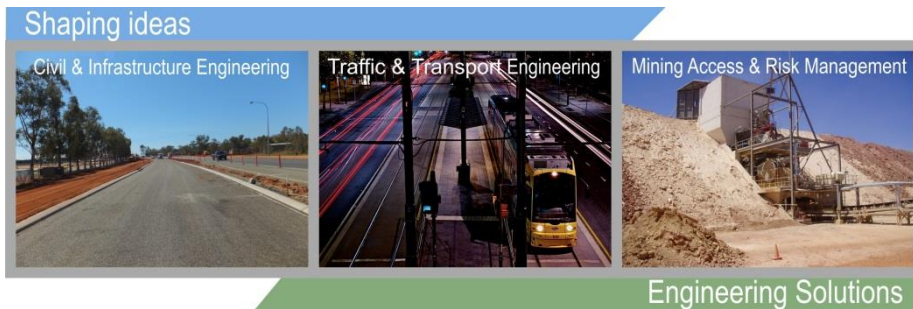





CONSULTING CIVIL & TRAFFIC ENGINEERS, RISK MANAGERS.



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Client: Rob Anson Architects

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## 1. Introduction

### 1.1. Proponent

Shawmac Pty Ltd has been commissioned by Rob Anson Architects on behalf of the developer to review the proposed development of the site located 1 Newmarket Parade, Butler in the City of Wanneroo.

### 1.2. Site Location and Land Use

The site is located as shown in **Figure 1** within the locality of Butler.



Figure 1 - Site Location

The existing site is a car park and children's playground used to service the Eden Beach Housing Estate display homes and land sales office. The existing site together with the surrounding area is shown on the aerial photograph on **Figure 2**.



Figure 2 - Local Context

### 1.3. Reference Information

In undertaking the study, the information listed below was referenced.

- MRWA Functional Hierarchy Criteria;
- Livable Neighborhoods Guidelines 2009;
- Austroads *Guide to Road Design, Part 4A*;
- Austroads *Guide to Traffic Management Part 3 - Traffic Studies and Analysis*.
- WAPC R-Codes
- Guide to Traffic Generating Developments Version 2.2, October 2002 – Roads and Traffic Authority, New South Wales; and
- Trip Generation 8th edition, 2008 - Institute of Transportation Engineers, Washington, USA.

## 2. Site Proposal

### 2.1. Regional Context

The site is located within the City of Wanneroo approximately 43km north of the Perth CBD and 16km north of the Joondalup Town Centre. It has direct street frontage to Marmion Avenue, Camborne Parkway and Newmarket Parade with carpark access from Newmarket Parade. **Figure 3** shows the site location in a regional context.

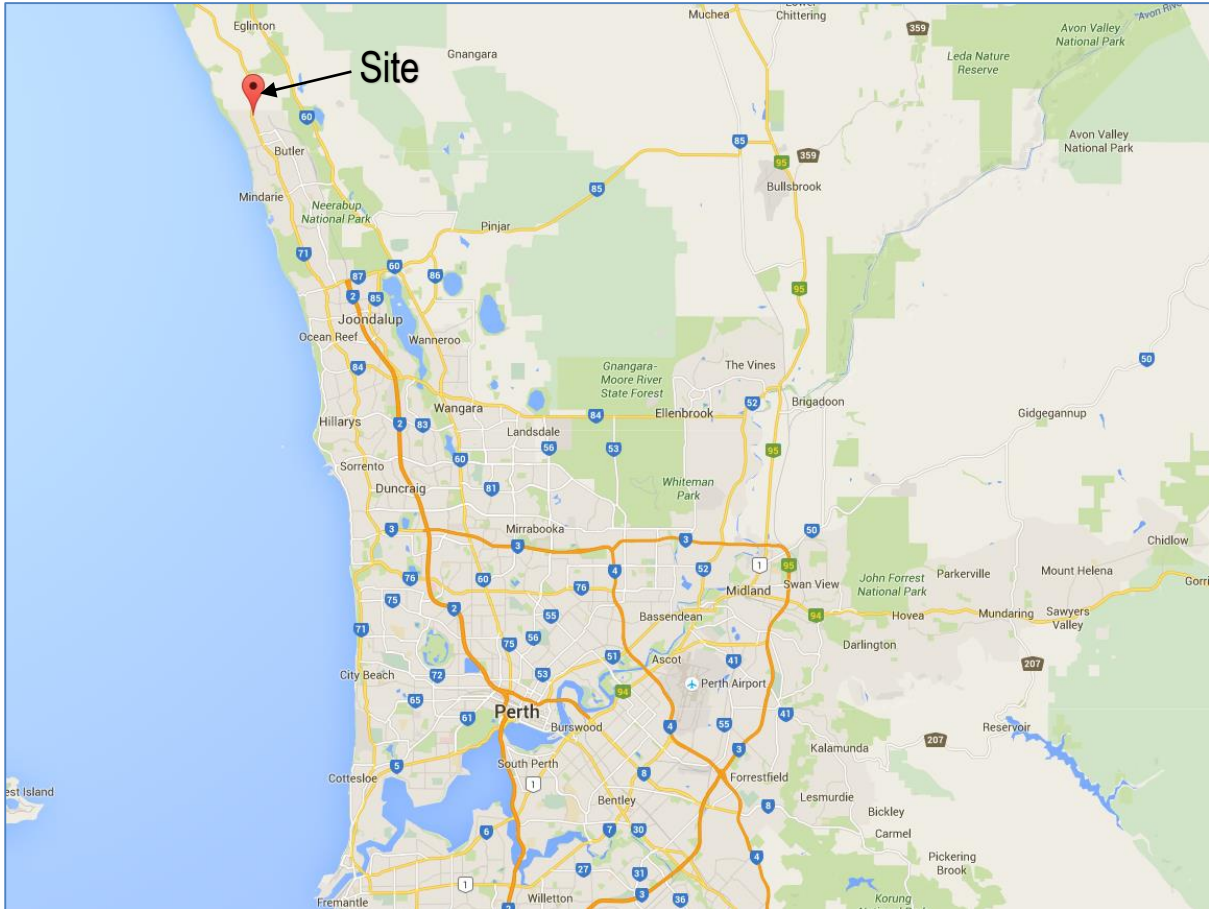


Figure 3 - Regional Context

### 2.2. Proposed Land Use

The application proposes redevelopment of the subject site. The subject site is zoned Urban Development in the City of Wanneroo *Town Planning Scheme No. 2 (TPS2)*. An extract of TPS 2 is shown in **Figure 4**.

The development proposal is for a three-storey multiple dwelling development consisting of 54 residential apartments on three levels with sheltered parking provided at ground level. The proposed land use is summarised in **Table 1** and an extract of the development site layout is shown in **Appendix A**.

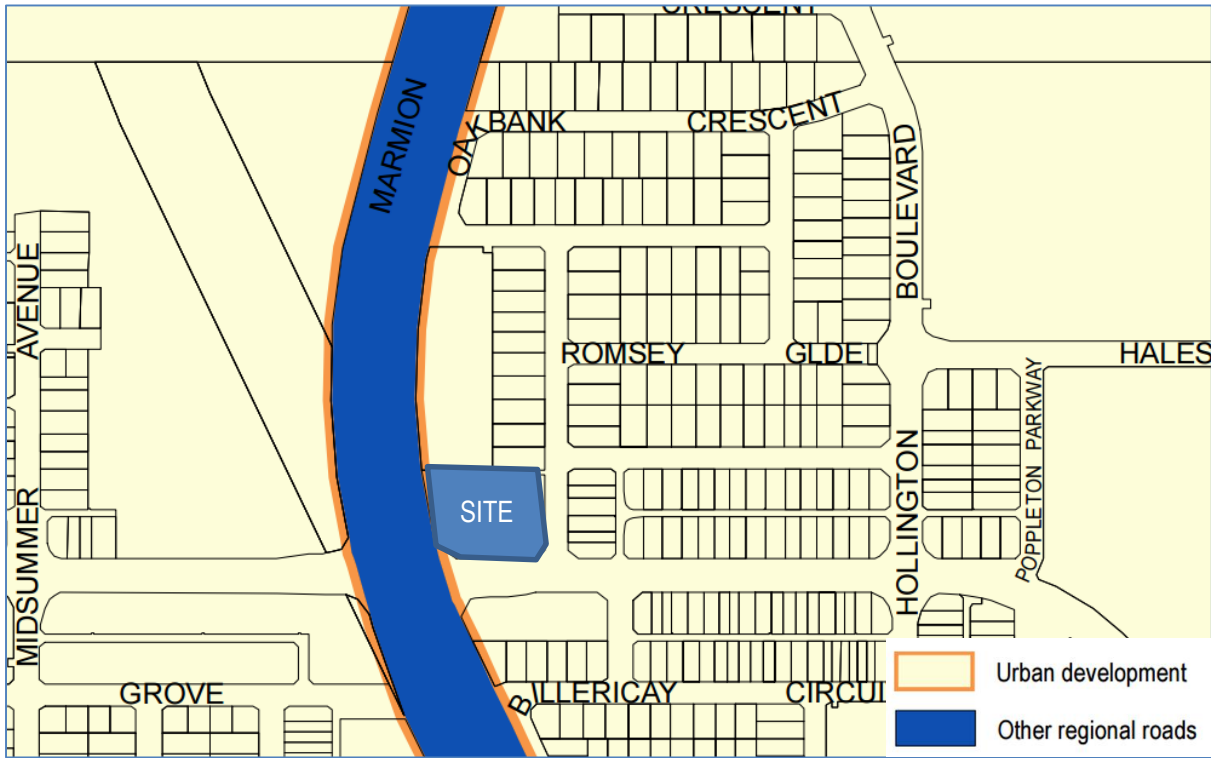


Figure 4 - Zoning

Table 1 - Proposed Development Quantum

Level	2x1	2x2	3x2	Parking Bays	Other
Ground	3	14	1	61 Resident Bays 9 Visitor Bays	17 Resident bicycle parking spaces 7 Visitor bicycle parking spaces Bin Storage
2 <sup>nd</sup>	3	14	1		
3 <sup>rd</sup>	3	10	5		
<b>Totals</b>	<b>9</b>	<b>38</b>	<b>7</b>	<b>70 Parking Bays</b>	<b>24 Bicycle Racks</b>

### 2.3. Major Attractors and Generators of Traffic

The main attractors and generators expected to influence traffic flows to and from the site include:

- Mitchell Freeway towards Perth CBD and other employment, educational and retail centres;
- Butler Town Centre and Train Station;
- Joondalup Town Centre and Edith Cowan University Joondalup Campus; and
- Eden Beach, Quinns Rock Beach and Yanchep Beach.

Figure 5 shows the desire lines to these various attractors and generators.



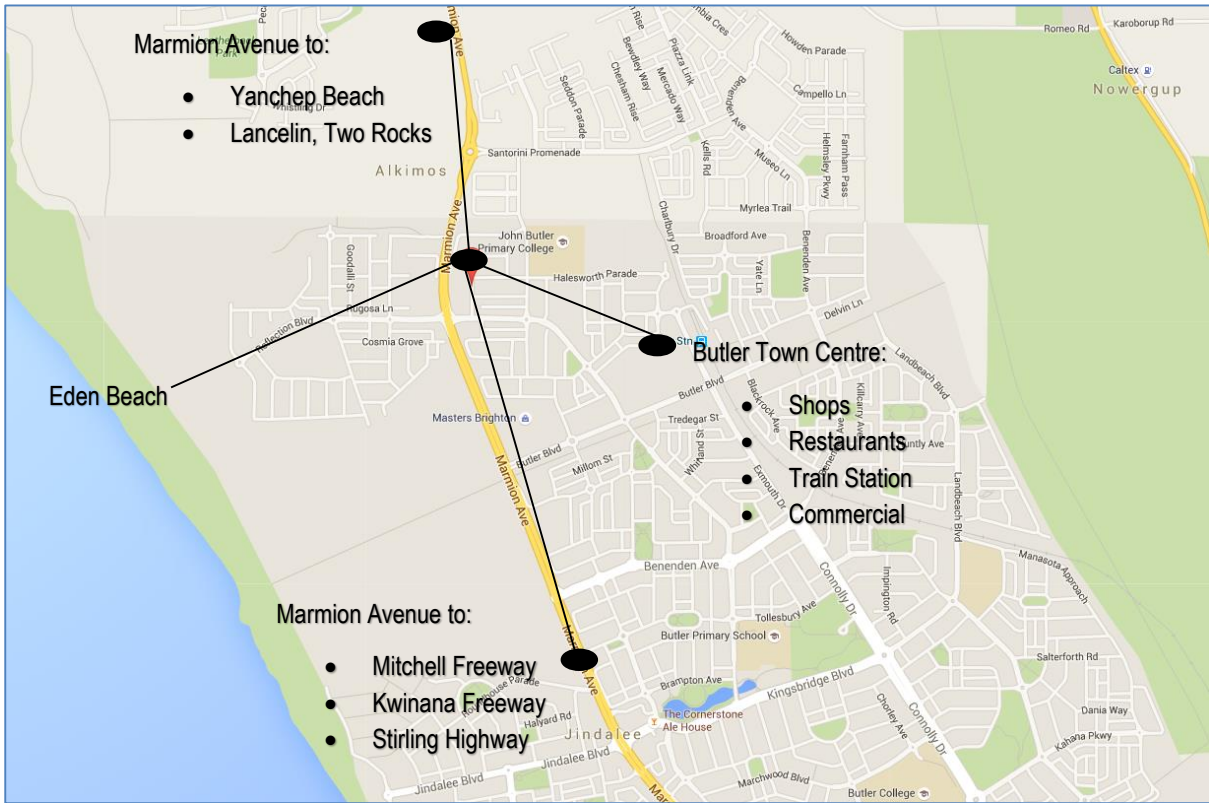


Figure 5 - Major Attractors and Generators



## 3. Existing Situation

---

### 3.1. Existing Roads

#### **Newmarket Parade**

As Newmarket Parade is a relatively newly constructed road, it has not yet been added to the MRWA Road Information Mapping. Based on the *Butler-Jindalee District Structure Plan No. 39 (DSP 39)* it is assumed that Newmarket Parade is an 'Access Road'. Adjacent to the site, Newmarket Parade has been constructed as a sealed single carriageway with two 3m wide traffic lanes and 4.5m wide verges. There are 1.5m wide concrete footpaths on both sides of the road and four paved parallel parking bays on the eastern side of the road. There are paved aprons one each terminating intersection along Newmarket Parade. No current traffic count data was available however traffic modelling for the *Butler-Jindalee DSP 39* the predicted ultimate traffic volumes for Newmarket Parade were 1142 vpd.

#### **Marmion Avenue**

Marmion Avenue is a 'Distributor A' under the MRWA Metropolitan Function Hierarchy and is owned and maintained by the City of Wanneroo. Adjacent to the site, Marmion Avenue is a dual-carriageway with a central median and on-road cycling paths. On the south-bound approach to a set of traffic signals with Camborne Parkway and Reflection Boulevard, Marmion Avenue has dedicated left and right-turning lanes and there is a 2.8m wide concrete path on the eastern side of the road. Traffic counts from the City of Wanneroo from June 2015 indicated that daily traffic volumes of 17,613 vpd south of Santorini Promenade.

#### **Camborne Parkway**

Camborne Parkway is a 'Local Distributor' under the MRWA Metropolitan Functional Hierarchy and is under the care and control of the City of Wanneroo. Adjacent to the site, Camborne Parkway is described as a sealed-divided carriageway road with a central median, two 3.5m wide traffic lanes and left and right-turning lanes at the signalised intersection with Marmion Avenue. There are on-road cycling lanes and concrete footpaths on both sides of the road. SCATS data for the intersection with Marmion Avenue indicate daily traffic volumes of 2,326 vehicles per day.

### 3.2. Road Hierarchy vs Actual Flows

**Figure 6** shows the road hierarchy of the roads surrounding the site as an extract from the *Road Information Mapping* tool available from the MRWA website. The newer developments to the east and west have not been added this tool and as such the road classification for Camborne Parkway and Newmarket Parade has been taken from the District Structure Plan for the area.

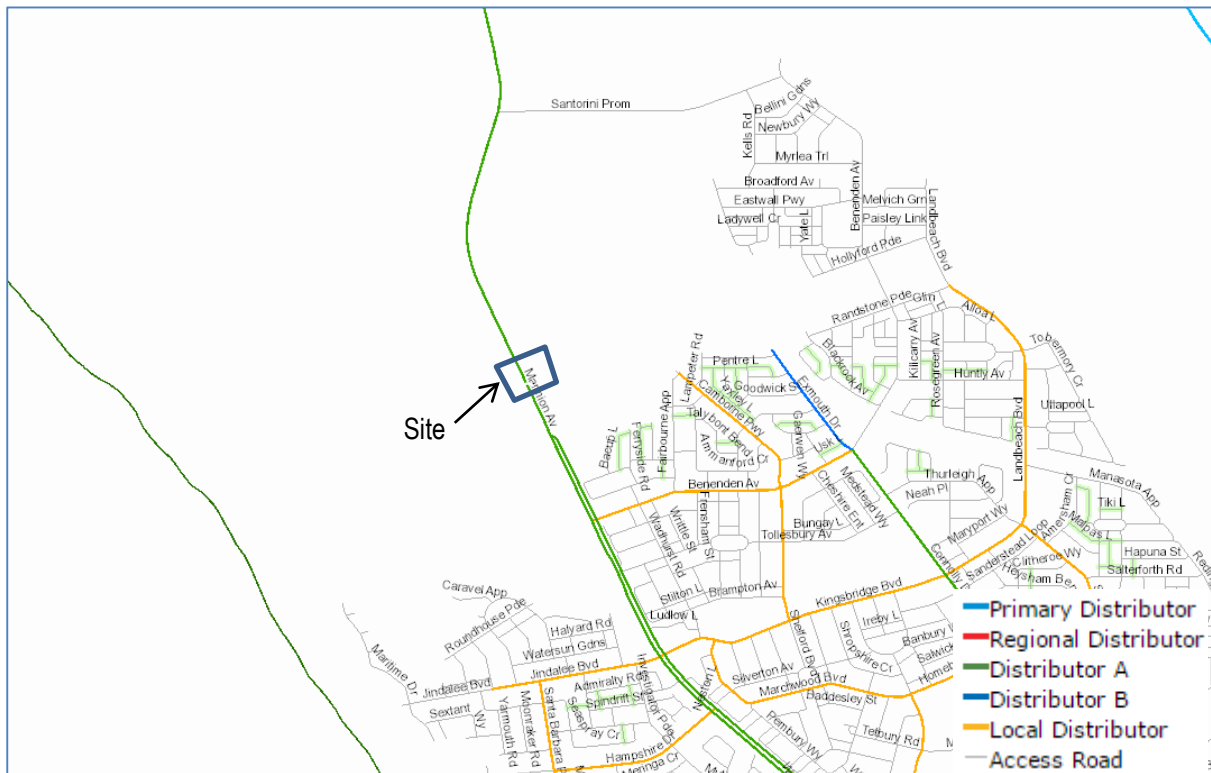


Figure 6 - Road Hierarchy

Table 2 details the comparison of current traffic volumes against the maximum desirable volumes provided within the MRWA Functional Hierarchy criteria / Liveable Neighbourhood Guidelines.

Table 2 - Road Classification and Indicative Maximum Traffic Volumes

Classification	Location of Count	Indicative Traffic Volume. (vpd)	Traffic Volume (vpd)	Source
Access Road	Newmarket Parade	3,000 vpd	1,142 vpd	Butler-Jindalee DSP 39 traffic forecasts
Distributor A	Marmion Avenue	> 8,000 vpd	17,613 vpd	City of Wanneroo (June 2015)
Local Distributor	Camborne Parkway	6,000 vpd	2,326 vpd	MRWA SCATS data

The table above indicates that Newmarket Parade, Marmion Avenue and Camborne Parkway are currently operating in accordance with each respective classification.

### 3.3. Changes to the Surrounding Network

New residential communities will continue to be released to the north and west of the subject site.

The Mitchell Freeway is currently being extended to Hester Avenue. The MRS has land provisions for the extension of the Mitchell Freeway and the railway up to Yanchep.



## 4. Transport Assessment

### 4.1. Assessment Years

The development is assessed on current network conditions.

### 4.2. Time Periods for Assessment

Assessment is based on both daily traffic and peak hour periods.

### 4.3. Development Generation and Distribution

In order to estimate the impact of traffic generated by the proposed development, the Road and Traffic Authority (RTA), NSW “Guide to Traffic Generating Developments” was referred to. Generation based on these reference documents are shown on **Tables 3 and 4**.

Table 3 - Predicted Daily Trip Generation

Land use	Generation Rate			Unit	Quantum	Estimated Generation			Source
	ADT	AM Peak	PM Peak			ADT	AM Peak	PM Peak	
Residential dwelling - Medium density residential flat building (1-2BR).	4.50	0.45	0.45	Units	47	212	21	21	RTA Guide.
Residential dwelling - Medium density flat building (>2BR).	6.00	0.60	0.60	Units	7	42	4	4	RTA Guide.
<b>Total</b>						<b>254</b>	<b>25</b>	<b>25</b>	

Table 4 - Predicted Peak Hour Movements

Land use	Peak Distribution			
	AM Peak In	AM Peak Out	PM Peak In	PM Peak Out
Residential dwelling - Medium density residential flat building (1-2BR).	8	13	13	8
Residential dwelling - Medium density flat building (>2BR).	2	2	2	2
<b>Total</b>	<b>10</b>	<b>15</b>	<b>15</b>	<b>10</b>

It is estimated that the proposed development has the potential to generate approximately 254 vehicle trips per day or approximately 25 vehicles in the morning and afternoon peak hour periods.

#### 4.4. External Roads

Predicted flows on the adjacent road is show in Table 5.

Table 5: Predicted Mid Block Traffic

Location	Daily	AM Peak	PM Peak
Newmarket Parade	1,142	114	114
Development Traffic	254	25	25
<b>TOTAL</b>	<b>1,396</b>	<b>139</b>	<b>139</b>

Traffic volumes are within the indicative volumes for the relative road classifications and no adverse or unacceptable impacts are predicted.

Based on the major desire lines and the road network configuration, a distribution for traffic on Camborne Parkway and Marmion Avenue was assumed as follows:

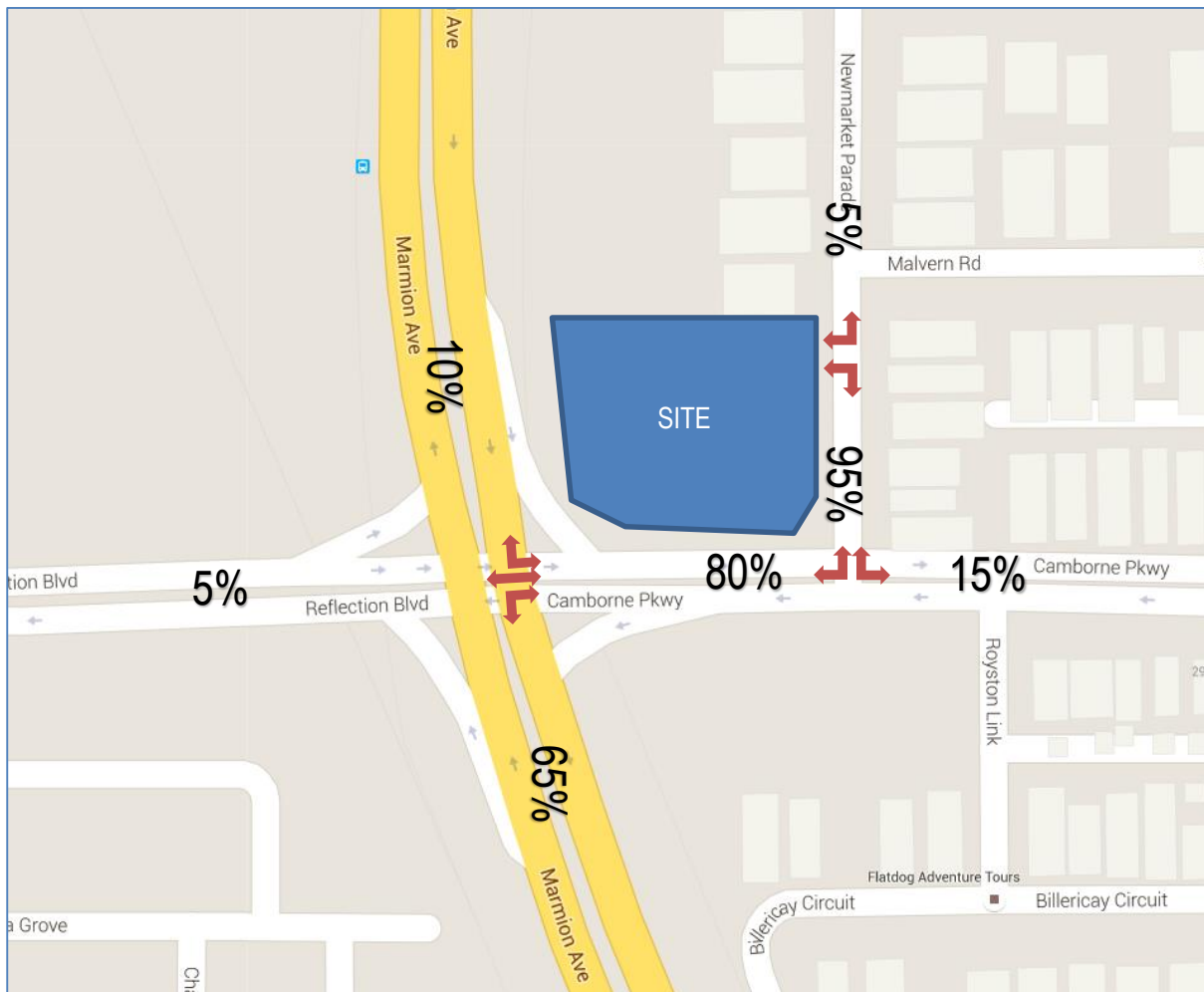




Table 6: Predicted External Traffic

Location	Existing Volumes			Predicted Volumes		
	Daily	AM Peak	PM Peak	Daily	AM Peak	PM Peak
Marmion Avenue (North of Camborne)	17,613	1,276	1,490	17,638	1,301	1,515
Marmion Avenue (South of Camborne)	17,613	1,276	1,490	17,778	1,292	1,506
Camborne Parkway (West of Newmarket)	2326	242	162	2529	262	182
Camborne Parkway (East of Newmarket)	2326	242	162	2364	246	166
Reflection Boulevard	2,699	166	180	2,712	167	181

The additional traffic as a result of the proposed development would account for a less than 13% increase on all external roads and therefore are not expected to have any adverse effects.

#### 4.5. Impact on Intersections

Warrants for analysis for intersections as shown in Table 6.1 of Austroads Guide Traffic Management Part 3, Traffic Studies and Analysis as shown in Table 7 below were applied and determined that analysis was not required.

Table 7 - Analysis Warrants

Intersection	Hourly volume major road	Hourly volume minor road	Comment.
Warrants as per Table 6.1 of Austroads Guide to Traffic Management Part 3, Traffic Studies and Analysis - Two Lane Major Road Cross Road	400 vph 500 vph 650 vph	250 vph 200 vph 100 vph	Table details flows that initiate intersection analysis. As major flows increase, there is reduced capacity to accept minor flows.
<b>Camborne Parkway - Newmarket Parade (Southbound)</b>	<b>242</b>	<b>&lt;100</b>	<b>3 way intersection – Analysis not required.</b>
<b>Newmarket Parade - Site Access</b>	<b>139</b>	<b>&lt;100</b>	<b>3 way intersection – Analysis not required.</b>

## 5. Pedestrian and Cycle Networks

An extract of the Perth Bicycle Network Maps - Joondalup and Stirling is shown in **Figure 7**. This document has not been updated since November 2013 and hence does not show the cycling facilities adjacent to the site. There are bicycle lanes on both sides of Marmion Avenue and Camborne Parkway which connect to the PSP alongside the train line.

There are concrete paths on all roads surrounding the site and signalised pedestrian crossing is also facilitated at the intersection of Marmion Avenue/ Camborne Parkway / Reflection Boulevard.

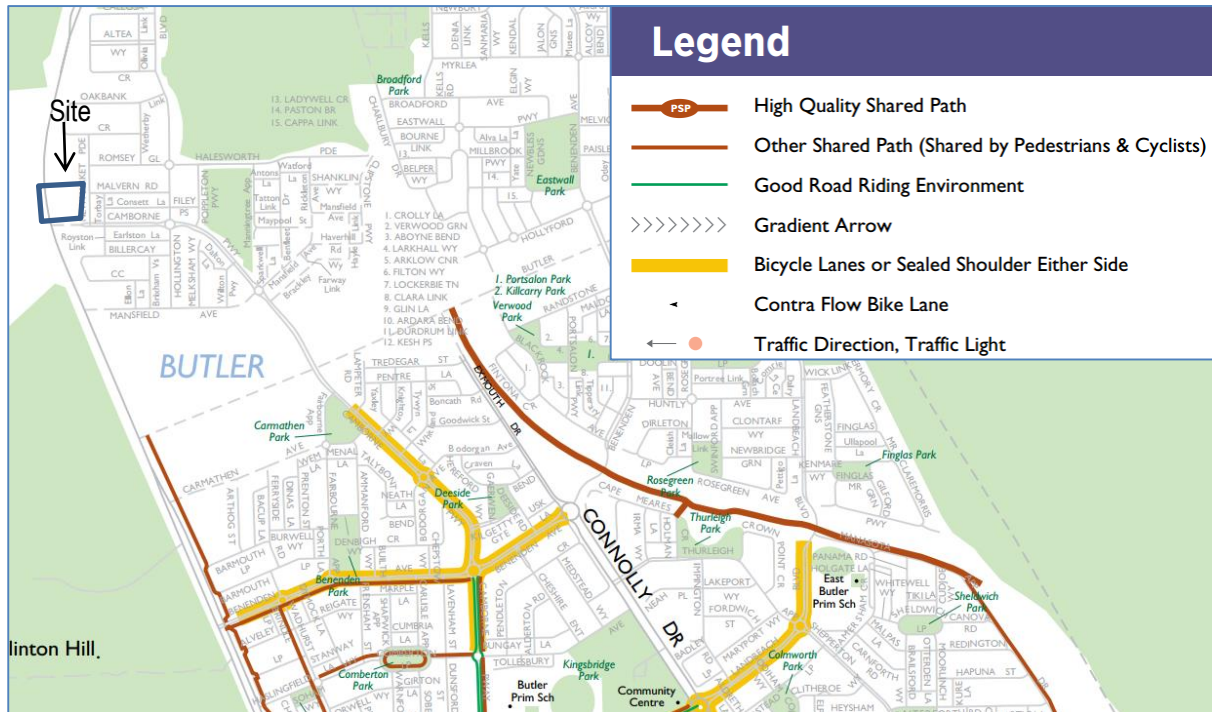


Figure 7 - Cyclist Facilities

## 6. Public Transport

Comprehensive public transport services are provided by bus and train services as shown on **Figure 8**. The nearest bus stops on Marmion Avenue are approximately 260m from subject site and service bus routes 490 and 491 which operate from Yanchep and Two Rocks to Butler Train Station. The nearest bus stop on Camborne Parkway is approximately 400m from the subject site and services bus route 483 which operates between Butler and Clarkson Train Station.

The Butler Train Station is approximately 1.2km from the site and operates frequent services to and from the Perth CBD providing a connection to the greater metropolitan area.

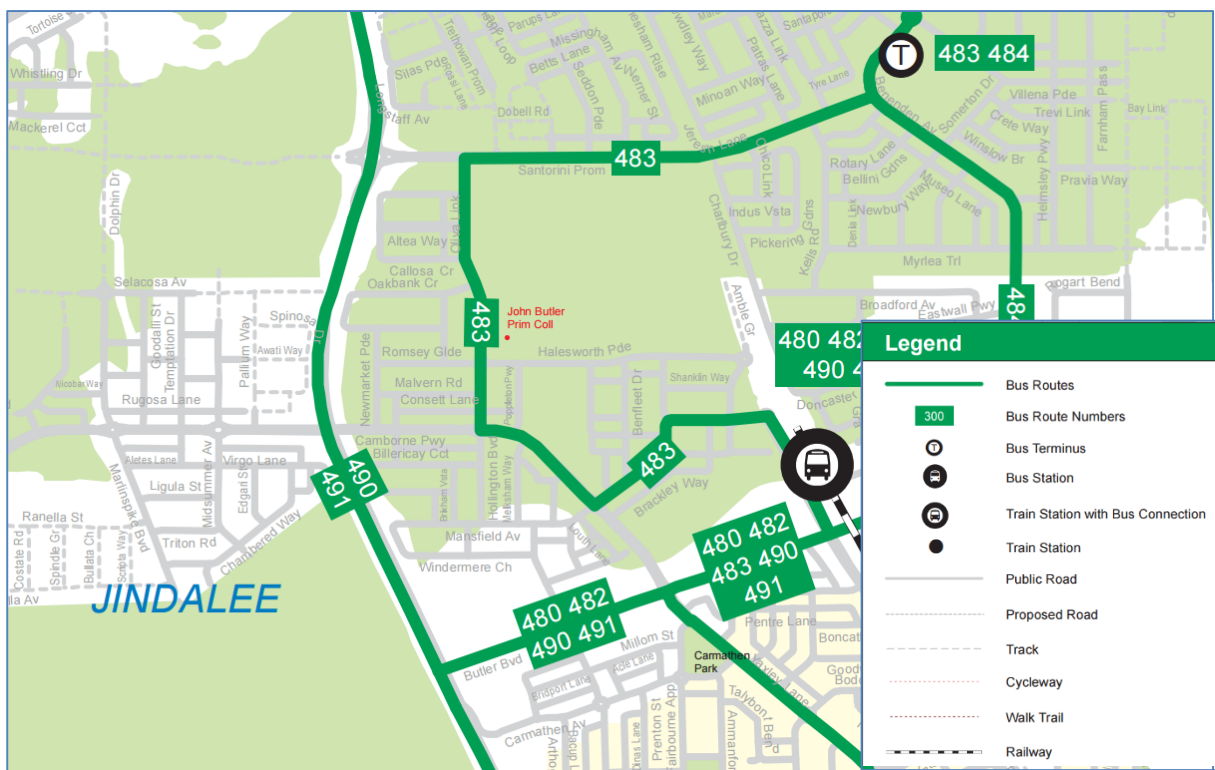


Figure 8 - Public Transport Facilities





## 7. Site Access and Parking

### 7.1. Parking.

Car parking is proposed to be located on the ground floor with access from Newmarket Parade. The City of Wanneroo TPS 2 references the WAPC R-Codes for the parking requirements for residential developments.

As the proposed development is within 250m of a high-frequency bus route the reduced parking rates can be adopted as shown in the table below.

Table 8 - Parking Requirements and Provisions

Type of Dwelling	Car Parking Spaces	Number of Dwellings	Required Bays	Supplied Bays
2+ bedroom dwelling	1 per dwelling	54	54	61
Visitor Bays	1 per 4 dwellings	54	14	9 + 4 verge
<b>TOTAL</b>			68	70 + 4 verge

The proposed on site parking is 70 bays with 61 bays allocated to dwellings and 9 bays for visitors. The development also proposes 4 parallel parking bays to be constructed on the council verge, adjacent to the site. Together with the existing four parallel parking bays on the eastern side of Newmarket Parade, a total visitor parking provision of 17 bays will be available for the site.

The site is classed as a 1A parking facility (residential, domestic and employee parking) and comparison of the required dimensions versus the bay dimensions assessed from the drawing are summarised on Table 9.

Table 9 - Parking Bay Dimensions

Bay details.	Bay dimension required.	Bay dimension provided.	
Ninety degree bays	5.4 x 2.4 x 5.8 aisles.	5.4 x 2.4 x 6m aisles.	Complies.

Bay dimensions and parking area layout complies with the requirements of AS 2890.1 – Parking Facilities: Off Street Car Parking.

The parking bays at the end of blind aisles have been provided with the extra clearance compliant with the requirements of AS2890.1. The car park has a secure sliding gate with 7 of the visitor bays outside the compound. As the parking facility prevents public access, it is therefore not subject to the restrictions applying to the number of bays for a blind aisle as listed as six 90 degree bays for a public car park under AS2890.1

For parking near obstacles, Figure 5.2 from AS2890.1:2004, shown below as **Figure 9** provides dimensions for clear zones to be provided around a parked car. This is relevant when columns or walls occur near the sides of the bays.

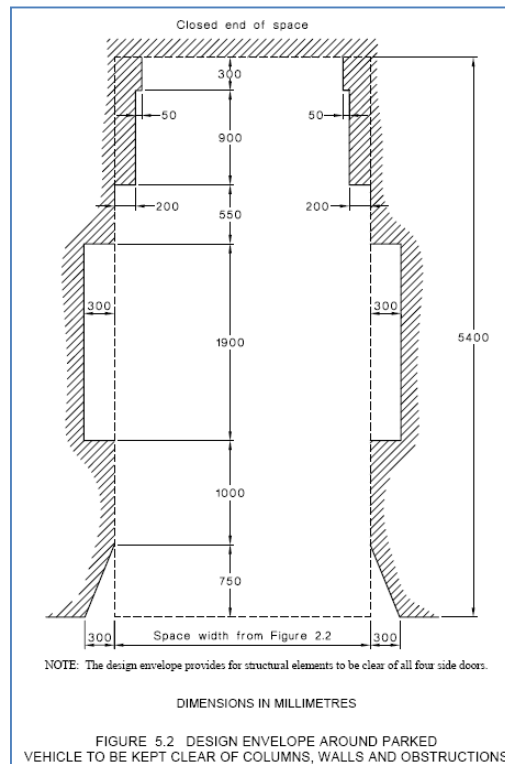


Figure 9 - AS 2890 Figure 5.2 Extract

Parking bays near solid walls or obstructions are outside the area influenced by front car doors and bay dimensions are considered to be adequate.

Access to the carpark incorporates a new 6m wide crossover to council specifications.

The R-Codes require one bicycle space for each three dwellings and one bicycle space for each ten dwellings for visitors, to be designed in accordance to AS2890.3. For 54 dwellings, a minimum of 18 resident and 6 visitor bicycle parking spaces are required. 17 bicycle racks are provided within the gated parking area, and 7 bicycle racks are provided near the footpath entry to the complex. The total on site bicycle parking is 24 bays which is equal to the R-code requirement.

## 8. Access Movements

Access to and from the development is proposed via a 6 metre wide crossover to Newmarket Parade. Australian Standard AS2890.1:2004 Parking Facilities Part 1 Off-Street Parking Facilities recommends the maximum crossover gradients to be 1 in 20 as specified in Section 3.3(a) - shown as **Figure 10**.

### 3.3 GRADIENTS OF ACCESS DRIVEWAYS

At entry and exit points, the access driveway should be graded to minimize problems associated with crossing the footpath and entering the traffic in the frontage road.

Maximum gradients on and near access driveways, other than at domestic properties (see Clause 2.6), shall be as follows:

- (a) *Property line/building alignment/pedestrian path*—max. 1 in 20 (5%) between edge of frontage road and the property line, building alignment or pedestrian path (except as provided in Item (d)), and for at least the first 6 m into the car park (except as provided below).

The grade of the first 6 m into the car park may be increased to 1 in 8 (12.5%) under the following conditions:

- (i) The grade is a downgrade for traffic leaving the property and entering the frontage road.
- (ii) The user class is Class 1, 1A or 2 only.
- (iii) The maximum car park size is—
  - (1) for entry into an arterial road—25 car spaces, or
  - (2) for entry onto a local road—100 car spaces.

The maximum grade across the property line shall remain at 1 in 20 (5%).

Figure 10 - AS2890.1 clause 3.3a - Gradients of Access Driveways

### 8.1. Service Vehicles

The bin store is located on the eastern side of the property on the northern side of the driveway. Rubbish bins will be collected by a private contractor.



## 9. Conclusion

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Based on the assessment of traffic generation it is predicted that there will be no unacceptable impact on the adjacent road segments.

With respect to the development, the following is concluded;

- Under the current development scenario, the theoretical generation from the site is an additional 254 vehicles per day with the additional predicted peak AM movements as 25 vph and PM movements as 25vph;
- The location of the proposed access and egress are considered appropriate and are expected to operate safely;
- Based on the expected usage pattern it is considered that the proposed parking is adequate to service the land use;
- The proposed bicycle parking on-site is compliant with the requirements of the R-codes;
- Internal parking areas cater for all expected classes of vehicles; and
- Parking Bays are in accordance with AS2890.



## Appendix A - Site Plan

---













Appendix B - Traffic Counts

**Weekly Vehicle Counts (Virtual Week)**

**VirtWeeklyVehicle-56**

Site: T02532--M16--.ONS  
 Description: **MARMION AVE SOUTH OF SANTORINI PROMENADE JINDALEE <80>**  
 Filter time: **14:00 Tuesday, 9 June 2015 => 12:00 Wednesday, 17 June 2015**  
 Scheme: Vehicle classification (AustRoads94)  
 Filter: CIs(1 2 3 4 5 6 7 8 9 10 11 12 ) Dir(NESW) Sp(10,160) Headway(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
								1 - 5	1 - 7
<b>Hour</b>									
0000-0100	38.0	35.0	50.5	60.0	58.0	139.0	137.0	48.7	71.0
0100-0200	26.0	26.0	18.5	41.0	35.0	68.0	101.0	27.5	41.8
0200-0300	18.0	22.0	20.5	26.0	29.0	36.0	61.0	22.7	29.1
0300-0400	39.0	61.0	42.0	45.0	39.0	44.0	36.0	44.7	43.5
0400-0500	134.0	164.0	150.5	159.0	138.0	74.0	45.0	149.3	126.9
0500-0600	559.0	581.0	563.0	608.0	579.0	186.0	76.0	575.5	464.4
0600-0700	1237.0	1235.0	1228.0	1203.0	1194.0	481.0	189.0	1220.8	999.4
0700-0800	<b>1285.0&lt;</b>	<b>1268.0&lt;</b>	<b>1288.0&lt;</b>	1257.0	1272.0	591.0	363.0	<b>1276.3&lt;</b>	1076.5
0800-0900	1254.0	1219.0	1235.5	<b>1289.0&lt;</b>	<b>1381.0&lt;</b>	869.0	479.0	1269.0	<b>1120.3&lt;</b>
0900-1000	999.0	925.0	1080.0	990.0	980.0	1046.0	827.0	1009.0	990.9
1000-1100	992.0	1058.0	990.5	1040.0	1013.0	1262.0	1170.0	1014.0	1064.5
1100-1200	982.0	1025.0	927.0	1090.0	1067.0	<b>1336.0&lt;</b>	<b>1376.0&lt;</b>	1003.0	1091.3
1200-1300	1033.0	1020.0	1104.0	1072.0	1087.0	<b>1339.0&lt;</b>	1421.0	1063.2	1153.7
1300-1400	972.0	1018.0	1028.0	1013.0	1038.0	1272.0	<b>1486.0&lt;</b>	1013.8	1118.1
1400-1500	1267.0	1205.0	1252.0	1313.0	1184.0	1278.0	1391.0	1237.7	1261.9
1500-1600	<b>1482.0&lt;</b>	<b>1523.5&lt;</b>	<b>1488.0&lt;</b>	<b>1457.0&lt;</b>	<b>1466.0&lt;</b>	1242.0	1332.0	<b>1490.0&lt;</b>	<b>1439.3&lt;</b>
1600-1700	1323.0	1389.0	1432.0	1404.0	1230.0	1137.0	1259.0	1361.2	1320.4
1700-1800	1208.0	1260.5	1283.0	1235.0	1327.0	1190.0	1026.0	1262.3	1223.8
1800-1900	806.0	969.5	963.0	982.0	1079.0	849.0	631.0	961.5	906.1
1900-2000	487.0	537.0	563.0	614.0	635.0	571.0	406.0	562.2	543.8
2000-2100	341.0	403.5	417.0	465.0	443.0	374.0	291.0	412.2	392.3
2100-2200	237.0	283.0	334.0	342.0	396.0	376.0	215.0	312.5	308.3
2200-2300	127.0	156.0	153.0	172.0	287.0	266.0	124.0	175.2	180.1
2300-2400	63.0	87.0	82.0	91.0	196.0	224.0	63.0	101.0	111.6
<b>Totals</b>									
0700-1900	13603.0	13880.5	14071.0	14142.0	14124.0	13411.0	12761.0	13961.0	13766.6
0600-2200	15905.0	16339.0	16613.0	16766.0	16792.0	15213.0	13862.0	16468.7	16010.2
0600-0000	16095.0	16582.0	16848.0	17029.0	17275.0	15703.0	14049.0	16744.8	16302.0
0000-0000	16909.0	17471.0	17693.0	17968.0	18153.0	16250.0	14505.0	17613.2	17078.6
<b>AM Peak</b>	0700	0700	0700	0800	0800	1100	1100		
	1285.0	1268.0	1288.0	1289.0	1381.0	1336.0	1376.0		
<b>PM Peak</b>	1500	1500	1500	1500	1500	1200	1300		
	1482.0	1523.5	1488.0	1457.0	1466.0	1339.0	1486.0		

\* - No data.