

Town Planning

Engineering

Project Management



Tuart Brook Local Structure Plan

City of Bunbury

May 2014 (Final)



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CERTIFIED THAT THIS STRUCTURE PLAN WAS ADOPTED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON

9/12/2013..... Date

Signed for and on behalf of the Western Australian Planning Commission

W. J. Hare

An officer of the Commission duly authorised by the Commission pursuant to section 16 of the *Planning and Development Act 2005* for that purpose,

In the presence of:

J. Holden..... Witness

26/6/2014..... Date

And

PURSUANT TO THE COUNCIL'S RESOLUTION HEREUNTO AFFIXED IN THE PRESENCE OF:

B. B. B. B. B.
.....
Mayor, City of Bunbury

N. N. N. N. N.
.....
Chief Executive Officer, City of Bunbury

13/06/2014..... Date

This Structure Plan is prepared under the provisions of the City of Bunbury Town Planning Scheme No.7

Date of Expiry: **19 OCTOBER 2035**

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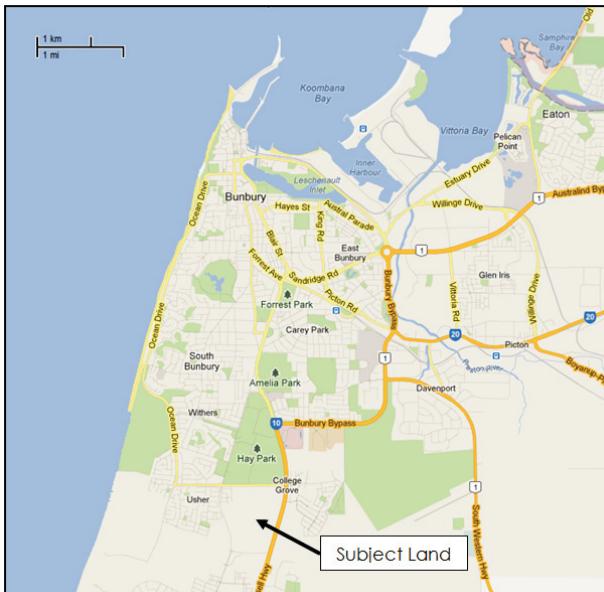
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Executive Summary

The Tuart Brook Structure Plan Area is located approximately 5.7 kilometres or 9 minutes (by road) south of the Bunbury Central Business District (refer **Figure 1**). The Structure Plan area is bounded by Washington Avenue to the north, Bussell Highway to the east, the Preston River to Ocean Regional Park to the south and Parade Road to the west.

Figure 1
Location Map



Source: Google Maps (www.maps.google.com.au)

Various Structure Plans have been devised for the Tuart Brook area over the past two decades. Most recently, TPG on behalf of the Department of Housing lodged a revised Structure Plan with the City of Bunbury in July 2011. This was formally advertised and, in response to the submissions received and various issues raised during this period, it was decided to further revise the Structure Plan.

The Tuart Brook Local Structure Plan has been prepared by MPM Development Consultants, on behalf of the Department of Housing and Kingslane Pty Ltd, and has been formulated using the Structure Plan Preparation Guidelines as released by the Western Australian Planning Commission in August 2012.

The new Structure Plan for the locality addresses the concerns raised during the advertising period associated with the previous (July 2011) version.

The Structure Plan incorporates 24.63ha of Regional Open Space, 8.1ha of Public Open Space, a 4.0ha Primary School and a 7,539m² local centre site capable of providing for a range of retail and community related uses. Once developed, the Structure Plan is estimated to be capable of supporting approximately 1,142 dwellings and an overall estimated population of 2,878 people.

Greenfield developments such as that proposed by Tuart Brook are limited within the Greater Bunbury Region. Appropriate planning and design at Structure Planning stage is of utmost importance as it will have a significant impact on the ability of Bunbury to accommodate forecasted growth.

The Structure Plan embraces the principles of the WAPC's Liveable Neighbourhoods and seeks to:

- provide a walkable and permeable structure;
- foster a strong sense of community and identity;
- provide an inter-connected network of streets to provide for safe and efficient walking, cycling and driving experiences;
- ensure active street/land use interfaces maximising surveillance opportunities;
- provide for safe and convenient access to the public transport network;
- provide, as far as possible, a mixed use urban development to cater for a variety of living, employment and leisure opportunities;
- provide a wide variety of lot sizes and housing types to cater for a range in housing choice and lifestyle opportunities;
- avoid key environmental areas and incorporate these features into the design of the area;
- provide an integrated approach to the design of open space and urban water management;
- promote opportunities for affordable housing; and,
- ensure the efficient use of the developable portions of the structure plan area.

Table 1
Structure Plan Summary Table

Item	
Total area covered by the Structure Plan	94.5462ha
Area of each land use proposed:	
R20	12.0761ha
R30	13.3977ha
R40	3.8147ha
R60	0.2421ha
R40/R60	9.125ha
ROS	24.6287ha
School	4.0000ha
POS	8.0961ha
Local Centre	0.7539ha
Landscape Buffer	1.4488ha
Roads/Pedestrian Access Ways	16.2504ha
Drainage	0.6804ha
Estimated Lot Yield	648
Estimated No of Dwellings	1,142
Estimated residential site density	12.07 dwellings per ha
Estimated residential site density (excluding ROS)	16.39 dwellings per ha
Estimated Population	2,878 people
Number of primary schools	1
Estimated commercial floor space	1,200m ² NLA
Employment self sufficiency targets	27 jobs/110 workers = 25%
Estimated number and % of Public Open Space:	
- Regional Open Space	24.6287ha 26.05%
- District Open Space	0 ha 0%
Estimated area and number of Parks:	
- Neighbourhood parks	7.3905ha 4 parks
- Local parks	0.7052ha 1 park
Estimated number and area of natural area and biodiversity assets	22.24ha 7 sites

Notes: 1. Estimated population based on 3.0 persons/dwelling for R20 to R60 and 1.5 persons/dwelling for aged person's sites.
2. Natural area & biodiversity assets sites comprised of Areas A, B, C, D, L, M & N in Table 5 and Figure 4.
3. Estimated lot yields and numbers of dwellings subject to detailed design and survey.

Part One – Statutory Section

1.1 Structure Plan Area

The boundaries of the structure plan area include that portion of the Local Government district of the City of Bunbury designated as "Tuart Brook Local Structure Plan Area" as shown on **Figure 2** - Tuart Brook Local Structure Plan Area.

Bussell Highway defines the eastern boundary of the structure plan area with Washington Avenue to the north, Centenary Road to the south and Parade Road to the east.

The structure plan area is contained within the inner edge of the broken line shown on the structure plan map. The lots included in the structure plan and the approximate lot areas are included in **Table 2** below.

The Structure Plan (refer to **Figure 3**) incorporates 24.63ha of Regional Open Space (ROS), 8.1ha of Public Open Space (POS), a 4.0ha Primary School and a 7,539m² local centre site capable of providing for a range of retail and community related uses.

Once developed, the Structure Plan is estimated to be capable of supporting approximately 1,142 dwellings and an overall estimated population of 2,878 people.

It should be noted that Lot 802 was previously known as Lot 500. Any reference to Lot 500 within this report (and/or appendices) shall relate to the new Lot 802.

Table 2
Lot Details

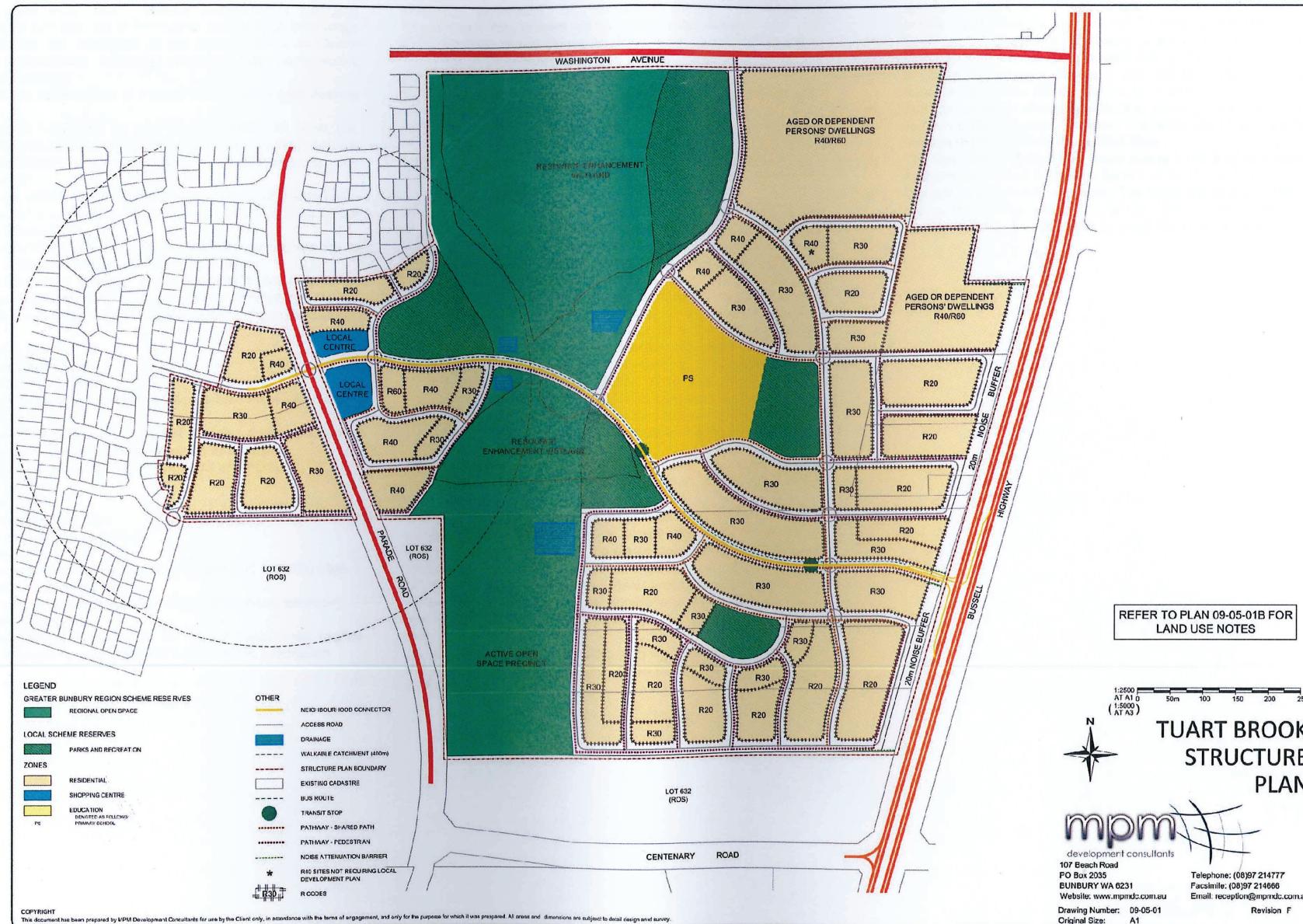
Lot	Road	Plan No.	Area (ha)
800	Parade Rd	P65631	1.7408
801	Parade Rd	P65631	3.9189
802	Washington Ave & Parade Rd	P65631	25.826
501	Washington Ave	P46368	28.325
100	Bussell Hwy	P57761	3.0175
4	Bussell Hwy	D31183	2.0234
3	Bussell Hwy	D31183	1.8251
7	Bussell Hwy	D69285	0.2009
8	Bussell Hwy	D75424	13.864
4	Bussell Hwy	D30204	6.9882
3	Bussell Hwy	D30204	6.8164
Total Area			94.5462

Source: landgate.wa.gov.au

Figure 2
Tuart Brook Local Structure Plan Area



Figure 3
Tuart Brook Local Structure Plan



LAND USE NOTES

1. Regional Open Space (ROS) will be ceded by the landowner to the Crown free of cost and without any payment of compensation at the time of subdivision. The whole ROS and Resource Enhancement Category wetlands will be vested with the City of Bunbury to be managed for a range of uses consistent with the objectives of the Preston River to Ocean Regional Park (i.e. conservation, recreation, drainage, flood management, infrastructure and community).
 2. No direct lot access will be permitted to Parade Road, Washington Avenue or Bussell Highway.
 3. No significant remnant vegetation or new planting areas on ROS (i.e. densely planted areas) and Resource Enhancement Category Wetlands are to be cleared to facilitate the implementation of subdivision works and various management plans.
 4. No landfill or drainage waters are to encroach or be directly discharged onto the Resource Enhancement Category Wetlands or the adjoining ROS on Lot 632 (managed for conservation).
 5. The following management plans and selected planning documents are to be completed prior to lodgement of a subdivision application:
 - 5.1. Local Water Management Strategy - which incorporates provisions and management measures for flood control and water conveyance associated with the diversion of the Five Mile Brook through the subject land;
 - 5.2. Fire Management Plan;
 - 5.3. Wetlands Management Plan;
 - 5.4. Developer Contributions Plan;
 - 5.5. Acoustic Report (Noise and Landscape Management Plan) - Bussell Highway interface.
 6. The following management plans and selected planning documents are to be implemented via conditions of subdivision (where applicable):
 - 6.1. Integrated Open Space Management Plan (ROS and POS);
 - 6.2. Geo-technical Surveys;
 - 6.3. Mosquito Management;
 - 6.4. Urban Water Management Plan;
 - 6.5. Acid Sulfate Soils Management Plan;
 - 6.6. Fire Management Plan;
 - 6.7. Local Development Plans for the Local Centre and R40 and R60 sites (where noted on the structure plan*);
 - 6.8. Noise and Landscape Management Plan (Bussell Highway interface);
 - 6.9. Wetlands Management Plan.
- *Note: With the exception of sites noted * the City of Bunbury will require Local Development Plans for any R40 and R60 sites prior to subdivision.

- The cost of the following major infrastructure items are to be shared between the landowners, and secured preferably through a voluntary agreement or addressed through a Developer Contributions Plan (if there will be multiple subdivider):
- 7.1 Neighbourhood Connector Road and intersection treatment with Parade Road;
 - 7.2 Intersection treatment with Washington Avenue;
 - 7.3 Development of the Public Open Space Precinct on ROS (includes landscaping and drainage works);
 - 7.4 Wetland Rehabilitation (Resource Enhancement Category Wetlands only within the structure plan area);
 - 7.5 Five Mile Brook Diversion Drain - flood management;
 - 7.6 Other major drainage infrastructure (e.g. bio-filtration wetlands/basins);
 - 7.7 Noise and Landscape Management Plan (to be shared in cost to the extent that it benefits subdivider) - The provision of a 20 metre wide Landscape Buffer Reserve for the establishment of a low-maintenance landscaped earth bund along Bussell Highway (plus return walls at appropriate sites) for noise mitigation, visual screening and an aesthetic treatment to protect the amenity of single storey dwellings only. The design of the bund is to be to the satisfaction of the WAPC, in consultation with the City of Bunbury;
 - 7.8 Fencing (to be shared in cost to the extent that it benefits/affects subdivision) - along part of the common boundary with Lot 632 (i.e. ROS land adjoining the structure plan which is to be managed for conservation) except where the structure plan area is reserved as Regional Open Space; and
 - 7.9 Main Roads WA intersection upgrading measures, including traffic lights, at the intersection of the Neighbourhood Connector Road and Bussell Highway.
8. The subdivider's obligation for a 10 percent contribution of the gross subdivisible land area as POS is determined in the context to the land allocations proposed for the whole structure plan area. Matters relating to the equitable provision of POS between landowners is to be resolved between the landowners, preferably through a private agreement or by lodging joint applications for subdivision. A 10 percent POS provision will be required to be demonstrated for each stage of subdivision.
- All POS required by the structure plan will be required to be ceded, at the time of subdivision, to the Crown free of cost and payment of compensation.
9. Following the completion of a Fire Management Plan, the recommended fire management controls are to be reflected on an updated structure plan to the satisfaction of the WAPC, Department of Fire and Emergency Services and the local government.
 10. Development of aged or dependent persons dwellings on Lots 500 and 100 is permitted up to a maximum density of R40 for single dwellings and grouped dwellings, and R60 for multiple dwellings in accordance with the Residential Design Codes.
 11. Suitable areas for strategic landscape planting within the ROS and Resource Enhancement Category Wetlands are to be determined through the Wetlands Management Plan.
 12. The road layout of the extension to Honey Lane is to be determined at subdivision stage, to the satisfaction of the City of Bunbury.
 13. The interface between residential lots within the R30 and R40 cells and access design (50m south of Liam Street intersection west of Parade Road) to be addressed by Local Development Plan.

TUART BROOK STRUCTURE PLAN



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1.2 Structure Plan Content

The Structure Plan comprises:

- Part One – Statutory Section;
- Part Two – Non-statutory (explanatory) section; and,
- Appendices – Technical reports and supporting plans and maps including:
 - o Tuart Brook Local Structure Plan;
 - o 'Wetland Management Plan - 500 Washington Avenue, Usher', Bioscience (Undated);
 - o Certificates of Title;
 - o 'Lot 1 Washington Avenue, Bunbury Environmental Assessment', ENV (May 2006);
 - o 'Declared Rare & Priority Flora Survey, Threatened Ecological Community Identification & Wetland Assessment, Lot 1 Washington Avenue', ENV (December 2006);
 - o 'Lots 1, 3, P3, 4, 4, 5, 7, 8 and 11 Washington Avenue & Bussell Highway, Usher Fauna Assessment (Level 1) and Western Ringtail Possum Survey', ENV (January 2008);
 - o 'Aboriginal Sites Database', Department of Indigenous Affairs (October 2012);
 - o 'Report On An Archaeological Survey Proposed DWH Housing Sub-division In The Locality Of Wellington, Bunbury, Western Australia', Tempus Archaeology (July 2007);
 - o 'Report of an Ethnographic Survey of Lots 500 & 501, Washington Avenue, Bunbury, Western Australia', Ethnoscience (July 2007);
 - o 'Tuart Brook Structure Plan, Bunbury (Department of Housing) Traffic Noise Assessment', Gabriels Environmental Design (May, 2010).
 - o 'Tuart Brook Structure Plan Transport Assessment', Donald Veal Consultants (Final September 2012);
 - o 'Tuart Brook Precinct Local Water Management Strategy', hyd2o Hydrology (October 2012); and,
 - o Pre-Lodgement Consultation Summary.

Part One contains all information required to have statutory effect and includes the structure plan map and all the standards, requirements and prerequisites for subdivision and development within the structure plan area.

Part Two serves as a reference guide to explain and implement the statutory provisions in Part One.

1.3 Interpretations & Scheme Relationship

Unless otherwise specified in this part, the words and expressions used in this Structure Plan shall have the respective meanings given to them in:

- (a) the City of Bunbury Town Planning Scheme No 7 (the Scheme);

- (b) the Planning and Development Act, 2005; or if they are not defined in that Act –
 - i. the Dictionary of Defined Words and Expressions in Schedule 1 of the City of Bunbury Town Planning Scheme No. 7; or
 - ii. the Residential Design Codes; or
 - iii. the Building Code of Australia; or
 - iv. in a relevant Australian Standard, including any amendments gazetted thereto.

If there is a conflict between the meaning of a word or expression in the Structure Plan and the meaning of that word or expression in the Scheme, then the Scheme shall prevail.

The provisions of the Tuart Brook Local Structure Plan comprises of the Structure Plan Text and Structure Plan Maps. The Structure Plan is to be read in conjunction with the Scheme.

The structure plan map (**Appendix 1**) outlines land use, zones and reserves applicable within the structure plan area. The zones and reserves designated under this structure plan apply to the land within it as if the zones and reserves were incorporated into the Scheme.

Pursuant to clauses 6.2.8.2 and 6.2.8.3 of the Scheme:

- a) The provisions, standards and requirements specified under Part One of this Structure Plan shall have the same force and effect as if it were a provision, standard or requirement of the Scheme. In the event of there being any variations or conflict between the provisions, standards or requirements of the Scheme and the provisions, standards or requirements of this Structure Plan, then the provisions, standards or requirements of this Structure Plan shall prevail;
- b) Any other provision, standard or requirement of Part One of the Structure Plan that is not otherwise contained in the Scheme, shall apply to the structure plan area as though it is incorporated into the Scheme, and shall be binding and enforceable to the same extent as if part of the Scheme; and,
- c) Part Two of this Structure Plan and all appendices (with the exception of Appendix 1 as provided above), are to be used as a reference only to clarify and guide interpretation and implementation of Part One.

1.4 Operation Date

In accordance with Clause 6.2.8.1 of the Scheme, this structure plan shall come into operation on the date it is adopted by the Local Government pursuant to clause 6.2.5.15.

The Structure Plan shall be required to be adopted by the City of Bunbury and endorsed by the Western Australian Planning Commission (WAPC) prior to the approval of any application for subdivision and/or planning approval, and such approvals shall comply with the relevant adopted and endorsed Structure Plan.

In accordance with Clause 6.2.8.2 of the Scheme, if a Structure Plan imposes a classification on the land included in it by reference to reserves, zones or Residential Design Codes, then –

- (a) the provisions of the Structure Plan apply to the land as if its provisions were incorporated into the Scheme and it is binding and enforceable in the same way as corresponding provisions incorporated in the Scheme; and
- (b) the provisions in the Scheme applicable to land in those classifications under the Scheme, apply to the structure plan area.

Pursuant to sub-clause 6.2.8.3 of the Scheme, under the Structure Plan:

- (a) in the areas designated as zones, the permissibility of uses is to be the same as set out in the Zoning Table as if those areas were zones under the Scheme having the same designations;
- (b) the standards and requirements applicable to the zones and Residential Design Codes under the Scheme apply to the areas having corresponding designations under the Structure Plan;
- (c) the planning approval procedures including the procedures for the approval of uses and developments under the Scheme are to apply as if the land were correspondingly zoned or reserved under the Scheme; and,
- (d) any other provision, standard or requirement in the Structure Plan is to be given the same force and effect as if it were a provision, standard or requirement of the Scheme.

1.5 Land Use & Subdivision Requirements

The Tuart Brook Local Structure Plan Map (**Appendix 1**) outlines land use, zones and reserves applicable within the Structure Plan area. The zones and reserves designated under this Structure Plan apply to the land within it as if the zones and reserves were incorporated into the Scheme.

1.5.1 Land Use Permissibility

Consistent with sub-clause 6.2.8.4 of the Scheme, the Structure Plan, adopted and endorsed in accordance with the Scheme, will be used by the City of Bunbury and the Western Australian Planning Commission, respectively as a guide for the assessment of Applications for Planning Approval under the Scheme and of Applications for Approval to Subdivide Land under the provisions of Part 10 of the Planning and Development Act 2005. The subdivision of land within the structure plan area shall require further assessment and any approvals shall be conditioned with respect to the development control of issues of local and regional importance, additional infrastructure requirements to support the scale and nature of proposed development, and more detailed local planning considerations.

The subdivision, development and use of land included in the structure plan area is to be in accordance with the general standards for land use and development of the Scheme, the Residential Design Codes, and the following requirements and/or conditions of the Structure Plan to the satisfaction of both the Local Government and the Western Australian Planning Commission (WAPC).

The subdivision, development and use of land within the structure plan area will be in accordance with the Tuart Brook Local Structure Plan and **Table 3**.

Areas designated as either:

- "Shopping Centre";
- "Residential (R20)";
- "Residential (R30)";
- "Residential (R40)";
- "Residential (R60)"; or
- "Residential (R40/60) – Aged or Dependent Persons' Dwellings"

to be in accordance with the Scheme and the Residential Design Codes, as amended and applicable.

The permissibility of land uses within the Tuart Brook Local Structure Plan Area is as designated according to Table 3.

1.5.2 Residential Density Target

Excluding the significant area of Regional Open Space, the Structure Plan establishes a residential site density target of 16 dwellings per hectare and a minimum of 1,100 dwellings within the structure plan area. This compares with the density target of 15 dwellings per gross hectare established by the Department of Planning within the draft Greater Bunbury Strategy. Appendix 1 and Figure 16 define the residential densities that apply to specific areas within the Structure Plan.

1.5.3 Commercial

Pursuant to Clause 6.2.4.4 of the Scheme, the retail floorspace Net Lettable Area (NLA) for the Structure Plan is to be in accordance with **Table 4**.

1.5.4 Public Open Space

The provision of a minimum of 10 per cent public open space (POS) is to be achieved in accordance with the WAPC's Liveable Neighbourhoods. Public Open Space is to be provided generally in accordance with **Table 5** and **Figure 4** with an updated public open space schedule to be provided at the time of subdivision for determination by the WAPC, upon the advice of the City of Bunbury.

Table 3
Permissible Use Classes Within The Structure Plan Area

Structure Plan Zonings & Reserves	Permissible Use Classes & Associated Requirements
Areas designated as either: <ul style="list-style-type: none"> • 'Residential (R20)'; • 'Residential (R30)'; • 'Residential (R40)' – • 'Residential (R60)' • 'Aged or Dependent Persons' Dwellings (R40/60)' 	<ul style="list-style-type: none"> i) All land uses permitted within the 'Residential Zone', in accordance with the Scheme and the Residential Design Codes, as amended. ii) The first row of houses along the eastern boundary (Bussell Highway) will require acoustic upgrade to control traffic noise intrusions such that the indoor noise level criteria is met in accordance with the Tuart Brook Structure Plan Traffic Noise Assessment.
Areas designated as 'Aged or Dependent Persons' Dwellings (R40/R60)'	<ul style="list-style-type: none"> i) The definition of 'Aged or Dependent Person's Dwellings' shall be in accordance with that meaning at 6.11.2 of State Planning Policy 3.1 'Residential Design Codes'. ii) The meanings for 'Single Dwelling(s)', 'Grouped Dwelling(s)' or 'Multiple Dwelling(s)' shall be in accordance with the Residential Design Codes, as amended. The above uses and development thereof shall be permitted in accordance with the Scheme and Residential Design Codes and other relevant legislation. iii) Development of aged or dependent persons' dwellings is permitted to a maximum residential density of R40 for 'Single Houses' and 'Grouped Dwellings', and R60 for 'Multiple Dwellings' in accordance with the Residential Design Codes. iv) A 1.8 m tall fence on the boundary between the two Aged or Dependent Person's sites and the existing Caravan Park in accordance with the Tuart Brook Structure Plan Traffic Noise Assessment. v) A 1.8 m tall fence along the northern boundaries of the 'Aged or Dependent Persons' Dwellings site shall be required in accordance with the Tuart Brook Structure Plan Traffic Noise Assessment.
Areas designated as 'Shopping Centre' -	<ul style="list-style-type: none"> i) All land uses permitted within the 'Shopping Centre Zone', in accordance with the Scheme, as amended. ii) Development and land use shall be commensurate to that of a "Local Centre", with a maximum total retail floor space of 1,200m² net lettable area (nla).
Areas designated as 'Education (Primary School)' -	<ul style="list-style-type: none"> i) All land uses permitted within the "Education Zone", in accordance with the Scheme.
Areas designated as 'Parks and Recreation' -	<ul style="list-style-type: none"> i) Public Open Space for passive and active recreational uses in accordance with Part 3 – Reserves under the Scheme. ii) May have a maximum of 2% of public open space used as restricted dual use function for drainage in accordance with Liveable Neighbourhoods. <ul style="list-style-type: none"> Area N – 1.5993ha Area L – 2.9691ha Area M – 1.2636ha Area H – 1.5580ha Area I – 0.7052ha iii) Within that area designated as '20m Noise Buffer' a noise attenuation barrier shall be designed and constructed in accordance with the standards and management prescribed by the Local Government and the Western Australian Planning Commission.
Areas designated as 'Regional Open Space' -	<ul style="list-style-type: none"> i) Public Open Space for conservation, passive and active recreational uses in accordance with the Greater Bunbury Region Scheme (GBRS). <ul style="list-style-type: none"> Area 1 (north of east-west road) – 13.8293ha Area 2 (south of east-west road) – 10.7994ha
Areas designated as 'Resource Enhancement Wetland' -	<ul style="list-style-type: none"> i) Land uses for the purposes of protecting natural environments from impacts in order to maintain public health or ecological values, in accordance with Part 3 – Reserves under the Scheme. ii) May be used as restricted public open space for the purposes of aesthetic landscaping and incidental passive recreation and/or pedestrian linkage. iii) Land is to be managed in accordance with the "Regional Open Space Reserve" under the Greater Bunbury Region Scheme (GBRS).
Areas designated as 'Roads' -	<ul style="list-style-type: none"> i) Local Development Plans shall be required for, and shall show access restrictions to, lots located along the sections of those roads providing access into the Local Structure Plan Area. The extent of the access restrictions to be determined during detailed design. ii) 1.8 m tall fence along the southern boundary of the structure plan, up to a distance of 180 metres away from the east boundary in accordance with the Tuart Brook Structure Plan Traffic Noise Assessment.
Areas designated 'Noise Attenuation Barrier' -	<ul style="list-style-type: none"> i) Noise attenuation barriers shall be designed and constructed in accordance with the standards and specifications prescribed by the Local Government and the Western Australian Planning Commission.

Table 4
Retail Floorspace Provision

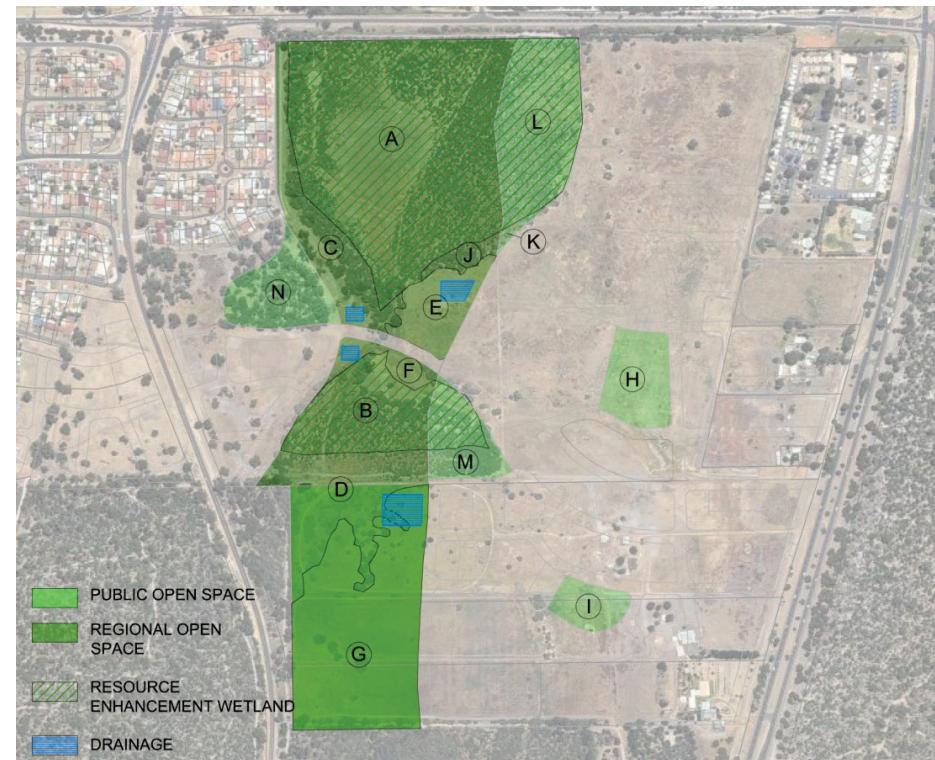
CENTRE	MAXIMUM NET LETTABLE AREA
Usher Local Centre	1,200m2 NLA

Table 5
Calculation of Gross Subdivisible Area & Public Open Space Provision
(refer to Figure 4)

	(ha)	(ha)	(ha)
Site Area			94.5462
Less			
Environmental Protection policy areas Wetlands to be ceded within ROS area			
Area A	10.1592		
Area B	2.3422	12.5014	
Protected Bushland Sites within ROS area			
Area C (excl. 50% drainage Area A)	1.9737		
Area D	2.8759		
Area J	0.3207	5.1703	
Unrestricted ROS Sites not included in public open space contribution			
Area E (excl. drainage Area B)	1.0845		
Area F (excl. 50% drainage Area A)	0.4378		
Area G (excludes drainage Area C)	5.4347	6.9570	
Total		24.6287	
Net Site Area			69.9175
Deductions			
Primary School	4.0000		
Local Centre	0.7539		
Drainage Areas	0.6804		
Bussell Highway Noise Buffer Reserve	1.4488	6.8831	
Gross Subdivisible Area			63.0344
Public Open Space @ 10%			6.3034
Public Open Space Contribution			
Unrestricted Public Open Space - 27.96%			
Restricted Public Open Space - 72.04%			
Unrestricted POS as a % of 10% POS Requirement (excl ROS) - 35.91%			
Unrestricted Public Open Space Sites			
2 local parks	H	1.5580	
	I	0.7056	2.2636
Restricted Use Public Open Space Sites			
3 bushland protection sites	L & K (incl. portion of REC Wetland)	2.9696	
	M (incl. portion of REC Wetland)	1.2636	
	N	1.5993	5.8325
Public Open Space Provision (excluding Regional Open Space)			8.0961
Portion of ROS cleared and not part of REC Wetland (possible unrestricted POS) - Areas E, F & G		6.9570	

Note: Gross subdivisible area includes house lots, access roads, and any land incidental to the subdivision. The gross subdivisible area does not include areas for schools, shopping centres, infrastructure (eg land required for sewer pump stations), dedicated drainage sites not having a recreational function and land set aside for arterial roads and other non-residential uses.

Figure 4
Open Space Plan



The Structure Plan proposes a contribution of approximately 12.8% of the Gross Subdivisible Area as public open space in addition to the 24.63 hectares (or 26.05% of the structure plan area) of Regional Open Space.

A large proportion (72.04%) of restricted public open space is proposed and is a design response to the unique physical attributes of the subject land and the associated biodiversity conservation objectives relevant to land's proximity to the Preston River to Ocean Regional Park. Approximately 23.5 hectares of remnant vegetation is located within both ROS and proposed local POS areas. This vegetation is of conservation significance because:

1. It forms part of an ecological linkage as identified in EPA Bulletin 1108 (Appendix 4);
2. The majority of the native complex forms part of the "Karrakatta Central and South" vegetation complex, which is poorly represented at a bioregion level;
3. A portion of the vegetation supports Western Ringtail Possums, albeit in low numbers, and potentially supports Red and White-tailed Black Cockatoos, which are protected under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999; and,
4. It may contain an occurrence of the "SCP18" threatened ecological community.

This relatively high proportion of restricted public open space shall be offset by:

1. the approximate 6.96 hectares of "unrestricted" Regional Open Space within the Structure Plan area; and,
2. the unrestricted POS areas being developed to a high standard.

The degraded and unrestricted portions of the Regional Open Space areas provide a potential opportunity to address the shortfall in provision of unrestricted public open space for active recreational use. In accordance with the notation on the structure plan, alternative 'active' recreational pursuits are to be investigated for these areas (eg playing field, trails and bike paths).

1.5.5 Reports/Strategies Required Prior to Subdivision

Prior to the lodgement of subdivision applications to the WAPC, the following management plans are to be prepared, as applicable, to the satisfaction of the relevant authority and provided with the application for subdivision (approving authority in brackets):

- a) Wetland Management Plan (Department of Parks and Wildlife);
- b) Local Water Management Strategy (Department of Water);
- c) Acid Sulfate Soils Investigation (Department of Environment Regulation);
- d) Bush Fire Management Plan (Department of Fire and Emergency Services);
- e) Mosquito-borne Disease and Nuisance Risk Assessment (City of Bunbury); and,
- f) Infrastructure and Servicing Strategy (City of Bunbury).

1.5.6 Conditions of Subdivision Approval

At the time of subdivision the following conditions may be recommended, as applicable, requiring the preparation and/or implementation of the following strategies (approving authorities in brackets):

- i) Wetland Management Plan (Department of Parks and Wildlife);
- ii) Geotechnical Investigations Report (City of Bunbury);
- iii) Mosquito Management Plan (City of Bunbury);
- iv) Urban Water Management Plan (Department of Water);
- v) Acid Sulfate Soils Report (Department of Environment Regulation);
- vi) Fire Management Plan (Department of Fire and Emergency Services);
- vii) Local Development Plans (City of Bunbury);
- viii) Cost Contribution Schedule (City of Bunbury); and
- ix) Infrastructure and Servicing Plan (City of Bunbury).

At the time of subdivision the City of Bunbury shall recommend to the WAPC the implementation of the following strategies which have been prepared and approved as part of the Structure Plan as conditions of subdivision:

- i) Wetland Management Plan;
- ii) Flora Survey/Assessment;
- iii) Fauna Survey/Assessment;
- iv) Archaeological Survey;
- v) Ethnographic Survey;
- vi) Traffic Noise Assessment;
- vii) Transport Assessment; and
- viii) Local Water Management Strategy.

1.6 Development Requirements

Local Development Plans (formerly Detailed Area Plans) are to be prepared in accordance with Clause 6.2.7 of the Scheme, prior to any subdivision and/or development of medium density and high density residential precincts (ie in excess of the R30 density code), 'Aged Persons' sites and the 'Local Centre'.

In addition, Local Development Plans shall be required for:

- i) those areas adjacent to the entry/exit points to and from the structure plan area, as determined by the Local Government, specifying any access restrictions together with the proposed means of access to proposed lots along those sections of road; and,
 - ii) for those lots near bushland and shall detail the proposed separation from bushfire hazards (eg in the form of internal accessways etc);
- to the satisfaction of the Local Government.

The Local Development Plans are to be prepared in accordance with the Scheme, Liveable Neighbourhoods and the Residential Design Codes and must show such detail to the satisfaction of the Local Government that the development of land within the

development site is consistent with orderly and proper planning and the achievement of the highest appropriate level of amenity.

In addition to those matters required in accordance with Clause 6.2.7 of the Scheme, the Local Development Plan may include information or detail dealing with, but not be limited to, the following –

- a) standards and requirements for development site planning and building design;
- b) lot layout of subdivision design and building envelopes;
- c) extent of land uses in accordance with the Zoning Table of the Scheme;
- d) interface and buffer treatments between the surrounding residential uses and the development site;
- e) residential densities where residential use is permissible;
- f) urban design treatment of streetscapes and residential interfaces;
- g) traffic management, including accessways and internal circulation;
- h) vehicle parking and circulation areas and treatments;
- i) pedestrian access and movement;
- j) building height and scale;
- k) development setbacks from boundaries;
- l) landscaping within setback areas and between buildings; and,
- m) views to and from the site (e.g. with regard to inland residential areas).

1.7 Other Requirements

Consistent with the provisions of Section 5.3 of State Planning Policy DC 3.6 'Development Contributions for Infrastructure', and in the absence of a Developer Contribution Scheme, the Department of Housing, Kingslane Pty Ltd and John Cranston will provide a voluntary agreement between the developers and the City of Bunbury with the relevant contributions to be implemented through voluntary legal agreements. The agreement will reflect the principles embodied in Section 5.2 of SPP DC3.6. Contributions may be a condition of subdivision approval and will become due and payable as part of the subdivision clearance process.

The development contributions may include common infrastructure works such as roads, drainage and sewer as well as the equitable apportionment of public open space and will be dependent upon the outcomes of the Building Better Regional Cities Federal Funding recently awarded in relation to a portion of the Structure Plan area.

Prior to the commencement of subdivisional works, the landowner will be required to provide a pre-works geotechnical report certifying that the land is physically capable of development or advising how the land is to be remediated and compacted to ensure it is capable of development and, in the event that remediation works are required, the landowner will be required to provide a post geotechnical report certifying that all subdivisional

works have been carried out in accordance with the pre-works geotechnical report.

The predominance of Moderate to High Risk Acid Sulphate Soils within the structure plan area may necessitate the preparation and approval of an Acid Sulphate Soils Management Plan to be imposed as a condition of subdivision approval. The Plan may be required to be submitted to, and approved by the Department of Environment Regulation before any subdivision works or development are commenced.

A condition of subdivision approval may be recommended to the WAPC requiring a Fire Management Plan to be prepared, approved and relevant provisions implemented during subdivisional works.

A Wetland Management Plan has been prepared for the wetland area on Lots 501 and 802 and is included as **Appendix 2**.

Part Two – Non-Statutory Section

1.0 Planning Background

1.1 Introduction & Purpose

The purpose of the Structure Plan is to provide for the orderly and proper planning of the Tuart Brook urban area in accordance with the State Planning Framework and the City of Bunbury Local Planning Policy Framework.

The intent of this Structure Plan is to guide the subdivision, development and infrastructure servicing of the Tuart Brook Local Structure Plan Area as a residential neighbourhood that is integrated with the surrounding College Grove, Dalyellup and Usher local areas.

1.2 Land Description

1.2.1 Location

The structure plan area is located approximately 5.7 kilometres south of the Bunbury Central Business District within the Locality of Usher. The structure plan area is generally bounded by Bussell Highway to the east, Parade Road to the west, Washington Avenue to the north and the Preston River to Ocean Regional Park situated immediately to the south (refer to **Figure 5**).

1.2.2 Area & Land Use

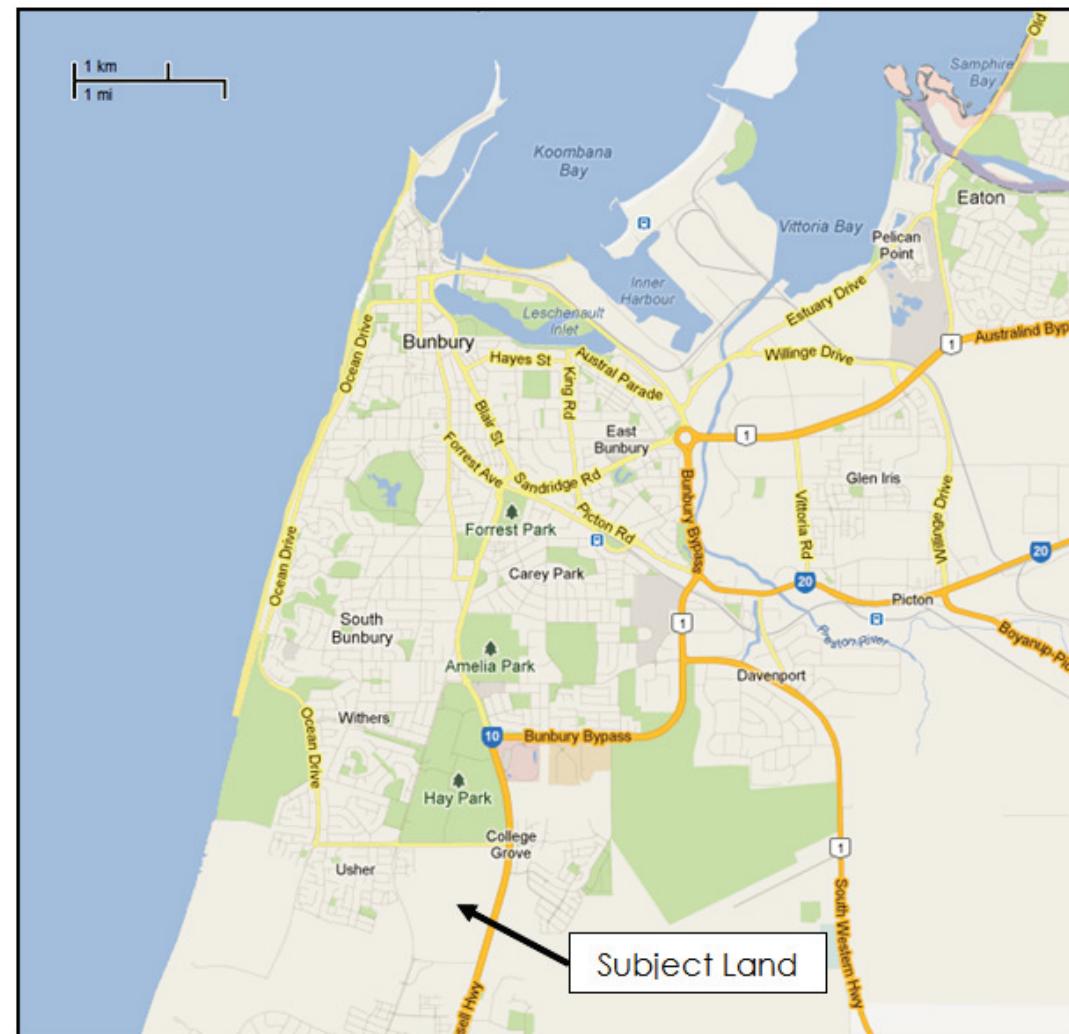
The structure plan area incorporates 11 lots as detailed in **Table 6** and **Figure 6**. The structure plan area comprises a total of 94.5 hectares and has historically supported rural land use activities (primarily grazing and agistment). Some low intensity grazing and agistment still occurs on portions of the subject land (refer to **Photos 1 & 2**).

Much of the subject land, due to its previous rural use, is generally cleared with some intermittent trees and areas of remnant vegetation.

Six dwellings together with outbuildings and sheds are variously positioned on those lots fronting Bussell Highway. The balance of the land remains vacant.

A large area of Regional Open Space (ROS) traverses the structure plan area in a north-south direction. Contained generally within the northern two-thirds of the ROS are two Resource Enhancement Wetlands (REW's). South of these the ROS is predominantly cleared grazing land (refer to **Figure 7** – Aerial Photograph).

Figure 5
Location Plan



Source: Google Maps (www.maps.google.com.au)

Table 6
Land Ownership

Lot	Owner	Certificate of Title	Area (ha)
800	Housing Authority	2763/835	1.7408
801	Housing Authority	2763/836	3.9189
802	Housing Authority	2763/837	25.8260
501	Housing Authority	2610/502	28.3250
100	Paul Barron	2682/137	3.0175
4	Angelina & Matteo Daqui	27/170A	2.0234
3	Nicola & Iolanda Tassone	1781/99	1.8251
7	James Norden & Michelle McCosker	1781/98	0.2009
8	Kingslane Pty Ltd	1836/884	13.8640
4	John Cranston	1287/465	6.9882
3	Giovanna Dichiera	1287/464	6.8164
Total Area			94.5460ha

Figure 6
Cadastral Boundaries



Source: www.landgate.wa.gov.au

Photo 1
Structure Plan Area from Washington Avenue looking south



Photo 2
Structure Plan Area from Lot 8 looking east



Figure 7
Aerial Photograph



Source: www.nearmap.com

1.2.3 Legal Description & Ownership

The legal descriptions and ownership details of lots within the structure plan area are summarised in Table 6 and copies of the Certificates of Title are provided in **Appendix 3**.

1.3 Planning Framework

1.3.1 Zoning

Greater Bunbury Region Scheme (GBRS)

Under the terms of the Greater Bunbury Region Scheme (GBRS) the subject land is predominantly zoned 'Urban', with the exception of a north-south corridor reserved as Regional Open Space (ROS) – refer to **Figure 8**.

City of Bunbury Town Planning Scheme No.7

The Tuart Brook Local Structure Plan area is predominantly zoned 'Residential R15' within the City of Bunbury Town Planning Scheme No 7 with the ROS reserved portion of the area transposed from the GBRS onto the Local Planning Scheme – refer **Figure 9**.

The structure plan area is included as part of the Special Control Area 'Development Investigation Policy Area' under Town Planning Scheme No 7. Development Investigation Policy Areas are areas designated for further strategic planning and investigations in relation to land use options, environmental issues, servicing requirements, transportation infrastructure needs, landscaping and design guidelines.

Clause 6.2.3.1 of Town Planning Scheme No 7 states that the City of Bunbury requires a Structure Plan for a Development Investigation Policy Area, or for any particular part or parts of a Development Investigation Policy Area, before recommending subdivision or approving development of land within the Development Investigation Policy Area.

Notwithstanding the R15 density coding currently assigned to the land, the provisions of Clause 6.2.8 apply in accordance with the discussion at Section 1.3 Interpretations & Scheme Relationship of Part 1 of the structure plan report.

1.3.2 Regional & Sub-Regional Structure Plans

Draft Greater Bunbury Strategy 2011-2031 and Beyond & the Draft Greater Bunbury Structure Plan 2011-2031

The draft Greater Bunbury Strategy 2011-2031 and Beyond and the draft Greater Bunbury Structure Plan 2011-2031 (refer **Figure 10**) have been prepared by the Department of Planning to guide urban and regional planning in the Greater Bunbury sub-region.

The Greater Bunbury Strategy incorporates the Greater Bunbury Structure Plan which is based on ensuring a 25 year supply of undeveloped land. The main purpose of the Structure Plan is to identify land ahead of the rezoning process and to stage the rezoning of that land in response to future growth trends.

The Strategy advocates that land that is already zoned, such as the Tuart Brook Local Structure Plan area, should be encouraged and prioritised for development given the considerable supply of land that has already been deemed suitable, or potentially suitable, for new urban development and that has already been zoned accordingly under the Greater Bunbury Region Scheme.

1.3.3 Planning Strategies

Local Planning Strategy for Activity Centres & Neighbourhoods (LPSACN)

The Local Planning Strategy for Activity Centres & Neighbourhoods (LPSACN) adopted by the City of Bunbury in March 2011 provides a 'principles' based general strategy to guide town planning scheme zoning, policy development and decision making in relation to residential, commercial and mixed use developments.

The principle aim of the LPSACN is to facilitate a network of mutually supportive residential neighbourhoods and activity centres that contribute to the economic, social and environmental sustainability of the City of Bunbury.

Based on a range of factors such as location, physical appearance, existing or proposed size and classification as well as results compiled from modelling data, the Strategy identifies centres regarded as being most suitable for designation as activity centres.

Tuart Brook is identified as hosting a future 'Local Centre' with a potential (not capped) retail floor space of 350m². Within the Strategy, 'Local Centres' are identified as having a maximum retail floor space of up to 2000m².

1.3.4 Policies

Liveable Neighbourhoods

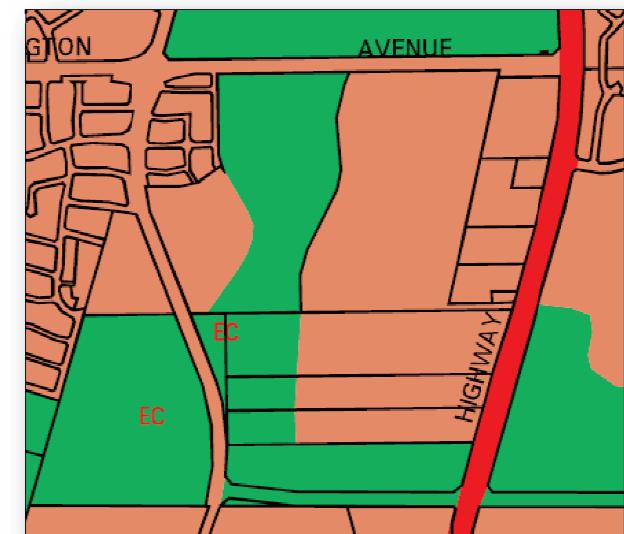
Liveable Neighbourhoods (2007) operates as a neighbourhood design code, intended to facilitate the development of sustainable communities. The policy has many aspects but fundamentally the principle idea is to promote walkable mixed-use neighbourhoods.

Local Centres, such as that proposed within the Tuart Brook Structure Plan, should be strategically located to maximise the benefit from passing traffic and should be within easy walking distance of local residents.

The Tuart Brook Structure Plan has been formulated to comply with the objectives and intentions of Liveable Neighbourhoods.

Figure 8

Extract from Greater Bunbury Region Scheme



Reserved lands

	regional open space
	railways
	port installations
	State forests
	waterways
	public purposes denoted as follows:

A	airport
H	hospital
HS	high school
TS	technical school
U	university
PU	public utilities
SU	special uses
P	prison

	primary regional roads
	other regional roads

Zones

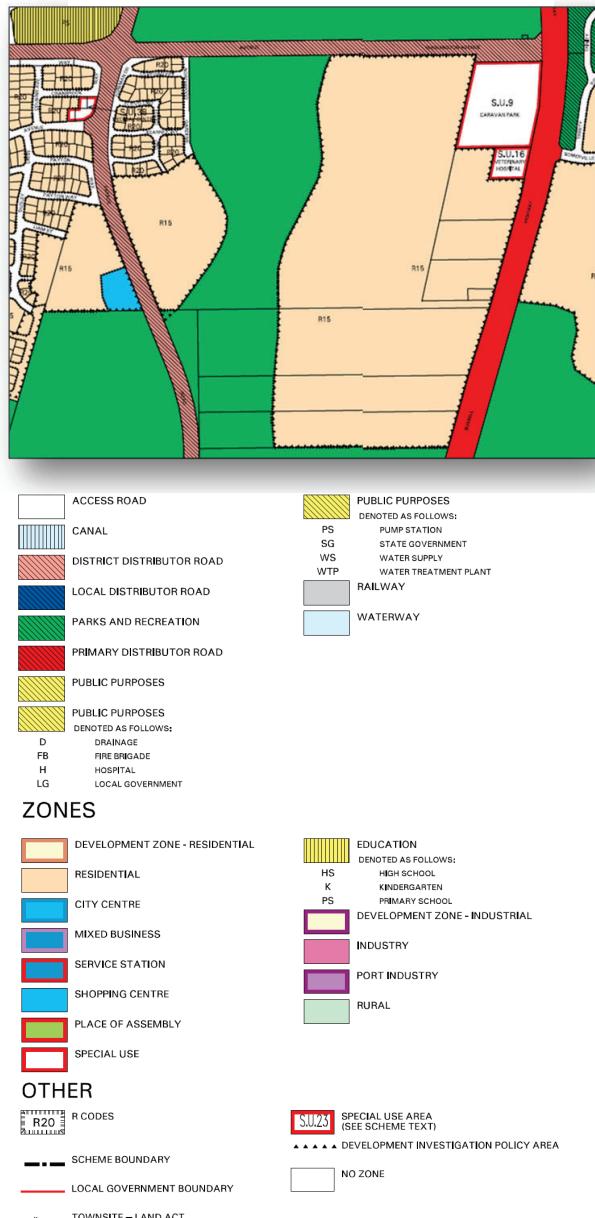
	urban
	urban deferred
	regional centre
	industrial
	rural
	private recreation

	special control areas denoted as follows:
	water catchments
	Kemerton industrial zone buffer area
	Glen Iris service corridor buffer area

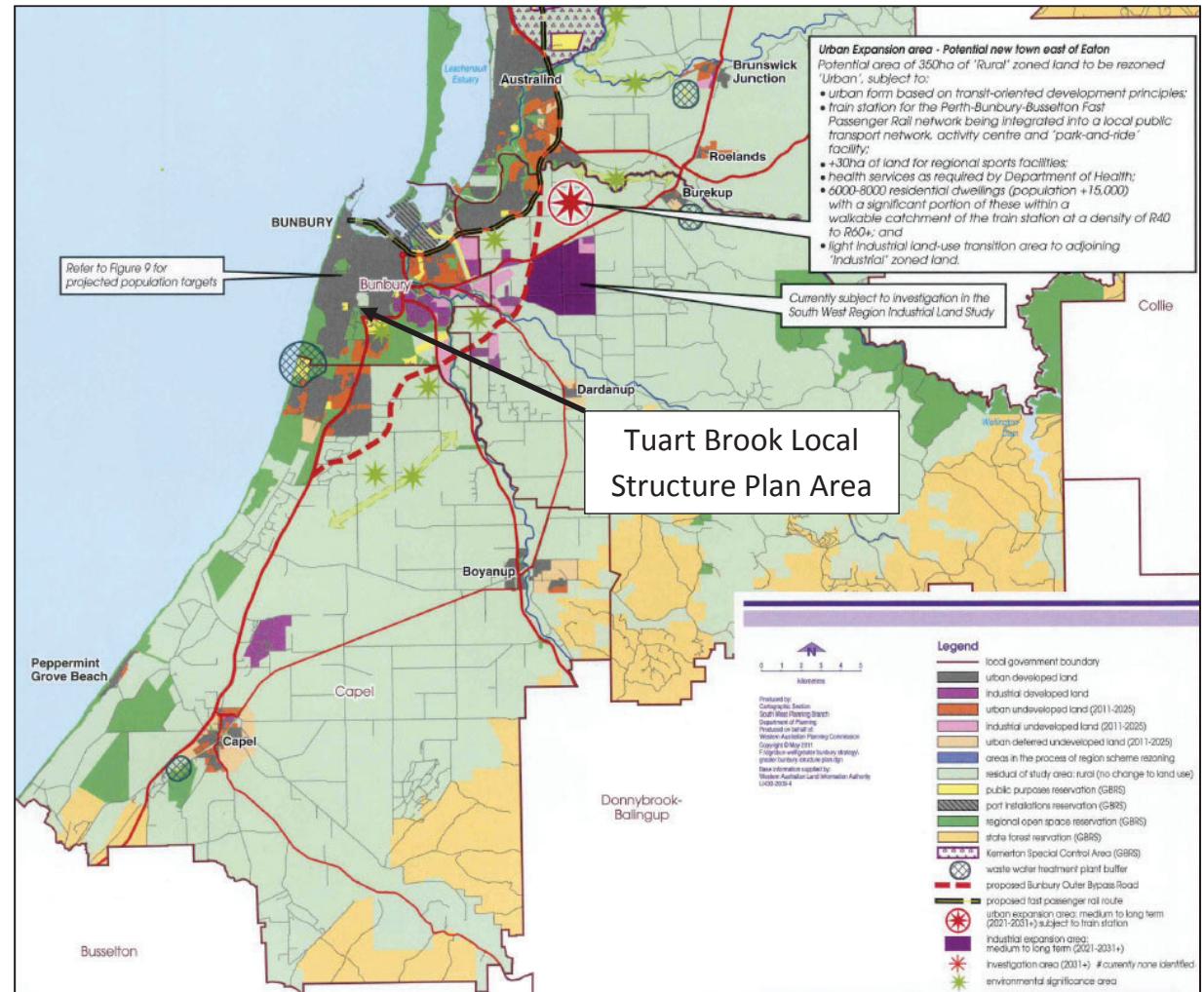
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Figure 9

Extract from City of Bunbury TPS No 7 Scheme

**Figure 10**

Extract from Greater Bunbury Structure Plan 2011-2031+



2.0 Site Conditions & Environment

2.1 Biodiversity & Natural Area Assets

In May 2006, ENV was commissioned to undertake an environmental assessment of Lot 1 (now Lots 501 and 802). The assessment report is included as [Appendix 4](#)). In addition, a Spring Survey into 'Declared Rare and Priority Flora, Threatened Ecological Community Identification and Wetland Assessment was undertaken by ENV for Lot 1 in 2006 (refer to [Appendix 5](#)). This was followed by a Fauna Assessment (Level 1) and Western Ringtail Possum Survey (again by ENV) in January 2008 for the whole of the structure plan area (refer to [Appendix 6](#)).

The findings of these various studies are summarised in the following extracts from the above reports as follows:

2.1.1 Environmental Assessment

- The overall condition of vegetation on Lot 1 varies between good to degraded. This is attributed to the cleared paddocks created for grazing, and the subsequent occurrence of introduced species (predominately **Ehrharta longiflora*, **Romulea rosea*, **Hypochaeris radicata* and **Hydrocotyle bonariensis*).
- Eight Priority Flora taxa have historically been found within the surrounding area. Due to the timing of the field survey, significant flora was only searched for on an opportunistic basis.
- Due to the timing of the survey and the scope of works, confirmation of the presence of the Threatened Ecological Community SCP18 (Shrublands on calcareous silts of the Swan Coastal plain) could not be undertaken.
- Twelve native plant taxa and five weed species were recorded during the survey.
- No Declared Rare Flora or Priority Flora species were located during the field investigation. A comprehensive Priority Flora Search could not be conducted due to the timing of the survey.
- TEC SCP18 is inferred as occurring within Site 3. This could not be confirmed however, due to the timing of the survey. (ENV 2006)

2.1.2 Spring Survey

- No additional native annual flora species were identified to the taxa contained within the earlier Environmental Report (ENV, 2006). It is assumed that this is in part attributed to existing livestock pressures and the degraded nature of the property's vegetation.
- Results of the investigation reveal that the site is degraded, with native flora taxa being widely spread across the site. Due to this fact, only two species from SCP18 were recorded within the Quadrant. A further two species however, were recorded opportunistically. The four species recorded were:
 - Gahnia trifida*;
 - Melaleuca viminea*;
 - Lepidosperma longitudinal*; and
 - Melaleuca teretifolia*.

- Given that 4 of the 16 typical indicator species are present, with calcareous silts believed to be present, ENV concludes that the occurrence of SCP18 Shrublands on calcareous silts is a possibility. Despite the degraded nature of this potential TEC site, SCP18 occurs at only one other known location (Yalgorup).
- Conservation of the potential TEC is recommended. (ENV 2006)

2.1.3 Fauna Assessment

The Fauna Assessment report makes the following general recommendations:

Western Ringtail Possum

- This species was found to be utilising the Tuart/Marri/Peppermint/ Banksia habitat on site, "albeit in low numbers".
- Impacts on the Tuart/Marri/Peppermint/Banksia habitat should be avoided, or that the extent of impact reduced, for instance by inclusion of this vegetation within POS.
- Landscape planting in the portion of land proposed for development to the west of the ROS should include at least a 30% *Agonis flexuosa* component.
- Plantings, as far as practical, should aim to ultimately create a continuous link between this habitat, the ROS and other remnant vegetation in and adjacent to the project area.
- Formulation of a development specific Western Ringtail Possum (WRP) management plan which details the status and distribution of WRPs on site, impact of development and mitigation and offset measures, as required. ENV considers that this will be necessary to achieve DEC approval and to support a referral to DEHWA if WRP habitat is to be cleared.

Black Cockatoo Species

- The Black Cockatoo species are highly mobile and would not be specifically relying on the site.
- Where possible retain and protect remnant vegetation on site that is suitable for cockatoos to use for foraging. If the area of vegetation identified as WRP habitat is retained this recommendation will be achieved in any event.
- Landscaping species lists should include cockatoo food plant species (e.g. *Corymbia*, *Banksia*, *Dryandra*, *Hakea*, and *Allocasuarina* etc.).
- If clearing of large trees containing hollows is required then it should, if possible, be conducted outside the known breeding season of Black Cockatoo species (mainly breeding around early July to December) to avoid the potential of disturbing/harming nesting birds.
- Potentially, 11 native mammals (principally bats), 88 bird, 9 frog and 15 reptile species could be expected to occur in, or utilise at times, the study area. Nine introduced species could also occur. Of the 132 native animals that could occur, five are considered to be rare or vulnerable. The majority of the site is cleared and development in these areas will have little or no impact on fauna.

- While the study area could be considered of some local significance, it is not considered, based on this assessment, to be of regional significance given its relatively small size and history of disturbance. Despite this the site forms part of a recognised ecological linkage and its function as such should be taken into account during development planning.
- A series of targeted surveys suggest that Western Ringtail Possums are utilising sections of the site in low numbers. (ENV 2008)

2.1.4 Wetland Management Plan

A Wetland Management Plan for Lot 500 has been prepared by Bioscience and is included in the appendices ([Appendix 2](#)).

Bioscience's report examining the wetland contained on Lot 500 showed that the centre of the wetland, besides weeds, is relatively bare with several dead trees and some salt tolerant grasses as well as evidence of pre-existing large trees. The immediate surrounding trees are in poor condition and many look to be dying also. The death of flora within the Resource Enhancement Wetlands is most likely due to high salinity. The fringing vegetation includes *Melaleuca rhamphophylla*, *M. Viminea* and to a lesser extent *M. teretifolia* over patches of *Gahnia trifida* and *Lepidosperma longitudinal* over weeds. The degraded condition of the vegetation in conjunction with high salinity has left the wetland deficient in significant functions and values. (Bioscience 2011)

Vegetation within the structure plan area is generally limited to the wetlands and Regional Open Space areas. A stand of remnant vegetation also exists to the south of the developed residential cell in the north-west corner of the structure plan area. This stand includes an understorey of weeds.

The development footprint associated with the structure plan proposals seeks to maximise the conservation of vegetation and associated fauna habitats by ensuring location of these areas within Regional and public open space areas.

In balancing these objectives with those of Liveable Neighbourhoods, the Structure Plan includes a connection with the established residential cell to the south-east of the Washington Avenue/Parade Road intersection. It is recommended that during detailed design of this location, care should be taken to minimise the extent of impacts and removal of significant vegetation.

Having regard to the above and subject to detailed design, the proposed Structure Plan may require clearing of an area of habitat greater than 0.5ha in size within the Tuart, Marri, Peppermint and Banksia Tall Forest/Open Woodland and therefore, referral of the proposal to the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) may be warranted.

2.2 Landform & Soils

2.2.1 Soil Type

The subject site lies on the Safety Bay Sands within the Quindalup Dune System of the Swan Coastal Plain.

2.2.2 Topography

The structure plan area is considered to have low relief with some minor variations in topography. The site generally ranges from 4m AHD in the north east to 10M AHD in the south west corner, with the majority of the site lying at around 4m AHD.

2.2.3 Acid Sulfate Soils (ASS)

The Department of Environment Regulation has compiled a series of maps indicating ASS risk areas. The maps indicate that the land generally has a moderate to high risk with some areas holding a low to moderate risk of ASS being disturbed (refer to **Figure 11**). The potential for ASS disturbance represents a development constraint for the structure plan area and will require further investigation and testing.

2.3 Surface Water & Groundwater

The site is predominantly low lying with sandy soils and a high groundwater table. Five Mile Brook and its floodplain and two resource enhancement wetlands are located in the central area of the site and will be maintained post development within a large Regional and Public Open Space corridor.

2.3.1 Local Surface Water Hydrology

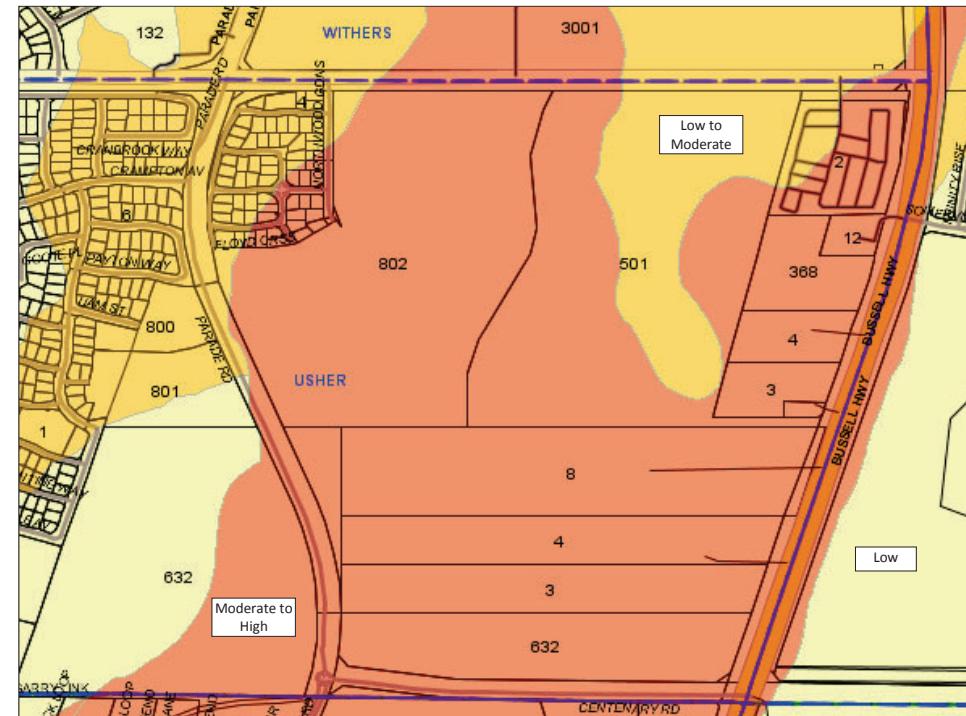
The site has two main catchments with all flow directed towards the centre of the site from the western boundary at Parade Road and the eastern boundary at Bussell Highway. The central area of the site forms a low lying depression with topography less than 5mAHD.

The site falls within the catchment for Five Mile Brook. Flow from Five Mile Brook predominantly heads south via a diversion drain but some flow traverses the undeveloped areas as overland flow towards the site.

Flow into the site is via two separate culverts under Centenary Road which flow into poorly defined depressions within Lot 532 and in a northerly direction through the central area of the site with a small drainage channel forming through the central area of the site.

All flows discharge via two culverts under Washington Avenue and direct flows towards the channelized Five Mile Brook Drain. (Hyd2o, 2012)

Figure 11
Acid Sulphate Soil Classifications



Source: www.landgate.wa.gov.au (WA Atlas)

2.3.2 Five Mile Brook Hydrology

In 2012, Water Technology undertook the Five Mile Brook Hydrological Study Stage 1 Report, on behalf of the City of Bunbury. The aim of the study was to provide a review of previous hydrology studies that have been undertaken for the catchment, review flood extents for Five Mile Brook and develop management strategies for the city.

The modelling included the Tuart Brook Local Structure Plan area and assumed the site was developed (however this was based on a superseded version of the Structure Plan assuming a larger Regional Open Space area).

In summary the modelling determined the following:

- In a 1 in 100 year average recurrence interval (ARI) event, the study shows that the 35ha Regional Open Space receives floodwater from Five Mile Brook. The flood depth in this area is typically shallow and less than 0.5m over the majority of the flooded area.
- Five Mile Brook flows for a 1 in 100 year ARI event are estimated as approximately 4.2m³/s at Centenary Road, reducing to 2.2m³/s south of Washington Avenue due to the attenuation within the sites wetland area. (Hyd2o, 2012)

2.3.3 Groundwater

Groundwater flow is in a north-west direction. The maximum recorded groundwater levels (as recorded by ENV during Nov 2007-Oct 2009) were in September 2009. Groundwater mapping undertaken by Hyd2o shows groundwater ponds within the wetland areas during the winter months. Depth to groundwater ranges from at surface within the central area of the site to over 1.5m near the western and eastern boundaries. (Hyd2o, 2012).

2.3.4 Wetlands

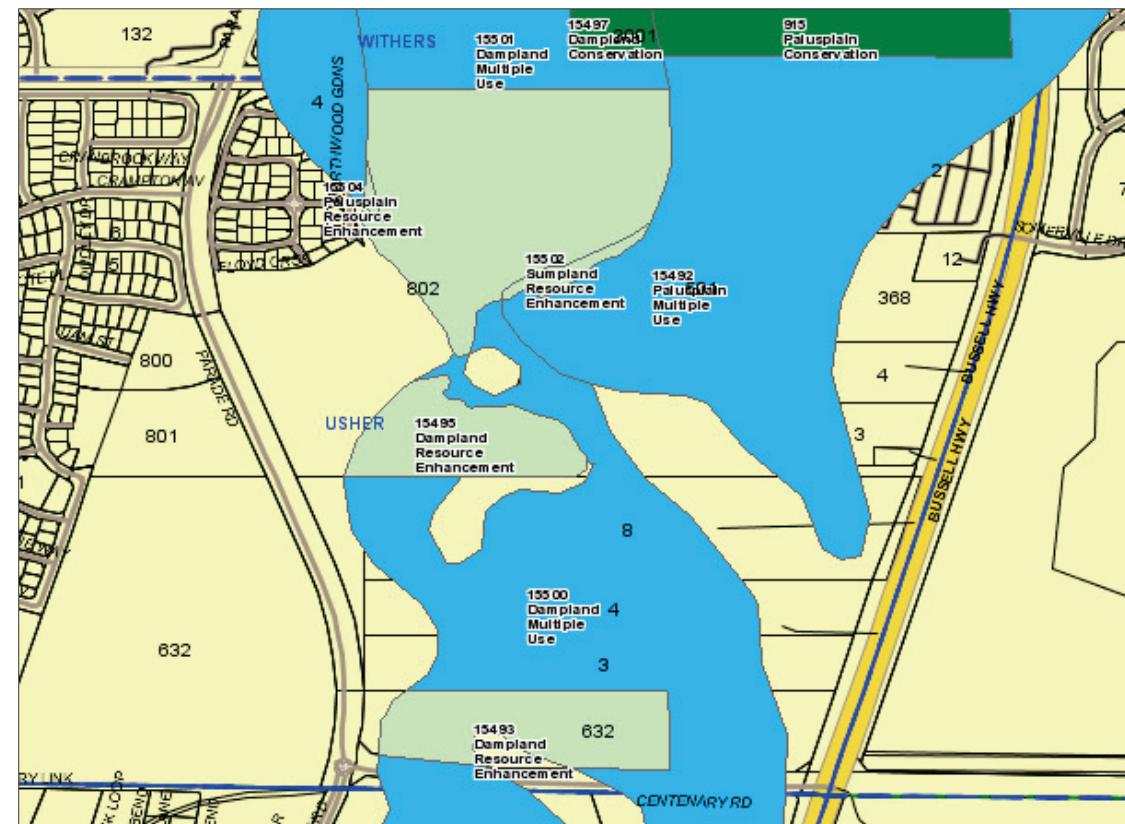
The Geomorphic Wetlands Dataset displays the location, boundary, geomorphic classification and management category of wetlands on the Swan Coastal Plain. The dataset indicates that two Resource Enhancement Wetlands (REW's) exist within the structure plan area (refer to **Figure 12**). The northern REW was recently re-classified from a Conservation Category Wetland to a Resource Enhancement Wetland. Another REW is located on Lot 632 adjacent to the southern boundary of the structure plan area.

The balance of the structure plan area is classified as a Multiple Use Wetland. The EPA recommends that all reasonable measures are taken to retain the hydrological functions of such wetlands.

A Wetland Management Plan for Lot 500 has been prepared by Bioscience and is included in this report as Appendix 2.

The report concludes that the degraded state of the REW wetland contained on Lot 500 cannot be restored to pre-European

Figure 12
Wetland Classifications



settlement conditions, however suggests that integration of stormwater management into wetland management could innovatively and effectively restore some of the values that would have not otherwise been restored.

Additionally the report concluded that it is unlikely that a wetland buffer zone will serve any protection value against the threats that already exist within the wetland on Lot 500. A large buffer zone could also create a sense of removal from the community which would be counterproductive to the objectives outlined in the wetland management plan. The wetland on Lot 500 does not require a buffer protection zone due to its highly degraded state.

2.4 Bushfire Hazard

The road layout enables safe vehicular and pedestrian access/egress in the event of a fire emergency. Three alternative routes of access are provided along the northern, western and eastern edges of the structure plan area. The road network also acts as a hazard separation zone between the Regional Open Space and adjoining development.

Reticulated water is also proposed to service the development which enables a source of water for fire fighting purposes. Hydrant locations will be detailed at detailed engineering design stage.

2.5 Heritage

A search of the Department of Indigenous Affairs Aboriginal Heritage Inquiry Database reveals that Aboriginal site 24507 exists within the development (refer to **Appendix 7**). Site 24507 contains Aboriginal Artefacts/Scatter and is an open access non-restricted site. An excerpt from the Aboriginal Heritage Inquiry System is shown below in **Figure 13**.

Any disturbance of Aboriginal Sites requires permission from the Department of Aboriginal Affairs.

Separate Ethnographic and Archaeological Surveys were undertaken for Lots 500 and 501 by Ethnoscience in July 2007 (refer to **Appendices 8a** and **8b**, respectively).

2.6 Context & Other Land Use Constraints

2.6.1 Regional & Local Context

The structure plan area is located within the locality of Usher and is approximately 6.5km (by road) south of the Bunbury City centre.

A range of community facilities are within close proximity to the site including:

- Bunbury Regional Hospital;
- St John of God Hospital;
- Minninup Forum Shopping Centre;
- Parks Centre Shopping Complex;
- South West Sport Centre incorporating Hay Park;

- Edith Cowan University;
- South West College of TAFE;
- A number of local primary schools; and,
- Proposed Dallyellup District Centre.

Figure 13
Aboriginal Heritage Site



The Structure Plan site is situated on Bussell Highway, providing excellent connectivity to the city centre and outer regional areas.

The major roads surrounding the site include Bussell Highway, being a Primary Distributor, Washington Avenue and Parade Road both of which are District Distributor Integrator B roads, and Centenary Road which is a Neighbourhood Connector.

Within the structure plan area there are no existing internal roads, pedestrian or cycle networks. There is a footpath on the east side of Northwood Gardens however there are no connecting pathways along Washington Avenue adjacent to Northwood Gardens.

There are no existing public transport facilities within the structure plan area, although the transport provider, Bunbury City transit currently operates in the vicinity of the site.

Figure 14 provides a context and site analysis identifying the key opportunities and constraints related to the structure plan area. The figure identifies the regional open space/conservation area networks, an analysis of existing neighbourhood form in surrounding areas, the cultural heritage site and surrounding road and

community infrastructure. Due to the extensive area of 'Moderate to High Risk' Acid Sulfate Soil Classification over much of the structure plan area (refer to Figure 11) this has not been mapped. The structure plan area is generally devoid of topographic features. View corridors are focussed onto the central ROS areas.

2.6.2 Noise Impacts

Noise impacting the structure plan area can be considered originating from both the Bunbury Airport and traffic noise from Bussell Highway. Noise modelling of Bunbury Airport was undertaken in 1999 using the Australian Noise Exposure Forecast (ANEF) system. Using this system it is considered that areas outside of the 20ANEF contour are considered unconstrained to residential development. As such the impact of Aircraft noise on the structure plan area is considered negligible as it falls outside of the contour area.

A Traffic Noise Assessment was commissioned for the structure plan area by the Department of Housing in May 2010. The Assessment, undertaken by Gabriels Environmental Design (refer to **Appendix 9** and **Figure 15**), concluded as follows:

"Noise modelling of future traffic flows (year 2031) indicates that the following noise amelioration measures are required to achieve compliance with the outdoor limit criteria (State Planning Policy 5.4) across the Tuart Brook Structure Plan:

- A 2 metre tall berm (total berm width of 6 metres) with a 1.8 metre solid fence on top of the berm – in the following locations:
 - Along the eastern boundary of the structure plan.
 - Along southern boundary of the structure plan, within a 65 metre distance from the eastern boundary.
 - Along the boundary between the 'Existing Special Use' and the Aged / Grouped Housing, within a 65 metre distance of the eastern boundary.
- 1.8 m tall fence along the northern boundaries of the Aged Housing (and Aged / Grouped Housing).
- 1.8 m tall fence on the boundary between the Aged Housing and the existing Caravan Park.
- 1.8 m tall fence along the southern boundary of the structure plan, up to a distance of 180 metres away from the east boundary.

In addition to this, the first row of housing along Bussell Highway (the eastern edge of the structure plan) will need acoustic upgrade to achieve compliance with the indoor noise level criteria (State Planning Policy)."

Notwithstanding the recommendations contained within the above Noise Assessment, a 20 metre wide reserve is proposed within the structure plan adjoining Bussell Highway to accommodate a vegetated bund in accordance with WAPC requirements for residential development abutting Regional Roads in the Greater Bunbury region.

Figure 14
Site Context, Opportunities & Constraints Map

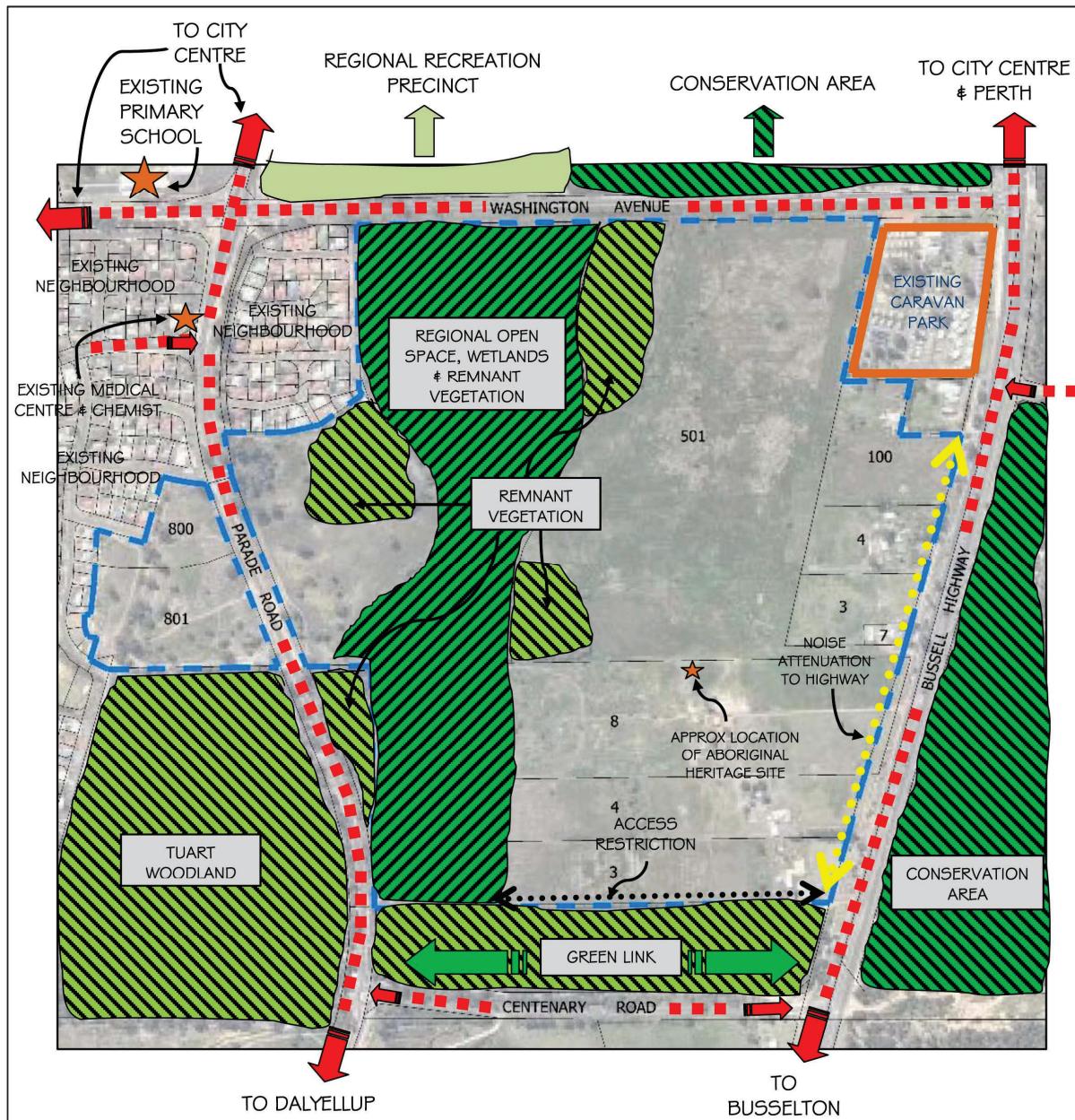
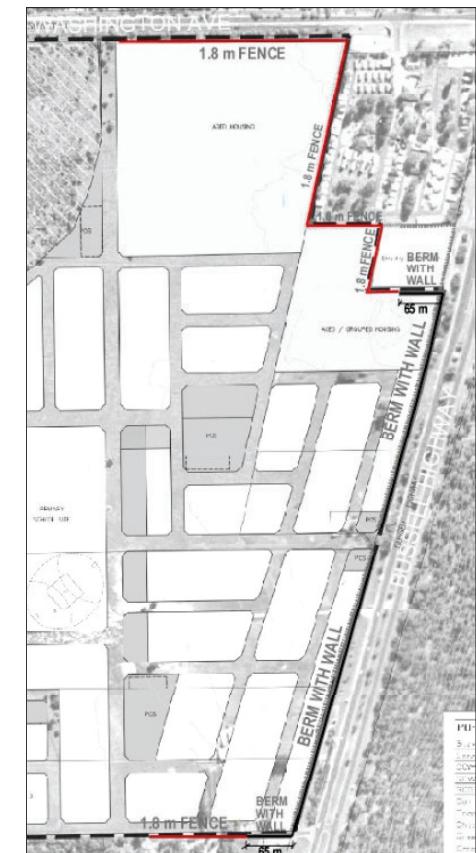


Figure 15
Recommended Noise Attenuation Measures



3.0 Land Use & Subdivision Requirements

3.1 Land Use

The Tuart Brook Local Structure Plan is generally regarded as a self-contained greenfields site in a number of different ownerships. The Tuart Brook Local Structure Plan has regard to existing residential development to the west and north-west as well that development fronting Bussell Highway which includes a veterinary clinic and caravan park.

The structure plan provides opportunities for the further development of the caravan park in the future.

The Tuart Brook Local Structure Plan proposes a range of land uses; Residential R20, R30, R40 and R60, two aged persons' sites (at a density of Residential R40/R60), one local centre and a Primary School, in addition to both 'Local' and 'Regional' public open space.

As per the Structure Plan Summary Table contained in the Executive Summary, the Structure Plan incorporates 8.1 hectares of local public open space, a 4.0 hectare Primary School and one local centre. Once developed, the Structure Plan is estimated to be capable of supporting approximately 1,142 dwellings and an overall population of 2,878 people.

The structure plan has been formulated to inter-connect with adjoining existing residential areas. It is based on a permeable road network providing for ease of access as well as a variety of areas having different outlook opportunities.

3.2 Open Space

Public Open Space is the dominant feature of the Tuart Brook Local Structure Plan. Several areas of 'Local' and 'Regional' public open space are proposed throughout the structure plan area and are illustrated in Figure 4 and summarised in Table 5.

The location and provision of public open space and parkland areas has been determined based on both the physical attributes of the structure plan area as well as the guiding principles embodied in Liveable Neighbourhoods. The Structure Plan seeks to achieve a balance between the Regional, District and Local open space requirements while having regard to the playing fields and facilities already established at Hay Park immediately to the north of the structure plan area.

The Regional Open Space, as identified in the Greater Bunbury Region Scheme and the City of Bunbury Town Planning Scheme No 7, incorporates the boundaries of the Resource Enhancement Wetlands and is identified as being particularly important in providing a wildlife and conservation corridor.

The majority of the open space areas contain wetlands and/or significant vegetation and fauna habitats. The predominance of conservation based open space has been balanced against the requirement for suitable areas of open space to cater for active pursuits.

A local public open space area (adjoining the primary school site) is specifically targeted at active use. Another local park of approximately 7,060m² is proposed in the southern half of the main structure plan area and is intended for both active and passive use. These areas have been located so as to be central to residential areas to provide:

1. a focal point for local neighbourhoods;
2. for ease of access; and,
3. high levels of surveillance.

The plan proposes that a portion of the Regional Open Space already denuded of vegetation be set aside as an active open space precinct in recognition of the land's already denuded state. Identification of this precinct also recognises the predominance of conservation based open space within the structure plan area and the pressures currently being exerted on Hay Park to meet demand for active recreational needs within the Region. The ultimate design and layout of this precinct will be dependent upon further detailed planning and negotiations between the City of Bunbury and Western Australian Planning Commission.

The location of public open space is site responsive catering for vegetation retention objectives as well as providing opportunities for both passive and active recreational pursuits. The location of open space areas also assists in the creation of a "Sense of Place" consistent with Liveable Neighbourhood objectives. The objective of meeting the needs of a broad range of users is achieved within the structure plan.

Each open space area is located so as to achieve clear sightlines from nearby buildings and so as to be safe and conveniently located to serve the majority of future structure plan area residents.

3.3 Residential & Aged Persons

Consistent with current WAPC policy (including the Residential Design Codes and Liveable Neighbourhoods), the Structure Plan provides for a range of residential densities and therefore housing choice and lifestyle opportunities. Proposed densities range from R20 through to R60 (refer to [Figure 16](#)). The plan also includes two aged person's sites.

The Structure Plan has been formulated to meet the requirements of Liveable Neighbourhoods. The Residential Design Codes, administered by the City of Bunbury, will provide a comprehensive basis for the control of residential development within the structure

plan area. The R-Codes will "outline the 'rules' which apply to residential development". (R Codes)

The proposed Aged Person's sites are well located in terms of proximity to the Bunbury Regional Hospital and St John of God Hospital. Both sites are located in the north-east corner of the structure plan area with one site fronting Washington Avenue and the other fronting Bussell Highway. Both of these road networks are serviced by existing public transport links, providing future residents with good access to public transport.

The higher R60 densities are generally focussed around the local centre which fronts Parade Road – a local distributor road. These sites provide opportunities for a variety of affordable and higher density housing including multi-storey apartments. Multiple dwelling development is not permitted on land zoned for residential purposes where the residential density code (R Code) is less than or equal to R30.

Medium density sites (R30 and R40) are generally focussed around points of interest including overlooking public open space areas, the school site and near the larger aged person's site and provide opportunities for the development of units and 'cottage' (narrow lot) housing. Planning Approval is required from the Local Government for any dwelling on Lot(s) less than 350m² and/or where the lot is in an area subject to a Local Development Plan (referred to in the Scheme as a Detailed Area Plan or DAP).

The R20 sites are scattered through the structure plan area and provide for single residential housing. The structure plan proposes the development of this land consistent with the average 500m² applicable to R20 coded land.

Consistent with the 'General Objectives' of the R-Codes, the Tuart Brook Local Structure Plan:

- a) provides for a full range of housing types and densities that meet the needs of a broad range of people;
- b) provides for local variations in neighbourhood character;
- c) ensures, as far as possible, high levels of local amenity;
- d) makes provision for on-site facilities;
- e) seeks to protect and enhance the amenity of adjoining residential areas; and,
- f) incorporates environmentally sensitive design.

The Structure Plan responds to the residential density target of 15 dwellings per gross hectare established for the preferred growth scenario within the Draft Greater Bunbury Strategy. Having regard to the fact that Regional Open Space consumes 26.05% of the structure plan area, the achievement of a residential site density of 12.07 dwellings/hectare is significant. Excluding the Regional Open Space area, the residential site density is 16.39 dwellings per hectare.

The Structure Plan layout seeks to maximise the outlook opportunities for residential development taking advantage of the significant areas of local and regional public open space. The grid

road pattern seeks to maximise opportunities for solar orientation of housing and provide for high levels of permeability, equity and accessibility. The road layout provides for diversity and interest in the local street environments to assist in the development of local character and a sense of place consistent with Liveable Neighbourhood objectives.

3.4 Movement Networks

The internal road layout has been designed to achieve a high level of permeability as well as to provide safe and efficient access to facilities for vehicles, pedestrians and cyclists.

The layout is well integrated with the surrounding road network and developed areas with a strong east-west link from Parade Road connecting to an access onto Bussell Highway as well as a northern entry point to the site from Washington Avenue.

A Transport Assessment Report has previously been undertaken for earlier versions of the Tuart Brook Structure Plan. A review of this work, as well as a review based on a revised Structure Plan/road layout have been prepared by Donald Veal Consultants and is included as **Appendix 10**. The report:

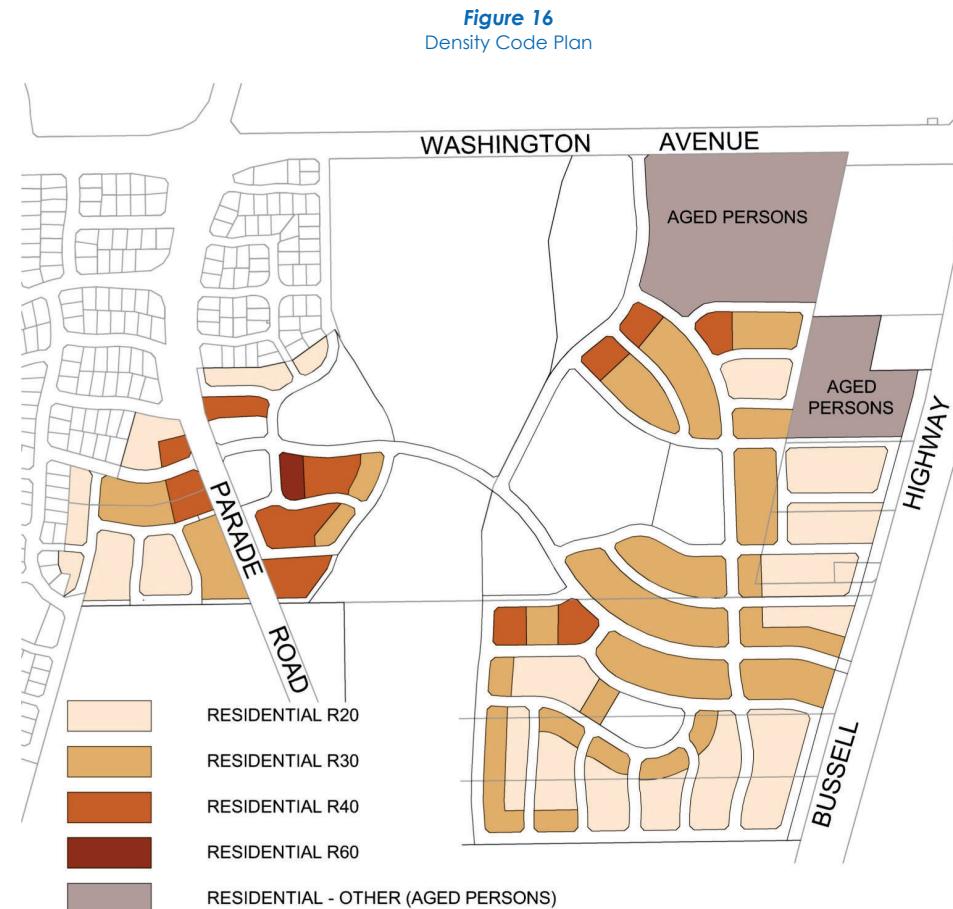
- describes and justifies road network and hierarchy;
- assesses the proposed road network capacity for peak demand;
- describes existing roads and intersections together with upgrading requirements;
- discusses the level of permeability and accessibility provided by the proposed road network;
- provides estimates of traffic volumes;
- provides indicative road cross sections for each road type, showing carriageway, median and verge widths and accommodation of service infrastructure and street trees;
- describes and justifies the proposed public transport network;
- identifies required intersection controls and traffic management issues; and,
- describes the proposed major pedestrian and cyclist network and links with the strategic cycle network.

The proposed road network is shown in **Figure 17**. As the roads are currently un-named, road numbers have been used to identify roads for the Transport Assessment.

The proposed road reserve widths generally range from 20m for the major connectors to 15m for the minor access streets. These widths are consistent with the range stated in *Liveable Neighbourhoods* (WAPC 2009).

Cross sections for the internal road network are yet to be confirmed. Figures 18, 19, 20 and 21 show sample cross sections for various categories of access roads as contained in *Liveable Neighbourhoods* (WAPC 2009).

The transport assessment undertaken by DVC demonstrated that the major internal roads (Roads 1, 2 and 3 as per Figure 17) are likely to carry between 1,000 and 3,000 vehicles per day making



designs similar to Neighbourhood Connector B and Access Street B (as above) appropriate. Access Street C could be considered for streets fronting higher residential density areas.

As per the requirements for built up areas, the proposed speed limit is 50km/h, with the exception of school zones.

All of the intersections within the internal road network are indicated as being "T-intersections" with the exception of:

- Road 1/Road 2;
- Road 1/Road 3;
- Road 1/Road 4;
- Road 1/Road 13;
- Road 2/Road 3;
- Road 2/Road 4;
- Road 2/Road 5; and
- Road 2/Road 6.

All of these intersections are shown as roundabouts except Road 2/Road 6, which is proposed as a cross road.

The proposed internal road network will result in the creation of four new intersections with the external road network as follows:

- Road 1 with Parade Road;
- Road 1 with Bussell Highway;
- Road 3 with Washington Avenue; and
- Road 9 with Liam Street.

The intersection of Road 1 with Parade Road will form a roundabout, whilst the others will be "T-intersections".

The volume of traffic expected to be generated by this development is 7,593 vpd with 897 am peak hour trips distributed over the three access points. These volumes are within the capacity of the roads and intersection, with the following exceptions:

- Whilst an all movement priority intersection of Bussell Highway with Road 1 would function adequately with the structure plan area reaching full development (assuming existing through traffic volumes), the intersection may eventually require signalisation in order to safely provide the full range of movements if volumes of through traffic on Bussell Highway continue to grow.
- It is estimated that up to 1,942 additional daily trips will be distributed onto Parade Road. This would increase the total volume on Parade Road to 7,100 vpd. The current classification of this section of Parade Road has a recommended maximum flow of 6000vpd.

There are some significant areas within the structure plan area that do not currently fall within the walkable catchment of any existing bus stops. The traffic assessment undertaken by DVC therefore recommends that an additional service be provided to

Figure 17
Internal Road Network and Identification



run along Road 1, with associated stops near the major internal intersections. This is reflected in the Structure Plan.

The Structure Plan includes an internal network of shared use and pedestrian paths to facilitate cyclist and pedestrian movements.

Figure 18

Sample Road Cross Section – Neighbourhood Connector B, 50km/hr (<3000vpd)

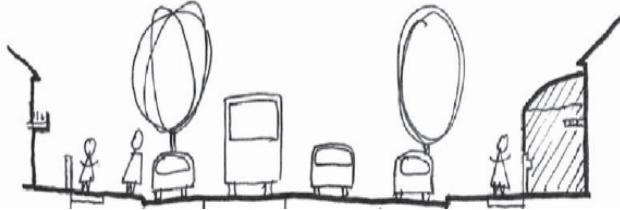


Figure 19

Sample Cross Road Section – Access Street B, 40km/h <3000vpd

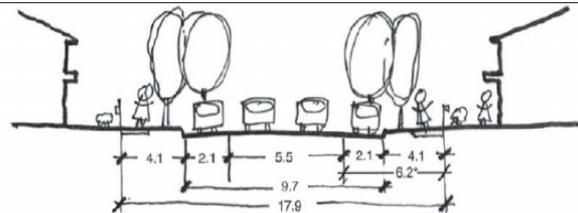


Figure 20

Sample Road Cross Section, Access Street C – Yield Access Street, 40km/h <3000vpd

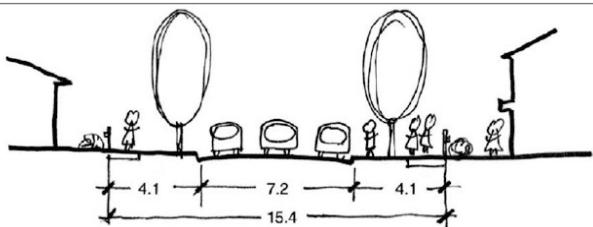
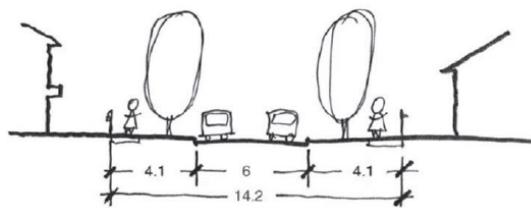


Figure 21

Sample Road Cross Section, Access Street D – Narrow Yield Access Street, 40km/h <1000vpd



3.5 Water Management

A Local Water Management Strategy (LWMS) has previously been prepared for earlier versions of the Tuart Brook Structure Plan, and is required to be reviewed. The City has undertaken its own investigations in relation to 5 Mile Brook and will make available its data to inform a review of the LWMS.

On behalf of the Department of Housing and Kingslane, Hyd2o Hydrology Consultants were engaged to prepare the revised LWMS, which is attached as Appendix 10.

3.5.1 Stormwater Management

In accordance with Water Sensitive Urban Design (WSUD) principles, stormwater management principles for the Tuart Brook Local Structure Plan area will include:

- maintenance of existing regional surface water flow paths and catchments consistent with overarching strategies;
- retention and rehabilitation of existing resource enhancement wetlands in Regional Open Space areas;
- Use of Public Open Space areas for ephemeral stormwater retention and detention areas;
- Use of higher density urban residential zonings to reduce landscape nutrient input. (Hyd2o, 2012)

3.5.2 Groundwater Management

Development levels in the site will be largely dominated by fill requirements to achieve adequate separation to groundwater.

Hyd2o's Local Water Management Strategy states that fill, in the order of 1.5 metres, is likely to be required in existing low lying areas, ranging to no fill being required on the western side of the site near Parade Road where groundwater clearance exceeds 1.5m.

3.5.3 Water Efficiency Measures

Consistent with the Water Corporation's "Waterwise" land development criteria, measures will be introduced to reduce scheme water consumption within the development, including:

- promotion of waterwise practices including water efficient fixtures and fittings;
- all houses to be built to 5 star building standards;
- use of native plants in POS areas;
- use of groundwater bores for irrigation of POS and common areas;
- where practicable, maximising on site retention of stormwater;
- use of rainwater tanks for non-potable water.

3.6 Education Facilities

The Department of Education and Training has previously indicated the need for a Primary School within the Tuart Brook Local Structure Plan area. A 4 hectare site has been allocated centrally within the structure plan area and is co-located with an adjoining local public open space area to enable shared use opportunities and the creation of a neighbourhood focal point.

3.7 Activity Centres & Employment

The Structure Plan proposes a local centre on the eastern side of Parade Road. The provision of a local centre is consistent with the City of Bunbury's Local Planning Strategy for Activity Centres and Neighbourhoods, which identifies the Tuart Brook area with potential for having 350m² of retail floor space. Local Centre's however are generally identified as having a maximum retail floor space up to 2000m². The Local Centre is to be the subject of future detailed design, a Local Development Plan and an application for the City of Bunbury's Planning Approval and associated assessment.

Having regard to the distinct lack of local centre floor space within both Usher and College Grove, together with the considerable additional development proposed within the structure plan area, the Tuart Brook Local Structure Plan provides a local centre site of 7,575m² to cater for the development of a local centre of up to approximately 1,200m² of retail floor space while also catering for other potential uses capable of meeting the local needs of surrounding residents.

The location of the local centre has been determined in consultation with Council and Department of Planning staff with the location considered to provide for convenient access for existing and future residents within the general locality as well as passing traffic.

The broad range of uses proposed within the structure plan area provides an array of employment opportunities including associated with:

- Aged housing;
- Aged care;
- Teaching and associated support staff;
- Retail; and,
- Community.

3.8 Infrastructure Coordination, Servicing & Staging

At the time of preparing this report, other than for the Department of Housing land holdings, individual land owner intentions in relation to the staging and timing of works were unknown.

Given that the Department of Housing, Kingslane Pty Ltd and John Cranston are the three major land owners and, unlike other land owners within the structure plan area, are not "land locked", it is considered likely that these land owners will be first to commence with subdivision/development.

An indicative Staging Plan is shown at **Figure 22** in accordance with advice provided by the Department of Housing.

3.8.1 Roads

All streets will be developed by the land owners/developers and will be standard kerb with asphalt seal. Detailed road design will be undertaken as part of the planning of subdivision.

Generally, streets adjoining Public Open Space (POS) will have a one-way cross fall towards the public open space and propose to have a flush kerb on the POS side to enable street runoff to enter the POS via overland flow. The verges and POS are to be stabilized and/or grassed or vegetated to prevent erosion.

Generally the proposed movement network hierarchy will consist of three distinct types:

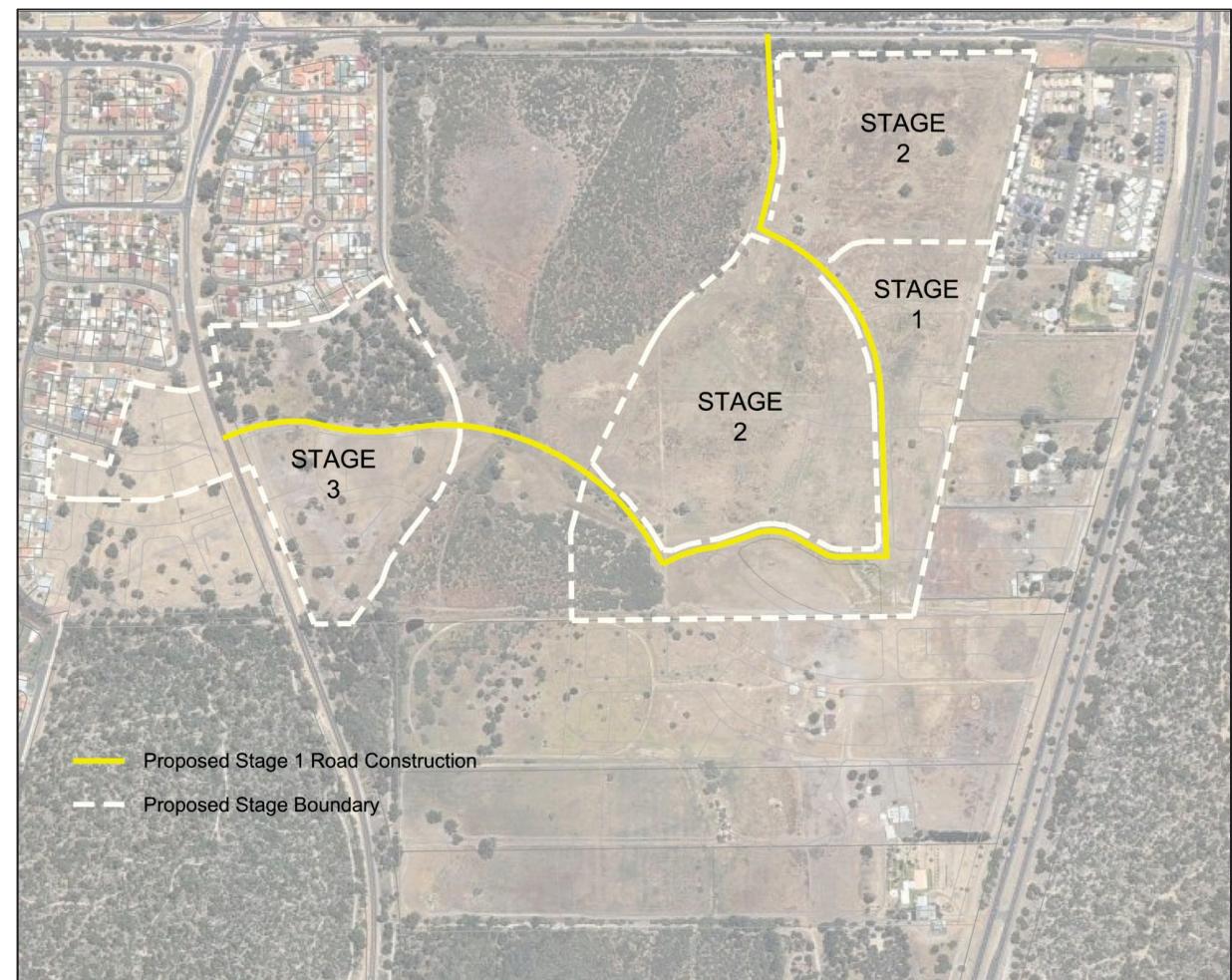
- 18m and 20m entry roads incorporating footpaths, street parking and landscaping;
- 15 to 16m residential streets incorporating footpaths, street parking and landscaping;
- 6m laneways incorporating service easements, street lighting and occasional tree planting.

Rear laneways of 6.01m are used in places to provide rear loading on smaller cottage style lots.

It is envisaged road widths will comprise 7.4m carriageways within the 20m road reserves and 6m carriageways within the 16m road reserves and laneways.

It is proposed that landscaped verges of 3.5m will be provided where possible. This provides for an aesthetically pleasing environment, segregating vehicles and pedestrian movement, and as a catchment for stormwater runoff from road pavements. Road pavements will be cambered to facilitate stormwater run-off into the landscaped verges. This will provide sufficient area for service infrastructure and street tree planting.

Figure 22
Staging Plan



3.8.2 Site Works

Site works will include earthworks (i.e. cutting and filling as required), with earthwork areas to be stabilised during construction. Existing remnant vegetation is to be kept where appropriate and within the proposed Parks and Recreation Reserves and Wetland areas.

Fill will be provided at sufficient depth above the existing water table on the site to allow disposal of roof stormwater by soakage on the lots in conjunction with a sub soil drainage system within the road reserves, and in order to achieve a minimum separation of 1.5m between lot level and groundwater level.

The filling of the lots will also be required in some areas to obtain the necessary clearance for flood protection purposes. The 100 year flood levels from the 5 Mile Brook Flood Study (WAWA, 1995) at Washington Avenue is given as approximately 5.1 m AHD. Therefore for flood requirements alone the minimum fill levels for the site are generally 0.5 m above this flood level at 5.6m AHD.

Site works on the site will also need to recognise the likelihood of Acid Sulphate Soils and management plans developed accordingly. A full geotechnical investigation will be required to be undertaken for individual sites and would identify Acid Sulphate Soil issues and the appropriate management of these soils.

Roads may be constructed lower than the lots to reduce fill volumes and provide overland flow paths for local storm events. Detailed earthwork specifications will be investigated during the detailed design of subdivision.

3.8.3 Sewer

The Water Corporation is the current ERA licensed service provider for sewerage services for the Structure Plan area. The existing Water Corporation sewer is located near the structure plan area's north-east corner at the intersection of Washington Avenue and Bussell Highway, near the Washington Avenue wastewater pumping station. This pumping station is not of sufficient depth to service all of the structure plan area. A new pumping station(s) will be required to allow connection of the south-eastern portion of the site as well as some of the western land adjacent to Parade Road.

The location of this station(s) is likely to be adjacent the eastern side of the Regional Open Space and central to the development. The location would be finalised in conjunction with final subdivision design on the site. Acid Sulphate Soils considerations may also vary the location of this pump station to minimise impact on the site.

The construction of the sewer system for the site will also require construction of a main sewer line across the central ROS reserve to link the structure plan areas. Consideration will need to be given to the incorporation of design elements for the pump station including, for example, the inclusion of containment structures to

mitigate the impact of potential sewerage spills on important wetlands and waterways situated downstream.

3.8.4 Water

Aqwest is the current ERA licensed service provider for provision of water supply to this site.

A 200 mm water main is located along a part of Washington Avenue to the north of the site. Additional mains are located along both Bussell Highway and Parade Road on each side of the subject land.

A ring main feeder system will distribute water along the roads within the proposed development. A standard water reticulation mains will be provided to each relevant part of the development to provide a potable drinking water supply to each lot.

External water mains upgrades to service this site would be negotiated with Aqwest.

3.8.5 Non Potable Water Supply

There are currently no ERA licensed service providers in this area providing non potable water supplies.

If a licensed operator is established prior to construction of this development then a non potable water supply could be developed to each lot via a "third pipe" system.

Detailed investigations should be undertaken to determine if a licensed operator is likely to occur closer to development of this site.

3.8.6 Power

Initial indications are that Western Power is able to service the structure plan area however the full extent of any external upgrades of network capacity would not be fully known until the development proceeds and then is determined by what reserve capacity remains in the system at that time.

3.8.7 Gas

Atco Gas Australia has advised that it has existing gas reticulation infrastructure in the area that can cater for the total development area. The extent of any external upgrades that may be required would be determined at the time of development and is subject to staging.

3.8.8 Drainage

The Tuart Brook site is part of the Five Mile Brook catchment. This area feeds directly into the Five Mile Brook drain, which flows northerly to a pumped ocean outlet near Bunbury. The local catchment feeding to Tuart Brook is approximately 104 hectares.

The stormwater collection and disposal within Tuart Brook will be designed in accordance with the Local Water Management Strategy (LWMS) included at Appendix 11. The emphasis is on retention, treatment, use, and environmental and cultural benefit from stormwater systems, rather than conveyance (i.e. drainage) and disposal.

"Stormwater management is proposed to be undertaken consistent with DoW water sensitive urban design practices.

The system will consist of pipes, linear POS/ROS multiple use corridors, and ephemeral water storage areas with biofiltration to infiltrate and attenuate peak surface water flows and provide water quality treatment for the proposed development.

Key elements of the system which are reflected in the structure plan include:

- Maintenance of existing regional surface water flow paths and catchments consistent with overarching strategies.
- Retention and rehabilitation of existing resource enhancement wetlands in Regional Open Space areas.
- Use of POS areas for ephemeral stormwater retention and detention areas.
- Use of higher density urban residential zonings to reduce landscape nutrient input." (Hyd2o Tuart Brook Precinct Local Water Management Strategy, October 2012)

Tuart Brook presents an ideal opportunity to showcase the latest developments in Water Sensitive Urban Design (WSUD) while also leading to an efficient, cost effective design. All of these concepts can be further developed at the subdivision design stage and would be further detailed in an Urban Water Management Plan for the subdivision.

On the main central road networks, bio-retention systems could be introduced in a central swale. On the smaller scale roads, bio-retention gardens can be used in the road verges. Other measures that could be readily introduced are grassed swales adjacent to POS and Parks and Recreation Reserves.

The basic principles in the adopted strategy would be to treat the following storm events:

- 1 in 1 year event treated for water quality outcomes;
- 1 in 5 year event catered for in minor conveyance system for minor flooding protection and serviceability; and,
- 1 in 100 year event designed for to ensure flood protection of the development.

Because of the ample flood storage available on site there is not a requirement to detain flows internally within the development to reduce flood peaks, other than the requirements for water quality treatment in the 1 in 1 year events.

The water quality targets to be used in detail design of the WSUD treatment train are:

- At least 80% reduction in total suspended solids;
- At least 60% reduction in total phosphorus;
- At least 45% reduction in total nitrogen;
- At least 70% reduction in gross pollutants.

Final details of the proposed stormwater drainage system are to be detailed in the Urban Water Management Plan for the subdivision.

3.9 Developer Contribution Arrangements

Consistent with the provisions of Section 5.3 of State Planning Policy DC 3.6 'Development Contributions for Infrastructure', and in the absence of a Developer Contribution Scheme, the Department of Housing and Kingslane Pty Ltd will provide a voluntary agreement between the developers and the City of Bunbury with the relevant contributions to be implemented through voluntary legal agreements. The agreement will reflect the principles embodied in Section 5.2 of SPP DC3.6. Contributions may be a condition of subdivision approval and will become due and payable as part of the subdivision clearance process.

The development contributions may include common infrastructure works such as roads, drainage and sewer as well as the equitable apportionment of public open space and will be dependent upon the outcomes of the Building Better Regional Cities Federal Funding recently awarded in relation to a portion of the Structure Plan area.

3.10 Other Requirements

Once approved, the Tuart Brook Local Structure Plan forms the statutory framework to guide subdivision and development within the structure plan area. As the development progresses it may be necessary to vary aspects of the Structure Plan and as such the plan is intended to be adaptable subject to suitable justification. Modifications to the adopted Structure Plan are to be undertaken in accordance with clause 6.2.6 of the Scheme.

Various detailed investigations will need to be undertaken in order to support the eventual subdivision of the site. These may include:

- Sustainability Study;
- Community Facility Plan;
- Design Guidelines;
- Landscaping Plan;
- Urban Water Management Plan;
- Cost Contribution Schedule;
- Infrastructure & Servicing Strategy.

With the exception of the Community facility Plan, the responsibility for formulation of these strategies, plans, guidelines etc will rest with the land owners/developers.

In accordance with the discussion at section 1.3.1 above and Clause 6.2 of the City of Bunbury Town Planning Scheme No.7, the inclusion of the structure plan area within a 'Development Investigation Policy Area' means that following adoption of the Structure Plan by the City of Bunbury and endorsement by the Western Australian Planning Commission, the City and WAPC are able to consider applications for development approval and subdivision without the necessity for the Scheme Map to be amended to appropriately reflect the adopted Structure Plan. Subsequent amendments to the relevant operative Town Planning Scheme may be undertaken by the City to accord with land usage or as part of a review of the Scheme.

Table 7
Technical Appendices Index

Appendix No.	Document Title	Nature of Document	Referral/approval agency	Summary of doc modifications
1	Tuart Brook Local Structure Plan	Planning	City of Bunbury & Western Australian Planning Commission	
2	'Wetland Management Plan - 500 Washington Avenue, Usher', Bioscience (Undated)	Environmental	EPA/Department of Environment, Department of Water	
3	Certificates of Title, Landgate	General		
4	'Lot 1 Washington Avenue, Bunbury Environmental Assessment', ENV (May 2006)	Environmental	EPA/Department of Environment	
5	'Declared Rare & Priority Flora Survey, Threatened Ecological Community Identification & Wetland Assessment, Lot 1 Washington Avenue', ENV (December 2006)	Environmental	EPA/Department of Environment	
6	'Lots 1, 3, P3, 4, 4, 5, 7, 8 and 11 Washington Avenue & Bussell Highway, Usher Fauna Assessment (Level 1) and Western Ringtail Possum Survey', ENV (January 2008)	Environmental	EPA/Department of Environment	
7	'Aboriginal Sites Database', Department of Indigenous Affairs (October 2012)	Heritage	Department of Indigenous Affairs	
8a	'Report On An Archaeological Survey Proposed DHW Housing Sub-division In The Locality Of Wellington, Bunbury, Western Australia', Tempus Archaeology (July 2007)	Heritage	Department of Indigenous Affairs	
8b	'Report of an Ethnographic Survey of Lots 500 & 501, Washington Avenue, Bunbury, Western Australia', Ethnoscience (July 2007)	Heritage	Department of Indigenous Affairs	
9	'Tuart Brook Structure Plan, Bunbury (Department of Housing) Traffic Noise Assessment', Gabriels Environmental Design (May, 2010)	Noise	Main Roads WA, City of Bunbury	
10	'Tuart Brook Structure Plan Transport Assessment', Donald Veal Consultants (Final September 2012)	Transport	Department of Water, City of Bunbury	
11	'Tuart Brook Precinct Local Water Management Strategy', hyd2o Hydrology (October 2012)	Water Management	Main Roads WA	
12	Pre-Lodgement Consultation Summary	General		