

LOT 800 Crabtree Street

Transport Impact Statement

CW1006300



Prepared for
Department of Communities and Housing

30 August 2017


Contact Information

Cardno (WA) Pty Ltd
Trading as Cardno
ABN 77 009 119 000

11 Harvest Terrace, West Perth WA 6005

Telephone: 08 9273 3888
Facsimile: 08 9486 8664
International: +61 8 9273 3888

wa@cardno.com.au
www.cardno.com

Author(s): 
Edmond Hoang
Traffic Engineer

Approved By: 
Daniel Jenkins
Senior Traffic Engineer

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Table of Contents

1	Introduction	1
1.1	Background	1
1.2	Existing Site	1
1.3	Site Visit	3
1.4	Consultation with the Authorities	3
1.5	Existing Road Network	3
1.6	Existing Traffic Volumes	4
1.7	Existing Intersection Operation	4
2	Proposed Development	7
2.1	Development Details	7
2.2	Car Parking Provision	7
2.3	Bicycle Parking Provision	7
2.4	Access Arrangements	7
2.5	Development Traffic Generation	7
2.6	Development Traffic Distribution	7
2.7	Vehicle Access	8
2.8	Provision for Service Vehicles	8
2.9	Intersection Operation	8
3	Proposed Parking	10
3.1	Parking Requirements	10
3.2	Bicycle Parking Requirements	10
4	Pedestrian / Cycle Networks	12
4.1	Existing Pedestrian/Cycle Networks and Facilities	12
4.2	Proposed Pedestrian/Cycle Networks and Facilities	13
5	Public Transport Services	14
5.1	Existing Public Transport Facilities	14
5.2	Future Public Transport Facilities	15
6	Site Specific Issues	16
6.1	Accident Data	16
6.2	Other Site-Specific Issues	16
7	Summary	19

Appendices

Appendix A	Site Plan
Appendix B	WAPC Checklist
Appendix C	SIDRA Output
Appendix D	Other Site Specific Issues

Tables

Table 1-1	Existing Traffic Volumes – Monday to Friday averages	4
Table 1-2	Crabtree Street/La Salle Road Intersection Performance - 2017 Existing	6

Table 2-1	Development Traffic Generation – Peak Hours of the Development	7
Table 2-2	Crabtree Street/La Salle Road Intersection Performance - 2017 Existing + Development	9
Table 3-1	R-codes Parking Requirements	10
Table 3-2	Site Parking Provision and Requirements	10
Table 3-3	City Bicycle Parking Requirements	11
Table 3-4	Site Bicycle Parking Provision and Requirements	11
Table 5-1	Bus Route Frequency	15
Table 6-1	Crash Statistics on midblock of Crabtree Street	16
Table 6-2	Crash Statistics on midblock of La Salle Road	16
Table 6-3	Crash Statistics on Crabtree Street/ La Salle Road intersection	16
Table 6-4	Residents' Traffic-related Objections; and Responses	17

Figures

Figure 1-1	Site Location	1
Figure 1-2	Close up Image of the Site	2
Figure 1-3	Zoning Map	3
Figure 1-4	Crabtree Street/ La Salle Road Intersection Layout (Nearmap ariel view and SIDRA Layout)	5
Figure 1-5	Existing Traffic Distribution	6
Figure 2-1	Vehicle Access and Facilities Location	8
Figure 2-2	Existing + Development Traffic Distribution	9
Figure 4-1	Cycling Map	12
Figure 5-1	Surrounding Public Transport Network	14

1 Introduction

1.1 Background

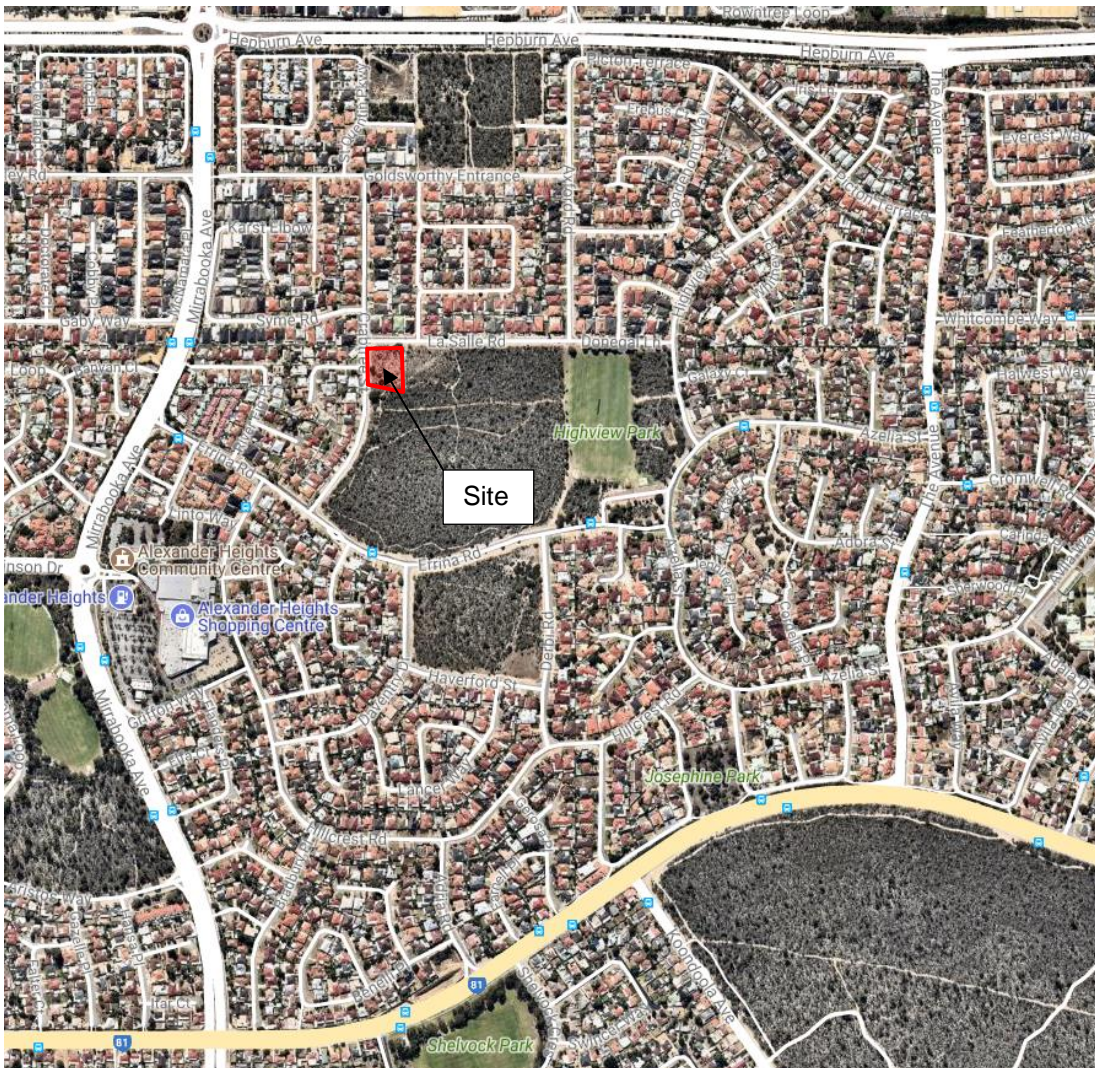
Cardno was commissioned by the Department of Communities and Housing (the Client) to prepare a Transport Impact Statement (TIS) as part of a re-zoning application for the proposed residential apartment building (29 units). The development site (the Site) is located at Lot 800 Crabtree Street, Alexander Heights, City of Wanneroo.

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) “*Transport Impact Assessment Guidelines: Volume 2 – Planning Schemes, Structure Plans & Activity Centre Plans*” (2016) and the checklist is included at **Appendix B**.

1.2 Existing Site

The Site is located at Lot 800 Crabtree Street, in the City of Wanneroo. **Figure 1-1** shows the location of the Site.

Figure 1-1 Site Location



Source: Nearmap (2017)

The existing Site comprises bushland. A close up image of the existing site is shown in **Figure 1-2**.

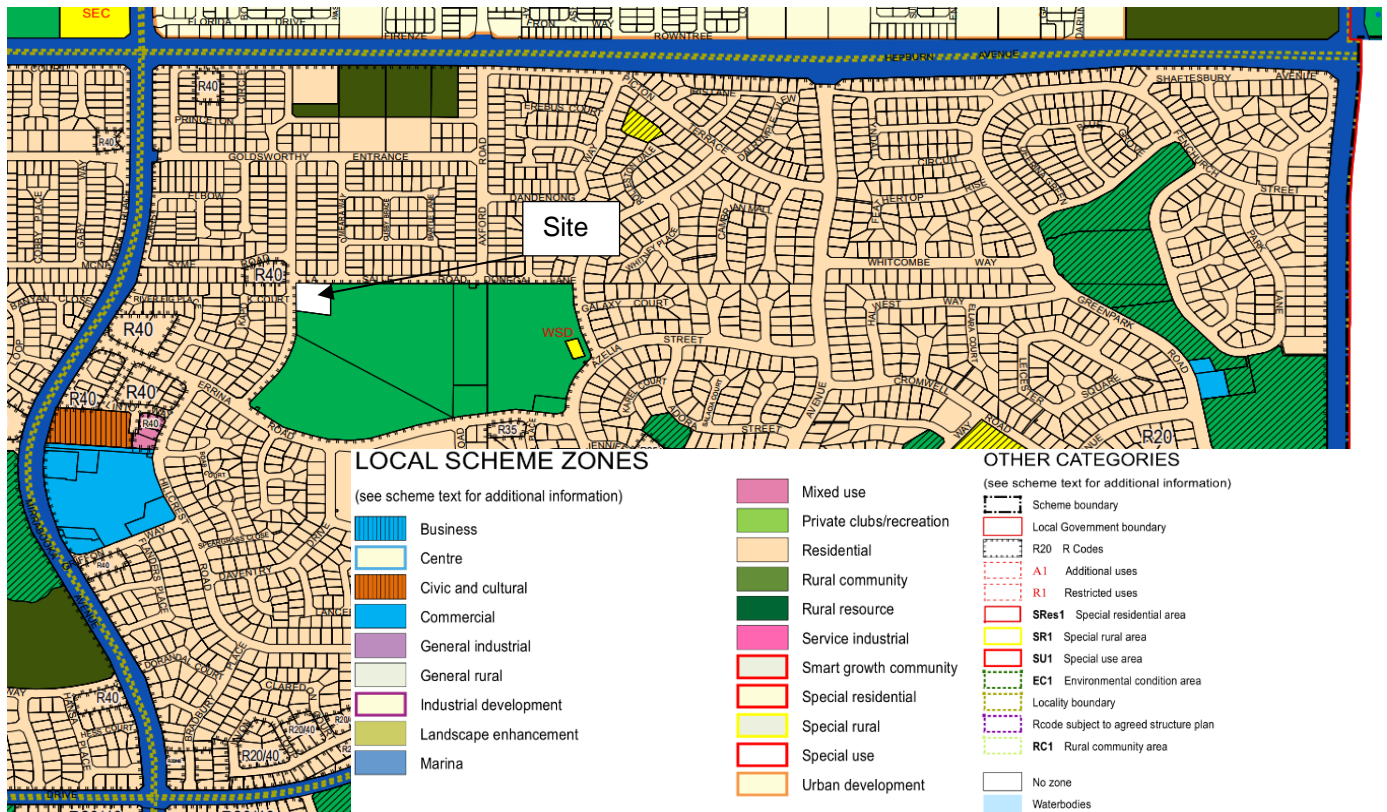
Figure 1-2 Close up Image of the Site



Source: Nearmap (2017)

In the City of Wanneroo Town Planning Scheme No.2, the Site is zoned as “No Zone”. Other areas surrounding the Site are zoned as “Residential” and “Rural Resources”. This is shown in **Figure 1-3** below.

Figure 1-3 Zoning Map



Source: City of Wanneroo Town Planning Scheme No.2 (last amendment in May 2017)

1.3 Site Visit

An on-site traffic survey was undertaken by Cardno on 21 August 2017 (Monday) during the AM peak period between 8:00am and 9:00am. During the survey period, no queues were observed at the Crabtree Street/La Salle Road intersection.

Another site visit was also conducted on 10 August 2017, to make general observations of the road environment.

1.4 Consultation with the Authorities

The City, Main Roads WA and the Public Transport Authority were all consulted for a scoping opinion before competing this TIS.

No specific transport or traffic concerns were raised.

1.5 Existing Road Network

The Site is bounded by Crabtree Street to the west and La Salle Road to the North. The eastern and southern edges are bounded by bushland, which is zoned as “Parks and Recreation” in the Region Scheme.

Crabtree Street is located along the western boundary of the Site. Crabtree Street is a two-way undivided carriageway with an approximate kerb-to-kerb width of 7.2m. Crabtree Street is defined as an Access Road under the road hierarchy of Main Roads WA and has a posted speed limit of 50km/h. A footpath is provided on the eastern side of the road (approximately 1.2m width).

La Salle Road is located along the northern boundary of the Site. La Salle Road is a two-way undivided carriageway with an approximate kerb-to-kerb width of 7.2m. Crabtree Street is defined as an Access Road under the road hierarchy of Main Roads WA and has a posted speed limit of 50km/h. A footpath is provided on the northern side of the road (approximately 2m width).

Intersection of La Salle Road and Crabtree Street: this intersection, immediately adjacent to the north-west corner of the Site, is a simple priority intersection in which La Salle Road gives way to Crabtree Street. While there are no Give-way markings or signage, the geometry clearly indicates the priority assigned to Crabtree Street. There is also a threshold treatment over the end of La Salle Road, comprising flush brick paving of a different colour to the road surface, thus further emphasising the priority and encouraging slower speeds. Dropped kerbs from the footpaths direct pedestrians to cross the road at this threshold treatment.

1.6 Existing Traffic Volumes

Existing traffic volumes for Crabtree Street and La Salle Road were provided by the City of Wanneroo in the form of Metrocount data. The Monday to Friday average traffic volumes are summarised in **Table 1-1**.

Table 1-1 Existing Traffic Volumes – Monday to Friday averages

Road Name	Year	AM Peak Traffic Volumes	PM Peak Traffic Volumes	Daily Traffic Volumes
Crabtree Street (north of Syme Road)	2016	104	123	1,300
La Salle Road (East of Truscott Elbow)	2016	72	86	927

Source: Metrocount data from the City of Wanneroo

1.7 Existing Intersection Operation

An analysis of the existing intersection operation was conducted using SIDRA v7.0 for the Crabtree Street/La Salle Road intersection. The Nearmap aerial view and the SIDRA intersection layout is shown in **Figure 1-4**. The peak hours for the existing road network are as follows (based on the Metrocount traffic data):

- > AM Peak: 8am to 9am; and
- > PM Peak: 3pm to 4pm.

An on-site traffic survey was undertaken by Cardno on 21 August 2017 during the AM peak period to determine turning volumes at the intersection. For the PM peak period, the follow methodology was used to estimate the PM traffic turning volumes:

- > For the purpose of this assessment, it is assumed that the proportion of turning movements during the PM period will be the same as the AM peak period. While this assumption may have its limitations, the volumes are so low that the actual directional split will have little impact on the operation of the links or the intersection of La Salle Road / Crabtree Street.
- > A calibration factor was determined by comparing the AM and PM peak traffic volumes of the supplied Metrocount traffic volumes from the City of Wanneroo.
- > The factor was used to scale the survey traffic data from the AM peak period to estimate the traffic volumes in the PM peak period.

The traffic volumes for the AM and PM peak periods are shown in **Figure 1-5**.

The results of the SIDRA analysis is summarised in **Table 2-1** for the existing intersection operation. A detailed SIDRA output is also included in **Appendix C**.

Figure 1-4 Crabtree Street/ La Salle Road Intersection Layout (Nearmap ariel view and SIDRA Layout)

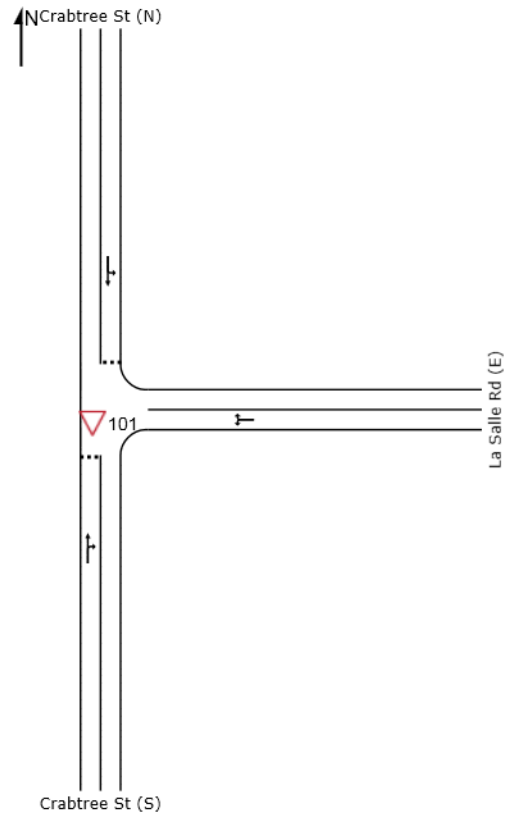
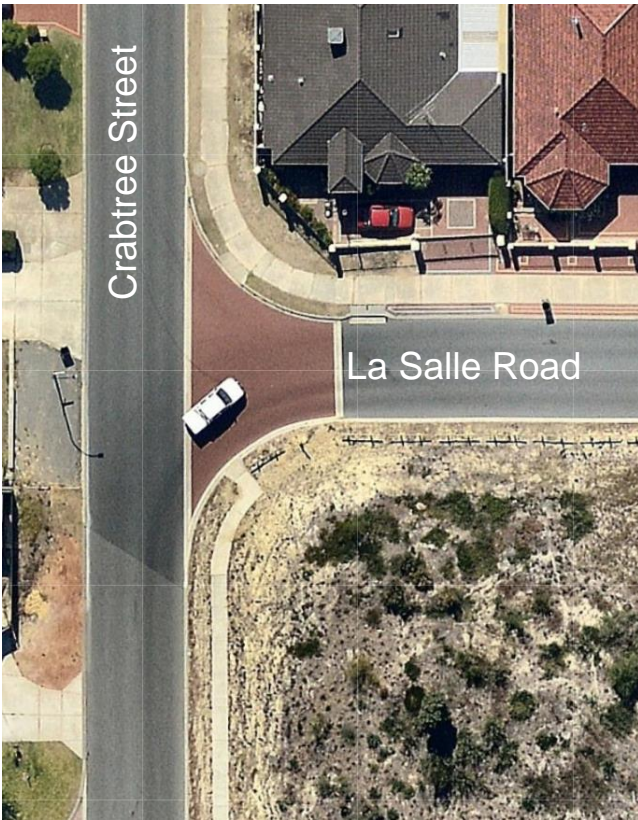
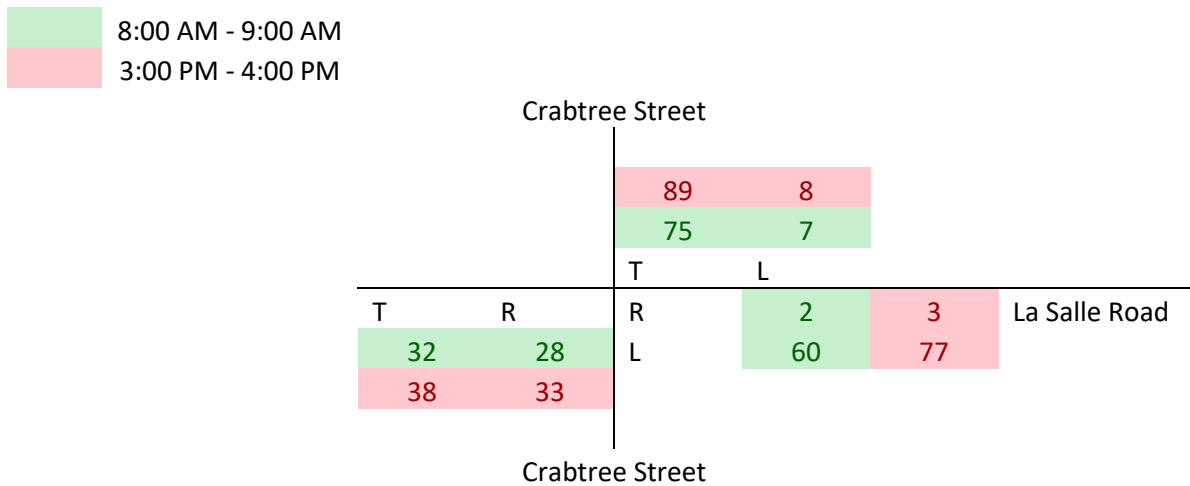


Figure 1-5 Existing Traffic Distribution

Table 1-2 Crabtree Street/La Salle Road Intersection Performance - 2017 Existing

Intersection Approach	2017 Existing								
		AM Peak				PM Peak			
		DOS	Delay	LOS	95% Queue (m)	DOS	Delay	LOS	95% Queue (m)
Crabtree Street – S	T	0.047	4.2	LOS A	0.2	0.056	4.2	LOS A	0.2
	R	0.047	5.9	LOS A	0.2	0.056	6	LOS A	0.2
La Salle Road – E	L	0.033	5.5	LOS A	0	0.043	5.5	LOS A	0
	R	0.033	5.4	LOS A	0	0.043	5.4	LOS A	0
Crabtree Street – N	L	0.057	5.5	LOS A	0.2	0.068	5.5	LOS A	0.3
	T	0.057	4.4	LOS A	0.2	0.068	4.5	LOS A	0.3

The results of the SIDRA analysis indicate that the intersection performs satisfactorily with a LOS A for all approaches, minimal queuing and minimal delays. This is corroborated by observations during the morning peak site visit, as detailed in **Section 1.3**.

2 Proposed Development

2.1 Development Details

The proposed development consists of the following:

- > 29 residential apartments; and
- > 38 on-site parking bays

The apartments will comprise:

- 15 * 1-bed units;
- 11 * 2-bed units; and
- 3 * 3-bed units.

Plans illustrating the layout of the Site is included in **Appendix A**.

2.2 Car Parking Provision

Details on car parking provision is provided in **Section 3.1**.

2.3 Bicycle Parking Provision

Details on bicycle parking provision is provided in **Section 3.2**.

2.4 Access Arrangements

Main vehicular access will be onto La Salle Road; pedestrian accesses will be provided onto both Crabtree Street and La Salle Road.

2.5 Development Traffic Generation

Trip generation has been calculated for the proposed development, utilising trip generation rates from the *Institute of Transportation Engineers (ITE) "Trip Generation" 9th Ed*. In this document, the residential apartment land use (Land Use 220 – Apartment) generates:

- > 0.51 vehicle trips per dwelling, weekday AM peak hour of adjacent street; 20% entering, 80% exiting;
- > 0.62 vehicle trips per dwelling, weekday PM peak hour of adjacent street; 65% entering, 35% exiting; and
- > 6.65 vehicle trips per dwelling, weekday, 50% entering, 50% exiting.

Applied to the proposed development, this results in traffic generation as shown in **Table 2-1** below.

Table 2-1 Development Traffic Generation – Peak Hours of the Development

	Inbound	Outbound	Total
Weekday AM Peak Hour	3	12	15
Weekday PM Peak Hour	12	7	19
Daily Total	97	97	194

This suggests very minimal traffic generation is expected from the proposed development.

2.6 Development Traffic Distribution

The generated traffic will all access La Salle Road initially. The split between eastbound and westbound is likely to result in more traffic to and from Crabtree Street, as this was observed in the existing directional split of traffic. **Figure 1-5** shows a morning peak split of 36% of La Salle Road traffic heading eastbound and 64% westbound.

The volumes are however so low, and the existing traffic so low, that the actual directional split will have little impact on the operation of the links or the intersection of La Salle Road / Crabtree Street. This is shown further below in **Section 2.9**.

2.7 Vehicle Access

All vehicles will be required to enter and exit the Site from the access located along La Salle Road as shown in **Figure 2-1**.

2.8 Provision for Service Vehicles

The refuse truck will be arranged to egress and ingress to the Site from the northern access in forward gear, and collect the refuse waste at the allocated bin store as shown in **Figure 2-1**. This will be assessed in more detail at the Development Application stage when designs have been progressed further.

Figure 2-1 Vehicle Access and Facilities Location



2.9 Intersection Operation

An analysis of existing + development traffic was conducted using SIDRA v7.0 for the Crabtree Street/La Salle Road intersection.

To be conservative, it is assumed that all the generated trips from the Site will access the Crabtree Street / La Salle Road intersection. Thus, the traffic volumes for the AM and PM peak periods are shown in **Figure 2-2**.

The results of the SIDRA analysis is summarised in **Table 2-2** for the existing + development traffic. A detailed SIDRA output is also included in **Appendix C**.

Figure 2-2 Existing + Development Traffic Distribution

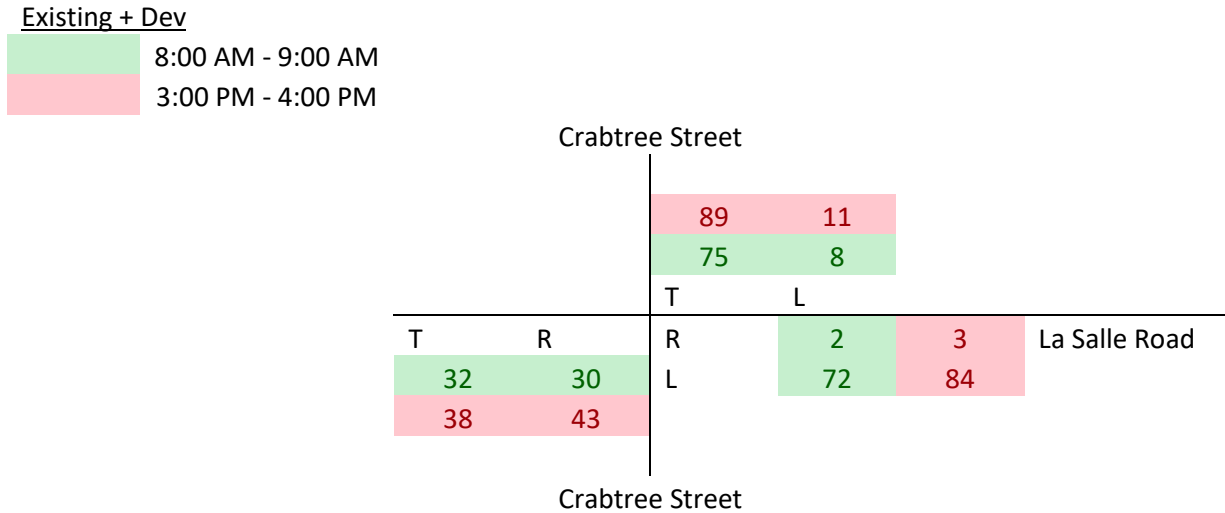


Table 2-2 Crabtree Street/La Salle Road Intersection Performance - 2017 Existing + Development

Intersection Approach	2017 Existing + Development								
		AM Peak				PM Peak			
		DOS	Delay	LOS	95% Queue (m)	DOS	Delay	LOS	95% Queue (m)
Crabtree Street – S	T	0.049	4.2	LOS A	1.2	0.066	4.3	LOS A	1.6
	R	0.049	5.9	LOS A	1.2	0.066	6	LOS A	1.6
La Salle Road – E	L	0.04	5.5	LOS A	0	0.047	5.5	LOS A	0
	R	0.04	5.4	LOS A	0	0.047	5.4	LOS A	0
Crabtree Street – N	L	0.058	5.5	LOS A	1.5	0.07	5.5	LOS A	1.9
	T	0.058	4.4	LOS A	1.5	0.07	4.5	LOS A	1.9

The results of the SIDRA analysis indicate that the intersection performs satisfactorily with a LOS A for all approaches, minimal queuing and minimal delays. Furthermore, there is very little difference between this and the existing scenario as detailed in **Section 1.7**.

3 Proposed Parking

3.1 Parking Requirements

The car parking provision required to service the Site is set out in the *State Planning Policy 3.1 – Residential Design Codes (R-codes) (2015)*.

The surrounding area is zoned R-40 and the Site would be in a “Location A” according to Sub-Section C3.1 of Section 6.3.3. in of the R-codes, due to it being within 250 metres from a high-frequency bus route (see Section 5.1). In the R-codes, a ‘high-frequency bus route’ is defined as “A public transport route with timed stops that runs a service at least every 15 minutes during week day peak periods (7 to 9am and 5 to 7pm)”. Based on these factors, the requirements for the Site land uses have been summarised in **Table 3-1**.

Table 3-1 R-codes Parking Requirements

Land Use	Car Parking Requirements
Residential	
<ul style="list-style-type: none"> ▪ Under 110m² and/or 1 or 2 bedroom dwelling 	1 bay per dwelling
<ul style="list-style-type: none"> ▪ 110m² or more and/or 3 or more bedroom dwelling 	1.25 bays per dwelling
<ul style="list-style-type: none"> ▪ Residential Visitors 	0.25 bays per dwelling

Table 3-2 presents the total parking requirements for the Site compared to the proposed provision detailed in the Site plans.

Table 3-2 Site Parking Provision and Requirements

Land use	Car Parking Requirements	Site Car Parking Provision
Residential (apartments)	26 parking bays for 1 and 2 bedroom apartments 4 parking bays for 3 bedroom apartments 30 parking bays in total	38 parking bays in total
Visitor	8 bays	
Total	38 bays	38 bays

The parking provision therefore satisfies the minimum requirements.

Additionally, there is a wide verge (approximately 5.5 metres between the Site boundary and the road pavement) on the southern side of La Salle Road, which could easily accommodate any excess visitor parking over and above the requirements. The verge immediately adjacent to the Site has a low wooden fence to prevent parking, as this is close to the intersection, so verge parking would all be at a distance of at least 45 metres from the intersection. To the east of this, there is approximately 230 metres of verge that could be used for parking, adjacent to the land zoned as “Parks and Recreation”.

This would not constrain pedestrian access along La Salle Road because the footpath, as well as all properties, are on the northern side. On the southern side, the land adjacent to the Site is zoned as “Parks and Recreation”, so it would never require repeated access points as is the case with the residential properties on the northern side of the road. The Site itself will have pedestrian access on Crabtree Street as well as La Salle Road. Furthermore, on-site observations showed this verge to be un-used by parked cars currently.

As such, it is considered that the verge on the southern side of La Salle Road could provide even more visitor parking with no impact on traffic or pedestrian amenity.

3.2 Bicycle Parking Requirements

The minimum bicycle parking requirements as set out in the *State Planning Policy 3.1 – Residential Design Codes (R-codes) (2015)* as shown in **Table 3-2**.

Table 3-3 City Bicycle Parking Requirements

Land Use	Bicycle Parking Requirements
Residential	1 bicycle bay per 3 dwellings
Visitor	1 bicycle bay per 10 dwellings

Table 3-4 presents the total bicycle parking requirements for the Site compared to the proposed provision detailed in the Site plans.

Table 3-4 Site Bicycle Parking Provision and Requirements

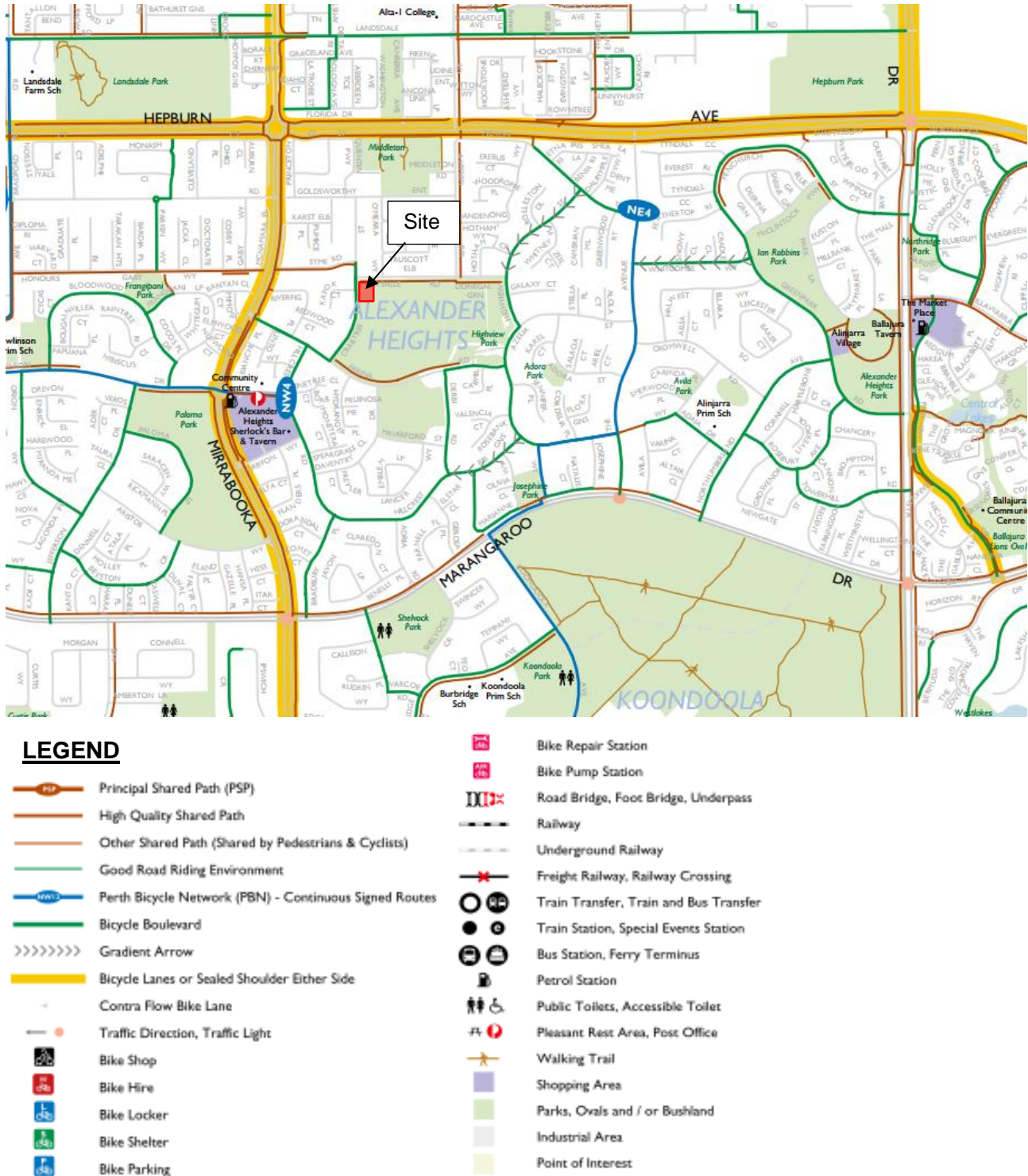
Land use	Bicycle Parking Requirements	Bicycle Parking Provision
Residential	10	A bike store will be provided on-site (see Figure 2-1)
Visitor	3	
Total	13 bicycle bays	

4 Pedestrian / Cycle Networks

4.1 Existing Pedestrian/Cycle Networks and Facilities

Existing cycle networks can be identified from the Department of Transport’s Comprehensive Bike Map, an extract of which is shown in **Figure 4-1**.

Figure 4-1 Cycling Map



Source: Department of Transport (2016)

As shown in cycle map above, the Site is currently served with a good cycling and walking network as there is a 'good road riding environment' along Crabtree Street and a shared path along La Salle Road. In addition, there is also a footpath along the eastern side of Crabtree Street that is not shown in the above cycle map.

Overall, the Site is considered to have a good footpath and cycling network connecting to the surrounding areas.

4.2 Proposed Pedestrian/Cycle Networks and Facilities

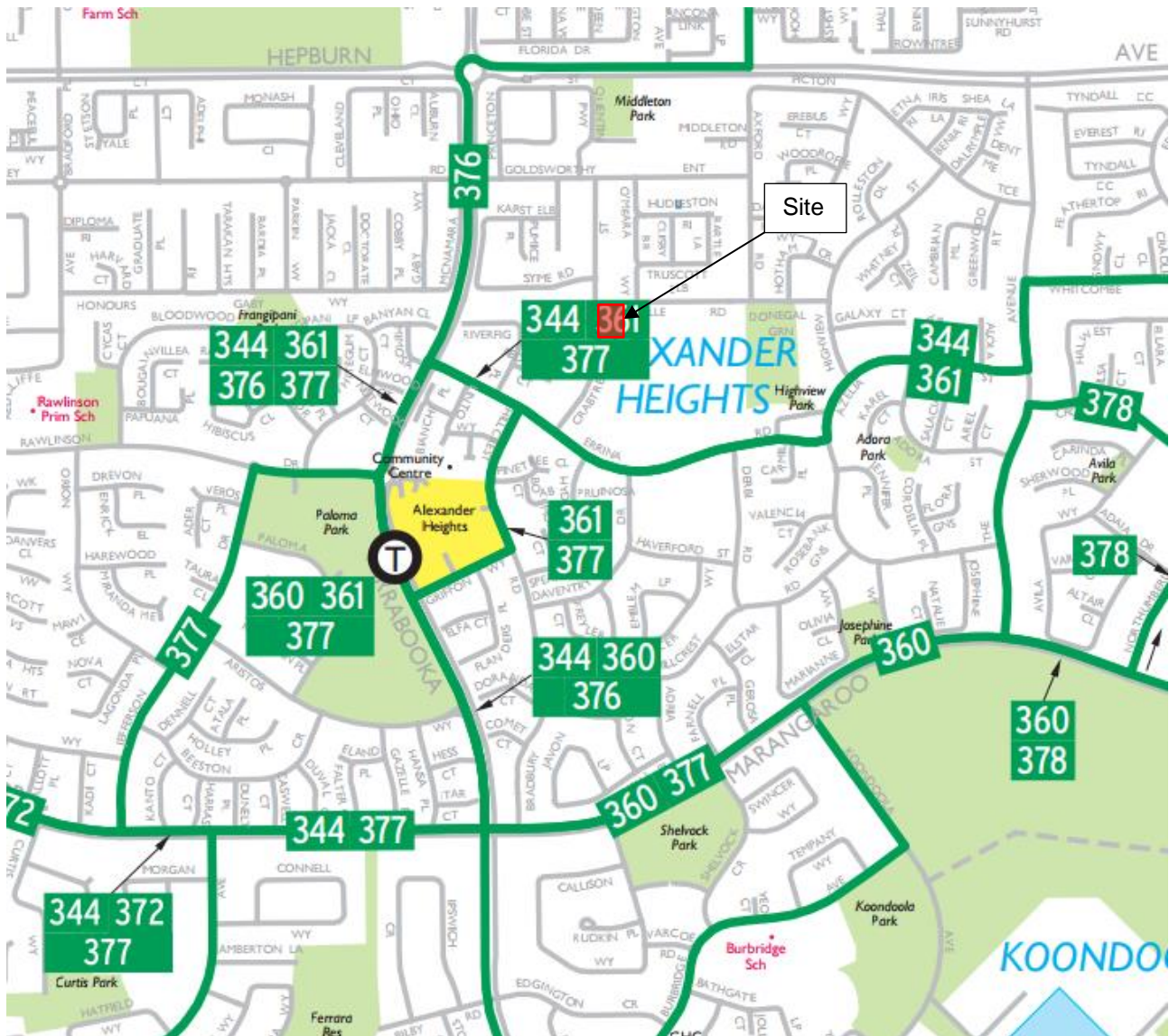
The City is currently seeking feedback and comments on the draft *Cycling Strategy and Plan 2015* to provide a strategic framework in developing recreational, sport and commuter cycling facilities in the future. However, it is understood that currently, there are no planned changes to the cycling and walking network in the vicinity of the Site from the draft plan.

5 Public Transport Services

5.1 Existing Public Transport Facilities

Existing bus services are identified in **Figure 5-1**. The nearest bus stop is located along Errina Road approximately 250m south of the Site for Route 344 and 361. Route 376 is located 300m west of the Site along Mirrabooka Avenue. Route 377 is located 300m south west of the Site near the intersection of Mirrabooka Avenue and Errina Road **Table 5-1** provides a summary of the peak and off peak frequency of the nearby bus services.

Figure 5-1 Surrounding Public Transport Network



Source: Transperth (June 2017)

Table 5-1 Bus Route Frequency

Route Number	Route Description	Weekday Peak Frequency	Weekday Off-Peak Frequency	Saturday Peak Frequency	Sunday/Public Holiday Peak Frequency
344	Morley Bus Station to Warwick Station	10-15mins	30-60mins	60mins	60mins
361	Perth to Alexander Heights	15mins	60mins	60mins	60mins
376	Landsdale to Mirrabooka Bus Station via Mirrabooka Avenue	10mins	30-60mins	60mins	60mins
377	Landsdale to Mirrabooka Bus Station via Koondoola Avenue	10mins	30-60mins	60mins	60mins

Overall, the Site has good access to public transport with the bus services located within walking distance.

5.2 Future Public Transport Facilities

There are currently no additional public transport facilities planned within the vicinity of the Site.

6 Site Specific Issues

6.1 Accident Data

A search of the Main Roads WA Reporting Centre for traffic accident data was made. This search covered all recorded traffic accidents between 1 January 2012 and 31 December 2016 for the following:

- > Crabtree Street (midblock between Erina Road and Goldsworthy Entrance)
- > La Salle Road (midblock between Axford Road and Crabtree Street)
- > Crabtree Street/La Salle Road Intersection

These are summarised and presented in **Table 6-1**, **Table 6-2** and **Table 6-3**.

Table 6-1 Crash Statistics on midblock of Crabtree Street

Type of Crash (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Other	-	-	-	1	-	1
Total	0	0	0	1	0	1

Table 6-2 Crash Statistics on midblock of La Salle Road

Type of Crash (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Hit Object	-	-	1	1	-	2
Total	0	0	1	1	0	2

Table 6-3 Crash Statistics on Crabtree Street/ La Salle Road intersection

Type of Crash (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Hit Object	-	-	-	-	1	1
Total	0	0	0	0	1	1

A summary of the crash data is as follows:

- > There were a total of four crashes recorded in the vicinity of the Site over 5 years.
- > Only one crash was recorded that required medical attention, which occurred on La Salle Road.
- > No crashes required hospital attention and none were fatal crashes.
- > The majority of the crashes led to property damage only.
- > Overall, there were minimal crashes recorded on the surrounding road network and it is considered unlikely that the minimal traffic generated by the Site will cause any material impact to the existing traffic safety.

6.2 Other Site-Specific Issues

Some traffic-related objections to the development proposal were raised by local residents. This Section of the TIS addresses these.

These are also enclosed in full in **Appendix D**.

The traffic-related objections are summarised in **Table 6-4** below, together with our responses.

Table 6-4 Residents' Traffic-related Objections; and Responses

Objection	Response
<p>“The traffic along Crabtree Street and Lasalle Road, especially during peak times can be ridiculous. There is always a continuous flow of traffic on these roads and during peak times the traffic can back up around 5 to 8 cars long at the intersection of Crabtree Street and Errina Road. Cars trying to turn right onto Lasalle Road can back up past Kapok Court (My Street), as the cars traveling along Crabtree is consistent.</p> <p>My main concerns about the traffic is the added pressure on these two roads. Crabtree Street is the only road that connects this section of Alexander Heights to the main artery roads of the area (Mirrabooka Ave and Hepburn Ave). If the City does decide to develop apartments on the lot with thirty-three multiple dwellings, this will cause more stress onto the road and intersections.”</p>	<p>Sections 1.3 and 1.6 of this TIS include commentary on observed traffic; Sections 1.7 and 2.9 have modelled the likely queuing at the intersection of Crabtree Street and La Salle Road.</p> <p>While it is accepted that these do not give a complete picture compared to the observations of a local resident, the following can be made:</p> <ul style="list-style-type: none"> • The Metrocount data supplied by the City was for an entire week in each case. • The modelling in Sections 1.7 and 2.9, using industry standard methodologies, showed such low queuing and delay results that – even allowing for possible modelling ‘variation’ (that is, the inherent potential for a model to differ slightly from reality simply due to limitations in modelling compared to ‘real-life’) – the actual queuing and delay cannot be expected to be significant. • This is in fact demonstrated by the point made by this objector who states that queues of 5 to 8 cars long occur at the intersection of Crabtree Street and Errina Road; this is a quite normal level of queuing for many urban areas and furthermore, the development traffic will make minimal change to this. • Expected development traffic – as detailed in Section 2.5 – is under 1 additional car every 3 minutes. • Similarly, the concern that traffic queuing at the intersection of Crabtree Street and La Salle Road can extend back past Kapok Court does not appear to be an unusual level of queuing; the distance between the intersections is only 43 metres.
<p>“My fellow neighbours and myself on Kapok Court have the added pressures of trying to exit our street with speeding cars, blind spots, and the line of cars blocking Kapok Court when trying to turn right onto Lasalle Road. When at the intersection of Kapok Court and Crabtree Street there are blind spots on both sides. The bend on the right side and the crest on the left, this is a major safety issue that City of Wanneroo have never thought to rectify.”</p>	<p>This is not an issue related to this development proposal, other than the potential increase to the “<i>the line of cars blocking Kapok Court when trying to turn right onto Lasalle Road</i>” due to additional development traffic. However, as noted above, the existing queuing is a quite normal level of queuing for many urban areas and furthermore, the development traffic will make a very minimal change to this.</p> <p>The City may wish to consider conducting a local area traffic management or safety study of the area.</p>
<p>“Will each dwelling have off street parking? Even if each dwelling is only a ONE CAR family, (remembering most are TWO CAR families nowadays), we are looking at 18 to 33 cars. What is stopping the corner of La Salle Road and Crabtree Street turn into a parking lot, <u>with cars parked dangerously on a corner</u>? No one likes to park their car far from their house.</p>	<p>This has been addressed in Section 3 of this TIS: the development will be provided with the required amount of car parking including visitor parking. Additionally, as noted in Section 3, there is plentiful opportunity for verge parking in the unlikely event that visitor parking is insufficient.</p> <p>The corner of La Salle Road and Crabtree Street is prevented from turning ‘into a parking lot’ by the recently constructed low wooden fence on La Salle Road’s southern side. The City may like to consider</p>

<p>Have you even taken into account visitors parking for all the 18 to 33 dwellings?"</p>	<p>similar treatments elsewhere at this intersection to allay this resident's concern; however, this is unrelated to this development, for the reasons given above and in Section 3.</p>
<p>"La Salle and Crabtree Streets are quiet suburban streets NO BUS ROUTES, and to-date, minimum traffic. Why was the site changed from LOT 691 on Errina Road, Alexander Heights? Which in all accounts, would have been a far more suitable LOT for medium density residential development? Pavements already in place, road crossing areas already installed and several bus routes on your doorstep."</p>	<p>As detailed in Section 5 (and in Section 3 with regard to the R-codes location classification), the Site is close to public transport even if not directly on a bus route.</p> <p>As detailed in Section 2.5, additional traffic will be less than 1 additional car every 3 minutes.</p> <p>As detailed in Section 1.5, there are road crossing facilities over La Salle Road in the form of dropped kerbs.</p>

7 Summary

This Transport Impact Statement outlines the transport aspects of the proposed development focusing on traffic operations, access, and car parking. Discussions regarding pedestrian, cycle, traffic and public transport considerations are also provided.

This statement has been prepared in accordance with the WAPC “*Transport Impact Assessment Guidelines: Volume 2 – Planning Schemes, Structure Plans & Activity Centre Plans*” (2016) for lodgement with the development application to the Council.

The following conclusions have been made in regards to the proposed development:

- > The proposed development comprises 29 new residential apartments.
- > The proposed development is anticipated to generate 15 vehicles and 19 vehicles during the AM and PM peak period respectively.
- > The nearby intersection of Crabtree Street/ La Salle Road currently operates well below capacity and the development traffic will not significantly alter this due to its minimal traffic volume. The results of the SIDRA analysis indicate that the intersection will continue to perform satisfactorily with a LOS A for all approaches, minimal queuing and minimal delays.
- > The proposed development has good access to public transport with bus services located within walking distance.
- > The proposed development has access to a good pedestrian and cycling network.
- > Parking provision satisfies the requirements of the R-codes. Additionally, there is a wide verge on the southern side of La Salle Road, which could easily accommodate any excess visitor parking over and above the requirements. The verge immediately adjacent to the Site has a low wooden fence to prevent parking, as this is close to the intersection, so verge parking would all be at a distance of at least 45 metres from the intersection. It is considered that this verge allow could even more visitor parking with no impact on traffic or pedestrian amenity.
- > The proposed development is expected to have negligible impact on the surrounding area in terms of traffic generation or safety.
- > Section 6.2 applies the above conclusions to the concerns raised by local residents and demonstrates that these concerns are largely addressed when considering the probable impacts of this small-scale development of only 29 units.

Transport Impact Statement

APPENDIX

A

SITE PLAN

LA SALLE ROAD

CRABTREE STREET



**LOT 800 CRABTREE STREET
ALEXANDER HEIGHTS**

Concept Feasibility

SITE = 4019m²

R40 Multi-Dwelling Plot Ratio = 0.6

Plot Ratio Allowable Area = 2411.4m²

15 x 1 Bed 1 Bath @ 55m² = 825m²

8 x 2 Bed 1 Bath @ 73m² = 584m²

3 x 2 Bed 2 Bath @ 80m² = 240m²

3 x 3 Bed 2 Bath @ 95m² = 285m²

TOTAL (incl. stores & walls) = 2245m²

Actual Plot Ratio = 0.56

On-site Parking Provision (at grade)

1 bay per small unit = 23

1.25 bays per medium unit = 7.5

0.25 bays per unit for visitors = 7.75

Total car bays = 38

Ground Floor

- Pedestrian zone & access
- Shared pedestrian and vehicular zone
- Landscape and separate entry path zone
- Outdoor living areas
- Access core
- Passive surveillance



First Floor

Rev	Date	Note
01	05/06/13	Sketch Design

Lot 800 (30) Crabtree Street
Alexander Heights
Multiple dwelling concept/ feasibility study R40



Scale 1:500 @ A3

Transport Impact Statement

APPENDIX

B

WAPC CHECKLIST

Item	Status	Comments/Proposals
Structure Plan Proposal		
Regional context	Section 1.2	
proposed land uses	Section 2.1	
Table of land uses and quantities	Section 2.1	
Major attractors/generators	Section 1.2	
Specific issues	Sections 1.4 and 6	
Existing Situation		
existing land uses within Structure Plan	Section 1.2	
existing land uses within 800m of Structure Plan area	Section 1.2	
	Section 1.5	
existing pedestrian/cycle networks within Structure Plan area	NA	
existing public transport services within Structure Plan area	NA	
existing road network within 2 or 5km of Structure Plan area	Section 1.5	
traffic flows on roads within structure plan area (PM and/or AM peak hours)	NA	
traffic flows on roads within 2 (or 5) km of structure plan area (AM and/ or PM peak hours)	Section 1.6	
existing pedestrian/cycle networks within 800m of structure plan area	Section 4.1	
existing public transport services within 800m of structure plan area	Section 5.1	
Proposed internal transport networks		
changes/additions to existing road network or proposed new road network	Section 2	
road reservation widths	Section 2	
road cross-sections & speed limits	Section 2	
intersection controls	Section 2	
pedestrian/cycle networks and crossing facilities	Section 2.3	
public transport routes	NA	
Changes to external transport networks		
road network	NA	
intersection controls	NA	
pedestrian/cycle networks and crossing facilities	NA	
public transport services	NA	
Integration with surrounding area		
trip attractors/generators within 800 metres	Section 1.2	
proposed changes to land uses within 800 metres	NA	
travel desire lines from structure plan to these attractors/generators	NA	

Item	Status	Comments/Proposals
adequacy of external transport networks	Sections 2 and 6	
deficiencies in external transport networks	Sections 2 and 6	
remedial measures to address deficiencies	Sections 2 and 6	
Analysis of internal transport networks		
assessment year(s) and time period(s)	NA	
Structure plan generated traffic	Section 2.5	
extraneous (through) traffic	NA	
design traffic flows (that is, total traffic)	Section 2.5	
road cross-sections	NA	
intersection controls	NA	
access strategy	Section 2.7	
pedestrian/cycle networks	NA	
safe routes to schools	NA	
pedestrian permeability & efficiency	NA	
access to public transport	NA	
Analysis of external transport network		
extent of analysis	Section 2.9	
base flows for assessment year(s)	Section 1.6	
total traffic flows	Section 2.9	
road cross-sections	NA	
intersection layouts & controls	Section 2.9	
pedestrian/cycle networks	NA	
Conclusions	Section 7	

Transport Impact Statement

APPENDIX

C

SIDRA OUTPUT

Existing 2017

MOVEMENT SUMMARY

▽ Site: 101 [Crabtree Street/ La Salle Rd 2017 AM Peak]

Crabtree Street/ La Salle Rd
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Crabtree St (S)												
2	T1	32	0.0	0.047	4.2	LOS A	0.2	1.1	0.10	0.54	50.3	
3	R2	28	0.0	0.047	5.9	LOS A	0.2	1.1	0.10	0.54	52.0	
Approach		60	0.0	0.047	5.0	LOS A	0.2	1.1	0.10	0.54	51.2	
East: La Salle Rd (E)												
4	L2	60	0.0	0.033	5.5	LOS A	0.0	0.0	0.00	0.58	52.3	
6	R2	2	0.0	0.033	5.4	LOS A	0.0	0.0	0.00	0.58	51.3	
Approach		62	0.0	0.033	5.5	NA	0.0	0.0	0.00	0.58	52.2	
North: Crabtree St (N)												
7	L2	7	0.0	0.057	5.5	LOS A	0.2	1.5	0.15	0.50	52.6	
8	T1	75	0.0	0.057	4.4	LOS A	0.2	1.5	0.15	0.50	50.6	
Approach		82	0.0	0.057	4.5	LOS A	0.2	1.5	0.15	0.50	50.9	
All Vehicles		204	0.0	0.057	5.0	NA	0.2	1.5	0.09	0.54	51.5	

MOVEMENT SUMMARY

▽ Site: 101 [Crabtree Street/ La Salle Rd 2017 PM Peak]

Crabtree Street/ La Salle Rd
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Crabtree St (S)												
2	T1	38	0.0	0.056	4.2	LOS A	0.2	1.4	0.12	0.54	50.2	
3	R2	33	0.0	0.056	6.0	LOS A	0.2	1.4	0.12	0.54	51.9	
Approach		71	0.0	0.056	5.0	LOS A	0.2	1.4	0.12	0.54	51.1	
East: La Salle Rd (E)												
4	L2	77	0.0	0.043	5.5	LOS A	0.0	0.0	0.00	0.58	52.3	
6	R2	3	0.0	0.043	5.4	LOS A	0.0	0.0	0.00	0.58	51.3	
Approach		80	0.0	0.043	5.5	NA	0.0	0.0	0.00	0.58	52.2	
North: Crabtree St (N)												
7	L2	8	0.0	0.068	5.5	LOS A	0.3	1.8	0.18	0.51	52.5	
8	T1	89	0.0	0.068	4.5	LOS A	0.3	1.8	0.18	0.51	50.5	
Approach		97	0.0	0.068	4.5	LOS A	0.3	1.8	0.18	0.51	50.7	
All Vehicles		248	0.0	0.068	5.0	NA	0.3	1.8	0.10	0.54	51.4	

Existing 2017 + Development

MOVEMENT SUMMARY

▽ Site: 101 [Crabtree Street/ La Salle Rd 2017 + Development AM Peak]

Crabtree Street/ La Salle Rd
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: Crabtree St (S)												
2	T1	32	0.0	0.049	4.2	LOS A	0.2	1.2	0.11	0.54	50.2	
3	R2	30	0.0	0.049	5.9	LOS A	0.2	1.2	0.11	0.54	51.9	
Approach		62	0.0	0.049	5.0	LOS A	0.2	1.2	0.11	0.54	51.2	
East: La Salle Rd (E)												
4	L2	72	0.0	0.040	5.5	LOS A	0.0	0.0	0.00	0.58	52.3	
6	R2	2	0.0	0.040	5.4	LOS A	0.0	0.0	0.00	0.58	51.3	
Approach		74	0.0	0.040	5.5	NA	0.0	0.0	0.00	0.58	52.2	
North: Crabtree St (N)												
7	L2	8	0.0	0.058	5.5	LOS A	0.2	1.5	0.17	0.51	52.5	
8	T1	75	0.0	0.058	4.4	LOS A	0.2	1.5	0.17	0.51	50.6	
Approach		83	0.0	0.058	4.5	LOS A	0.2	1.5	0.17	0.51	50.8	
All Vehicles		219	0.0	0.058	5.0	NA	0.2	1.5	0.10	0.54	51.5	

MOVEMENT SUMMARY

▽ Site: 101 [Crabtree Street/ La Salle Rd 2017 + Development PM Peak]

Crabtree Street/ La Salle Rd
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
South: Crabtree St (S)												
2	T1	38	0.0	0.066	4.3	LOS A	0.2	1.6	0.13	0.55	50.0	
3	R2	43	0.0	0.066	6.0	LOS A	0.2	1.6	0.13	0.55	51.8	
Approach		81	0.0	0.066	5.2	LOS A	0.2	1.6	0.13	0.55	51.1	
East: La Salle Rd (E)												
4	L2	84	0.0	0.047	5.5	LOS A	0.0	0.0	0.00	0.58	52.3	
6	R2	3	0.0	0.047	5.4	LOS A	0.0	0.0	0.00	0.58	51.3	
Approach		87	0.0	0.047	5.5	NA	0.0	0.0	0.00	0.58	52.2	
North: Crabtree St (N)												
7	L2	11	0.0	0.070	5.5	LOS A	0.3	1.9	0.19	0.51	52.4	
8	T1	89	0.0	0.070	4.5	LOS A	0.3	1.9	0.19	0.51	50.5	
Approach		100	0.0	0.070	4.6	LOS A	0.3	1.9	0.19	0.51	50.7	
All Vehicles		268	0.0	0.070	5.1	NA	0.3	1.9	0.11	0.54	51.4	

Transport Impact Statement

APPENDIX

D

OTHER SITE SPECIFIC ISSUES

Attachment No. 136 to DPS 2: Summary of Submitters' Comments

	Submitter	Comment	Applicant's Response
1.0	Objection		
	<ul style="list-style-type: none"> Objection 1.0 	<p>Dear Chief Executive Officer, I am writing this submission to the City Of Wanneroo in regards to the proposed planning of Lot 800 Crabtree Street, Alexander Heights and my concerns to the planned development.</p> <p>Traffic: The traffic along Crabtree Street and Lasalle Road, especially during peak times can be ridiculous. There is always a continuous flow of traffic on these roads and during peak times the traffic can back up around 5 to 8 cars long at the intersection of Crabtree Street and Errina Road. Cars trying to turn right onto Lasalle Road can back up past Kapok Court (My Street), as the cars traveling along Crabtree is consistent.</p> <p>My main concerns about the traffic is the added pressure on these two roads. Crabtree Street is the only road that connects this section of Alexander Heights to the main artery roads of the area (Mirrabooka Ave and Hepburn Ave). If the City does decide to develop apartments on the lot with thirty three multiple dwellings, this will cause more stress onto the road and intersections.</p> <p>My fellow neighbours and myself on Kapok Court have the added pressures of trying to exit our street with speeding cars, blind spots, and the line of cars blocking Kapok Court when trying to turn right onto Lasalle Road. When at the intersection of Kapok Court and Crabtree Street there are blind spots on both sides. The bend on the right side and the crest on the left, this is a major safety issue that City of Wanneroo have never thought to rectify.</p> <p>Traffic has been a major issue in this area and the City of Wanneroo has never addressed these issues. There should be an investigation into the traffic of these streets before any development commences.</p> <p>Department of Housing: Under the proposal the dwellings will be government housing. I have no issues if the dwellings are for the elderly/disabled and are set up like a complex. The concerns I have with the development is if the dwellings are utilised for social housing. You don't have to travel far to see the anti social behaviour, house pride and crime these government housings bring to an area. Prime examples of these issues are suburbs such as Balga, Koondoola, Girrawheen and Mirrabooka.</p>	

Attachment No. 136 to DPS 2: Summary of Submitters' Comments

	Submitter	Comment	Applicant's Response
		<p>I have lived in Alexander Heights since 1992 and I have never had a break in or have felt unsafe walking around the area. The thought of a Department of housing development and with the minority groups these housing complexes bring to an area, worries me. I would like to stress, I am not a close minded person and I understand not every person who lives in government housing is a criminal, has a criminal past or has anti social behaviour.</p> <p>Development: Another concern that myself and others in the neighbourhood have discussed is the development itself. Will it be a gated community with a carpark? Will it have streets? How high will these apartments be? I don't believe these apartments should be any higher then two storey, as it will not suit the area.</p> <p>Thank you for reading my submission and the concerns/objections I have to this development..</p> <p>I would like to be kept informed via post or email on the progression/debate of this development.</p> <p>I would like to keep my name from this submission private.</p>	
2.0	No Objection		
	<ul style="list-style-type: none"> Western Power 	<p>Western Power has no objection to the proposed amendment subject to future subdivision and development within the area having the following conditions applied to protect Western o Powers easement and restriction zone requirements for existing and planned new transmission and distribution infrastructure.</p> <p>Subdivision/Development conditions</p> <ul style="list-style-type: none"> All subdivision and development shall be designed and constructed to protect Western Power infrastructure and interests from potential land use conflict. Where subdivision/development applications adjoin or affect Western Power interests they should be referred for comment prior to approval by the local authority to ensure no land use conflict. 	

Attachment No. 136 to DPS 2: Summary of Submitters' Comments

	Submitter	Comment	Applicant's Response
		<ul style="list-style-type: none"> • Works associated with new distribution lines and the upgrading of existing lines (including increasing capacity and undergrounding) will be at the developer's cost. Electrical design will be to the satisfaction of Western Power (refer to http://www.westernpower.com.au/ldd/Underground distribution schemes.html and http://www.westernpower.com.au/documents/WA Distribution Connections Manua l.pdf) • Western Power is to be consulted as part of any shared cost contribution plan if applicable. • Western Power is to be provided with data and other information to a suitable standard prior to subdivision and development to update load demand forecasting and subsequent detailed infrastructure planning. Please liaise with the Network Forecasting team in this regard on 13 10 87 or enquirv(S)westernpower.com.au. • At time of any subdivision or development arrangements shall be made for the provision of an easement(s) pursuant to Section 167 of the Planning and Development Act 2005 for existing or planned power infrastructure being granted free of cost to Western Power where power infrastructure and its restriction zone remains over private freehold land. • No subdivision or development (including drainage, fill, fencing, storage or parking) will be permitted within Western Power line easements or restriction zones without the prior written approval of Western Power or the relevant power line operator. Note: Further information on easement and restriction zone standard conditions are available from Western Power. • Western Power requires that the City of Wanneroo apply the minimum clearance requirements for transmission lines and overhead distribution lines for structure plans, infill and new development / subdivision applications within the jurisdiction to ensure appropriate protection of the asset. For distribution lines this is 3.0m from the centre line (horizontal and vertical). For transmission lines this is 8.0m for 66 kV lines, 10.0m for 132 kV lines and 35.0m for 330 kV lines. 	

Attachment No. 136 to DPS 2: Summary of Submitters' Comments

	Submitter	Comment	Applicant's Response													
		<p>General Information</p> <p>Western Power manages its assets on sites and corridors through a combination of privately owned land, easements on freehold land, restriction zones, the use of road corridors and other purposely zoned and/or reserved land under local and region planning schemes. Standard easement conditions restrict certain activities within the easement and Western Power should be contacted prior to implementing any building plans. Western Power's standard easement conditions are available at: http://www.westernpower.com.au/documents/WEB Easement brochure 6062012.pdf</p> <p>Where Western Power does not have easements on freehold land, it relies on "Restriction Zones" to ensure appropriate development occurs in the vicinity of its assets. This includes appropriate setbacks of buildings, vegetation and uses of land in the vicinity of power line assets. Western Power is able to apply conditions with respect to restriction zones under the Energy Operators (Powers) Act 1979.</p> <p>Restriction zones (see Table 1) have been developed based on the relevant Australian Standards and OHS compliance requirements for power lines. Western Power applies AS 7000 Overhead line design - Detailed procedures and Western Australian Occupational Safety and Health Regulation 1996 - Specifically Reg 3.64 in establishing minimum restriction zone setback requirements. Restriction zones are reviewed and updated on a regular basis.</p> <table border="1" data-bbox="405 1046 1319 1294"> <thead> <tr> <th colspan="3">Clearance (horizontal and vertical from centre of line)</th> </tr> </thead> <tbody> <tr> <td rowspan="3"><i>Transmission</i></td> <td>330kV</td> <td>35.0m</td> </tr> <tr> <td>132kV</td> <td>10.0m</td> </tr> <tr> <td>66kV</td> <td>8.0m</td> </tr> <tr> <td><i>Distribution</i></td> <td><33kV</td> <td>3.0m</td> </tr> </tbody> </table>	Clearance (horizontal and vertical from centre of line)			<i>Transmission</i>	330kV	35.0m	132kV	10.0m	66kV	8.0m	<i>Distribution</i>	<33kV	3.0m	
Clearance (horizontal and vertical from centre of line)																
<i>Transmission</i>	330kV	35.0m														
	132kV	10.0m														
	66kV	8.0m														
<i>Distribution</i>	<33kV	3.0m														
3.0	Objection															

Attachment No. 136 to DPS 2: Summary of Submitters' Comments

	Submitter	Comment	Applicant's Response
	<ul style="list-style-type: none"> • Objection 3.0 	<p>To whom it may concern</p> <p>When we first received the development proposal concerning LOT 800, my husband and I were shocked, at the preposterous idea of building so many dwelling, 18 houses or 33 two story dwelling (apartments), on such a small site.</p> <p>Looking at the satellite view of the LOT 800, the frontage on La Salle Road alone is the same in frontage area as the THREE BLOCKS opposite LOT 800 on La Salle Road. These THREE blocks are the average size of all the blocks in the area, normal standard SINGLE DWELLING HOMES. From our calculation if staying with the NORM and SAME SIZE blocks, as all the blocks surrounding the LOT 800 one can only fit SIX NORMAL /STANDARD SINGLE DWELLING on that SIZE BLOCK, positioning the blocks back to back in the LOT 800. Why would you change the size of the blocks, keep Alexander Heights suburban blocks uniform.</p> <p>A ?medium density residential development? can only me one thing. Homes West Housing/ Welfare Rentals.</p> <p>Are all these dwelling going to be SOLD to the public? Or are all the dwellings going to <u>be low cost rentals</u>?</p> <p>If our property value and house prices drop, <u>which no doubt it will</u>, will we receive a drop/discount in our rates and taxes?</p> <p>Quickly our shock turned to anger and outrage. Forget for a moment the 18 to 33 proposed dwelling crammed onto that site, will each dwelling have off street parking? Even if each dwelling is only a ONE CAR family, (remembering most are TWO CAR families nowadays), we are looking at 18 to 33 cars. What is stopping the corner of La Salle Road and Crabtree Street turn into a parking lot, <u>with cars parked dangerously on a corner</u>? No one likes to park their car far from their house.</p> <p>Have you even taken into account visitors parking for all the 18 to 33 dwellings?</p> <p>La Salle and Crabtree Streets are quiet suburban streets NO BUS ROUTES,</p>	

Attachment No. 136 to DPS 2: Summary of Submitters' Comments

	Submitter	Comment	Applicant's Response
		<p>and to-date, minimum traffic. Why was the site changed from LOT 691 on Errina Road, Alexander Heights? Which in all accounts, would have been a far more suitable LOT for ?medium density residential development. ? Pavements already in place, road crossing areas already installed and several bus routes on your doorstep.</p> <p>For the entire suburb of Alexander Heights this little NATURAL BUSH of land between La Salle and Errina Roads, is the <u>only</u> NATURAL, untouched, unspoilt Western Australian Bushland to be found from Marangaroo Drive, Mirrabooka Avenue, Kingsway and Alexander drive. Not including the two manicured lawned parks.</p> <p>This Bushland is the last significant NATURAL BUSHLAND area in Alexander Heights. Like a pair of lungs producing fresh air, recycling the carbon dioxide and producing fresh clean oxygen, this untouched piece of Western Australian Bushland should be protected, not developed.</p> <p>Not a day goes by without hundreds of the beautiful BLACK COCKATOOS are seen settling in the trees feeding and socializing. This is part of the bird?s route used as a feeding area on a daily basis. Something like that should be protected.</p> <p>I will be the first to admit I am no bird expert, but the black cockatoos look very much like the CARNABY?S BLACK COCKATOOS. And if that is the case they are FEDERALLY listed as ENDANGERED.</p> <p>This is an excerpt from BIRDLIFE AUSTRALIA STE. http://birdlife.org.au/projects/carnabys-black-cockatoo-recovery Why are they threatened?</p> <p><i>Once numerous, the charismatic and highly mobile Carnaby?s Black-Cockatoo is now classified in WA as ?rare or likely to become extinct? and federally listed as Endangered. The last 50 years has seen a 50% decline in their population, and their range has been reduced by up to one-third.</i></p>	

Attachment No. 136 to DPS 2: Summary of Submitters' Comments

	Submitter	Comment	Applicant's Response
		<p>Please see the two attached photos taken of these birds in La Salle Road, Alexander Heights. Not to mention the other Australian Wildlife that makes this Natural Bushland their home, and yes we have had the odd kangaroo make itself at home from time to time.</p> <p>Our family, is OUTRAGED AND OPPOSED to any development, ESPECIALLY SUCH A OUTLANDISH, BADLY CONCIVED, MEDIUM DENSITY DEVELOPMENT as being proposed for LOT 800, as is every neighbour we have spoken to living on La Salle Road and Crabtree Road.</p> <p>Finally, we just saw a current affair programme on television not two weeks ago regarding blocks of vacant land, not unlike this LOT 800 available for ?medium density residential development? in MOSMAN PARK and DELKEITH.</p> <p>Relocate this proposal to either of those suburbs, or are those residents SUPERIOR than those of Alexander Heights?</p>	
4.0	Objection		
	<ul style="list-style-type: none"> • Objection 4.0 	<p>My name is Martine Abbonizio and I live at 11 Hudleston Rise, Alexander Heights, which is about two streets away from the above proposal.</p> <p>I would like to express my disapproval of the above proposal.</p> <p>I disapprove the development of medium density residential for the area (proposal of mixed dwellings/apartments).</p>	