



DevelopmentWA
Broome North DSP Amendment
Traffic Addenda

November 2020

Table of contents

1.	Introduction	1
1.1	Background	1
1.2	Scope and limitations	3
1.3	Assumptions	3
2.	DSP Changes	4
2.1	Relocation of local centre	4
2.2	Relocation of District Open Space	5
2.3	Movement network	5
2.4	Recommendations	11

Table index

Table 1 Revised residential lot yields	7
Table 2 Stage 1 District Centre (Deep End Retail Review)	7
Table 3 Trip Rates (Broome Traffic Report)	8
Table 4 Relocated Local Centre Traffic Generation LDP3	8
Table 5 Levels of Service by Road Type (Source Riley Report LDP3)	9

Figure index

Figure 1 Current approved Broome North DSP	1
Figure 2 Proposed Broome North DSP	2
Figure 3 Relocation of local centre	4
Figure 4 Proposed site for residential and childcare (previous Centre site)	4
Figure 5 Relocation of District Open Space	5
Figure 6 District Centre Site	6
Figure 7 Fairway Drive/Centre access 2051 PM peak analysis	10

Appendices

Appendix A - (Broome North DSP Amendment)

1. Introduction

1.1 Background

DevelopmentWA has an interest in the development of a 700 hectare (ha) area identified as Broome North, four kilometres (km) north of the Broome town centre. The current approved District Structure Plan (DSP), shown in Figure 1, and two local structure plans require updating to incorporate a new district shopping centre, residential development of the existing local centre site and relocation of district playing fields and future school sites.

DevelopmentWA is undertaking a planning review which will include the amendment of the DSP, Local Development Plan 1 (LDP1) and LDP3 Structure Plans (marked as 1, 3 & Stage 6 Gujarri Estate respectively in Figure 1) as well as subdivision approval application for the LDP1 local centre site for residential development.

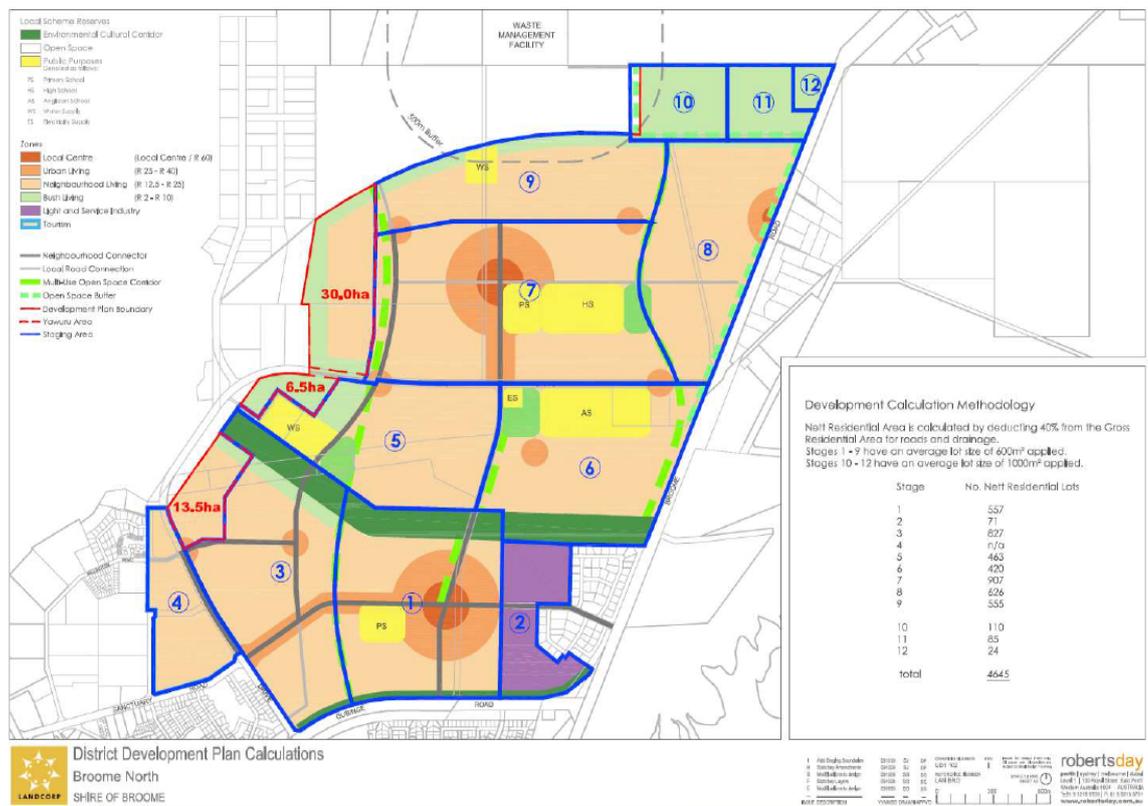


Figure 1 Current approved Broome North DSP

Figure 2 shows the proposed DSP.

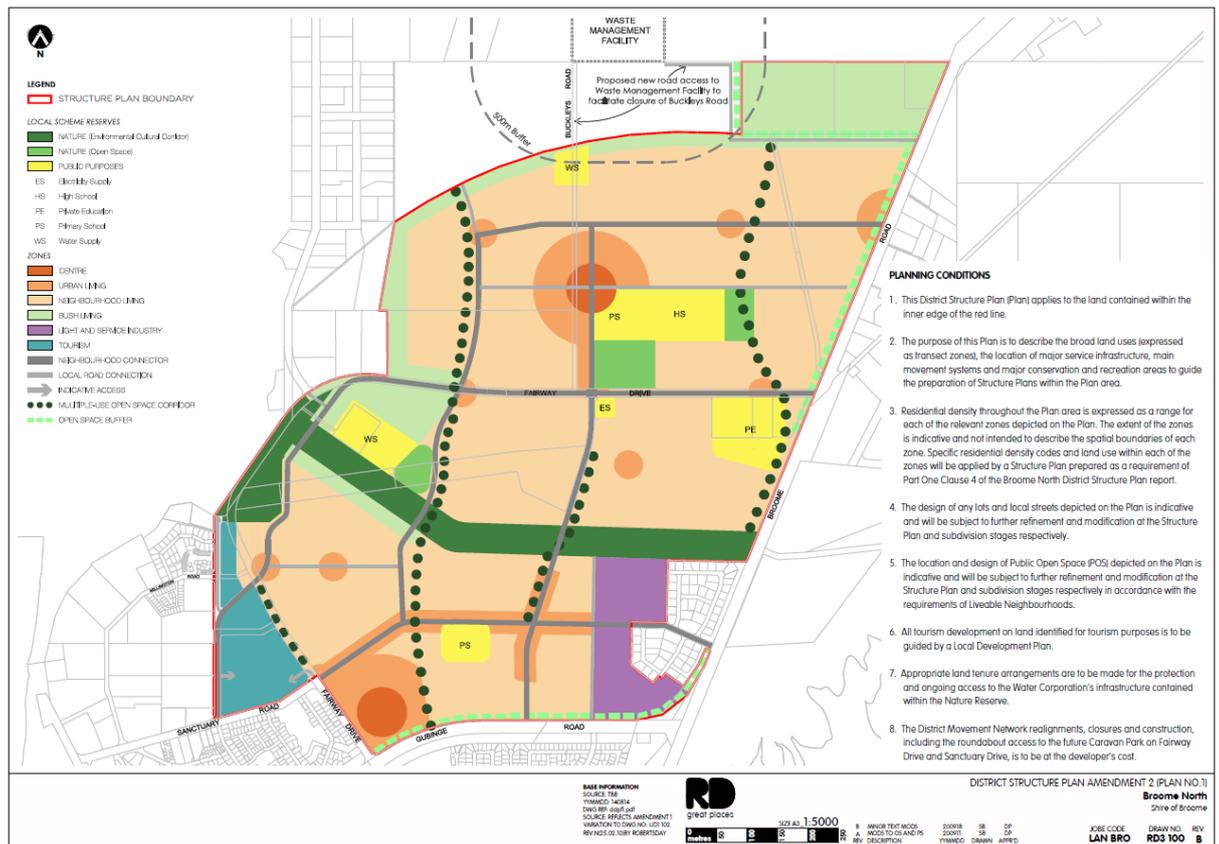


Figure 2 Proposed Broome North DSP

It is understood the Shire has agreed in principle with the submission of succinct addenda to each of the technical reports accompanying the DSP. The addenda need to comment on the two major structural changes, being:

1. Removal of local centre in LDP and addition of district centre in LDP3, consistent with the Shire's Local Commercial Strategy' and
2. Relocation of District Open Space per previous agreement as part of the Gujari Estate LDP process.

This document provides traffic commentary on the proposed changes to the DSP.

1.2 Scope and limitations

This report has been prepared by GHD for Development WA and may only be used and relied on by Development WA for the purpose agreed between GHD and the Development WA as set out in this report. GHD otherwise disclaims responsibility to any person other than Development WA arising in connection with this report.

GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Development WA and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

1.3 Assumptions

- Floor areas and lot yields as advised by the client are correct.
- Traffic distribution assumptions are suitable for analysis purposes.

2. DSP Changes

2.1 Relocation of local centre

Removal of local centre in LDP and addition of district centre in LDP3, consistent with the Shire's Local Commercial Strategy. Figures 3 and 4 refer.

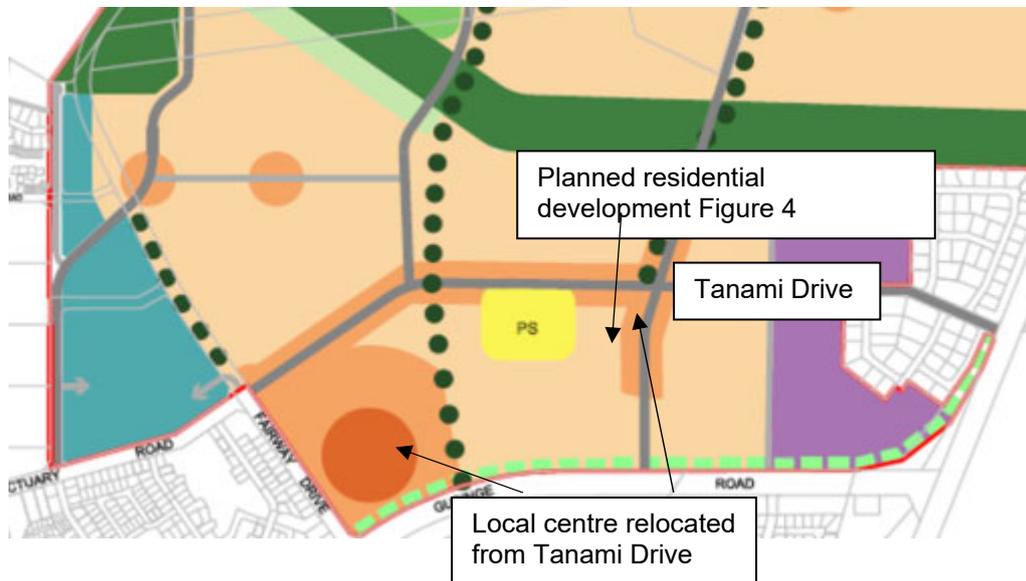


Figure 3 Relocation of local centre



Figure 4 Proposed site for residential and childcare (previous Centre site)

At the time of writing the current plan for the residential area is indicative and still subject to design work and therefore not included here. A proposed 2,600m² childcare centre site within LDP1 is also included.

2.2 Relocation of District Open Space

Relocation of District Open Space per previous discussions as part of the Gujarri Estate LDP process. Figure 5 refers.

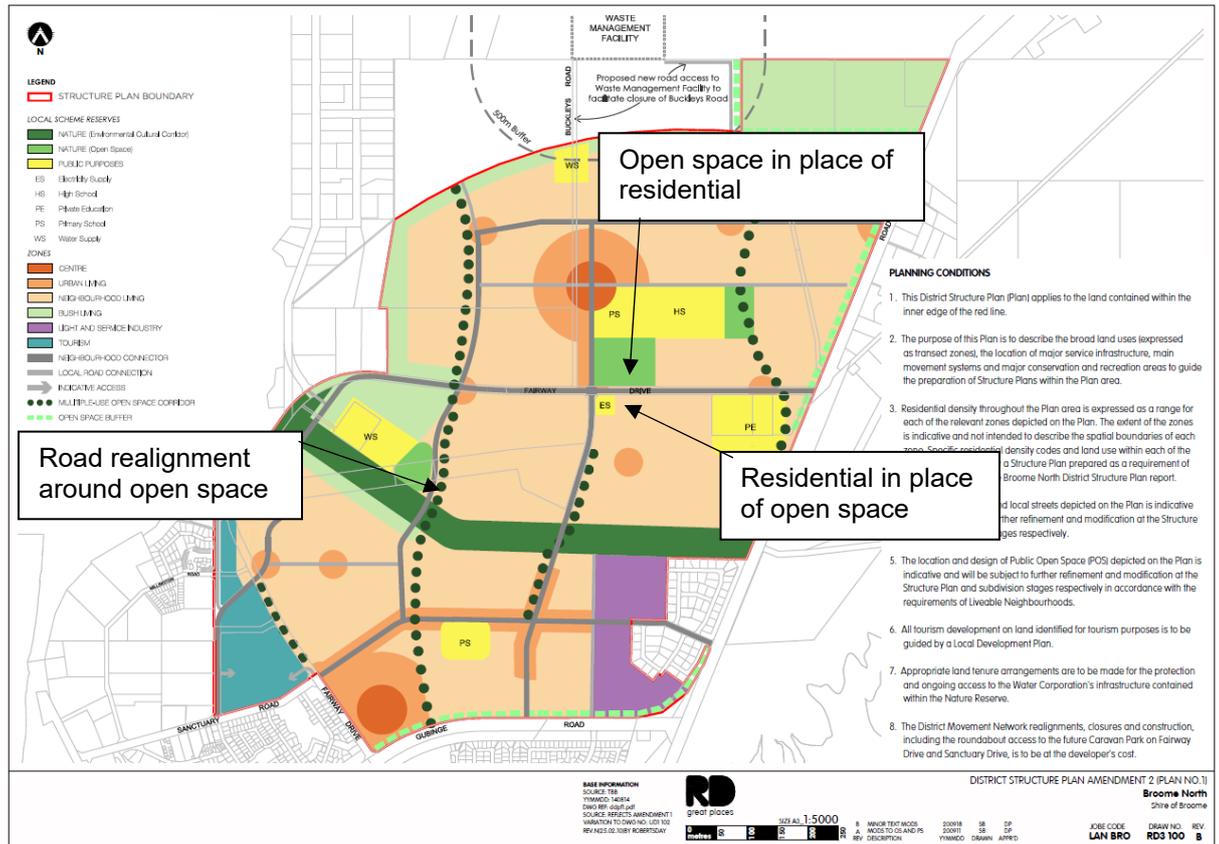


Figure 5 Relocation of District Open Space

2.3 Movement network

A previous traffic study was undertaken by Jacobs in 2016 (Broome Traffic Study), which modelled the Broome road network to 2051 for various scenarios. Riley Consulting prepared a Structure Plan Report in 2014 for LDP3 as residential development. The southern part of this area will now become a Centre in accordance with the Local Commercial Strategy. The relocation of the Centre to LDP3 and traffic impacts is considered further. Reference is made to the aforementioned traffic reports.

2.3.1 Base traffic on external network

A review of limited available traffic data from Main Roads WA Traffic Map indicates a general decline in traffic volumes since 2016:

Cable Beach Road: - 10% pa

Gubinge Road: - 2% pa

The Broome Traffic Study adopts a linear growth based on population growth and it is concluded that this report remains valid for use in informing subsequent assessment.

2.3.2 Traffic generation

Relocation of Local Centre

Figure 6 indicates the site of the relocated Centre. At the time of writing the current plan for the Centre area is indicative and still subject to design work and therefore not included here.



Figure 6 District Centre Site

Table 1 indicates the total lot yields and the reduction due to the proposed Centre, there will be a reduction of 38 dwellings due to the relocated centre.

Note: Figures in Table 1 and 2 are indicative and will be confirmed as part of relevant local structure planning processes.

Table 1 Revised residential lot yields

LDP 3 (Residential Scenario)	Yield
Total Yield	788 dwellings
Southern Cell (area subject to LDP Amendment)	167 dwellings
District Centre Concept	
Residential Yield	129 dwellings*
Difference in Residential Yield	38 dwellings
*Based on 76 dwellings with an average site 360 m ² /lot for Grouped Housing Sites, and 53 R12.5-R25 Lots	

A review of the Deep End Retail Review report indicates a Stage 1 District Centre as shown in Table 2.

Table 2 Stage 1 District Centre (Deep End Retail Review)

Tenant	GLA m ²
Supermarket	3,700
Liquor	200
Bakery	80
Café	100
Takeaway food/restaurant (#4)	350
Pharmacy	300
News/Lottery/Gifts	100
Hairdresser/other beauty (#2)	180
Total	5,010
<u>Non Retail</u>	
Medical centre	280
Gym	200
<u>Pad sites</u>	
Child care	
Fuel/fast food/car wash	

The Deep End Retail Review report adds “*It would seem appropriate to formalise the LCS recommendation by amending LDP3, as proposed. The general layout of the site in the TBB drawing gives enough flexibility to develop a range of options and configurations over time, as demand warrants.*”

Therefore for analysis purposes an ultimate 11,110 m² has been adopted as previously proposed to 2051. As previously indicated in this report this is indicative and will be confirmed as part of relevant local structure planning processes.

Trip rates used in the Broome Traffic Report are shown in Table 3.

Table 3 Trip Rates (Broome Traffic Report)

Land Use	Daily trip rate
Residential	13.81/dwelling
Local Centre	75.88/100 m ² GFA

For this assessment, a residential daily trip rate of 9.2 (Riley Report) has been adopted in view of the limited public transport opportunities and consistency with the *NSW Guide to Traffic Generating Development* which indicates 9 trips per dwelling per day.

Table 4 Relocated Local Centre Traffic Generation LDP3

Land use	Trip Rate/Day	Vehicles per day
<i>Previous: 788 dwellings</i>	9.2 (Riley Report)	7,249
Proposed: 750 dwellings	9.2 (Riley Report)	6,900
Proposed Local Centre: 11,110 m ²	80/100 m ² (a)	8,888
Total		15,788

(a) A rounded trip rate of 80/100 m² of GFA is used for the Local Centre for robust assessment.

The traffic generation from the LDP3 precinct is forecast to increase from 7,249 vehicles per day (vpd) to 15,788 vpd, which represents a nett gain of approximately 8,539 vpd (note: if the residential trip rate in the Jacobs report is used, the nett gain is 8,363 vpd).

Access to the Centre is via Fairway Drive (2) and one internal access. For the purpose of analysis, the following traffic distribution is assumed:

- 45% to the north = 3,999 vpd.
- 45% to the south = 3,999 vpd.
- 10% to the west = 890 vpd.

The Broome Traffic Study forecasts 7,775 vpd on Fairway Drive by 2051. Based on this assessment, relocation of the Centre could add up to around 4,000 vpd thereby increasing volumes to around 11,800 vpd.

The proposed treatment of Fairway Drive, is a Boulevard cross section with embayed parking (Neighbourhood Connector). Table 5 indicates levels of service for various types of road based on daily traffic volumes.

Table 5 Levels of Service by Road Type (Source Riley Report LDP3)

LOS	Single Carriageway ¹	2-Lane Boulevard ²	Dual Carriageway (4-Lanes) ³	Dual Carriageway (4-lane Clearway) ³
A	2,400vpd	2,600vpd	24,000vpd	27,000vpd
B	4,800vpd	5,300vpd	28,000vpd	31,500vpd
C	7,900vpd	8,700vpd	32,000vpd	36,000vpd
D	13,500vpd	15,000vpd	36,000vpd	40,500vpd
E	22,900vpd	25,200vpd ⁴	40,000vpd	45,000vpd
F	>22,900vpd	>25,200vpd ⁴	>40,000vpd	>45,000vpd

¹ Based on Table 3.9 Austroads - Guide to Traffic Engineering Practice Part 2

² Based on single carriageway +10% (supported by Table 3.1 Austroads - Guide to Traffic Engineering Practice Part 3) – Boulevard or division by medians.

³ Based on RRR Table 3.5 - mid-block service flow rates (SF.) for urban arterial roads with interrupted flow. Using 60/40 peak split.

⁴ Note James Street Guildford passes 28,000vpd.

Table 5 indicates the ultimate level of service of Fairway Drive by 2051 is forecast to be C/D for a daily volume of 11,800 vpd which is considered acceptable.

Intersection analysis

A roundabout is proposed at the main Fairway Drive/Centre access intersection.

Sidra analysis (PM peak period) has been undertaken for the operation of the Fairway Drive/ Centre access for 2051, assuming worst case all traffic uses the roundabout. It is acknowledged that two other accesses are likely to be available, one internal and one further south to Fairway Drive and results are therefore likely to be better than shown. A good level of service of A/B is forecast for all movements with no significant queueing or delay. Figure 7 refers.

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
South: Fairway Drive south												
1	L2	11	2.0	0.506	4.4	LOS A	4.1	28.9	0.58	0.55	0.58	45.7
2	T1	421	2.0	0.506	4.4	LOS A	4.1	28.9	0.58	0.55	0.58	46.8
3	R2	168	2.0	0.506	8.9	LOS A	4.1	28.9	0.58	0.55	0.58	37.5
Approach		600	2.0	0.506	5.6	LOS A	4.1	28.9	0.58	0.55	0.58	43.7
East: Centre access												
4	L2	168	2.0	0.334	1.7	LOS A	2.2	15.6	0.52	0.46	0.52	35.9
5	T1	37	2.0	0.334	1.5	LOS A	2.2	15.6	0.52	0.46	0.52	36.5
6	R2	168	2.0	0.334	4.4	LOS A	2.2	15.6	0.52	0.46	0.52	36.7
Approach		374	2.0	0.334	2.9	LOS A	2.2	15.6	0.52	0.46	0.52	36.3
North: Fairway Drive north												
7	L2	168	2.0	0.345	4.2	LOS A	2.3	16.3	0.50	0.51	0.50	36.3
8	T1	218	2.0	0.345	4.2	LOS A	2.3	16.3	0.50	0.51	0.50	47.6
9	R2	11	2.0	0.345	8.7	LOS A	2.3	16.3	0.50	0.51	0.50	47.8
Approach		397	2.0	0.345	4.3	LOS A	2.3	16.3	0.50	0.51	0.50	42.1
West: Sirius Way												
10	L2	21	2.0	0.112	7.5	LOS A	0.7	5.0	0.75	0.74	0.75	44.6
11	T1	37	2.0	0.112	8.3	LOS A	0.7	5.0	0.75	0.74	0.75	34.6
12	R2	21	2.0	0.112	12.0	LOS B	0.7	5.0	0.75	0.74	0.75	45.7
Approach		79	2.0	0.112	9.1	LOS A	0.7	5.0	0.75	0.74	0.75	39.5
All Vehicles		1449	2.0	0.506	4.8	LOS A	4.1	28.9	0.55	0.53	0.55	40.9

Figure 7 Fairway Drive/Centre access 2051 PM peak analysis

The Broome Traffic Study has analysed the Fairway Drive/Gubinge Road intersection to 2051 and indicates levels of service of A-C and worst degree of saturation as 0.58. The increased traffic due to the relocation of the Centre is not anticipated to significantly impact this intersection.

Residential Development Tanami Drive (former Centre site)

Land use will include:

- Child Care Centre (2,500 m²)
- 37 residential dwellings

Note: Figures are indicative and will be confirmed as part of relevant local structure planning processes.

Reviewing the Broome Traffic Study 2016 by Jacobs, the forecast traffic volumes to 2051 on the section of Tanami Drive west of Magabala Road for various scenarios do not exceed 234 vehicles per hour (vph) in one direction and 351 vph in both directions. Based on peak hour factors in the report, this would represent approximately 4,400 vpd.

The former Broome North Commercial Centre site will become Residential R20, and will generate lower traffic volumes.

An 11,100 m² centre is forecast to generate around 8,888 vpd compared with 340 vpd for 37 residential lots (9.2 trips x 37 dwellings) + 200 vpd to the Child Care Centre, assuming 50 children, 540 vpd in total.

Tanami Drive is designated as a Neighbourhood Connector in the DSP and provides ultimate connectivity between Broome Road and Sanctuary Road/Cable Beach Road West (both local distributors). Broader traffic volumes previously forecast on Tanami Drive to the east and west are significantly higher than this short section for all scenarios. Given that the Commercial

Centre will be relocated to the southwest off Fairway Drive, traffic patterns will change, however Tanami Drive will still ultimately form an important east-west route.

No change to the classification of Tanami Drive is recommended and it should remain a Neighbourhood Connector.

Relocation of District Open Space

A review of the relocation of District Open Space, as shown in Figure 5, indicates no significant change to traffic volumes on the road network. No further recommendations are made.

2.4 Recommendations

Following assessment of the Broome North DSP Amendment, no significant changes are recommended for the transport network.

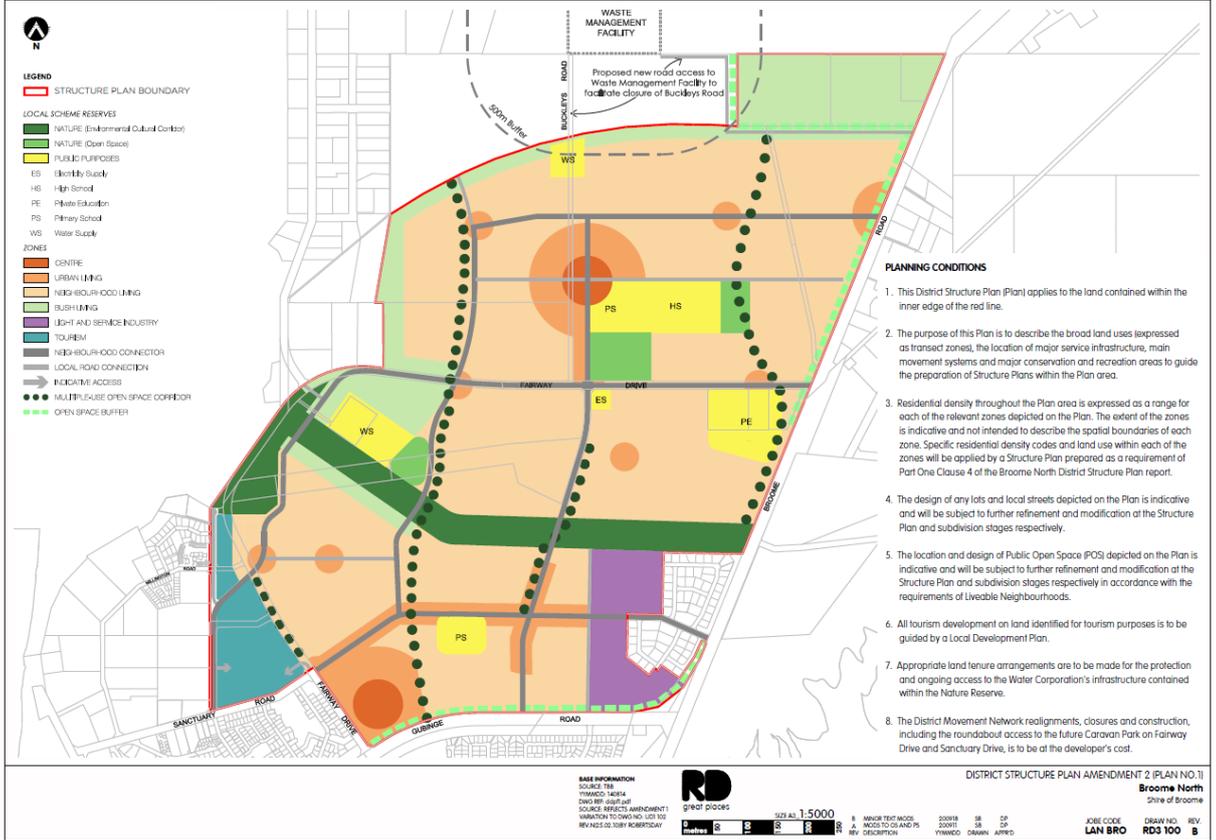
The proposed treatment of Fairway Drive as a Boulevard, together with a roundabout at the access to the Centre, is considered suitable.

No change to the classification of Tanami Drive due to the relocation of the Centre is recommended and it should remain a Neighbourhood Connector.

The relocation of the District Open Space is not considered to require any significant changes to the proposed road network.

Appendices

Appendix A - (Broome North DSP Amendment)



GHD

Level 10

999 Hay Street

T: 61 8 6222 8222 F: 61 8 9463 6012 E: permail@ghd.com

© GHD 2020

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

G:\61\12515596\Tech\Broom North DSP Report Current

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	S. McDermott	S. Barlow		S. Barlow		06/10/2020
B	S. McDermott	S. Barlow		S Barlow		23/11/2020

www.ghd.com

