. As the road network improvements will improve traffic conditions, it is likely that growth will return traffic to 2017 conditions which represents a 2% per year increase on Centre Dandenong Road from expected post opening conditions.

Spring Road & Tootal Road

With regard to Spring Road and Tootal Road a 2% per annum increase will be adopted to existing traffic volumes.

11.3.2 Traffic Distribution

Considering the location of the site in relation to the arterial road network, public transport facilities, schools, recreation and retail and employment precincts, the directional distribution shown in Table 23 has been adopted. In addition, particular regard has been made in relation to the distribution of lots across the site.

Table 23 Adopted Directional Traffic Distribution

<i>Origin/Destination</i>	<i>Percentage</i>
Spring Road (North)	21%
Spring Road (Southeast)	19%
Centre Dandenong Road (East)	26%
Howard Road (South)	4%
Centre Dandenong Road (West)	23%
Tootal Road (North)	7%

Furthermore, based on typically observed rates, the residential traffic distribution shown in Table 24 has been adopted.

Table 24 Residential Traffic Distribution - Subdivision

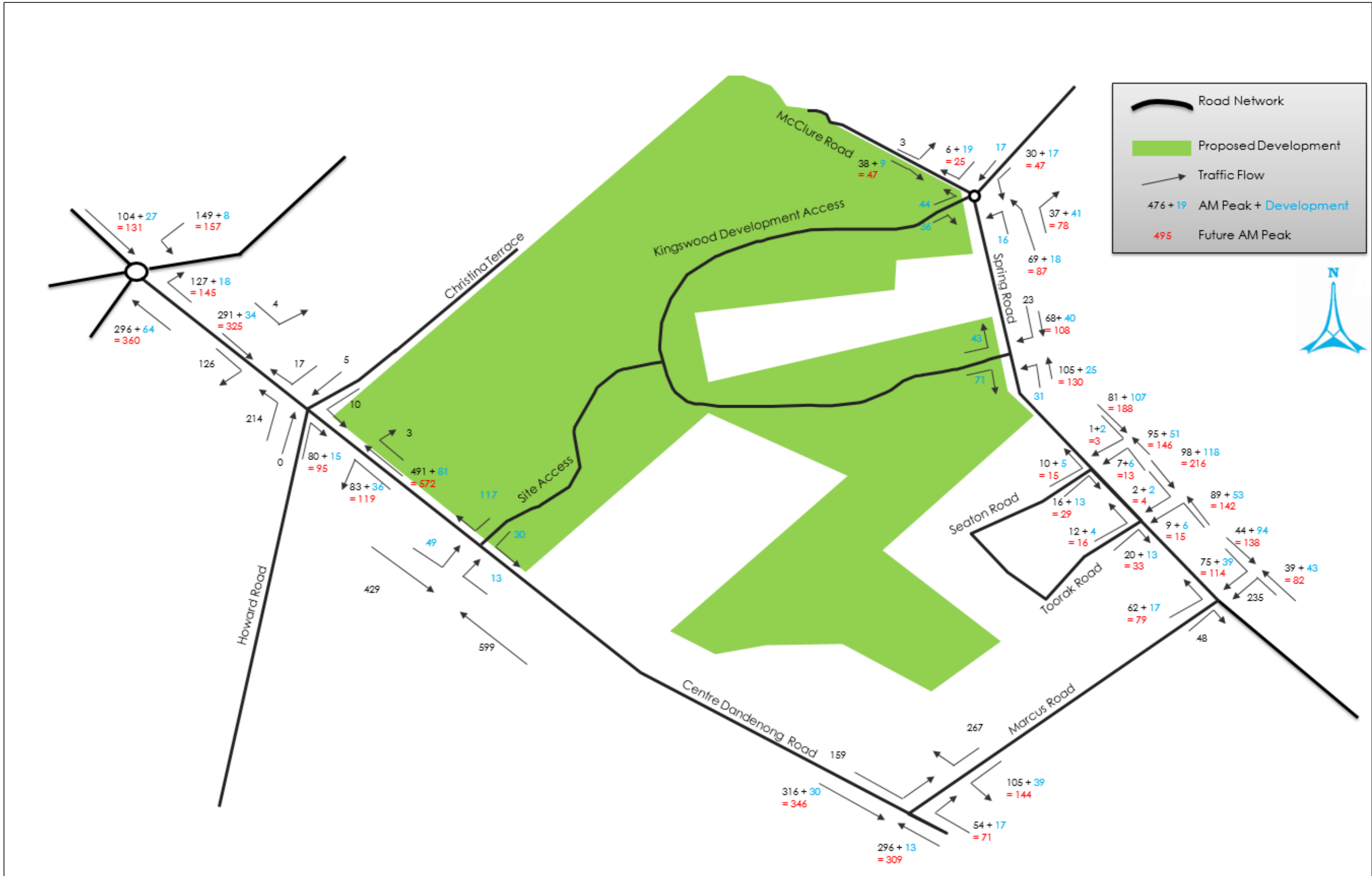
<i>Peak Hour</i>	<i>Percentage of Daily</i>	<i>Outbound</i>	<i>Inbound</i>
AM Peak	10%	70%	30%
PM Peak	10%	40%	60%

11.3.3 Future Traffic Volumes – 2028

Based on the above, the future intersection volumes across the network can be calculated by combining the existing volumes with the expected traffic volume growth, and superimposing the traffic anticipated to be generated by the proposed development.

The resultant peak hour traffic volumes are shown in Figure 38 and Figure 39.

Figure 38 Scenario 1 – Post Development Conditions (2028) AM Peak



11.3.4 Traffic Impact – Peak Hours

To assess the operation of the intersections in the vicinity of the site post development, the traffic volumes have been input into SIDRA Intersection.

The results of the analysis is provided in Table 25 through to Table 31.

Table 25 Centre Dandenong Road / Tootal Road (Scenario 1)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Centre Dandenong Road (SE)	0.444	6.9	21.7
Tootal Road	0.31	8.2	13.7
Old Dandenong Road	0.111	7.2	4.7
Centre Dandenong Road (NW)	0.401	9.4	26.1
Intersection	0.444	9	26.1
PM Peak			
Centre Dandenong Road (SE)	0.266	6.5	11
Tootal Road	0.306	9.5	13.1
Old Dandenong Road	0.329	8.4	14.2
Centre Dandenong Road (NW)	0.377	7.8	20.6
Intersection	0.377	8.1	20.6

As shown above, following development of the site, the intersection of Centre Dandenong Road and Tootal Road will operate under excellent conditions during the morning peak hour and under good conditions during the afternoon peak hour, with reasonable queues and delays to motorists. The increased capacity and performance of the roundabout is a result of the road upgrade works at the intersection, which are outlined in Section 8.3.

Table 26 Centre Dandenong Rd / Howard Rd / Christina Tce (Scenario 1)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Centre Dandenong Road	0.505	14.2	63.2
Christina Terrace	0.047	19.2	2.8
Centre Dandenong Road	0.482	17.4	53.7
Howard Road	0.522	21.3	55.2
Intersection	0.522	16.8	63.2
PM Peak			
Centre Dandenong Road	0.302	12.6	49.9
Christina Terrace	0.019	29.3	2.3
Centre Dandenong Road	0.594	15.9	131.7
Howard Road	0.593	34.2	80.7
Intersection	0.594	17.9	131.7

As shown above, following development of the site, the intersection of Centre Dandenong Road / Howard Road / Christina Terrace will operate under good conditions, with some limited increases to queues and delays to motorists.

Table 27 Centre Dandenong Rd / Marcus Road (Scenario 1)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Centre Dandenong Road</i>	0.34	22.1	57.8
<i>Marcus Road</i>	0.344	22.1	58
<i>Centre Dandenong Road</i>	0.348	21.3	59.4
Intersection	0.348	21.8	59.4
PM Peak			
<i>Centre Dandenong Road</i>	0.37	17.3	62.3
<i>Marcus Road</i>	0.451	29.1	71.2
<i>Centre Dandenong Road</i>	0.447	16.3	87.3
Intersection	0.451	20	87.3

As shown above, following development of the site, the intersection of Centre Dandenong Road and Marcus Road will continue to operate under excellent conditions, with some limited increases to queues and delays to motorists.

Table 28 Marcus Road / Spring Road (Scenario 1)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road</i>	0.138	4.2	0
<i>Spring Road</i>	0.094	3.1	3.1
<i>Marcus Road</i>	0.064	6.2	1.3
Intersection	0.138	4.1	3.1
PM Peak			
<i>Spring Road</i>	0.112	3.4	0
<i>Spring Road</i>	0.065	3.2	2.1
<i>Marcus Road</i>	0.133	6	2
Intersection	0.133	4.2	2.1

As shown above, following development of the site, the intersection of Marcus Road and Spring Road will continue to operate under excellent conditions, with some limited increases to queues and delays to motorists.

Table 29 Spring Road / Toorak Drive (Scenario 1)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road</i>	0.044	0.5	0
<i>Spring Road</i>	0.062	0.1	0.2
<i>Toorak Drive</i>	0.031	6.5	0.8
Intersection	0.062	1	0.8
PM Peak			
<i>Spring Road</i>	0.077	0.7	0
<i>Spring Road</i>	0.046	0.3	0.4
<i>Toorak Drive</i>	0.02	6.8	0.5
Intersection	0.077	0.9	0.5

As shown above, following development of the site, the intersection of Spring Road and Toorak Road will continue to operate under excellent conditions, with some limited increases to queues and delays to motorists.

Table 30 Spring Road / Seaton Drive (Scenario 1)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road</i>	0.045	0.5	0
<i>Spring Road</i>	0.053	0.1	0.2
<i>Seaton</i>	0.027	6.4	0.7
Intersection	0.053	1	0.7
PM Peak			
<i>Spring Road</i>	0.072	0.7	0
<i>Spring Road</i>	0.041	0.7	0.7
<i>Seaton</i>	0.019	6.6	0.5
Intersection	0.072	1	0.7

As shown above, following development of the site, the intersection of Spring Road and Seaton Drive will continue to operate under excellent conditions, with some limited increases to queues and delays to motorists.

Table 31 Spring Road / McClure Road / Site Access (Scenario 1)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road (S)</i>	0.134	5.8	6
<i>Spring Road (NE)</i>	0.073	5.5	3
<i>McClure Road (W)</i>	0.045	9.4	1.8
<i>Kingswood Site Access (SW)</i>	0.094	7.2	3.8
Intersection	0.134	6.5	6
PM Peak			
<i>Spring Road (S)</i>	0.132	6.2	5.9
<i>Spring Road (NE)</i>	0.081	5	3.3
<i>McClure Road (W)</i>	0.115	8.6	4.8
<i>Kingswood Site Access (SW)</i>	0.058	6.8	2.3
Intersection	0.132	6.7	5.9

As shown above, following development of the site, the new roundabout intersection of Spring Road and McClure Road will continue to operate under excellent conditions, with some limited increases to queues and delays to motorists.

11.3.5 Site Access Operation

With regard to the site access points, a SIDRA analysis has been undertaken to assess the operation of the site access points to the external road network.

A summary of the results of the analysis for the Centre Dandenong Road traffic signals, and the southeast Spring Road T-intersection are provided in Table 32 and Table 33. The operation of the other Spring Road access integrating into the new roundabout is provided above in Table 31.

Table 32 Centre Dandenong Traffic Signals (Scenario 1)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Centre Dandenong Road	0.329	8.7	40.3
Site Access	0.324	25.2	27.4
Centre Dandenong Road	0.251	8.7	29.2
Intersection	0.329	10.7	40.3
PM Peak			
Centre Dandenong Road	0.236	5	25
Site Access	0.374	32.8	18.6
Centre Dandenong Road	0.401	5.5	49.2
Intersection	0.401	6.9	49.2

As shown above, the proposed site access in Scenario 1 will operate under 'excellent' conditions with manageable queues and delays experienced by motorists.

Table 33 Spring Road / SE Site Access (Scenario 1)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Spring Road (S)	0.045	1.1	0
Spring Road (NE)	0.038	1.2	1
Site Access (W)	0.062	6.2	1.6
Intersection	0.062	2.5	1.6
PM Peak			
Spring Road (S)	0.065	1.6	0
Spring Road (NE)	0.048	1.5	1.5
Site Access (W)	0.041	6.4	1.1
Intersection	0.065	2.2	1.5

As shown above, following development of the site, the site access to Spring Road forming a T-intersection will operate under excellent conditions.

Based on the above assessment, it is evident that as a result of the proposed development, the intersections in the vicinity of the site during peak periods will continue to operate under similar conditions with marginal increases to queues and delays experienced by motorists. This level of intersection operation is considered acceptable across a road network of this nature and in consideration of the likely trip destinations and existing conditions.

11.3.6 Daily Traffic Volumes

The traffic model prepared for the determination of traffic volumes generated by the proposed development has been further interrogated to project the level of daily traffic on the internal roads and external roads. A summary of the daily traffic volumes against the capacity and existing volumes is provided in Table 34.

Table 34 Projected Daily Traffic Volumes – Scenario 1

Road	Capacity (vpd)	Existing Volume (vpd)	Projected Daily Volumes	Future Traffic Volume	Existing %'age	Future %'age
Centre Dandenong Road	20,000	13,000	1,120	14,120	65%	70.6%
Marcus Road	10,000	5,700	570	6,270	57.4%	62.7%
Spring Road	7,000	2,000	1,280	3,280	28.6%	46.9%
McClure Road	3,000	1,150	256	1,406	38.3%	46.9%
Greenwoods Close	3,000	250*	0	250	8.3%	8.3%
Toorak Drive	3,000	450	256	706	15%	23.5%
Wolbers Road	3,000	300*	256	556	10%	18.5%
Mungari Street	3,000	50*	0	50	1.6%	1.6%
Seaton Drive	3,000	415	256	671	13.8%	22.4%

* Projected Volume

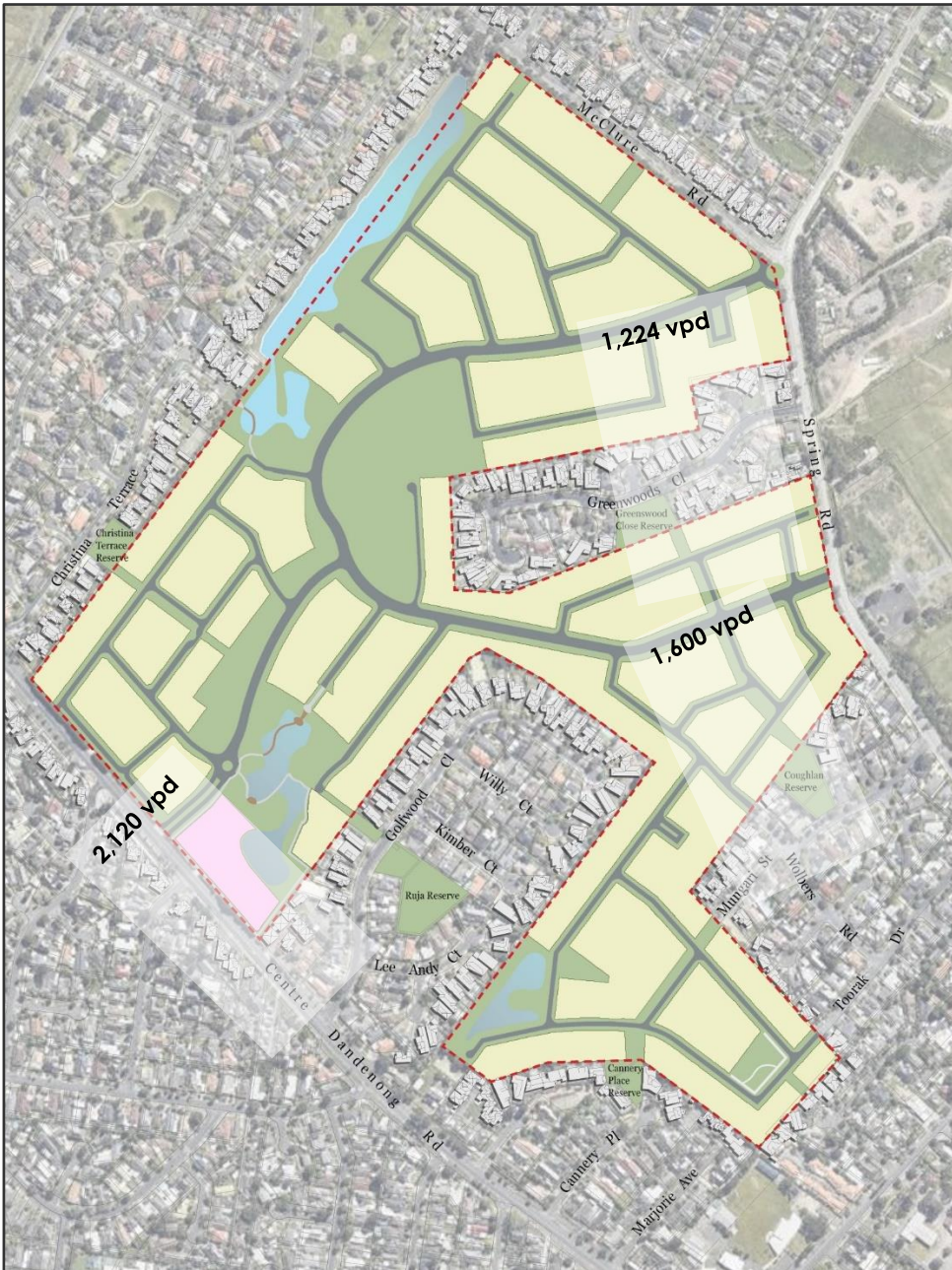
As shown above, the traffic generated by the proposed development will be readily accommodated by the proposed and existing road network with traffic volumes well within the identified capacities.

It is noted that some increases in traffic in relative terms may appear to be significant however across a period of 24 hours, the increases will be distributed across the day which will therefore limit the impact of the additional traffic and on the whole, will not represent a significant impact on the amenity and operation of the road.

11.3.7 Internal Traffic Volumes

Figure 40 has been prepared to illustrate the daily traffic volumes on the main roads within the subdivision. All traffic volumes on the internal roads are well within the desired capacities for the classification of roads proposed.

Figure 40 Internal Daily Traffic Volumes – Scenario 1



11.4 Scenario 2

Scenario 2 contemplates the closure of Spring Road at Westall Road. As discussed, it is not expected that this closure will occur during the delivery of the project as it is subject to a number of requirements with regard to funding, delivery and traffic modelling. Notwithstanding, the following assessment has been undertaken to review the impact of the development in 2028 assuming that Spring Road is closed.

A number of assumptions have been made with regard to existing traffic and redistribution across the road network.

11.4.1 Traffic Distribution

Considering the location of the site in relation to the arterial road network, the closure of Spring Road, public transport facilities, schools, recreation and retail and employment precincts, the directional distribution shown in Table 35 has been adopted. In addition, particular regard has been made in relation to the distribution of lots across the site.

Table 35 Adopted Directional Traffic Distribution – Scenario 2

<i>Origin/Destination</i>	<i>Percentage</i>
Spring Road (North)	5%
Spring Road (Southeast)	20.5%
Centre Dandenong Road (East)	27.5%
Howard Road (South)	13%
Centre Dandenong Road (West)	23%
Tootal Road (North)	11%

11.4.2 Future Traffic Volumes – 2028 (Scenario 2)

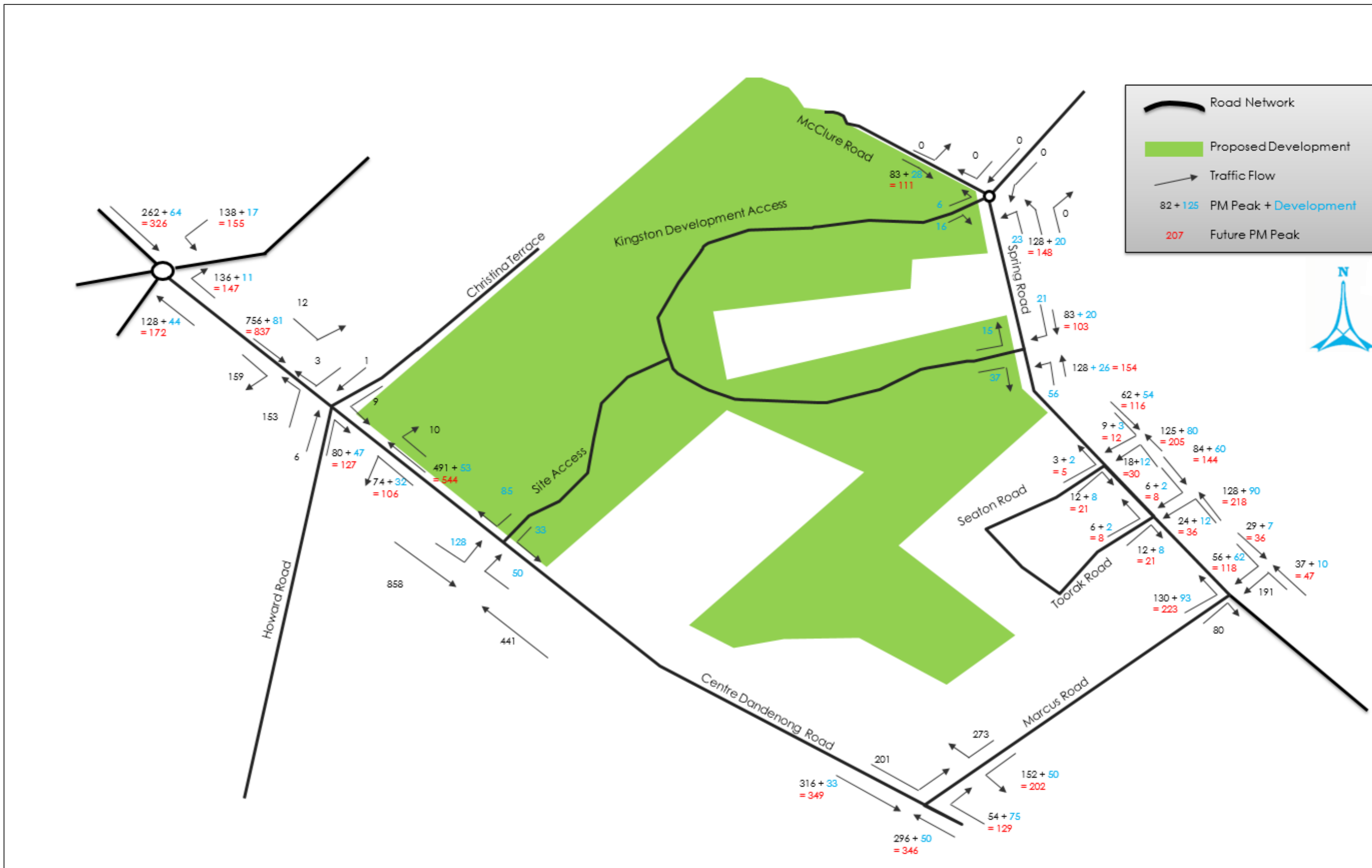
Based on the above, the future intersection volumes across the network can be calculated by combining the existing volumes with the expected traffic volume growth and the Spring Road redistribution of traffic, and superimposing the traffic anticipated to be generated by the proposed development.

The resultant peak hour traffic volumes are shown in Figure 41 and Figure 42 for the AM and PM peak respectively.

Figure 41 Scenario 2 – Post Development Conditions – AM Peak (2026)



Figure 42 Scenario 2 – Post Development Conditions – PM Peak (2026)



11.4.3 Traffic Impact – Peak Hours

To assess the operation of the intersections in the vicinity of the site post development, the traffic volumes have been input into SIDRA Intersection.

The results of the analysis is provided in Table 36 through to Table 45.

Table 36 Centre Dandenong Road / Tootal Road Intersection Operation (Scenario 2)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
Centre Dandenong Road (SE)	0.458	7	22.7
Tootal Road	0.311	8.2	13.8
Old Dandenong Road	0.116	7.2	4.9
Centre Dandenong Road (NW)	0.41	9.7	27.1
Intersection	0.458	9.1	27.1
PM Peak			
Centre Dandenong Road (SE)	0.27	6.5	11.2
Tootal Road	0.307	9.5	13.2
Old Dandenong Road	0.335	8.4	14.4
Centre Dandenong Road (NW)	0.379	7.8	20.8
Intersection	0.379	8.1	20.8

As shown above, following development of the site, the intersection of Centre Dandenong Road and Tootal Road will operate under 'excellent' conditions during the morning peak hour and under good conditions during the afternoon peak hour, with reasonable queues and delays to motorists. The increased capacity and performance of the roundabout is a result of the road upgrade works at the intersection, which are outlined in Section 8.3.

Table 37 Centre Dandenong Rd / Howard Rd / Christina Terrace (Scenario 2)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
Centre Dandenong Road	0.487	14.5	58.9
Christina Terrace	0.044	18.5	2.7
Centre Dandenong Road	0.465	17.7	56.3
Howard Road	0.519	20.6	55.9
Intersection	0.519	17	58.9
PM Peak			
Centre Dandenong Road	0.378	13.1	67.2
Christina Terrace	0.019	30.1	2.4
Centre Dandenong Road	0.623	16.3	142.3
Howard Road	0.635	35.4	85.2
Intersection	0.635	18.1	142.3

As shown above, following development of the site, the intersection of Centre Dandenong Road / Howard Road / Christina Terrace will operate under 'very good' conditions, with some increases to queues and delays to motorists.

Table 38 Centre Dandenong Rd / Marcus Road (Scenario 2)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Centre Dandenong Road	0.367	21.5	64.7
Marcus Road	0.362	23.6	60.5
Centre Dandenong Road	0.351	20	61.5
Intersection	0.367	21.6	64.7
PM Peak			
Centre Dandenong Road	0.404	19.4	75.2
Marcus Road	0.412	26.7	67.3
Centre Dandenong Road	0.327	17.6	58.2
Intersection	0.412	21.1	75.2

As shown above, following development of the site, the intersection of Centre Dandenong Road and Marcus Road will continue to operate under 'excellent' conditions, with some limited increases to queues and delays to motorists.

Table 39 Marcus Road / Spring Road (Scenario 2)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Spring Road	0.138	4.7	0
Spring Road	0.139	5.1	4.8
Marcus Road	0.087	6	1.2
Intersection	0.139	5.2	4.8
PM Peak			
Spring Road	0.112	4.5	0
Spring Road	0.09	5	3
Marcus Road	0.18	5.9	1.9
Intersection	0.18	5.2	3

As shown above, following development of the site, the intersection of Marcus Road and Spring Road will continue to operate under 'excellent' conditions, with some limited increases to queues and delays to motorists.

Table 40 Spring Road / Toorak Drive (Scenario 2)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Spring Road	0.041	0.6	0
Spring Road	0.056	0.1	0.2
Toorak Drive	0.031	6.4	0.8
Intersection	0.056	1	0.8
PM Peak			
Spring Road	0.071	0.8	0
Spring Road	0.043	0.4	0.5
Toorak Drive	0.02	6.6	0.5
Intersection	0.071	1	0.5

As shown above, following development of the site, the intersection of Spring Road and Toorak Road will continue to operate under 'excellent' conditions, with some limited increases to queues and delays to motorists.

Table 41 Spring Road / Seaton Drive (Scenario 2)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road</i>	0.042	0.5	0
<i>Spring Road</i>	0.048	0.1	0.2
<i>Seaton</i>	0.035	6.4	0.9
Intersection	0.048	1.2	0.9
PM Peak			
<i>Spring Road</i>	0.066	0.7	0
<i>Spring Road</i>	0.037	0.7	0.7
<i>Seaton</i>	0.02	6.5	0.5
Intersection	0.066	1.1	0.7

As shown above, following development of the site, the intersection of Spring Road and Seaton Drive will continue to operate under 'excellent' conditions, with some limited increases to queues and delays to motorists.

Table 42 Spring Road / McClure Road / Site Access (Scenario 2)

<i>Approach</i>	<i>D.o.S.</i>	<i>Avg Delay (sec)</i>	<i>Queue (m)</i>
AM Peak			
<i>Spring Road (S)</i>	0.103	3.9	4.3
<i>Spring Road (NE)</i>	0.002	5.7	0.1
<i>McClure Road (W)</i>	0.046	9	1.9
<i>Kingswood Site Access (SW)</i>	0.031	8.9	4.3
Intersection	0.103	5.9	4.3
PM Peak			
<i>Spring Road (S)</i>	0.116	4	4.9
<i>Spring Road (NE)</i>	0.003	6	0.1
<i>McClure Road (W)</i>	0.085	9	3.7
<i>Kingswood Site Access (SW)</i>	0.02	8.9	4.9
Intersection	0.116	6.2	4.9

As shown above, following development of the site, the new roundabout intersection of Spring Road and McClure Road will continue to operate under 'excellent' conditions, with some limited increases to queues and delays to motorists.

11.4.4 Site Access Operation

With regard to the site access points, a SIDRA analysis has been undertaken to assess the operation of the site access points to the external road network.

A summary of the results of the analysis for the Centre Dandenong Road traffic signals, and the Spring Road T-intersection are provided in Table 32 and Table 33. The operation of the other Spring Road access integrating into the new roundabout is provided above in Table 31.

Table 43 Centre Dandenong Traffic Signals (Scenario 2)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Centre Dandenong Road	0.378	10.9	47.1
Site Access	0.391	23.2	38
Centre Dandenong Road	0.287	10.8	33.9
Intersection	0.391	12.8	47.1
PM Peak			
Centre Dandenong Road	0.285	6.6	32.6
Site Access	0.416	31	25.1
Centre Dandenong Road	0.437	6.7	56.7
Intersection	0.437	8.5	56.7

As shown above, the proposed site access in Scenario 2 will operate under 'excellent' conditions with manageable queues and delays experienced by motorists.

Table 44 Spring Road / Site Access (Scenario 2)

Approach	D.o.S.	Avg Delay (sec)	Queue (m)
AM Peak			
Spring Road (S)	0.042	1	0
Spring Road (NE)	0.023	1	0.6
Site Access (W)	0.033	6	0.8
Intersection	0.042	2.2	0.8
PM Peak			
Spring Road (S)	0.059	1.5	0
Spring Road (NE)	0.037	1.2	1
Site Access (W)	0.033	6.3	0.9
Intersection	0.059	2	1

As shown above, following development of the site, the site access to Spring Road forming a T-intersection will operate under 'excellent' conditions.

11.4.5 Daily Traffic Volumes

The traffic model prepared for the determination of traffic volumes generated by the proposed development has been further interrogated to project the level of daily traffic on the internal roads and external roads. A summary of the daily traffic volumes against the capacity and existing volumes is provided in Table 45.

Table 45 Projected Daily Traffic Volumes – Scenario 2

Road	Capacity (vpd)	Existing Volume (vpd)	Projected Daily Volumes	Future Traffic Volume	Existing %'age	Future %'age
Centre Dandenong Road	20,000	13,000	2,000	15,000	65%	75%
Marcus Road	10,000	5,700	1,500	7,200	57.4%	72%
Spring Road	7,000	2,000	1,280	3,280	28.6%	46.9%
McClure Road	3,000	1,150	560	1,710	38.3%	57%
Greenwoods Close	3,000	250*	0	250	8.3%	8.3%
Toorak Drive	3,000	450	240	690	15%	23%
Wolbers Road	3,000	300*	256	556	10%	18.5%
Mungari Street	3,000	50*	0	50	1.6%	1.6%
Seaton Drive	3,000	415	256	271	13.8%	9%

* Projected Volume

As shown above, the traffic generated by the proposed development will be readily accommodated by the proposed and existing road network with traffic volumes well within the identified capacities.

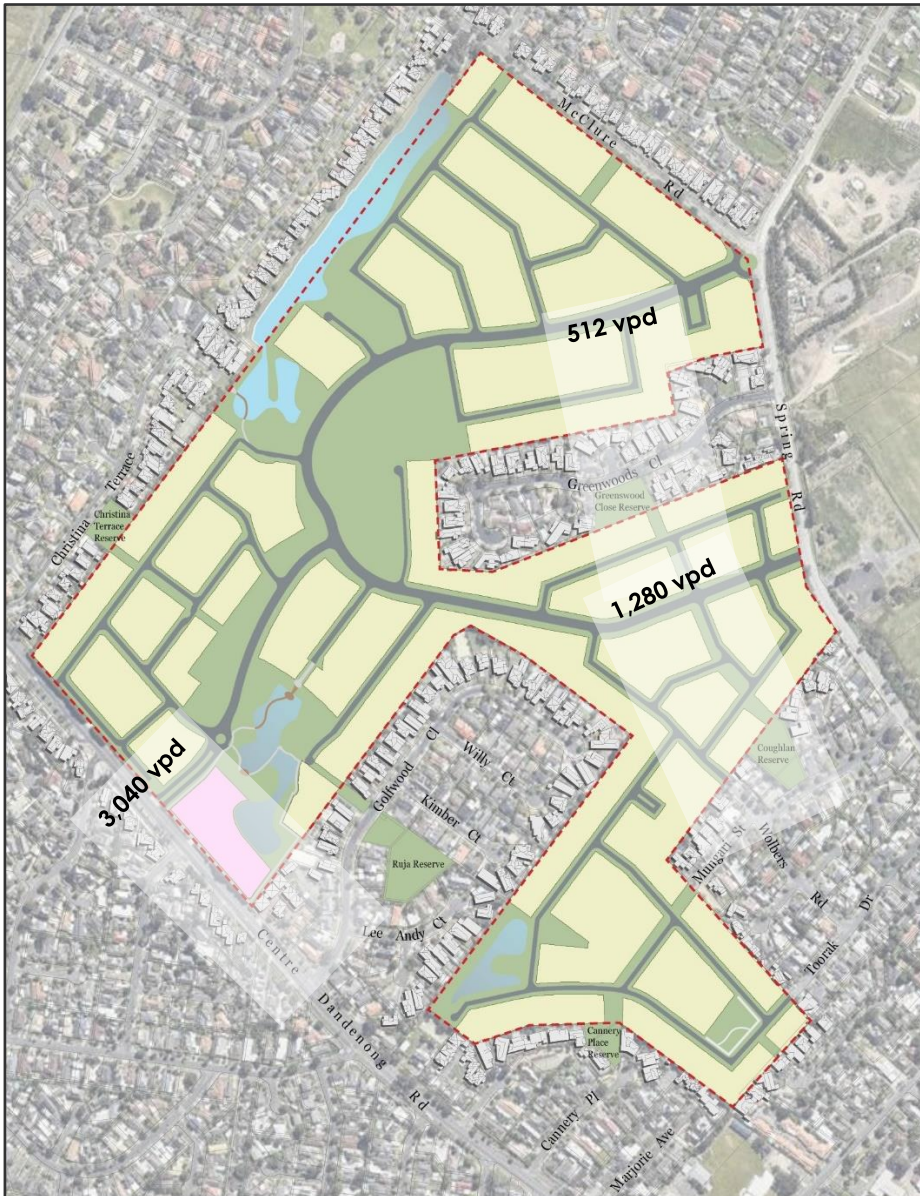
It is noted that traffic volumes in Scenario 2 on McClure road will increase 14% on existing traffic levels however it is expected that a greater traffic network review will be required if and when Spring Road closes to provide existing motorists with an alternative route to connect to the new freeway. Whilst this assessment indicates there will be an increase in actual fact there will be a need for the authorities to provide alternative connections. In any case, the expected increase is still within the capacity of a road of this nature.

11.4.6 Internal Traffic Volumes

Figure 43 has been prepared to illustrate the daily traffic volumes on the main roads within the subdivision.

All traffic volumes on the internal roads are well within the desired capacities for the classification of roads proposed.

Figure 43 Internal Daily Traffic Volumes – Scenario 2



11.5 Other Traffic Considerations

11.5.1 Spring Road / Westall Road

During the consultation process, some concerns were raised with the operation of the Spring Road / Westall Road intersection. The intersection operates left in / left out with priority given to through traffic on Westall Road. It is understood that there are some delays to traffic exiting from Spring Road into Westall Road.

Review of on-site conditions and traffic volumes indicates that there is a level of traffic using this intersection which in addition to traffic on Westall Road can make the movement out of Spring Road congested during peak hours. Peak hour conditions of this nature are not uncommon and are common place across the road network particularly at intersections with arterial roads.

12 WASTE MANAGEMENT

12.1 General

It is proposed to utilise Kingston Council's municipal waste collection services, to manage the collection and disposal of all waste streams associated with the development.

To encourage the efficient disposal of waste across the development and to encourage recycling and other sustainable strategies, each dwelling will be provided with the following bins by Council: -

Table 46 Bin Specifications

Dwelling Type	Stream	Capacity	Dimensions	Colour
Standard Residential lots	Waste	120 litre	0.48m wide, 0.56m deep & 0.93 m high	Red lid and body
	Recycling	240 litre	0.59m wide, 0.74m deep & 1.1m high	Yellow lid and dark green body
Townhouses	Waste	80 litre	0.47m wide, 0.56m deep & 0.89m high	Red lid and body
	Recycling	120 litre	0.48m wide, 0.56m deep & 0.93 m high	Yellow lid and dark green body

Bins for each dwelling will be stored within individual garages with a separate waste and recycling bin allocated to each dwelling. On collection days, bins will be transferred by the resident to the frontage road for collection by the Council service. Following collection, bins will be collected and returned by the resident.

Collections will occur weekly for waste bins and fortnightly for recycling.

12.2 Waste Truck Accessibility

A review of the accessibility of the standard Council waste vehicle has been undertaken which indicates that all roads within the estate have been suitably designed to accommodate the path of a typical Council garbage truck. In particular all roads have been provided with appropriate radii to allow for the path of a garbage truck at intersections.

12.3 Best Practice Waste Management

Best Practice Waste Management is an initiative designed to reduce the amount of waste generated through encouraging a change of behaviour and action on waste management and moreover recycling.

The benefits of reducing waste generation is far reaching and has been identified as significantly important by Council and the Victorian Government.

The Victorian Waste and Resource Recovery Policy "Getting Full Value" has been prepared by the Victorian Government, and "sets out a position and an approach that will position Victoria as a national leader in resource recovery".

One of the primary goals of the policy is to "Assist Victorians to reduce the waste they generate and save Victorians' money through efficient use of resources", for which the following strategic directions are listed:

- Support commercial, not-for-profit and Victorian public sector organisations to achieve financial savings through waste reduction;

- Provide households with the information and support they need to reduce waste by using household goods more efficiently;
- Continue to work in partnership with the Commonwealth Government through the National Waste Policy: Less Waste, More Resources, and take a lead role in national strategies that harness Victoria's strengths and capabilities

This policy builds on the Towards Zero Waste strategy, which was launched in 2005.

The proposed Owners Corporation shall encourage residents to participate in minimising and reducing solid waste production by:

- Promoting the Getting Full Value Strategy and the Municipality's Waste Management Strategy, including the use of The Waste Hierarchy, which in order of preference seeks to:
 - ✦ Avoid waste generation in the first place;
 - ✦ Increase the reuse and recycling of waste when it is generated; and
 - ✦ Recover, treat or contain waste preferentially to;
 - ✦ Its disposal in Land Fill (which is least desirable).
- Providing information detailing recyclable materials to ensure that non-recyclable materials do not contaminate recycling collections;
- Providing information regarding safe chemical waste disposal methods and solutions, including correct battery and electronics disposal methods;
- Encouraging composting for residents;
- Ensuring that there are arrangements in place to provide collection and reuse of garden/green waste in public open spaces managed by Council;
- Providing separate waste receptacles for general and recyclable waste in public open spaces managed by the Owners Corporation; and
- Providing tips for recycling and reusing waste, including encouraging the disposal of reusable items in good condition via donations to Opportunity Shops and Charities.

13 CONCLUSIONS

Considering the analysis presented above, it is concluded that:

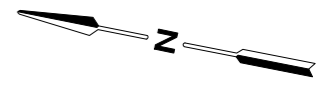
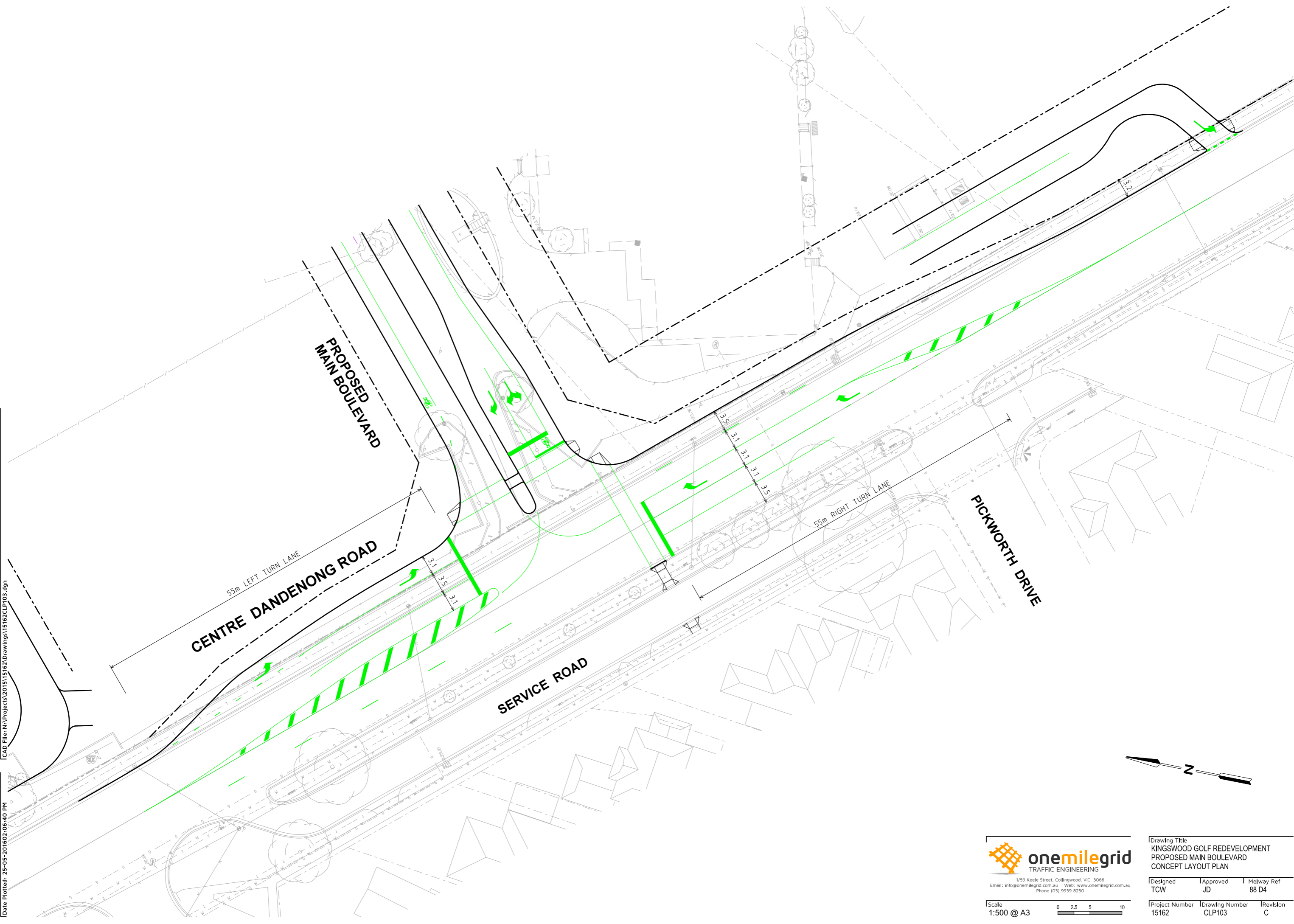
- It is proposed to rezone the land to allow for the development of the site for up to 800 dwellings;
- The development will comprise a mixture of low and medium density development;
- The site will include a connective road network and will include 3 primary connections to the external road network and 3 secondary connections;
- A single primary access to Centre Dandenong Road is proposed which will include traffic signals;
- A single left out access is proposed to Centre Dandenong Road from the mixed use precinct;
- Two access points are proposed to Spring Road comprising a new roundabout at McClure Road, and a typical T-intersection;
- Two lower order connections which will be the extension of existing local roads at Wolbers Road and Toorak Drive are proposed;
- The road network has been designed to include a main collector road that will link each of the proposed primary access points supplemented by access streets that will serve dwellings;
- Road cross sections have been designed to allow for the traffic function expected for each road whilst maintaining pedestrian amenity, and reducing vehicle speeds;
- A strong and highly connective pedestrian network is proposed as part of the development linking existing green spaces through the site and beyond;
- The proposed road network and associated green links will improve the amenity for existing residents providing linkages that are currently not available;
- Traffic generated by the proposed development is expected to be absorbed adequately by the external road network, with 2 traffic assessment scenarios analysed;
- In the event that Spring Road closes there will be a redistribution of traffic across the road network which is expected to be suitably accommodated;
- The traffic and transport impacts of the development are manageable and will not impact on existing traffic conditions in the area.

Appendix A Concept Intersection Plans



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TRAFFIC ENGINEERING

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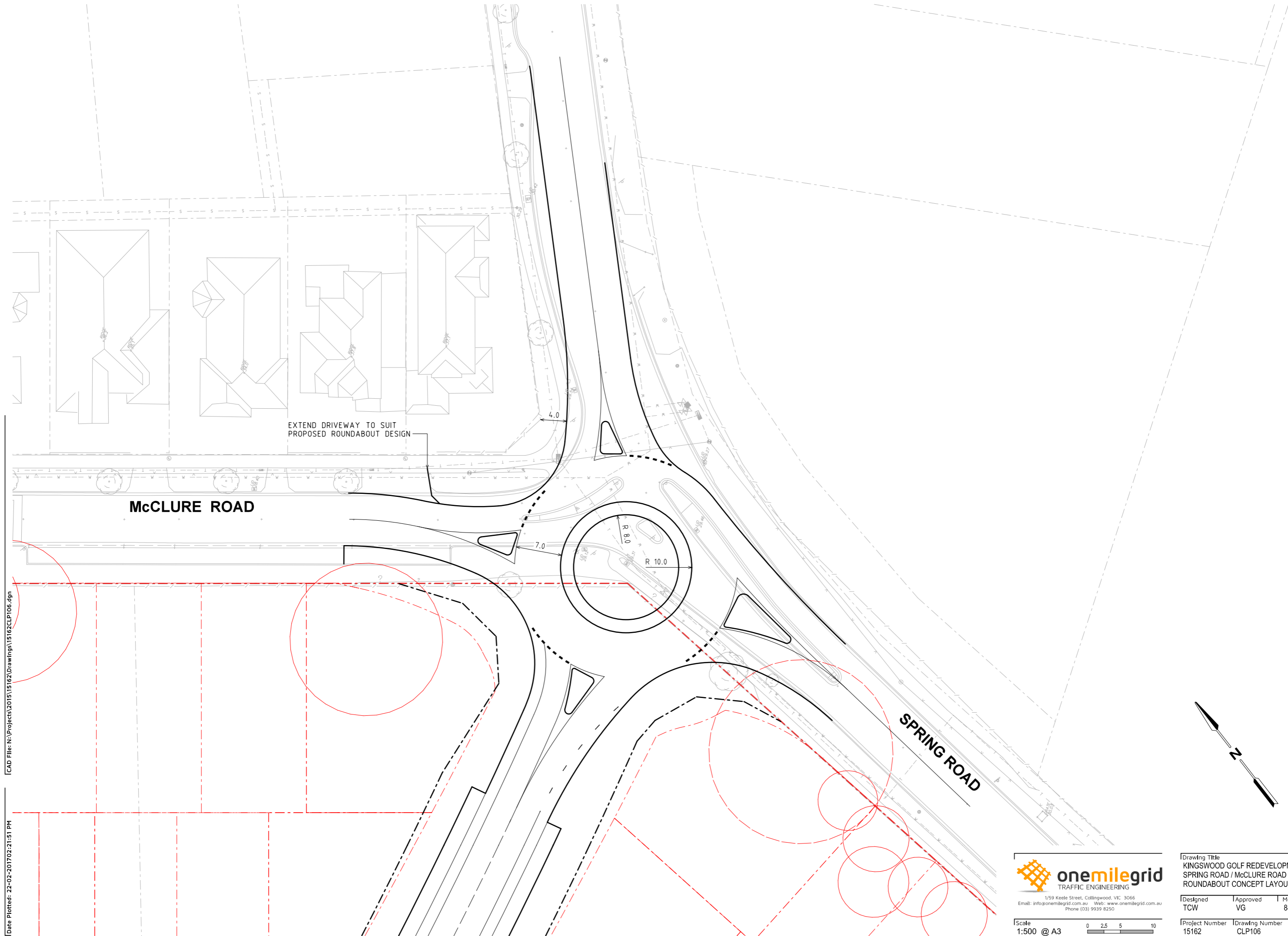
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KINGSWOOD GOLF REDEVELOPMENT
PROPOSED MAIN BOULEVARD
CONCEPT LAYOUT PLAN

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Designed TCW	Approved JD	Metway Ref 88 D4
Project Number 15162	Drawing Number CLP103	Revision C

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McCLURE ROAD

SPRING ROAD

EXTEND DRIVEWAY TO SUIT PROPOSED ROUNDABOUT DESIGN

4.0

7.0

R 8.0

R 10.0

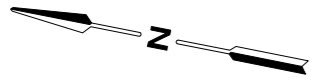
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Drawing Title
KINGSWOOD GOLF REDEVELOPMENT
SPRING ROAD / McCLURE ROAD
ROUNDABOUT CONCEPT LAYOUT PLAN

Designed	Approved	Metway Ref
TCW	VG	88 D4

Project Number	Drawing Number	Revision
15162	CLP106	A



TOTAL ROAD

CENTRE DANDENONG ROAD

OLD DANDEONG ROAD

CENTRE DANDENONG ROAD

KINGSTON DRIVE

19m SEMI TRAILER SWEEP PATH SHOWN DASHED
500mm CLEARANCE ENVELOPE SHOWN DOTTED

12.5m TRUCK SWEEP PATH SHOWN DASHED
500mm CLEARANCE ENVELOPE SHOWN DOTTED

12.5m TRUCK SWEEP PATH SHOWN DASHED
500mm CLEARANCE ENVELOPE SHOWN DOTTED

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Drawing Title KINGSWOOD GOLF REDEVELOPMENT CENTRE DANDENONG ROAD ROUNDABOUT CONCEPT LAYOUT PLAN		
Designed TCW	Approved JD	Metway Ref 88 D4
Project Number 15162	Drawing Number CLP105	Revision B