KINGSFORD

BULLSBROOK CENTRAL

REVISED LOCAL STRUCTURE PLAN

OCTOBER 2022

HATCH | RobertsDay okeland COMMUNITIES

KINGSFORD

Title	Kingsford Local Structure Plan	
Prepared for	Okeland Communities	
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	Landscape	Emerge Associates
	Environmental	RPS
	Aboriginal Heritage	Ethnosciences
	Retail Assessment	Taktiks4
	Bushfire	Strategen
	Hydrology	RPS
	Planning + Urban Design	Hatch RobertsDay

Revision	Comment	Author	Approved by	Date Issued
A	Draft for client review	TT	TT	August 2021
B	Final Version	TT	TT	September 2021
C	Final Version (A)	TT	TT	November 2021
D	WAPC Scheduled Modifications	TT	TT	August 2022
E	WAPC Scheduled Modifications	TT	TT	October 2022

Endorsement Page

This Structure Plan is prepared under the provision of the City of Swan Local Planning Scheme No. 17.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

13 May 2019 Date

Signed for and on behalf of the Western Australian Planning Commission:

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:

Witness

14 May 2019 Date

13 May 2029 Date of Expiry

Table of Amendments

Amendment No.	Summary of the Amendment	Amendment Type	Date Approved by WAPC
1	• Extension of the Structure Plan area to include land to the east of the structure plan that had been identified for future indicative development but which now has been rezoned for urban development pursuant to the Metropolitan Region Scheme (MRS); • Contract the approved Bullsbrook Structure Plan area to exclude land that will comprise the Kingsford Town Centre Precinct Structure Plan • Modify the existing Residential Density Codes indicated over various parts of the Structure Plan area by eliminating an area with an R40 coding and changing a 45ha area from R20-50 to R20-40; and • Reconfigure some areas of proposed Public Open Space	Standard	01 November 2022

EXECUTIVE SUMMARY

The Kingsford Local Structure Plan (Structure Plan) has been prepared to guide the subdivision and development of Lots 1-6 & 1314 Great Northern Highway, Lots 2, 7-10, 900, 901 & 1396 Chittering Road, Lots 1165, 834, 433 and Part Lot 1343 Hurd Road, and Portion Lots 2792 & 1288 Taylor Road, Bullsbrook, within the City of Swan municipality. Implementation of a Structure Plan over this 207.32ha development site will assist in the delivery of strategic planning objectives set out by the State Government and the City of Swan in relation to housing supply, affordability and delivery of urban development.

The Structure Plan provides an overarching planning framework to guide and facilitate the development of the Structure Plan area for urban purposes, and has been prepared in accordance with the provisions of Part 5A.1 of the City of Swan Local Planning Scheme No.17, Planning and Development (Local Planning Schemes) Regulations 2015 and associated Structure Plan Framework.

The Structure Plan is aligned with the Bullsbrook Townsite District Structure Plan approved by the Western Australian Planning Commission (WAPC) in April 2018, which provides a high-level development framework for the broader locality through the allocation of land uses and service delivery.

The Structure plan provides for a range of residential densities and lot typologies, contributing to the availability of a diverse and affordable housing product within the North East Metropolitan Sub-Region. It also includes an integrated and legible movement network and generous provisions of public open space. It is anticipated that the LSP will accommodate approximately 2,355 lots and 2,355 dwellings, for a community of 6,947 residents.

The Structure Plan also provides the foundations for the development of the Kingsford Town Centre, which will provide a key employment and activity node within the City of Swan.

Development of the Structure Plan will be guided by Concept Plans prepared for each precinct Encourages a diversity of households to live within Kingsford, both in design and affordability.

Kingsford Estate is the first major extension of the Bullsbrook Townsite identified in the 'Bullsbrook Townsite Land Use Management Plan (BLUMP) endorsed in 2014 and associated MRS Amendments gazetted in late 2019.

The Kingsford project has commenced construction and will ultimately comprise over 2,355 homes, a Town Centre, District Open Space, Primary School and the re-alignment of Chittering Road. The project provides a number of critical community infrastructure elements necessary to support the long term growth of the expanded Bullsbrook

Executive Summary Table

ITEM	DATA	STRUCTURE PLAN REFERENCE
Total Kingsford Estate	207.32ha	
Area of each land use proposed (approx.): Residential: Private Clubs & Institutions (Church): Public Open Space: Core Creek Area: 1:1yr drainage: Roads (inclusive of 'Primary Regional Roads' Reservation):	 106.28ha 2.06 ha 24.88 ha 13.20 ha 1.9 ha 59.0 ha	
Total estimated lot yield	2,355 lots	
Estimated number of dwellings	2,355 dwellings	
Estimated residential site density	15 dwellings/gross urban zoned hectare 22 dwellings/site hectare	
Estimated population (based on 2.8 persons per dwelling)	6,947 people	
Number of high schools	0	
Number of primary schools	0	
Estimated number and % of public open space given over to: Regional Open Space Neighbourhood Parks (>3,000m2): Local Parks (<3,000m2):	 0 ha 15 parks @ 24.88 ha (12% of total Structure Plan area) 1 park @ 0.16 ha (~0.1% of total Structure Plan area)	

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APPENDICES

ABBREVIATIONS

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment Conservation Council
ASS	Acid Sulfate Soils
AS	Australian Standard
BGL	Below Ground Level
BMP	Bushfire Management Plan
BRA	Bio-Retention Areas
BRT	Ellenbrook Bus Rapid Transit
CBD	Central Business District
CCW	Conservation Category Wetland
CoS	City of Swan
DAA	Department of Aboriginal Affairs
DER	Department of Environment Regulation
DPaW	Department of Parks and Wildlife
DoP	Department of Planning
DoW	Department of Water
EPA	Environmental Protection Authority
FSA	Flood Storage Areas
Ha	Hectare
LDP	Local Development Plan
LILO	Left-in /Left-Out Road Intersection
LWMS	Local Water Management Strategy
MGL	Maximum Groundwater Level
MRS	Metropolitan Region Scheme
MRWA	Main Roads Western Australia
NESRF	Draft North-East Sub-Regional Planning Framework
OMSRS	Draft Outer Metropolitan Perth & Peel Sub Regional Structure Plan
POS	Public Open Space
PTA	Public Transport Authority
UWMP	Urban Water Management Plan
VPD	Vehicles per day
WAPC	Western Australian Planning Commission
WSUD	Water Sensitive Urban Design

PART 1
IMPLEMENTATION

1.0 Structure Plan Area

Kingsford Estate covers a total 207.32ha area, and is zoned 'Urban' under the Metropolitan Region Scheme (MRS).

This Local Structure Plan (LSP) applies to the land zoned 'Urban' under the MRS being Lots 1, 2, 3, 4, 5, 6 and 1314 Great Northern Highway, Lots 2, 7, 8, 9, 10, 900, 901 and 1396 Chittering Road, Lots 1165, 834, 433 and Part Lot 1343 Hurd Road, and Portion Lots 2792 & 1288 Taylor Road, Bullsbrook, being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map (refer Plan 1).

2.0 Operation

This Structure Plan comes into effect on the date on which it is approved by the Western Australian Planning Commission (WAPC) and is valid for a period of 10 years from that date, or another period determined by the WAPC in accordance with the Planning and Development (Local Planning Scheme) Regulations 2015 Schedule 2 – Deemed Provisions.

The Structure Plan is to be given due regard when making decisions on the development and subdivision of land within the Structure Plan area.

3.0 Staging

The development of the Structure Plan area will be implemented in multiple stages. The staging plan is indicative as timing, location and composition of the future stages will be dependent on market demand.

Stage 1, located within the north-western portion of the site, is currently under construction. The commencement of the project from this location has facilitated access to Chittering Road via upgraded roundabout intersecting with Maroubra Avenue and the development of the Display Village, Sales Office and 'first release' residential lots. The staging will now move eastwards to the north-south POS. Development will than progress and southwards with construction commencing for Stage 2 providing vehicle crossing of Ki-It Monger Brook. The staging will then continue south with a view to deliver the Kingsford Town Centre District Activity Centre, with potential to skip land parcels subject to individual landowner intentions.

The provision of engineering infrastructure and primary internal road network will also need to be staged to suit development demand and/or suitable access at an early stage. A detailed programme for this will be prepared as part of ongoing detailed planning and design of service infrastructure.

4.0 Subdivision and Development Requirements

Where land is zoned 'Urban' under the MRS and 'Residential Development' under the City of Swan Local Planning Scheme No. 17 (LPS17), the subdivision and development of land is to be generally in accordance with the Structure Plan (Plan 1).

4.1 Land Use Zones and Reserves

Land Use permissibility within the Structure Plan area shall be in accordance with the Structure Plan Map (Plan 1) and the corresponding Zones and Reserve under the City of Swan LSP17. Where there is a conflict with the Structure Plan and LSP17, the standards of LPS17 shall prevail to the extent of any inconsistency, in accordance with the Planning and Development (Local Planning Scheme) Regulations 2015 Schedule 2 – Deemed Provisions.

In addition to the uses permitted under LPS17, temporary land uses (including, but not limited to: sales office, car parking and café) which facilitate the sale of lots within the Structure Plan area are permissible land uses within the 'Residential Development' zone.

4.2 Kingsford Town Centre

A Precinct Plan (PP) has been prepared for the Kingsford Town Centre, in accordance with State Planning Policy 4.2 for a 'District Centre' within the centre hierarchy, prior to the subdivision and development of land.

4.3 Hazards and Separation Areas

a. Residential lots identified as a Bushfire Prone Area in the Bushfire Management Plan (Appendix 1) require a Bushfire Attack Level assessment and BAL Contour Plan to be prepared, in accordance with State Planning Policy 3.7, for an application of subdivision and/or development.

b. Residential lots identified within the Transportation Noise Assessment (Appendix 2) require a Detailed Noise Assessment (customised noise mitigation measure to be implemented), in accordance with State Planning Policy 5.4, to be prepared and submitted with an application for subdivision and/or development where noise limit is likely to be exceeded.

c. The landfill site, located in the southwestern portion of the Structure Plan area, is to be remediated prior to the subdivision and/or development of the land. All waste acceptance at the premises ceased in November 2018 and all waste processing was completed by the end of December 2020. Okeland Communities engaged Strategen JBSG / RPS to work with DWER on the licence surrender application /process. This process is ongoing with DWER. THE WAPC in their approval for the Lifting of Urban Deferment over the landfill land were advised applications for subdivision would not be lodged / considered until such time as the DWER Licence surrender process had been finalised.

4.4 Major Infrastructure

At the relevant time of subdivision, or as otherwise agreed, upon the advice of the City of Swan or Main Roads WA the following major infrastructure is to be constructed:

a. Dual-lane roundabout at the intersection of the approved subdivisional road with Great Northern Highway;
b. Upgrade of Maroubra Avenue, including intersection treatments, and the cul-de-sac of Chittering Road;
c. Southern intersection with Great Northern Highway, the location and type of this intersection is subject to detailed design in consultation with affected landowners, Main Road and the City of Swan; and
d. Suitable traffic management device(s) at the Alto Way/Hurd Road intersection.

4.5 Public Open Space

The provisions of a minimum 10% Public Open Space (POS) is to be provided in accordance with Liveable Neighbourhoods. POS is to be ceded free of cost to the Crown and vested for management to the City of Swan for the purpose of public open space. POS is to be provided generally in accordance with the Structure Plan (Plan 1) and Table 4 – Kingsford POS Schedule in Part Two of this report. An updated POS Schedule to be provided at the time of subdivision for determination by the WAPC, on the advice of the City of Swan.

Subdivision of Lot 2 will be subject to a separate contribute of Public Open Space, to the minimum 10% of the gross subdivisible area.

Ki-It Monger Brook core creek area is to be provided in addition to the 10% POS, and ceded free of cost to the Crown and vested for management to the City of Swan for the purpose of foreshore management and/or conservation.

4.6 Residential Development

4.6.1 Density Target

Residential densities application to the Structure Plan area shall be those densities shown on the Structure Plan Map (Plan 1).

Under Perth and Peel @ 3.5 million 'Connected City' scenario new urban areas are to use a minimum average residential target of 15 dwellings per gross hectare of Urban zoned land, and occupancy rate of 2.95 people per dwelling. The Structure Plan area complies, providing approximately 22 dwellings per ha.

Based on Liveable Neighbourhoods 'Site Hectare' definition, the Structure Plan 'developable area' equate to be developed for residential purposes and excludes non-residential land uses including streets, laneways and POS. Based on 2,355 dwellings, the Structure Plan estimates 22 dwellings per site hectare, this complies with LN target of 22 dwellings per site hectare.

4.6.2 Density Code Plans

The Structure Plan Map (Plan 1) defines the residential density ranges that apply to specific areas within the Structure Plan area.

A Residential Density Code Plan is to be submitted at the time of subdivision to the WAPC and will indicate the residential density code applicable to each lot within the subdivision consistent with the residential density code ranges identified on the Structure Plan (Plan 1) and location criteria contained in Clause 4.7.

Approval of the Density Code Plan is to be undertaken at the time of determination of the subdivision application by the WAPC. The approved Density Code Plan is to then form part of the Structure Plan and shall be used for the determination of future development applications.

Density Code Plans are not required if the WAPC considers that the subdivision is for one or more of the following:

a. The amalgamation of lots;
b. The purposes of facilitating the provision of access, services or infrastructure;
c. Land which by virtue of its zoning or reservation under the Structure Plan cannot be developed for residential purposes; or
d. Consolidation of land for 'superlot' purposes to facilitate land assembly for future development.

4.6.3 Locational Criteria

Residential densities applicable to the Structure Plan area are those residential densities shown on the Structure Plan (Plan 1).

The allocation of residential densities will generally be in accordance with the following location criteria:

DENSITY CODING	LOCATION CRITERIA
R5-R15 Precinct	
R5	The R5 density code applies to Residential zoned lots abutting/opposite land zoned Rural under the MRS and/or lots on the periphery of the LSP.
R10	The R10 density code applies as the base code to all Residential zoned lots, with the exception of those lots coded R5, R12.5 and R15 as set out below and above.
R12.5-R15	The R12.5 or R15 density code applies to Residential zoned lots abutting/opposite public open space.
R10-R30 Precinct	
R10	The R10 density code applies to Residential zoned lots abutting/opposite land zoned Rural under the MRS and/or lots on the periphery of the LSP.
R20	The R20 density code applies as the base code to all Residential zoned lots, with the exception of those lots coded R10 and R30 as set out above and below.
R25-R30	The R30 density code applies to Residential zoned lots where: • the lot is directly opposite/abutting public open space; or • the lot has a laneway abutting the rear boundary; or • the lot is located on a street block end.
R20 Precinct	
R20	The R20 density code applies, however lower densities may be provided to achieve bushfire requirements and/or where lots are located on steeply sloping land.
R20-R30 Precinct	
R20	The R20 density code applies as the base code to all Residential zoned lots, with the exception of those lots coded R30 as set out below.
R25-R30	The R30 density code applies to Residential zoned lots where: • the lot is within 100m of public open space; • the lot has a laneway abutting the rear boundary; or • the lot is located on a street block end.
R20-R40 Precinct	
R20	The R20 density code applies as the base code to all residential zoned lots, with the exception of those lots coded R30 and R40 as set out below.
R30-R40	The R30 density code applies to Residential zoned lots where: • the lot is located within a 100m walkable catchment of public open space; or • the lot is located within a 200m walkable catchment of a designated public transport route, or • the lot has a laneway abutting the rear boundary, or • the lot is located on a street block end. The R40 density code applies to Residential zoned lots where the lot is created within a 400m walkable catchment of the town centre.

Note: Lower densities may be acceptable to provide suitanle interface/transition to existing development, to retain significant trees, to accommodate steep slopes or to address bushfire requirements

4.6.4 Future Residential Subdivision

Subdivision approval for residential lots will not be supported within 500m of the landfill facility until it has been remediated to the satisfaction of the Department of Water and Environmental Regulation.

5.0 Local Developments Plans

Local Development Plans (LDPs) are to be prepared in accordance with Part 6 of the Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 – Deemed Provisions. LDPs may be required as a condition of subdivision approval for lots comprising one or more of the following site attributes:

a. Lots with an area of 260m^2 or less;
b. Irregular shaped lots;
c. Lots with an interface with, or outlook to POS;
d. Lots that obtain vehicular access from a laneway or right-of-way;
e. Lots that propose grouped or multiple dwelling development;
f. Lots affected by transport noise which exceeds the noise target as defined by the State Planning Policy 5.4 in relation to Great Northern Highway and Chittering Road; and
g. Lots affected by Bushfire Hazard, as identified by the Bushfire Management Plan (refer Appendix 1).

LDPs will generally be prepared to address one or more of the following:

a. Building orientation;
b. Building design and setbacks;
c. Overlooking and/or privacy;
d. Vehicle access;
e. Car parking;
f. Private open space;
g. Interface with POS (fencing, frontage, footpath location);
h. Noise protection provisions (if any);
i. Bushfire protection provisions (if any);
j. Laneway treatments; and
k. Any such information considered relevant by the proponent and/or determining authority to address the requirement of this Structure Plan.

6.0 Residential Design Code Variations

The City of Swan Local Planning Policy POL-LP-11 Variation to Deemed to Comply Requirements of the R-Codes – Medium Density Single House Development Standards (R-MD Codes) sets out acceptable variation to the deemed-to-comply provisions the R-Codes for lots coded R25-R60. Except where an approval Local Development Plan (LDP) varies the 'Deemed-to-Comply' provisions of the R-Codes, the standards set out in Local Planning Policy POL-LP-11 shall apply to this Structure Plan.

In the instance where R35 density code applies the lot will be subject to the R30 R-MD Code provisions, R50 code lots will be subject to the R40 R-MD Code provisions.

7.0 Other Requirements

7.1 Notifications on Title

In respect of applications for the subdivision of land the City of Swan may recommend to the Western Australian Planning Commission that a condition be imposed on the granting of subdivision approval for a notification to be placed on the Certificate(s) of Title(s) to advise of the following:

a. Construction standards to achieve higher noise standards in accordance with State Planning Policy 5.4 Road and Rail; Transportation Noise and Freight Considerations in Land Use Planning.
b. Building setbacks and construction standards to achieve a Bushfire Attack Level -29 or lower in accordance with Australian Standards (AS3959-2009): Construction of buildings in bushfire prone areas.

7.2 Development Contributions

The Structure Plan area will be subject to a Development Contribution Plan (DCP) pursuant to LPS17 and guided by State Planning Policy 3.6 – Development Contributions for Infrastructure. The DCP will generally be guided by documents including, but not limited to, the following:

a. Local Structure Plans and associated appendices;
b. City of Swan Transport Strategy; and
c. Bullsbrook Townsite Land Use Master Plan (BTLUMP).

The landowner will be liable to make a contribution toward the costs of providing infrastructure in the DCP at the time and in the circumstances as established through subsequent amendment to the Scheme or other agreed legal arrangement in the interim.

8.0 Additional Information

ADDITIONAL INFORMATION	APPROVAL STAGE	CONSULTATION REQUIRED
Density Code Plan	Subdivision application	WAPC City of Swan
Public Open Space Schedule	Subdivision application	City of Swan
Detailed Noise Management Plan	• Subdivision application/condition of subdivision for identified lots, or Development application for identified lots.	City of Swan
Bushfire Attack Level Assessment	• Subdivision application/condition of subdivision for identified lots, or • Development application for identified lots	City of Swan Department of Fire and Emergency Services
Urban Water Management Plan	• Condition of subdivision	City of Swan
Ki-It Monger Brook Foreshore Management Plan	Condition of subdivision for relevant landowner/stage adjacent foreshore	City of Swan
Wetland Management Plan	Condition of subdivision for relevant landowner/stage adjacent mapped wetland	City of Swan Department of Biodiversity, Conservation and Attractions

N

HURD ROAD

CHITTERING ROAD

NOCURNE RISE

CINTRA AVENUE

BREABLEY STREET

CAPORN STREET

PARKLAND PARADE

CHITTERING ROAD TO BE IN ACCORDANCE WITH APPENDIX B OF TRANSPORT IMPACT ASSESSMENT, TO ENABLE PROTECTION OF EXISTING TREES ALONG LSP BOUNDARY.

PICKETT PARK

COMMUNITY CENTRE

CHURCH

BULLSBROOK ROAD

GREAT NORTHERN HWY

R20

R20 - R30

R20 - R30

R5 - R15

R20 - R40

R20 - R40

R10 - R30

R20 - R40

R10 - R30

R40 - R60

R40 - R60

R20 - R40

R10 - R30

R20 - R40

A68

PS

WC

500m LANDFILL BUFFER

LANDFILL SITE

500m LANDFILL BUFFER

LEGEND

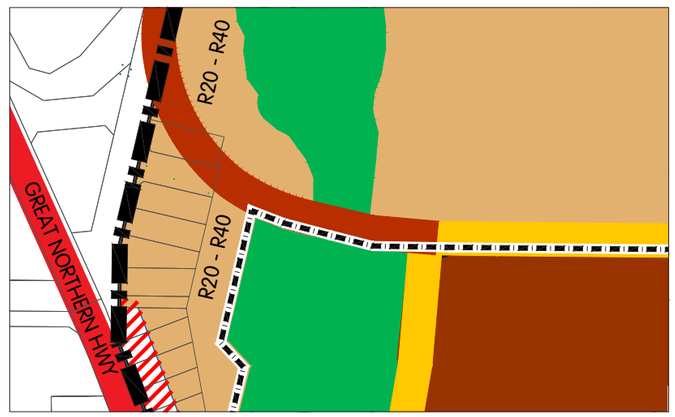
- LOCAL STRUCTURE PLAN BOUNDARY (254.61ha)
- AREA SUBJECT TO PRECINCT PLAN

ZONES

- RESIDENTIAL (R5-R15)
- RESIDENTIAL (R20)
- RESIDENTIAL (R10-R30)
- RESIDENTIAL (R20-R30)
- RESIDENTIAL (R20-R40)
- RESIDENTIAL (R40-R60)
- GENERAL COMMERCIAL
- PUBLIC PURPOSE - PS PRIMARY SCHOOL, WC WATER CORPORATION
- RECREATION
- DISTRICT OPEN SPACE
- PRIVATE CLUBS AND INSTUTIONS
- PRIMARY REGIONAL ROAD
- A68 ADDITIONAL USES - SERVICE STATION

RESERVES

- PRIMARY DISTRIBUTOR
- INTEGRATOR B
- NEIGHBOURHOOD CONNECTOR A
- NEIGHBOURHOOD CONNECTOR B



ENLARGEMENT

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CADASTRAL INFORMATION
SOURCE: MNG
YYMMDD: 220520
DWG REF: 97797lots-9999bi-PCG94
PROJECTION: PCG94

1:10,000 SIZE A3

0 metres 100 200 300 400 500

REV	DESCRIPTION	YYMMDD	DRAWN	APPR'D
Z	ADJUST LANDFILL BUFFER	221007	TG	TT
Y	MODIFY DENSITIES	220803	SB	TT
X	MODIFY DENSITIES	210930	SB	TT
W	ADD PROPOSED URBAN AREA	210811	SB	TT

KINGSFORD LOCAL STRUCTURE PLAN
Bullsbrook
City of Swan

REF NO.	DRAW NO.	REV.
AMX BUL	**RD1 107**	**Z**

PART 2
EXPLANATORY

1.0 Introduction

1.1 Purpose

The Kingsford Local Structure Plan (Structure Plan) has been prepared by RobertsDay and the project team on behalf of Okeland Communities (the developer). The purpose of the Structure Plan is to guide the orderly and proper subdivision and development of the Structure Plan area for 'urban' purposes, in line with the Bullsbrook Townsite District Structure Plan.

The Structure Plan is prepared in accordance with the requirements of Planning and Development (Local Planning Schemes) Regulations 2015 and the Western Australian Planning Commission (WAPC) Structure plan Framework, with regard to the City of Swan Local Planning Scheme No. 17 (LSP17) – Part 5A.

1.2 Project Vision & Objectives

The project vision and objectives for the Structure Plan will provide the overarching principles that guide the design, planning and place making development efforts. Located in the foothills of the Darling Scarp, views and green links to the Scarp are a key place identifier for the region providing bush backdrop.

Project Vision:

"Immersed in the captivating foothills, Kingsford celebrates the past and embraces the future to create an authentic urban village that is hallmarked by rich characters, a progressive outlook and engaged community"

– Okeland Communities

Project Objectives:

Creating Community Well-Being

- Authentic neighbourhoods and values;
- Healthy living, green walking and cycling links;
- New Town Centre as extension of existing town and community facilities;
- Highly connected green space and street network;
- Engaged community on-show through diverse activities, particularly on main street;

Inspired by Nature

- Ki-It Monger Brook celebrated as the lifeblood of Kingsford;
- Streets and houses oriented to capture breath taking views of the Darling Scarp;
- Natural landform retained for district sense of place and views as far as the City;
- Tree retention within public spaces and streets;

Character Rich

- Ki-It Monger Brook heritage discovery trails celebrating Indigenous and European site history;
- Contemporary, rural village-feel town centre;
- Adventure destination park, showcasing Bullsbrook's aviation history;
- Elevated larger lots and country lifestyle choices;
- Attention to detail and design quality throughout;

Progressive

- Advantages of contemporary urban living within a country setting;
- Environmentally sustainable and economical lifestyle choices;
- Education and health at the heart of the community;
- Design that prioritise walking and cycling;
- Urban places and space for knowledge exchange.

1.3 Land Description

1.3.1 Location

The Structure Plan area is located within the municipality of the City of Swan and in the locality of Bullsbrook, Perth which is approximately 40km north-east of the Perth CBD and 25km north of the Midland Town Centre (refer Figure X).

The Bullsbrook locality is well serviced by a number services and communities facilities which will provide immediate benefit to future residents including: Bullsbrook High School (Bullsbrook College), Pickett Park Oval, Bullsbrook Public Library, Ethel Warren Bullsbrook Community Centre, RSL Branch, Bullsbrook Community Kindergarten, Chequers Golf Club, as well as a number of sporting clubs, youth facilities, skate park, BMX track, tennis courts and bridle trail, all within close proximity to the Structure Plan area.

The improvement to the surrounding transport connections, including NorthLink (Perth to Darwin Highway), Great Northern Highway and Stock Road extensions have and will improve the traffic flow and accessibility of the Bullsbrook locality from central Perth.

Key employment areas within the sub-region include the well-established Strategic Metropolitan Centre at Midland (which is accessible by the Perth–Midland passenger rail line), the emerging Ellenbrook secondary centre, industrial centres at Malaga, Forrestfield and Hazelmere and attractors such as the Swan Valley and the Avon Valley. The area is also supported by Bullsbrook South industrial area and Muchea employment node, which provides service-based land uses such as transport, livestock, fabrication, warehousing, wholesaling and general commercial use. The viticulture and tourism related industries in the Swan Valley will continue to grow and contribute to employment provision and economic growth within the sub-region. In addition, the sub-region has established regional links to, employment nodes at Perth Airport, Kewdale and the Morley and Cannington strategic metropolitan centres.

The Royal Australian Air Force base (RAAF) which is west of the Structure Plan area, has played a key economic driver for Bullsbrook since the 1940s with strong community ties. The base is now supported by an industrial park which benefits from the passing trade of Great Eastern Highway. This industrial area is anchored by the Bullsbrook Townsite which provides daily needs such as IGA, bank, pharmacy and service station.

1.3.2 Area and Land Use

The Structure Plan area is generally bound by Chittering Road and Great Northern Highway to the west, private landholdings to the south and east, and existing residential development to the north.

The Structure Plan area encompasses 254.6hacomprising largely cleared land, historically used for agricultural purposes, namely cattle and sheep grazing with limited environmental value. An existing homestead and associated outbuildings are located centrally within the Structure Plan. Remnant vegetation is primarily located along Ki-It Monger Brook, an existing seasonal creek line which traverses east-west centrally through the Structure Plan area.

1.3.3 Legal Description and Ownership

The Structure Plan encompasses the following landholdings:

The Structure Plan area comprises:

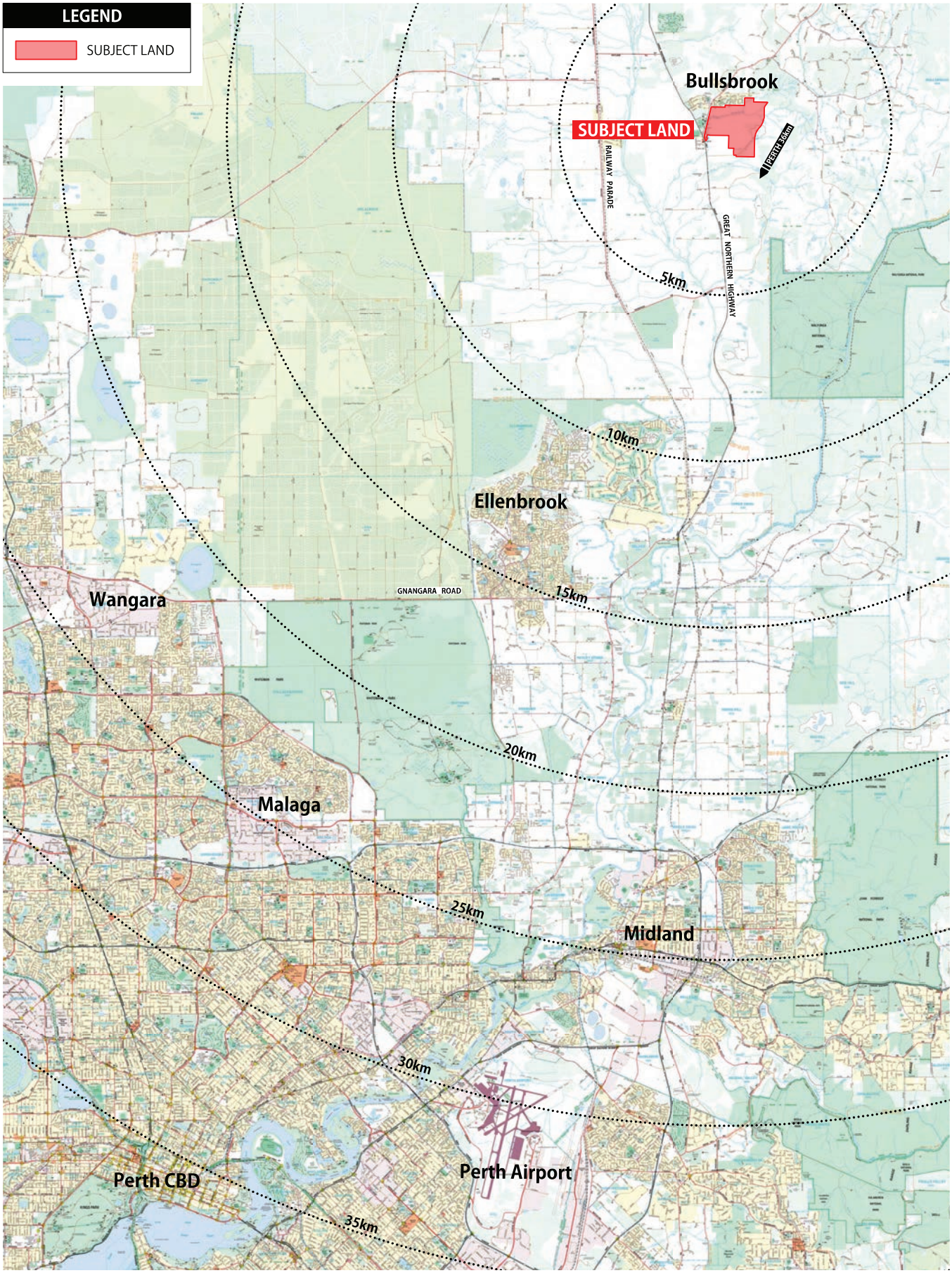
- Lots 1-6 Great Northern Highway
- Lots 2, 7, 8 ,9, 10, 900, 9007, 1396, 1314 Chittering Road
- Pt Lot 1343 and Lots 834, 433 Hurd Road.
- Pt Lot 2792 Taylor Road

1.4 Project Team

The following multi-disciplinary project team have been engaged to progress the preparation of the Structure Plan:

Discipline	Consultant
Acoustic	Herring Storer
Traffic and Transport	Transcore
Servicing and Infrastructure	JDSi
Surveyors	McMullen Nolan Group (MNG)
Landscape	Emerge Associates
Environmental	RPS
Aboriginal Heritage	Ethnosciences
Retail Assessment	Taktiks4
Bushfire	Strategen JBS&G
Hydrology	RPS
Planning + Urban Design	Hatch RobertsDay

FIGURE 1: Location Plan



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2.0 Planning Framework

2.1 Zoning and Reservations

2.1.1 Metropolitan Region Scheme

The current Metropolitan Region Scheme (MRS) zoning and reservations are shown in Figure 2.

Kingsford Estate covers a total 254.6ha area, of which is zoned 'Urban' under the MRS. The Structure Plan area only encompasses land which is zoned 'Urban' under the MRS. The balance of the Kingsford Estate, is zoned a mix of 'Rural' zone (8.8ha) and Primary Regional Road reservation (1.21ha).

An application to amend the MRS to rezone the balance of Kingsford Estate from 'Rural' zone has been lodged and is currently with WAPC. Once the land is zoned 'Urban' under the MRS, an amendment/ addendum to the Structure Plan will be required prior to subdivision and development of the land.

The land reserved as 'Primary Regional Roads' under the MRS will facilitate future widening required for Great Northern Highway, which abuts the south-western boundary of the Structure Plan area.

2.1.2 City of Swan Local Planning Scheme No. 17

The current Local Planning Scheme No. 17 (LPS 17) zoning and reservations are shown in Figure 3.

The Structure Plan area is zoned "Residential Development".

An MRS Amendment (1324/41) affecting the southern portion of the Structure Plan was gazetted on 10 December 2019, transferring the land from 'Rural' to 'Urban' zone. To reflect this change, Scheme Amendment No. 186 to LPS17 rezoned the land from "General Rural" to "Residential Development". This Scheme Amendment will ensure all land contained within the Structure Plan area is zoned "Residential Development" under LPS17.

The WA Planning Commissionat their meeting on the 25 August 2021 resolved to:

1. transfer portions of Lots 1314, 1396 & 9003 Chittering Road, Lot 433 and portions of Lots 834 & 1343 Hurd Road, and a portion of Lot 2792 Taylor Road, Bul/sbrook as shown on Plan No. 4.1661 from the Urban Deferred zone to the Urban zone pursuant to Clause 27 of the Metropolitan Region Scheme; and
2. amend the City of Swan Local Planning Scheme No. 17, by transferring the Urban zoned land from the General Rural and Landscape zones to the Residential Development zone pursuant to section 126(3) of the Planning and Development Act 2005.

Under LSP17 the objectives 'Residential Development' zone include:

c. Provide for the coordinated development of future residential areas through the application of a comprehensive plan to guide subdivision and development to be known as a "Structure Plan";
d. Provide for predominantly residential development, but including also a range of compatible services, consistent with the needs of an integrated neighbourhood, and planned so as to minimise adverse impacts on amenity;
e. Avoid the development of land for any purposes or at a time when it is likely to compromise development elsewhere in the district or prejudice the future development of land in the Residential Development zone for more appropriate purposes;
f. Take account of the need to protect the amenity and on-going use of adjacent property owners as well as to provide for the needs of future residents.

This Structure Plan has been prepared in accordance with Part 4 of the Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 – Deemed Provisions and Clause 5A.1 of LPS17 which requires a Structure Plan to be prepared for land zoned 'Residential Development' before any subdivision or development of the land is to be undertaken.

The balance of Kingsford Estate is zoned 'General Rural' and 'Landscape' under LPS17. This land is required to be zoned 'Urban' under the MRS and 'Residential Development' under LPS17 prior to inclusion within the Structure Plan area via a Structure Plan amendment/addendum.

FIGURE 2: Metropolitan Region Scheme

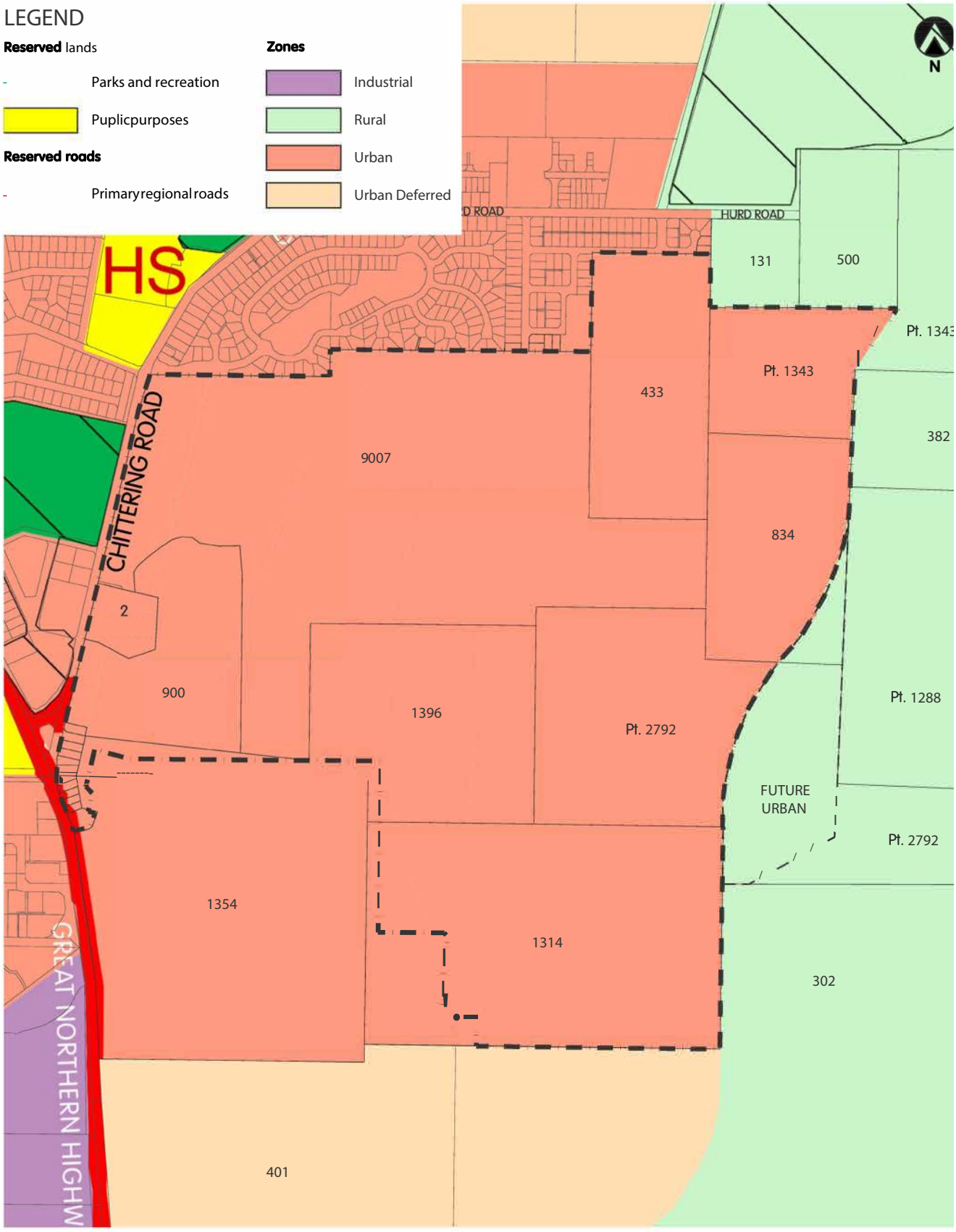
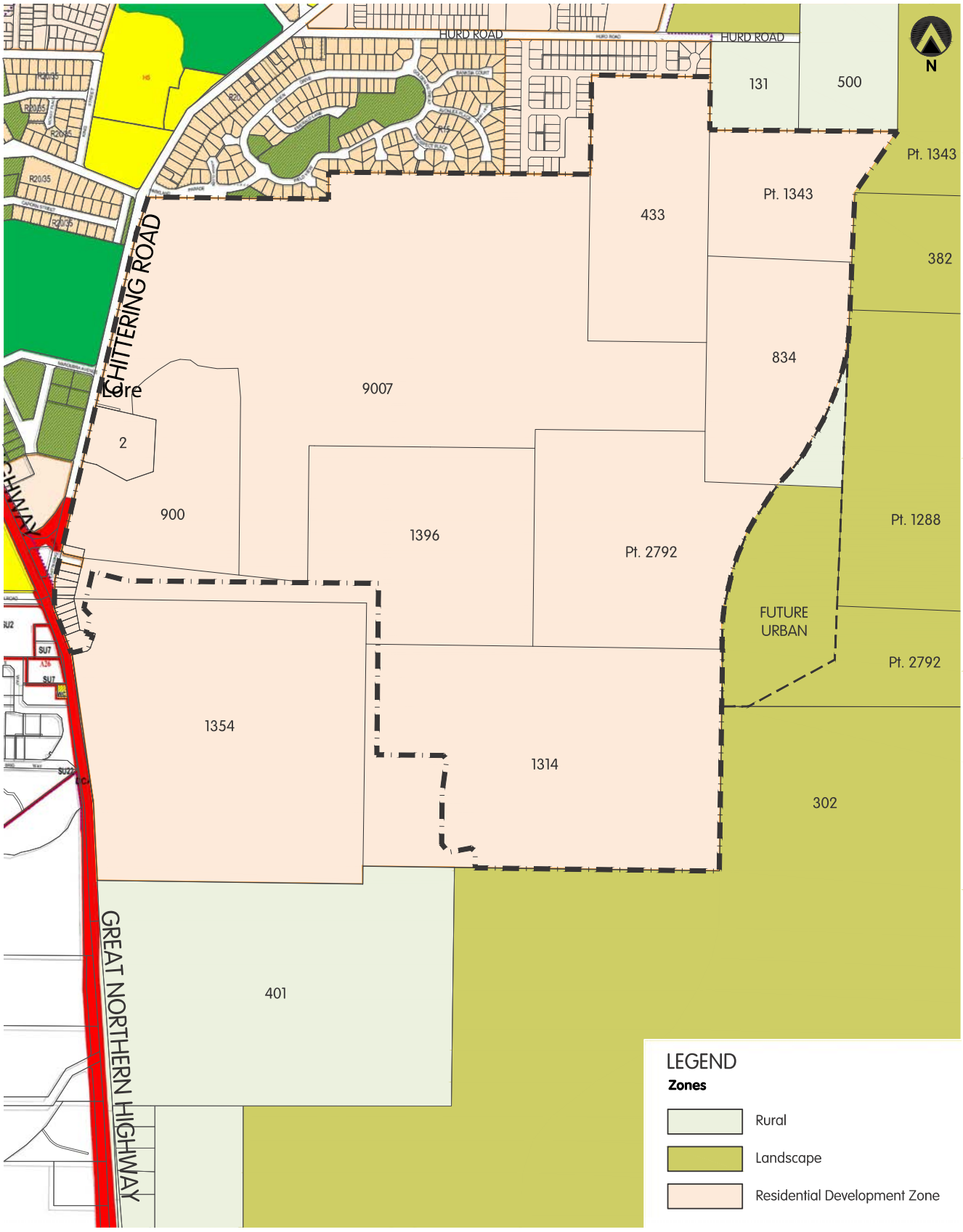


FIGURE 3: Local Planning Scheme No. 17



2.2 Strategic Planning Framework

2.2.1 Perth and Peel @ 3.5 million

Perth and Peel @ 3.5 million is the highest-level strategic planning document which establishes a vision for the future expansion of Perth Metropolitan and Peel Regions, which is project to grow to a population of 3.5 million, with a total 800,000 news dwellings to be provided by 2050. To achieve this expected growth without on our way of life, natural environment and physical infrastructure, the State sets housing targets for each sub-region. Of the new dwellings, 47% (380,000) dwellings are to be accommodated within existing infill areas, whilst the remaining 53% (420,000 dwellings) will be built in outer sub-regions. This 'Connected City' model ensures a wide range of choices to future home buyers across Perth and Peel. The suitability of development in the outer sub-regions is based on proximity to employment and services, protection of major environmental assets and capacity for efficient provisions of infrastructure and essential services.

The Structure Plan area is located within the North-East Sub-Region, which has a housing target of 102,560 to be provided by 2050. It is expected that this population growth will predominantly be focused within the City of Swan, which will contribute 73,450 additional dwellings (of which 25,690 infill) and approximately 60% of the sub-region's population by 2050.

The Structure Plan area is identified as 'Urban Zoned – Undeveloped' as land which is a State priority for increased density, being vacant, under-utilised urban land that can be serviced by the required infrastructure and located in proximity to activity centres, transit corridors and areas of high amenity (refer Figure X). The Sub-Regional Framework identifies 'Urban Zoned – Undeveloped' areas will contribute 57,440 new dwellings towards the housing target, and 'Urban Expansion' 35,330 news dwellings by 2050.

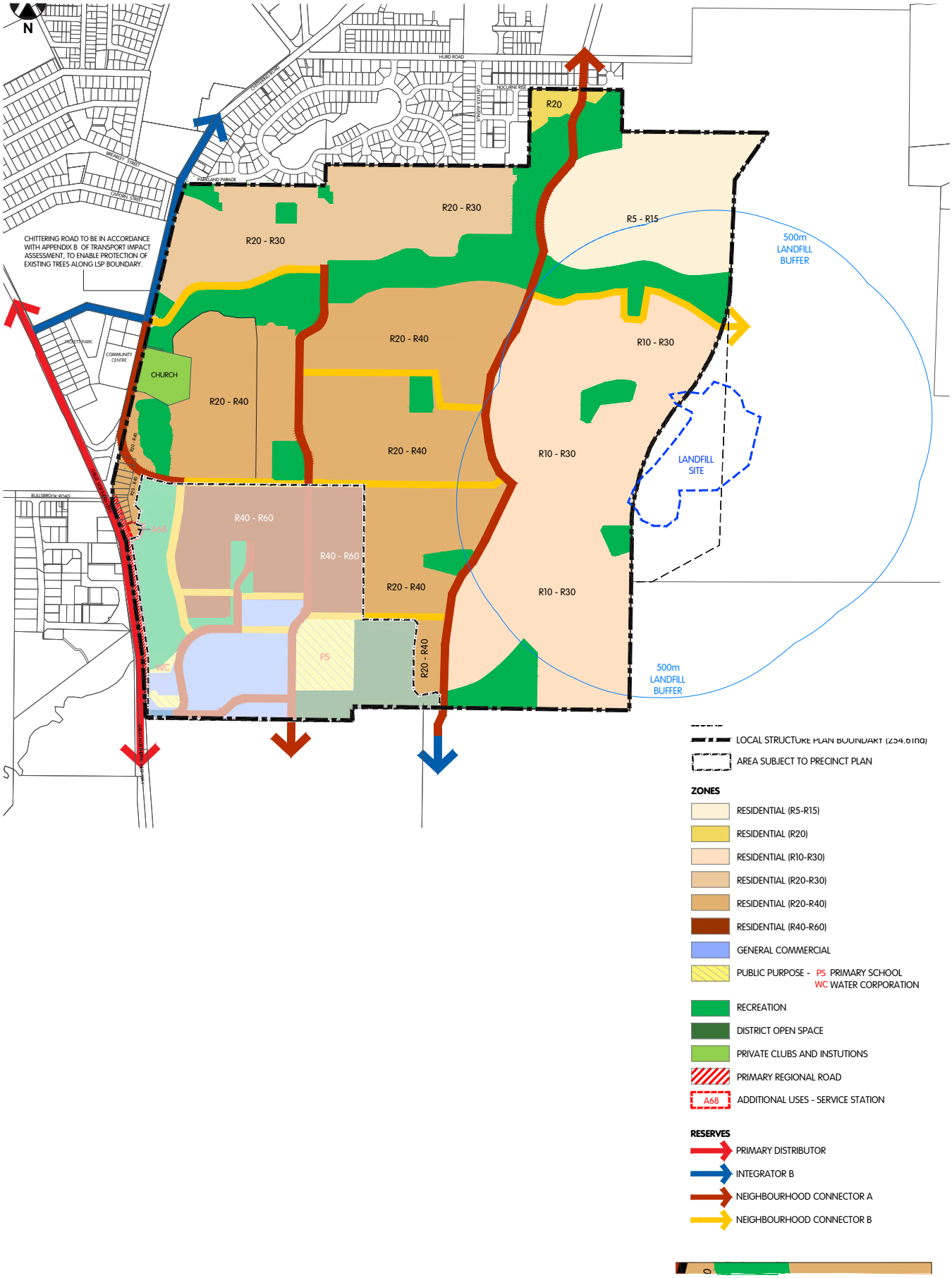
The Sub-Regional Framework also includes anticipated timeframes for the delivery of urban development sites, with the Structure Plan area identified as 'short term' to be developed by 2015-2031, with the balance of the Kingsford Estate identified as 'medium-long term' to be developed after 2022.

The planned residential growth within Bullsbrook will be supported by the Kingsford Town Centre which is identified within the Sub-Regional Framework as a "District Centre" within the activity centres hierarchy.

More broadly, the Structure Plan will be supported by the Bullsbrook South industrial area which is identified for future industry and commercial expansion to achieve an economic trade cluster focused on existing and proposed freight transport infrastructure. The Bullsbrook RAAF base will also continue to operate a as a key military air training facility and flight training base.

An intermodal freight terminal is identified south-east from Bullsbrook, accessible to Stock Road, to connect Perth-Geraldton. The terminal will have an important role in the freight network having rail connections to Fremantle Port and proposed Kwinana Outer Harbour, as well as to the regions in the north of the State. It is anticipated this facility will not be required prior to 2031.

FIGURE 4: Local Structure Plan



2.2.2 City of Swan draft Local Planning Strategy

The Local Planning Strategy provides the local context to interpret State and regional policies for the City of Swan. It provides the planning rationale for zones, reservations and development controls contains in the City of Swan's Local Planning Scheme No. 17 (LPS17). The Strategy will be the principal land-use document used to assist the City in decisions making over the next 10-15 years.

The Strategy outlines the intended development outcome over a 10-15 year period, to achieve the States housing target of 73,450 additional dwellings (of which 25,690 infill) and further 176,100 new residents.

The City will have regard to the strategies and actions which focus on the following themes/objectives:

1. Natural Resource Management and Environmental Protection – protect the City's natural resources, provide responsible environmental management and manage impacts of climate change;
2. Population and Housing – facilitate a wide range of housing and lifestyle choices for current and future residents;
3. Economy and Employment – Facilitate the creation of a sustainable economy and provide opportunities for growth in a wide range of employment areas;
4. Retail and Activity Centres – Develop a viable and sustainable network of activity centres to provide for the community's social and economic needs;
5. Tourism – to stimulate the tourism industry and showcase the Swan Valley and the City's main attractors;
6. Open Space and Community Facilities – Provide a diverse range of functional and quality open space and community facilities that can be managed in a sustainable way to meet the long terms needs of the community;
7. Rural Land Uses, Subdivision and Development - encourage sustainable development and land uses in rural areas whilst recognising the importance of protecting agricultural, natural and basic raw material resources;
8. Urban Design and Heritage – enhance the built form throughout the City to create interesting and attractive places and protect the City's heritage;
9. Transport, Traffic and Access - provide an integrated transport system that provides residents, workers and visitors with high quality, safe and efficient transport mode choices to meet the personal, employment and freight transport needs of the City into the future; and
10. Infrastructure Services - achieve a whole of government approach in the provision of and improvements to essential infrastructure (water, wastewater and power).

Bullsbrook is identified as a 'growth area' to accommodate the State's housing targets. A District level centre is also identified in Bullsbrook to cater for the future population growth.

The strategies and actions of the draft Local Planning Strategy will guide decision making with respect to future amendments to the MRS and LSP17, the adoption of Structure Plans and assessment of development proposals.

2.2.3 City of Swan Urban Housing Strategy

The Urban Housing Strategy reviews the City's current housing stock and identifies areas that are suitable for higher residential densities. It aims to ensure long term sustainable future residential development through the creation of an accessible, well connected and sustainable community where all demographics has access to varied housing. The Urban Housing Strategy is described as an informing document, and the draft Local Planning Strategy is the main document to guide consideration of development.

The principal objectives of the Urban Housing Strategy are to:

- Encourage the provision of a range of housing options through urban areas of the City to meet the changing needs of residents. This includes the provision of housing for Aged/Dependent persons and people with special needs.
- Facilitate the creation of walkable communities adjacent to activity centres and transport nodes that will reduce the demand for car based travel, encourage the use of alternative transport modes and provide opportunities for increased social interaction.
- Provide a strategy framework for increasing residential densities within existing established areas in selected locations. These location are to be identified in accordance with the principles of Liveable Neighbourhoods, Transit Oriented Development and heritage protection.
- Identify suitable mechanisms for controlling the built form outcomes in identified infill areas to protect existing residential amenity.

The Structure Plan will meet the objectives of the strategy through the provision of a range of housing densities and styles which will facilitate an accessible, amenable and walkable community. This will assist the City of Swan to fulfil its housing targets as its population grows.

The Urban Housing Strategy comprises an Infill Strategy and a Greenfields Strategy which respond to Perth and Peel @ 3.5 million and the City's draft Local Planning Strategy to achieve 73,450 additional dwellings by 2050. The Greenfields Strategy applies to greenfield areas which are subject to current and future structure planning. The Greenfields Strategy identifies the Structure Plan area as a mix of 'Urban Deferred Zoned Undeveloped' and 'Urban Expansion Area 2011 – 2015'.

2.2.4 City of Swan Bullsbrook Approved - Townsite District Structure Plan

The Bullsbrook Townsite District Structure Plan (DSP), provides a strategy for the future development of Bullsbrook Townsite and has been used as a base to guide the design of the Structure Plan and allocation of land uses.

The objectives of the DSP include:

- Allow for a diversity of land use, which:
    - Provides for metropolitan and local residential land needs for the growing population;
    - Create a vibrant activity centre with increased local employment and business opportunities, as well as improved services;
    - Assists in addressing the State's land shortage;
    - Generates local employment opportunities to contribute to self-sufficiency; and results in essential industrial growth within the existing 'Industrial' zone with an appropriate land use and built form interface along Great Northern Highway;
- Protect the natural environment;
- Provide the necessary basic infrastructure (including public open space and community facilities) to support urban development;
- Protect existing and identified long-term land uses, including the Pearce RAAF Base and resources; and
- Protect existing prime agricultural and horticultural land where applicable.

The DSP identifies the Structure Plan area to be developed for urban purposes, comprising largely of 'Future Residential'. A 'District Centre' co-located with a 'Primary School', 'Rapid Transit Terminus' and 'District Open Space' is to be provided to the south of the Structure Plan. An 'Activity Corridor' connects the existing Bullsbrook Townsite north of Chittering Road through the Structure Plan area to the 'District Centre'. This road will connect south, outside of the Structure Plan, to a smaller 'Neighbourhood Centre' at the intersection of Lage Road and Great Northern Highway. Ki-It Monger Brook is identified as 'Conservation' dissected by two north-south roads which provide key transport connections.

The DSP identifies a 'High School' nominated outside of Kingsford Estate, to the east. Based on pre-lodgement consultation with the Department of Education (DoE), it is our understanding the preferred approach is for expansion of the existing Bullsbrook College to be pursued in the first instance, with the site nominated in the DSP as a potential location in the event expansion of the existing Bullsbrook College cannot be facilitated.

The land use designations in the DSP have been generally reflected within the Structure Plan.

2.3 Planning Policies

The following State Government policies are considered relevant and applicable to the Structure Plan area:

- SPP 2.8 Bushland Policy for the Perth Metropolitan Region
- SPP 3.7 Planning in Bushfire Prone Areas
- SPP 5.4 Road and Road Noise
- SPP 7.0 Design of the Built Environment
- SPP 7.3 Residential Design Codes Volume 1
- Liveable Neighbourhoods

A number of Local Planning Policies and strategies have been taken into account of part of the Structure design, these include but are not limited to:

- Biodiversity Strategy
- Sustainable Environment Strategy
- Transport Strategy
- POL-E13.11 Inclusion of Pedestrian Accessways in Residential Subdivisions
- POL-C-104 Environmental Planning Policy
- POL-LP-11 Variation to deemed-to-comply requirements of the R-Codes Medium
- Density Single House Development Standards (R-MD Codes)

2.3.1 Liveable Neighbourhoods

Liveable Neighbourhoods (LN) is an operational policy used to guide the design and assessment of structure plans and subdivision applications in greenfield areas and larger infill sites.

The key initiatives of LN are covered under eight design elements: community design, movement network, lot layout, public parkland, urban water management, utilities, activity centres and employment and schools.

Objectives of particular relevance to this Structure Plan include:

- To ensure a site-responsive approach to urban development that supports and enhances the context in which it is located, strengthens local character and identity, integrates with its context and promotes a sense of community;
- To provide a safe, convenient and legible movement network, and to provide attractive streetscapes;
- To ensure that urban development lots have a suitable level of amenity, services and access;
- To provide a network of well-distributed parks and recreation areas that offer a variety of safe, appropriate and attractive public open spaces; and
- To integrate appropriate water management measures in an efficient urban structure and range of parkland types.

By providing for a diverse range of housing within a connected and walkable neighbourhood, structured around high-quality POS, the Structure Plan reflects the key aims of LN.

LN is a performance-based code where the requirements of LN may be satisfied in a number of ways. LN aims to balance the maintenance of acceptable standards and meeting strategic vision, with encouraging greater innovation in response to market needs.

2.3.2 State Planning Policy 7.3 – Residential Design Codes (Volume 1)

State Planning Policy 7.3 Residential Design Codes Volume 1 (R-Codes) provides a comprehensive basis for the control of residential development throughout the State. The key objectives of the policy are:

To encourage design which is responsive to the site, size and geometry of the development site;

a. To allow variety and diversity as appropriate where it can be demonstrated this better reflects context or scheme objectives;
b. To ensure clear scope of scheme objectives to influence the assessment of proposals; and
c. To ensure certainty in timely assessment and determination of proposals applied consistently across the State and local governments.
d. The R-Codes is a performance based document, where an application can either be assessed to satisfy the 'deemed-to-comply' provisions or by addressing the 'design principles' under the exercise of judgment by the City of Swan.

A Local Planning Policy (LPP) or Local Development Plan (LDP) may vary the provisions of the R-Codes where consistent with the 'element objectives' and 'design principles'.

2.3.3 State Planning Policy 5.4 – Road and Rail Noise

The purpose of this policy is to minimise the adverse impact of road and rail noise on noise sensitive land use and development within specified trigger distances of strategic freight and major traffic routes.

Great Northern Highway, which borders the south-western boundary of the Structure Plan is identified under the MRS as Primary Regional Road (red road), with a projected daily traffic count of 17,000 - 18,000. These roads have a "trigger distance" of 200m as measured from the road carriageway edge. The policy requires development within this trigger distance to require the preparation of a noise management plan to determine the actual noise levels and demonstrate the proposal can mitigate the impacts of noise through attenuation measures.

A Road Traffic Noise Impact Assessment has been prepared, in accordance with SPP 5.4 to support the design of the Structure Plan (refer Appendix I).

2.3.4 State Planning Policy 2.4 – Basic Raw Materials

This policy sets out the matters to be considered for development in the vicinity of identified Basic Raw Material Resource (BRM) areas. BRM are described as sand (including silica sand), clay, hard rock, limestone (including metallurgical limestone) and gravel and other construction and road building materials, which are generally important to land development. This policy seeks to ensure BRM can be extracted close to the market in the metropolitan region and sensitive development that could conflict with extraction.

The policy is applicable as the Structure Plan boundary incorporates the former Clay Quarry located within Kingsford Estate to the east. The operations ceased operation in December 2020.

2.3.5 City of Swan - Local Planning Policy (POL-LP-11)

Local Planning Policy POL-LP-11 Variation to Deemed to Comply Requirements of the R-Codes – Medium Density Single House Development Standards (R-MD Codes)

The City of Swan Local Planning Policy POL-LP-11 Variation to Deemed to Comply Requirements of the R-Codes – Medium Density Single House Development Standards (R-MD Codes) adopts the Medium-density single house development standards (R-MD Codes) via the WAPC Planning Bulletin 112/2016. The R-MD Codes reflects contemporary housing typologies and incorporates existing R-Code variations that have been applied to date.

The R-MD Codes replace the deemed-to-comply requirements of the following clauses of the R-Codes:

- Building and Garage setbacks;
- Open Space;
- Parking;
- Visual Privacy; and
- Solar Access.

All other relevant R-Code standards continue to apply. Where there is a conflict between the provisions of the R-MD Codes and an approved LDP, the LDP provisions prevail to the extent of any inconsistency.

2.3.6 Government Sewerage Policy

This policy establishes the State's position on the provision of sewerage through planning and development of land. The policy requires all subdivision and development to be connected to reticulated sewerage, unless it is exempted from this requirement under the Policy.

To address the requirements of the Policy a Local Water Management Strategy has been prepared (refer Appendix 3) in accordance with Better Urban Water Management including details relating to sewage disposal.

An Urban Water Management Plan will be required at the time of subdivision approval.

FIGURE 5: North East Sub-Regional Planning Framework

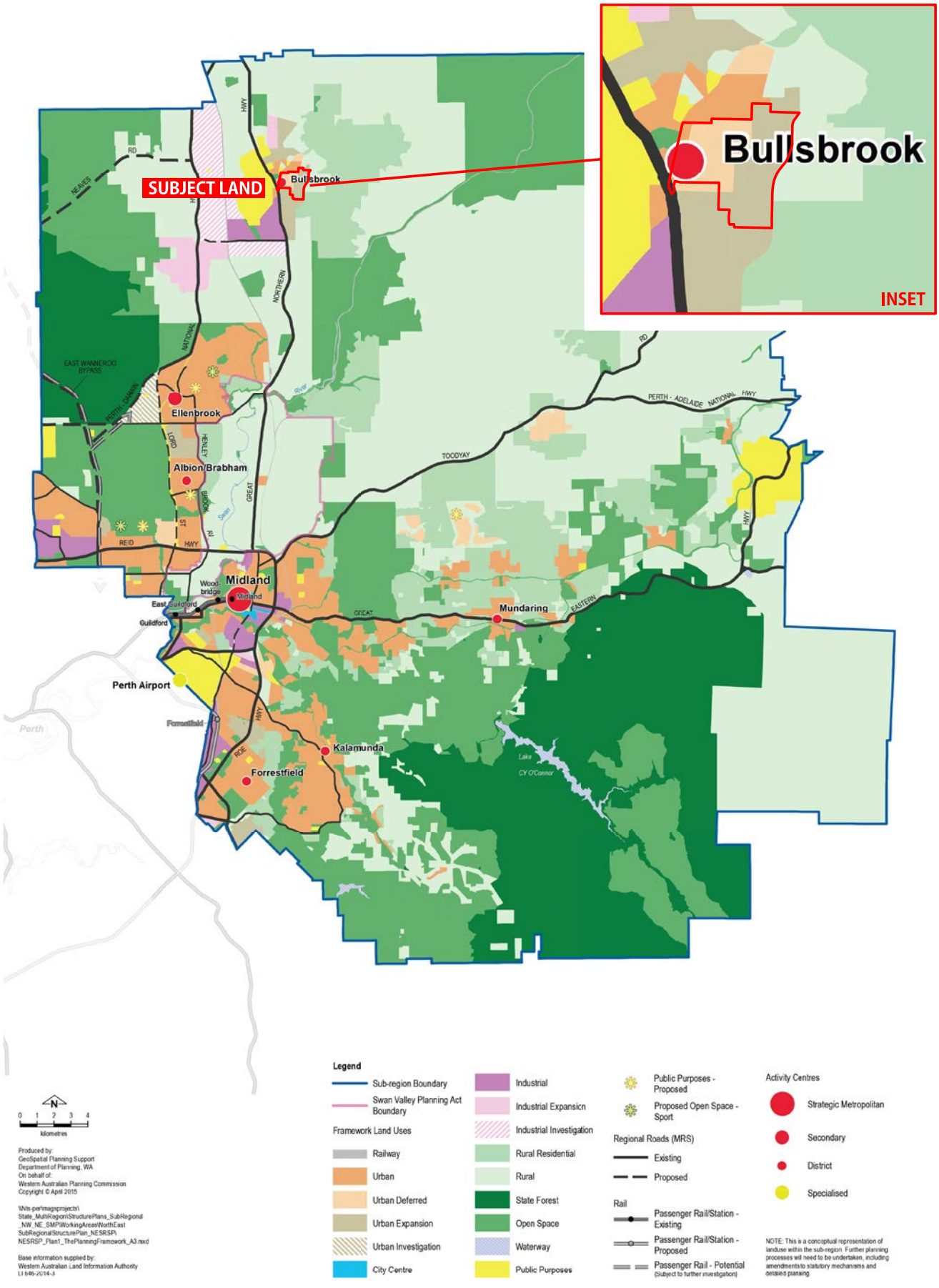
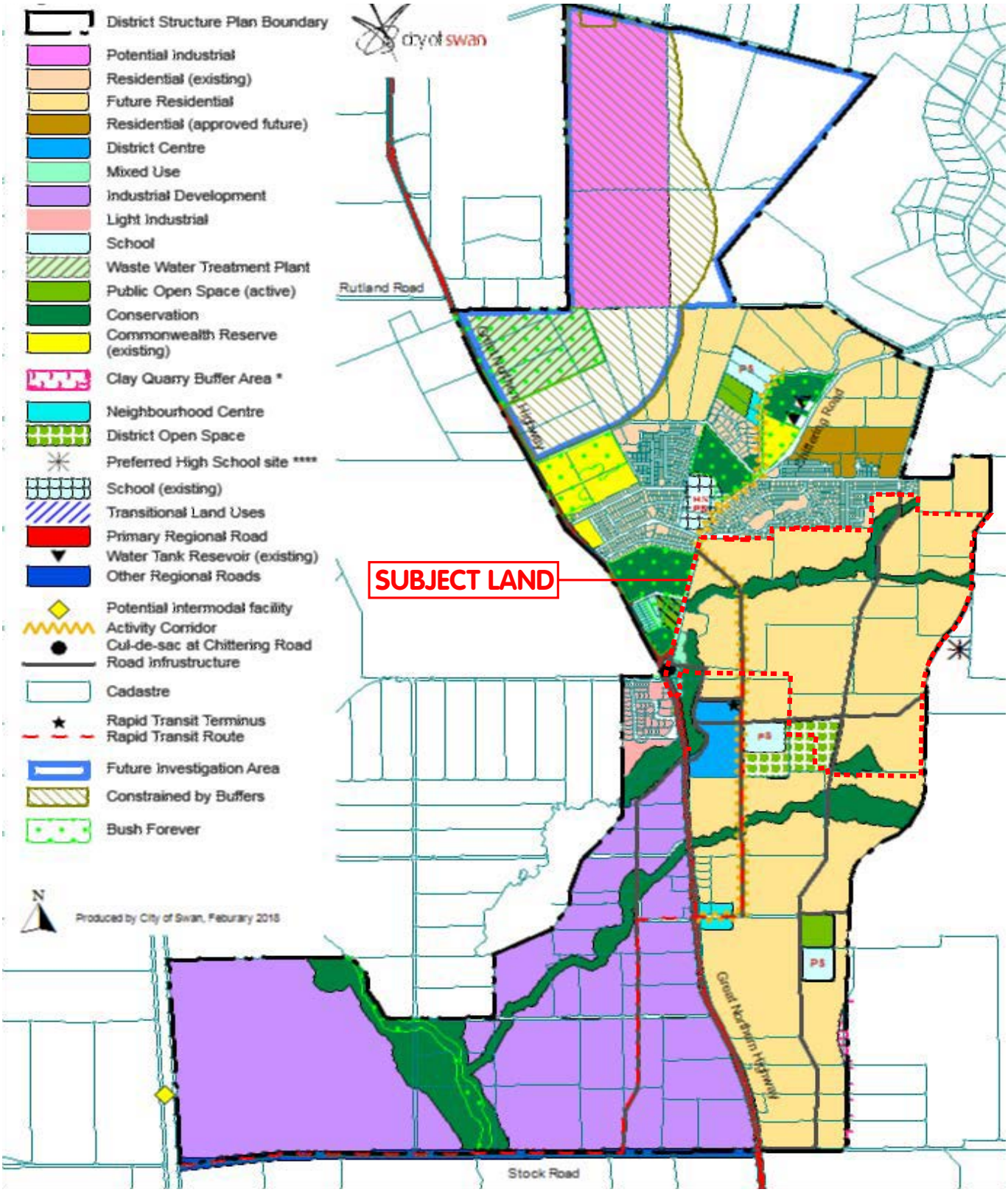


FIGURE 6: Bullsbrook District Structure Plan



3.0 Existing Site Conditions And Constraints

3.1 Biodiversity and Natural Area Assets

An Environmental Summary Report Strategy has been prepared by RPS (refer Appendix 4). To review the existing environmental factors that may be impacted as a result of the development and outline management measures to mitigate any potentially significant environmental impacts.

Historically, the site has been extensively cleared for agricultural purposes and consists largely of turfed paddocks used for cattle grazing, therefore has limited environmental values. Pockets of remnant vegetation are clustered along Ki-It Monger Brook, which traverses east-west through the site. A portion of Ki-It Monger Brook is classified as a Conservation Category Wetland (CCW).

Based on the key environmental outcomes RPS Group recommends the preparation and implementation of the following management plans:

- Preparation and implementation of a Ki-It Monger Brook Foreshore Management Area Report to ensure appropriate management of the Ki-It Monger Brook foreshore;
- Management of the portion of Conservation Category Wetland within the Ki-It Monger Brook through preparation of a Wetland Management Plan.
- Implementation of best practice water sensitive urban design and stormwater drainage management through Urban Water Management Plan(s);
- Planting trees as part of the landscaping works to improve and increase the amount of diverse vegetation;
- Preparation and implementation of an 'End of Life Management Plan' for the Class I Inert Landfill to ensure the landfill site is suitable for the land uses proposed.
- Management of Acid Sulfate Soils; and
- Implementation of management measures to reduce potential noise and fire impacts on future residences.

3.1.1 Vegetation

At a regional level, the remnant vegetation is primarily mapped as being the Guildford Complex, with small areas of Darling Scarp Complex and the Forrestfield Complex. The Guildford Complex has approximately less than 10% of the original (pre-European) extent remaining. The Guildford Complex is associated with Ki-It Monger Brook. The remnant trees within the Ki-It Monger Brook will be retained through the establishment of foreshore buffer areas, development setbacks, drainage retention and open space areas.

The remnant Guildford Complex is also located on the southern boundary of the Structure Plan area (Lot 1314), proposed within Public Open Space to be managed through the subdivision and development process.

A level 2 flora and vegetation assessment of the Structure Plan Area and surrounds was conducted by Ecologia (refer Appendix 1 of Appendix 4). This survey confirms there are no Threatened Ecological Communities (TECs) identified within the Structure Plan area.

The Structure Plan area has been used primarily for agricultural purposes and the majority of the land has been classified as Completely Degraded (Ecologia 2016). Stands of remnant vegetation associated with the Ki-It Monger Brook have been classified as 'Degraded'. Five vegetation units were found to occur within the Structure Plan area. The five vegetation units were associated with the agricultural land use and were rated as either "Completely Degraded" or "Degraded". The only vegetation units identified as being in "Excellent Condition" are located outside of Structure Plan area and are not currently identified for future urban development.

A Remnant Vegetation Management Plan will be prepared to identify and manage vegetation suitable for retention vegetation, outside of the Ki-it Monger Brook.

3.1.2 Flora

A total of 102 vascular plant taxa were recorded within the Structure Plan area and surrounds. Of these, 43.1% are native and 56.9% are introduced species.

No Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999 listed or Wildlife Conservation Act 1950 listed Threatened Flora, Priority flora or other flora species of significance were recorded in the Structure Plan area.

A literature review identified one Threatened flora taxon, Acacia anomala that has previously been recorded in Bush Forever No. 86 site located to the north-east of the Structure Plan Area. Based on historical land use, vegetation units mapped and condition, this species is considered likely to occur within the Bush Forever No.86 area but not within the Structure Plan area.

3.1.3 Bush Forever

The Structure Plan area is in close proximity on its northern site boundary (within Lot 857) to Bush Forever Site No. 86. The Bush Forever site is some 43ha of bushland associated with regionally significant vegetation and fauna habitat, including black cockatoo foraging and roosting habitat.

The vegetation within Bush Forever Site No. 86 includes Eucalyptus accedens, E wandoo woodlands, E wandoo, C. calophylla and E. marginata Open Forest to woodland with Allocasuarina humilis and Calytrix angulata (Government of Western Australia, 2000).

3.1.4 Fauna

The Structure Plan area exhibits a high level of disturbance from historic clearing of native vegetation and mostly comprises cleared agricultural paddocks. Consequently, it is highly unlikely that these areas provide suitable habitat for significant fauna species.

Potential habitat areas would include intermittent remnant native vegetation along the Ki-It Monger Brook. The creek line also allows for the movement of native fauna from the western portion of the site to areas of larger remnant vegetation to the east.

Consequently, through retention of vegetation within Ki-it Monger Brook the limited existing habitat within the Structure Plan area will be retained. Additionally, preservation of the adjacent Bush Forever site No. 86 north- east of the Structure Plan area will assist with retaining fauna habitat.

Based on the fauna habitats remaining within the Structure Plan area, the key species that could potentially be impacted through development of the site are listed below:

- Scattered stands, or individual Eucalyptus rudis trees within the creek lines:
- Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso)
- Carnaby's Black Cockatoo (Calyptorhynchus latirostris)
- Baudin's Black Cockatoo (Calyptorhynchus baudinii).
- The banks of the seasonal creek line may support the following migratory bird species:
- Rainbow Bee-eater (Merops ornatus) – migratory

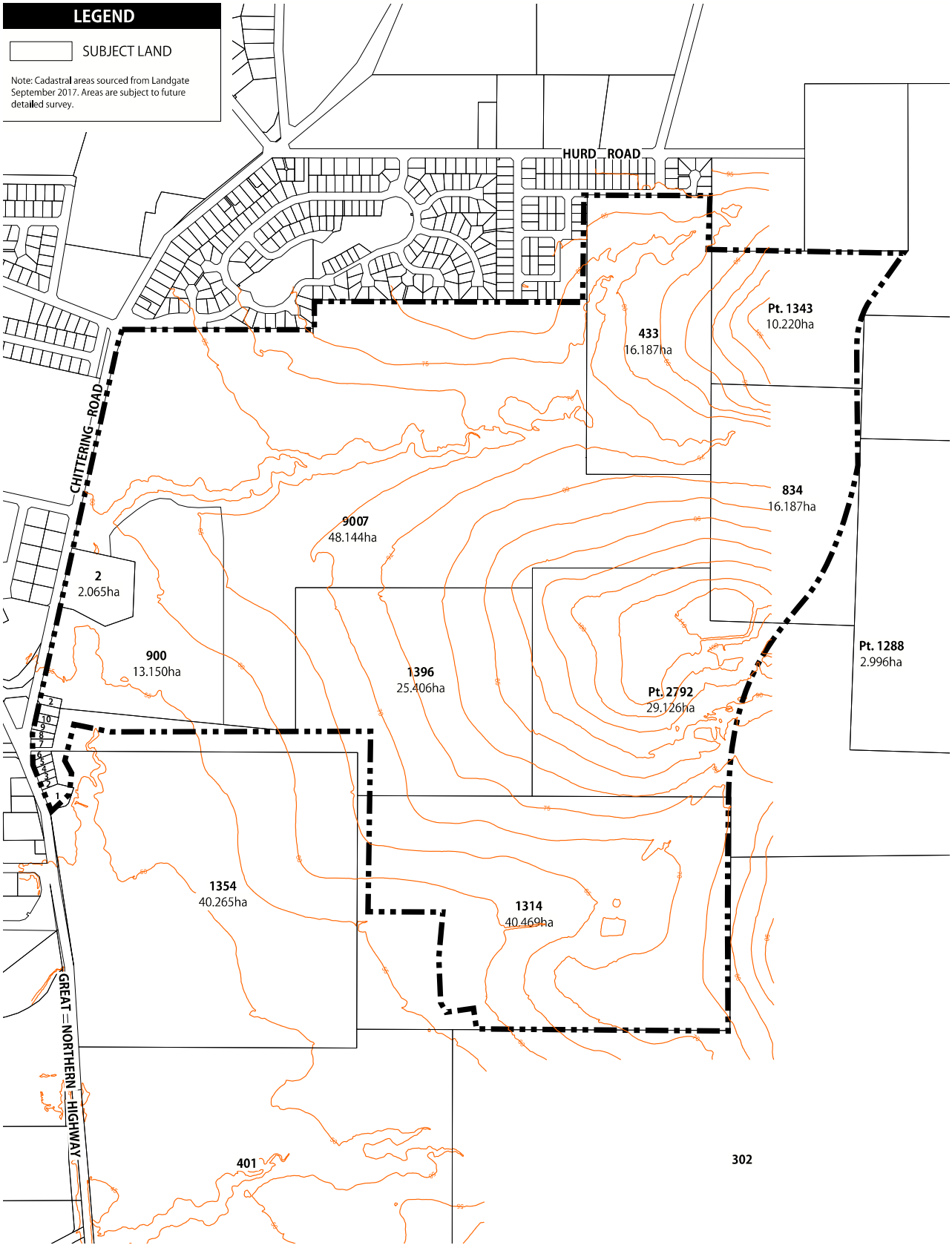
The proposed management and use of the Ki-it Monger Brook and water features on the site (dams) will replicate the pre-development conditions associated with both surface and groundwater availability to the existing vegetation. Therefore avifauna, in particular rainbow bee-eaters, can continue to utilise the creek area and the surrounding buffer after seasonal rain events.

Potential habitat within the Structure Plan area for black cockatoo species comprises poor foraging quality Eucalyptus rudis trees within the creek line and the occasional marri tree. These trees will be preserved in the Ki-it Monger Brook and the location of the road creek crossings will be selected to minimise the impacts to the existing mature trees.

Fauna habitat outside of the Structure Plan area (Bush Forever Site No.86) comprises more intact vegetation structure and potentially provides fauna habitat for the Carnaby's Black-Cockatoo (Calyptorhynchus latirostris) and Baudin's Black Cockatoo (Calyptorhynchus baudinii).

The Structure Plan responds to the objectives outlined in EPA Bulletin No. 20 Protection of natural areas through planning and development (EPA 2013).

FIGURE 7: Topography



3.2 Landform and Soils

The landform of the Structure Plan and its surrounds is unique and consists of a series of valleys and hill-tops. Located at the foothills of the Darling Scarp, this creates a topographical range from approximately 120 metres Australian Height Datum (m AHD) in the east, where the foothills begin down to approximately 50m AHD to the south-west, where the relatively flat landscape of the Swan Coastal Plain commences (refer Figure 7). A substantial proportion of the site could be categorised as having moderate to steep slope of 5% or more. Whilst only a portion of the site is excess of 10%, development on steeper land will need to be sensitively design and delivered. On steeper land generally, a combination of civil, landscape and built form solutions will need to address character and functional considerations.

The majority of the Structure Plan area is composed of Silty Sands that are described as strong brown, firm, friable and dispersive in parts. The eastern section of the site includes Siltstone whilst the south-western boundary is dominated by Pebbly silt associated with the Guildford Formation. Two small sections of the Structure Plan area on the eastern boundary has been mapped as granite.

The Department of Environment and Regulation (DER) has compiled broad-scale mapping of the risk of acid sulphate soils for regions of Western Australia. The Structure Plan area has not been assigned an Acid Sulfate Soils (ASS) risk rating and it is assumed there is a "low to no" known risk of ASS occurring within 3m of the natural soil surface (or deeper).

A search of the DER's Contaminated Sites database indicates that no registered contaminated sites were recorded within the Structure Plan area or lands immediately surrounding the site.

3.3 Groundwater and Surface Water

3.3.1 Groundwater

The Structure Plan area is located within the Bandy Spring Sub-area of the Swan Groundwater Area and is managed under the Gnangara Groundwater Areas Allocation Plan. The Bandy Spring Sub-area contains the Superficial Aquifer and Fractured Rock West Aquifer. A review of allocation limits identified that the Superficial Aquifer was fully allocated. The Fractured Rock West Aquifer is not expected to provide significant yields. The confirmed aquifers of the Swan Confined Groundwater sub-area (Leederville and Yarragadee North aquifers) extend beneath the western section of the site, which are also fully allocated. Through consultation with the Department of Water (DoW) and the City of Swan, it was agreed that groundwater could be abstracted from the Superficial Aquifer in the adjacent Cockman Bluff Sub-area and piped across the sub-area boundary to the development site to service its irrigation requirements.

Regional groundwater mapping by the Department of Water indicates groundwater migrates towards Ellen Brook, located approximately 2.3 km to the west. In the Perth Groundwater Atlas the May 2003 groundwater contours just extend onto the western boundary of the Structure Plan area and range from 50 m AHD in the north to 45 m AHD in the south. Groundwater levels monitored from on-site bores ranged from 30.49 m AHD to 77.89 m AHD. Due to the significant depth to groundwater over the majority of the site, a complete 18 month groundwater monitoring program (covering two winter peaks) has not been undertaken. The only two bores with relatively shallow groundwater levels are located near a dam at the landfill facility and the Ki-it Monger Brook respectively and hence it is interpreted the groundwater levels are influenced by localised water conditions.

3.3.2 Surface Water

The key water feature of the Structure Plan area is Ki-It Monger Brook which flows east to west across the northern part of the Structure Plan area. It then runs along the south side of the site, before crossing under Great Northern Highway at the site's south-west corner, until it confluences with Ellen Brook approximately 2.3km south-west of the site. A number of smaller drainage tributaries contribute to the Ki-it Monger Brook including a minor unnamed drainage course that traverses the southern section of the site and discharges into Ki-it Monger Brook near the site's south-west corner.

The Ki-it Monger Brook has been considerably modified including the constriction of dams and installation of culverts on the site which restrict flows as well as the clearing of riparian vegetation. In particular, a major dam located in the centre of the site has a major impact on flows downstream, as flows only occur once the water level reaches the height of the culverts installed in the dam wall.

3.3.3 Wetlands and Waterways

The Structure Plan area includes two wetlands that occur within sections of the Ki-it Monger Brook; one is classified as a Conservation Category Wetland (CCW) (UFI 12681) and one is a Multiple Use Wetland (MUW) which is likely to have few important ecological attributes and functions remaining.

A botanical assessment was conducted detailing the spatial extent and characteristics of the wetlands within the Structure Plan area, in particular the CCW (UFI 12681). There were no significant flora species recorded or likely to occur along Ki-it Monger Brook.

Both the CCW and MUW within Ki-it Monger Brook had vegetation condition rated as 'Degraded' with no or scattered native understorey plants, litter, high grazing levels and dominated by weeds. There were no differences in the vegetation type, floristic composition, condition or values in the CCW section of the Ki-it Monger Brook, the MUW section or the un-classified section (i.e. parts of the Ki-it Monger Brook that were surveyed but are not classified as a CCW or MUW).

Based on the current biophysical condition of Ki-it Monger Brook within the Structure Plan area, it is proposed to retain the foreshore area to the extent of the banks for the majority of the site. The width of the foreshore area will vary along its extent, ranging from approximately 120m at its widest and 10m at the narrowest point, incorporating both sides of the bank.

3.4 Heritage

A search of the Department of Indigenous Affairs (DIA) Aboriginal Heritage Inquiry System (AHIS) database identified one registered Aboriginal site of mythological significance within the Structure Plan area, being the Ki-It Monger Brook 2 (Site ID 3583). The desktop search also identified one 'Other Heritage Place' within the Structure Plan area, being the Bullya Spring (Site ID 22669).

Ethnosciences were engaged to carry out a desktop Aboriginal heritage assessment of the Structure Plan area and surrounds (refer Appendix 6).

A search of the Heritage Council's database resulted in no matches for European Heritage within the Structure Plan area.

3.5 Existing Movement Networks

A Transport Assessment, prepared by Transcore (refer Appendix 5), identified the following characteristics of the existing movement network.

3.5.1 Great Northern Highway

The Structure Plan area is located immediately east of Great Northern Highway, a 'Primary Regional Roads' reservation under the MRS; this providing excellent access to the broader Perth metropolitan region. A portion of Great Northern Highway road widening is anticipated within the Structure Plan area adjacent in accordance with the current MRS reservation (Clause 42 refers).

Great Northern Highway is classified as a 'Primary Distributor' by the MRWA with existing average weekday traffic volumes of ~14,362 vehicles per day to the south of Bullsbrook Road and ~10,503 vehicles per day south of Rutland Road. It is constructed as a two-lane (without median) rural highway adjacent to the Structure Plan area.

The posted speed limit on Great Northern Highway is 60km/h through the Bullsbrook town centre and adjacent to the Structure Plan area, increasing to 80km/h south of Butternab Road and 100km/h south of Lage Road.

All of the intersections along Great Northern Highway in the Bullsbrook area operate under priority control (i.e. Stop or Give Way control).

3.5.2 Chittering Road

The MRWA designates Chittering Road as a 'Regional Distributor' road with existing average weekday traffic volumes of ~6,205 vehicles per day to the east of Great Northern Highway and ~4,705 vehicles per day to the east of Hurd Road. It is a two-lane road, 7.4m wide between kerbs, within the Bullsbrook town centre and reverts to two-lane rural road standard northeast of Hurd Road.

All of the intersections along Chittering Road in the Bullsbrook area operate under priority control (i.e. Stop or Give Way control).

3.5.3 Existing Pedestrian and Cyclist Networks

There are currently no pedestrian or cyclist facilities within the Structure Plan (except for the recently constructed residential areas) area or on the adjacent extent of Great Northern Highway. Footpaths however are provided through the Bullsbrook town centre.

Chittering Road has a 2.0m shared path on one side within the Bullsbrook town centre and on both sides in the vicinity of the existing high school and primary school site.

3.5.4 Existing Public Transport

The closest existing bus route to the Structure Plan area is Bus Route 311 (Midland Station – Bullsbrook).

Route 311 runs on Great Northern Highway adjacent to the Structure Plan area. It provides six bus services each way on weekdays and two on Saturdays, Sunday and public holidays. Existing bus service time are primarily designed for journeys to and from work, school and other trips to and from Midland during business hours such as shopping or personal business trips.

4.0 Design Philosophy

The existing site conditions highlight opportunities and constraints the Structure Plan design must respond, these include:

- Undulating landform presents opportunities to create distinct urban villages;
- The Darling Range provides a dramatic landscape backdrop;
- The heavily vegetated Ki-It Monger Brook is a stunning natural asset and source of amenity, health, history, retreat, fun and discovery with the core creek area to be retained;
- Opportunity to provide ecological corridor linking the site to existing Bullsbrook green network;
- Offer of diverse views resulting from unique valley and hilltops;
- Vehicle access required from Chittering Road and Great Northern Highway;
- The Chittering Road realignment will provide the major north-south connection through the site in the form of an attractive transit boulevard;
- The centrally located existing homestead will be retained and integrated into the master plan design; and
- Steep topographic provides will need to be sensitively designed and delivered.

The Structure Plan design has taken into consideration the environmental and physical attributes within and external to the site, as well as acknowledging abutting land uses and how these can best be addressed with regard to interfacing with future residential land uses.

4.1 Concept Plan

A Concept Plan has been prepared to support the Structure Plan and provide an overview on the future pattern of subdivision and development. The Concept Plan is subject to detailed refinement at the subdivision stage.

The Concept Plan proposes an urban layout utilising an interconnected road network and open space system which embraces the existing landform and amenity, including the Ki-It Monger Brook. The design encourages safe pedestrian movements within the site, and to connect to regional infrastructure to various City of Swan community nodes.

The Concept Plan has been predicated on the following design principles:

A. Immersed in the Landscape

Views play a significant role in defining the sense of place. Spatially there are six areas on the site, each with a defined view shed, sense of enclosure of openness, and elevation, all of which enjoy views back to the scarp backdrop:

- Intimate middle valley featuring an elevated creek link;
- Larger lower valley with creek link and some long views;
- Flats has views to the scarp and creek line tree tops;
- Rise includes view to the scarp and creek line;
- Peak is an elevated long open space and city views; and
- Upper valley is elevated with clear views down to the creek line.

4.1.1 Connected by Nature

Ki-It Monger Brook provides a 4.2km contiguous ecological link which runs centrally through the estate and along the western boundary to provide a natural green setting. Walking and cycling paths set amongst avenues of existing and retained trees will provide the entire community with convenient access to the Brook, Town Centre, Playing fields and Primary School. The southern extent of the Brook is positioned on a meandering topographical low-point culminating in the Kingsford Town Centre where it takes on a more urban character before returning to nature. Within the Brook, the community will be able to engage with nature in various ways, without compromising ecological values.

4.1.2 Transit Village

The Bullsbrook Town site will over time have good access to public transport via a Rapid Transit Service line which is intended to service the Swan Urban Growth Corridor and Ellenbrook. Kingsford Estate will make a significant contribution to this, with an 'Activity Corridor' boulevard extending north-south through the site as a realignment of Chittering Road. For the boulevard to support walking, cycling and residential frontages it will need to be designed based on leading best practice. It is proposed that a bus stop terminus would be located adjacent to the Kingsford Town Centre consistent with the DSP.

4.1.3 Connected Open Space Network

New Bullsbrook will consist of a contiguous network of open spaces, with the primary objective of connecting the community with Brook, topographical points of interest, the Village Centre and the transit boulevard. The Green Loop will be the major open space connection, consisting of a series of local open spaces that punctuate the movement experience around the site. Highly identifiable within the landscape will be the public open space in the south east, formed around a large stand of retained trees on a knoll. The open space located on the central knoll within the Hill-Top Village plays a very important role in the urban structure. It is effectively a pivot point for aligning a series of avenues that provide visually and physical connectivity to other open spaces, including other high points, the existing Bullsbrook community facilities and the Village Centre.

4.1.4 Integrated Village Centre Heart / Town Centre

Being in the privileged position of the only landholding located next to the existing town, New Bullsbrook master planning and placemaking will focus on integration with the existing town to optimise mutual benefits. The Town Centre will become the nexus between Bullsbrook and New Bullsbrook. Fronting the Brook and Great Northern Highway, the centre will have a strong presence within the town and will be highly accessible. The southern connection will provide excellent access to Great Northern Highway generally, while the northern connection will link directly into the existing centre of town. To the north, the Brook and its network of walking and cycling trails will connect directly into the hub of existing community facilities, including Bullsbrook College, the new library, community centre and café.

The Kingsford Town Centre will over time offer the existing and future community district level retail, education, a diversity of public spaces, services, lifestyle, rapid transit, more urban living choices and, above all, a place for the entire community to come together.

A separate 'Precinct Plan' for the Town Centre has been lodged with the City of Swan and WA Planning Commission (July 2021).

4.2 Village of three neighbourhoods

Kingsford Estate will consist of three distinct neighbourhoods: Brook, Heart and Hilltop.

Brook

The lifeblood of New Bullsbrook and focal point of this neighbourhood will be Ki It Monger Brook. The design response to the Brook will be to integrate the two sides of the neighbourhood, and connect the other neighbourhoods and the broader community with the rich Indigenous and European heritage of the site. Defining the edges of this neighbourhood will be existing housing to the north, proposed avenues to the east and south, together with the Brook and Bush Forever to the west.

Heart

This neighbourhood will be the 'Heart' and soul of the New Bullsbrook Village. It will be where the needs and aspirations of the community are most proudly on display. Activity will be at its greatest in this neighbourhood, with its concentration of the Village Centre, transit terminus, urban housing, playing fields, clubhouse and primary school.

Hill-Top

This neighbourhood is distinguished by its desirable elevated location east along 3 hilltops, each with its own public open space focal point. Tree-lined avenues and the Brook define the western edge of the neighbourhood, while the scarp makes for a picturesque eastern boundary.

4.3 Land Use

In accordance with the DSP the Structure Plan will be developed for urban purposes, comprising largely of Residential land uses with a District Centre co-located with a Primary School and District Open Space to be provided within the southern portion of the Structure Plan.

Ki-It Monger Brook will be leveraged as an area of existing amenity. Where possible, areas of POS have been positioned to allow for the retention of existing trees and co-located with natural low points of the site.

An overview of the Structure Plan land uses is provided in Table 1.

TABLE 1: Land Composition

LAND USES	AREA (HA)	PERCENTAGE
Residential	106.28 ha	51.3%
Private Clubs and Institutions (Church)	2.06 ha	1.0%
Recreation (Core Creek)	13.20 ha	6.37%
Recreation (Public Open Space)	24.88 ha	12%
1:1 year drainage	1.90 ha	0.92%
Road Reserves	59 ha	28.41%
Total Kingsford Estate	207.32 ha	100%

4.3.1 District Activity Centre / Town Centre

The "Kingsford Town Centre", is planned at the southern end of the Structure Plan area to service the Kingsford Estate and wider Bullsbrook population. This is centre is identified in the Bullsbrook DSP as a District Activity Centre will significantly contribute to the provision of employment opportunities and self-sufficiency in the area.

In accordance with State Planning Policy 4.2 – Activity Centres, and SPP 7.2 Precinct Design Guidelines a separate Precinct Plan for the Town Centre has been prepared and lodged with the City of Swan. The Structure Plan however has taken the future development of the District Activity Centre into consideration to ensure the future development of this site is not prejudiced by the surrounding land use planning.

4.4 Sensitive Interface

A nursery is located adjacent to the Structure Plan area, south of the proposed District Activity Centre. The generic separation distance from a nursery is 100m (EPA 2015). The generic buffer is primarily based on potential noise impacts.

In regards to interface management, the Town Centre and playing fields are proposed adjacent to the nursey site to manage the long-term interface. The design outcome ensures no sensitive land uses are located within 100m of the nursery.

It should also be noted that the land south of the Structure Plan area (including the nursery) has been identified as future residential land in the DSP.

4.5 Residential

4.5.1 Projected Dwellings

The Structure Plan proposes approximately 2,355 lots dwellings, within a residential density range of R5 to R50, over 106 ha.

Under Perth and Peel @ 3.5 million 'Connected City' scenario new urban areas are to use a minimum average residential target of 15 dwellings per gross hectare of Urban zoned land, and occupancy rate of 2.95 people per dwelling.

The indicative total dwelling yield of 2,355 equates to a total residential estimate of 6947 at 2.95 persons per household (based on Perth and Peel @ 3.5 million average people per household for greenfield locations).

Based on Liveable Neighbourhoods 'Site Hectare' definition, the Structure Plan 'developable area' equate to 106ha to be developed for residential purposes and excludes non-residential land uses including streets, laneways and POS. Based on 2,355 dwellings, the Structure Plan estimates 22 dwellings per site hectare, this complies with LN target of 22 dwellings per site hectare.

The projected dwelling yields across the Structure Plan area are subject to subdivision design and detailed review of drainage and environmental constraints. Preferred lot mix and market demand at the time of land release will also influence final dwelling yields.

4.6 Residential Density Coding

The Structure Plan offers a range of density code 'bands' commensurate with the topographic and natural constraints of the site. These bands range from R5-R15, R10-R30, R20, R20-R30 and R20-R40.

The lower density of the nominated range represents a base code for the Precinct with the higher density to be allocated in accordance with the locational criteria outlined in Part 1, Clause 4.6.

The broad R5 to R40 density range offers a flexible minimum and average lot product in response to topographic and environmental constraints, as well as proximity to the Kingsford Townsite and key transport routes. The range also seeks to maximise opportunities for diversity in lot product and housing typologies, enabling the Structure Plan design to evolve to suit market demand at the time of staging release.

A specific density coding will be allocated to residential lots at the time of subdivision application.

Within each of the above density bands, density will generally increase in response to amenity and decrease in response to topography.

4.6.1 Residential R5 - R15 Precinct

This density coding 'band' applies to the areas located farthest from the Kingsford Town Centre, on the steepest topography in the north-eastern portion of the structure plan area, as a sensitive transition to the Darling Scarp. A mix of lots is envisaged, encompassing larger lifestyle lots with built form designed sensitively to building envelopes and more traditional homes.

The R5 density coding will apply as the base code. The relatively higher densities between R10 and R15 will be located in general proximity to public open space, key distributor roads and bus routes.

The lower R5 density code also applies to lots located directly adjacent to the rural zoned land to the east.

4.6.2 Residential R10 – R30 Precinct

Located away from the Kingsford Town Centre, on steeper topography and for the eastern portion as a context sensitive transition to the scarp. A mix of residential lot types and built form is proposed, ranging from larger lots to cottage lots.

The R10 density coding will apply as the base code. The relatively higher density coding within the 'band' will generally apply to lots in proximity to public open space, key distributor roads and bus routes.

Proximity generally defines those lots within a 250m walkable catchment of a public open space area and within a 200m walkable catchment of designated public transport route.

The lower R10 density code also applies to lots located directly adjacent to the rural zoned land to the east.

4.6.3 Residential R20 Precinct

Located on the northern boundary of the Structure Plan area, this small isolated cell will deliver residential lots in keeping with the existing residential area to the north and west.

4.6.4 Residential R20 - R30 Precinct

Located in the northern portion of the Structure Plan area on generally flat land. The R20 code will apply as the base code. A mix of residential lot types and built form is proposed.

The higher R30 density code will apply to 'Residential' zoned lots where the following criteria is met;

a. the lot is created within a 100m walkable catchment of a public open space; and

This R-code range will allow for the delivery of project homes for first homebuyers while also reflecting the benefits of locating R30 lots / homes close to or overlooking POS.

4.6.5 Residential R20 – R40 Precinct

Located adjacent the Town Centre and includes the gently sloping land running north-south between the Ki-it Monger Brook and the southern boundary of the structure plan. The R20 code will apply as a base code. The R30 coded lots are intended to be located in close proximity to or overlooking POS. The R40 coded lots will provide some housing diversity / affordability close to the primary school and town centre.

5.0 Implementation

5.1 Acoustic

Transportation Noise Assessment's have been prepared by Herring Storer to address the adjoining regional and district road networks (refer Appendix 2).

These assessment were undertaken in accordance with the WAPC's updated State Planning Policy 5.4 – Road and Rail Transportation Noise and Freight Considerations in Land Use Planning (SPP 5.4), with the key findings as follows.

The acoustic assessment's carried out for the Structure Plan area found that without mitigation, 'noise targets' set by SPP 5.4 would be exceeded for dwellings close to Chittering Road.

5.1.1 Pearce RAAF Base

With respect to potential noise from the Pearce RAAF Base, the acoustic assessment found that the development is located outside the Australian Noise Exposure Forecast (ANEF) 20 contour. Hence, residential development without any requirement for noise amelioration, is acceptable within this development.

5.1.2 Great Northern Highway

To mitigate the noise impacts for Great Northern Highway, two design options are provided:

- An access road be constructed between the first row of residences and Great Northern Highway, such that residences front Great Northern Highway. 'Quiet House' Design is required for the 'first row' of dwellings fronting Great Northern Highway.
- If the first row of residences to the Great Northern Highway is located at or outside the 60 dB(A) contour, then with the inclusion of a 2 metre highback fence, residences may back on to Great Northern Highway (i.e. back yards to the Great Northern Highway). To then achieve compliance "Quiet House" design requirements as outlined for either Packages "A" or "B" would be required, depending on dwelling setbacks.

All affected residential lots will require a notification on Title where noise targets are exceeded.

5.1.3 Chittering Road

The results of the acoustic assessment indicate that noise received at residences located adjacent to Chittering Road would, with the exception of a small section of the development, comply with the above acoustic criteria. Apart from this small section where development could occur within the 55 dB(A) contour, there are no acoustic requirements.

For the section of the development within the 55 dB(A) contour, standard construction would be acceptable and only notification on titles would be required.

The recommendations above for both Great Northern Highway and Chittering Road are made for single storey dwellings. Specialist acoustic advice should be sought for double storey dwellings.

5.2 Bush Fire Management

An updated Bushfire Management Plan (BMP) (13 September 2021) has been prepared by Strategen (refer Appendix 1); this report prepared in accordance with the WAPC's Guidelines for Planning in Bushfire-Prone Areas 2015, and SPP 3.7: Planning in Bushfire Prone Areas, and the Australian Standard AS3959-2009 Construction of buildings in bushfire prone areas (AS3959) (Standards Australia 2009).

The assessment of the existing vegetation within the Structure Plan area (Figure 4 of Appendix 1) identified that vegetation within the Ki-It Monger Brook foreshore area and internal Conservation Category Wetland (CCW) on Lot 1354 Great Northern Highway as permanent extreme bushfire hazard considerations. The adjacent Bush Forever Site No.86 was also identified as an 'extreme' bushfire hazard. All other woodland, shrubland and grassland within the Structure Plan area were assigned 'moderate' levels of bushfire hazard.

With respect to the post-development scenario, the BMP takes a precautionary approach to the allocation of bushfire hazard levels. As such, the 'extreme' and 'moderate' levels of bushfire hazard identified in the pre-development assessment remain consistent in the post-development assessment with the exception of cleared areas which represent a 'low' bushfire hazard.

The post-development scenario will be revisited at the subdivision stage where further detailed landscaping and lot layouts will be available.

It should be noted that where of dwellings are within 100m of vegetation assessed as having 'extreme' or 'moderate' bushfire hazard level implementation of increased building construction standards may be required.

The proposed movement network (explored further in Section 5.3) appropriately satisfies the requirements of the Guidelines for Planning in Bushfire Prone Areas with suitable linkages proposed to future and existing development on adjacent landholdings. Two primary north-south linkages traverse the Structure Plan area, ensuring all residents and visitors of the development are provided with at least two vehicular access routes connecting to the surrounding public network at all times. In total, five significant access and egress points are proposed by the Structure Plan.

5.3 Proposed Movement Network

An updated Transport Impact Assessment (September 2021), prepared by Transcore, identifies projected traffic volumes and suggested road hierarchies in and adjacent to the Structure Plan area (Appendix 5 refers). Key findings from the report include:

Access to the Structure Plan area is proposed via the following key entry points:

- A roundabout treatment at the intersection of Chittering Road and Maroubra Avenue to allow full movement connection into the Structure Plan area.
- A key 4-way intersection on Great Northern Highway, near the District Activity Centre. This may either be a signalised intersection or a roundabout.
- A key 3-way intersection on Chittering Road, south of Sacri. This is the northern access point of the Chittering Road re-alignment through the site.
- Two major access and egress points are provided within the south of the Structure Plan area, which will connect to future development sites.
- One additional major access point is provided to the north, linking with existing residential development.
- Other minor points of access and egress, to be detailed at future planning stages, will be provided within the Structure Plan area to ensure a legible road network.

The proposed road hierarchy for the Structure Plan area is illustrated in Figure 4.

The road hierarchy focuses on the provision of three key north-south roads:

- The existing Chittering Road which is re-aligned to enter the Structure Plan area. The existing portion of Chittering Road connecting with Maroubra Road is an Integrator B. The portion of Chittering Road south of Maroubra Road is a Neighbourhood Connector A which provides access into the Structure Plan;
- Neighbourhood Connector A road which runs within the Structure Plan to the west. This provides connection from the District Activity Centre and the future school site to northern section of the Structure Plan across Ki-It Monger Brook.
- Neighbourhood Connector A which runs within the Structure Plan to the east. This provides connection through the Structure Plan area to the hinterland to the north.

The road network is based on a modified grid format; this provides a legible road hierarchy providing residents with defined directional ('way finding') routes to key nodes within and around the site. The key north-south roads serve as the connection into the Structure Plan area and the feeder roads to all lower order Neighbourhood Connectors and Access Streets.

Where lots front a road over with a volume of 5,000vpd or more, they are to be designed either so vehicles entering the street can do so travelling forward or provided with alternate forms of vehicle access.

A description of each of the proposed internal roads included in the Structure Plan area is provided herein.

5.3.1 Integrator B

Integrator B roads are proposed in the Structure Plan area in two locations:

- Along the existing Chittering Road alignment, north of Maroubra Avenue; and
- From the four-way intersection of Great Eastern Highway to the District Activity centre, connecting to two Neighbourhood Connector A roads;

With respect to the existing Chittering Road alignment through to Marourabra Road, a variation to the standard LN Integrator B cross section of 25.0m – 29.2m is proposed at 20m. The variation is incorporated on the basis that this existing section of Chittering Road is constrained by land nominated as Bush Forever on its western boundary and Public Open Space, landscaping or proposed frontage roads within the Structure Plan area on its eastern boundary.

The constraints on the eastern boundary negate the requirements for on-street parking for this section of Chittering Road and substantially reduces the verge width required for underground services.

The 20.0m cross section includes 7.0 of trafficable pavement, two 1.5m cycle lanes, 2.0m median strip and 4.0m verges to both sides. The design intent is to maximise retention of existing trees and, overall, to create a low speed environment that will help integrate the existing town with the site. An indicative depiction of this cross-section is provided below as Figure 17.

The southern Integrator B section, connecting through to Great Northern Highway, is expected to have a road design and width in accordance with LN. The road design may consist of a cross-section between 25.0m and 27m.

This 2-lane boulevard style road may comprise 7.5m wide pavements, incorporating 3.2m carriageways, 1.8m cycle lane and 2.5m on-street parking bays, a 3.0 - 4.0m central median and 3.5m – 5.0m verges to provide a suitable space in which to accommodate landscaping and a shared path.

Verges may be further reduced if parking is embayed. An indicative depiction of this cross-section is provided below as Figure 18.

Width of the road design will respond accordingly to environmental and urban design factors such as tree retention and proximity to the District Activity Centre.

Integrator B roads are suitable for traffic flows up to 15,000vpd and can accommodate traffic flows up to 20,000vpd with suitable intersection treatments.

FIGURE 8: Intergrator B Cross Section 20m

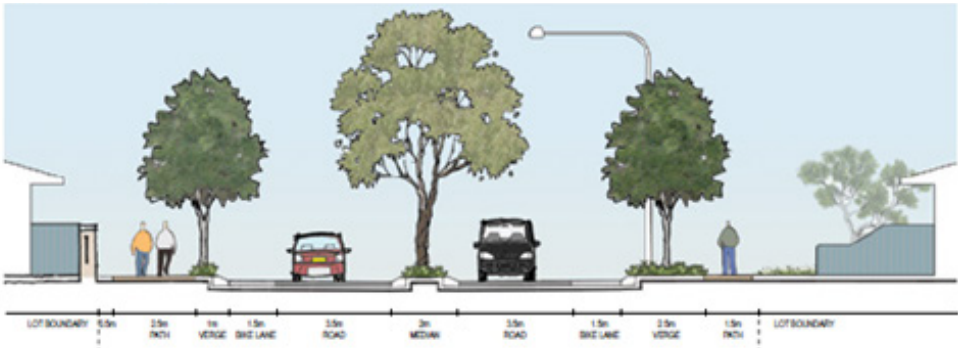
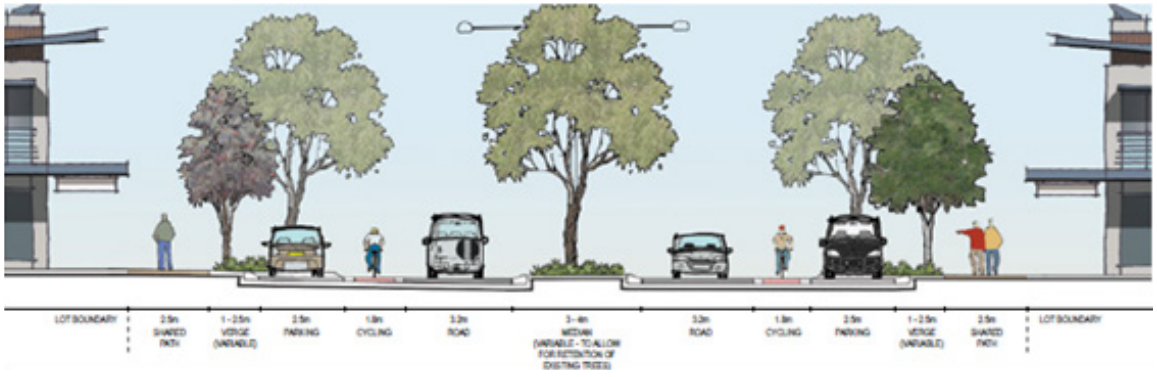


FIGURE 9: Intergrator B Corss Section 25-27m



5.3.2 Neighbourhood Connectors

A mix of Neighbourhood Connector A and B roads are proposed throughout the Structure Plan area and primarily facilitate key east-west linkages.

5.3.3 Neighbourhood Connector A

The western 'north-south' Neighbourhood Connector A will provide a key spinal road linkage from development in the north, to future District Activity Centre and school site.

The main difference between Integrator B and Neighbourhood Connector A cross-sections is the width of the median (6.0m compared to 2.0m).

The road design will generally consist of a 7.1m single carriageway which incorporates 2.1m on-street parking, a 1.5m cycle path and 3.5m trafficable pavement. The Neighbourhood Connector A also includes a 4.1m verge (which may be reduced if parking is embayed) and a 2.0m median.

Where the Neighbourhood Connector A acts as an extension of the existing Chittering Road alignment a reduced road reserve of 20.0m may be accepted where on-street parking is not required. An indicative depiction of this cross-section is provided below as Figure 19.

The road design may potentially widen to accommodate a 'living stream'. The 'living stream' is intended to convey stormwater within dedicated road reserve and provide a 'green-link' as reflected in the Landscape Strategy.

The road design under both scenarios (status quo and 'living stream') will be sufficient to accommodate shared paths, dedicated on-street parking, landscaping/tree planting and provision of infrastructure services.

Neighbourhood Connector A roads may accommodate traffic volumes up to 7,000vpd.

5.3.4 Neighbourhood Connector B

The proposed Neighbourhood Connector B roads provide supplementary east-west connectivity within the Structure Plan area. The primary difference between Neighbourhood Connector B and Neighbourhood Connector A is the lack of a median strip as well as dedicated cycle path.

The road design will generally incorporate a 19.4m cross section which comprises a 7m wide trafficable pavement and 6.2m wide verges on both sides which incorporate on-street parking, footpath and landscaping. Similar to Neighbourhood Connector A, the verge width may be reduced if embayed parking is provided.

Alternatively, subject to detailed design, a reduced trafficable pavement width of 6m may be proposed and offset with a median strip and/or additional landscaping as well as potential for footpaths on both sides of the street.

Neighbourhood Connector B roads are suitable for traffic flows up to 3,000 vpd.

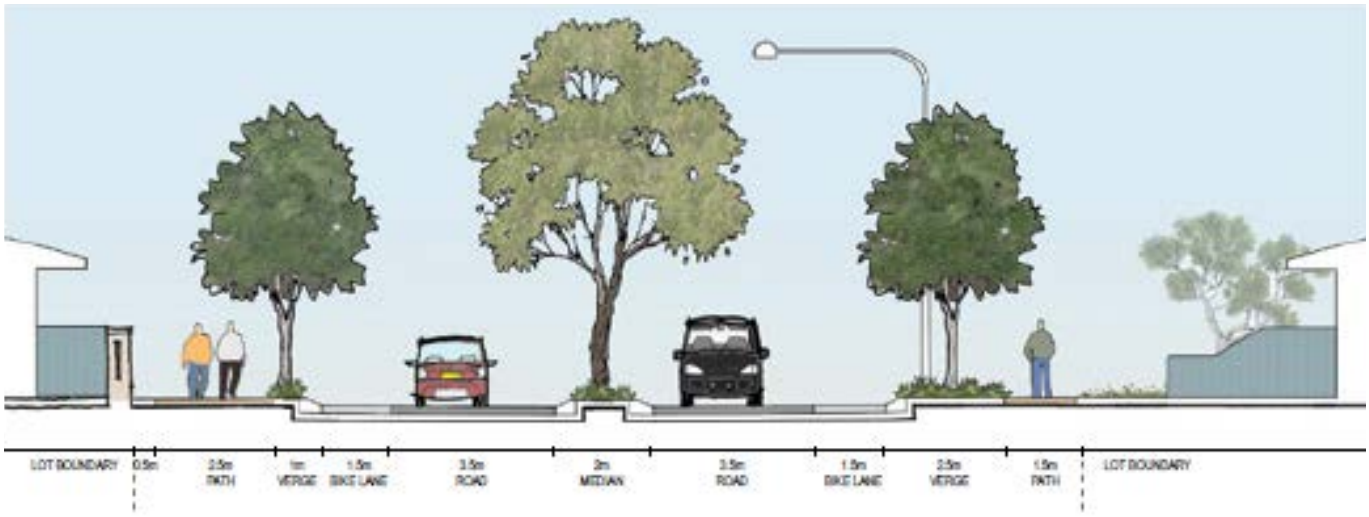
5.3.5 Access Streets

Generally, local access streets serving residential land uses will comprise 16m road reserves with 5.5m wide trafficable pavement, 4.0m verges to each side (incorporating 1.5m footpaths) as well as the opportunity for a 2.5m on-street parking bay to one side.

Projected traffic volumes for this type of road are expected to be less than 1,000 vpd.

Where fronting public open space, Access Street verges may be reduced to minimum 2.5m depending on the location and alignment of services, street parking and pedestrian traffic.

FIGURE 10: Neighbourhood Connector A Cross Section 20m



5.3.6 Public Transport

The Structure Plan area currently has access to the 311 bus service which runs on Great Northern Highway adjacent to the Structure Plan area. The 311 provides six bus services each way on weekdays and two on Saturdays, Sundays and public holidays. It is also notated that the DSP envisages a bus depot within the DAC or surrounds.

The Structure Plan design allows for bus services on all of the proposed Neighbourhood Connector and Integrator B roads, which are a suitable standard to accommodate bus services. This allows flexibility for the Public Transport Authority to plan future bus routes within this area.

5.3.7 Pedestrian and Cycle Infrastructure

In accordance with the requirements of Liveable Neighbourhoods, paths are to be provided to both sides of all Integrator B and Neighbourhood Connector roads, with at least one side being a shared path.

All Access Streets are to have a shared path or footpath on at least one side of the carriageway subject to local demand.

5.4 Landscape Strategy

A Landscape Strategy (Appendix 6), including a Landscape Master Plan has been prepared by Emerge Associates in support of the Structure Plan.

The positioning and configuration of POS areas is influenced by the desire to provide a continuous east-west 'green-link' through the Structure Plan area; this to enhance and improve pedestrian connectivity and synergy between key POS areas.

The 'green-link' and 'linear' POS layout will enable a safe, attractive and appealing pedestrian link (focus) across the entire Structure Plan area. Also of importance is the role it will play in providing a drainage function.

A total of 15 'neighbourhood' POS areas and one 'local' POS area is proposed throughout the Structure Plan area. These areas of POS will generally be informal in nature and characterised by revegetation and native parkland plantings to encourage passive recreation uses. Additionally, they will provide local residents with areas of localised turf for informal active recreation.

POS 17 is significantly larger than the other 'neighbourhood' POS providing approximately 2.94ha of creditable open space. The purpose of this POS is primarily to provide for the retention of trees in an area nominated as a 'specific commitment area' under the Draft Green Growth Plan.

Linkages with adjoining residential streets and the linear POS network will provide the necessary access to these significant areas of POS. The POS areas will form an interconnected series of spaces along the linear park network, each with the potential to offer rest areas for elderly or disabled residents, or exercise stations for others.

Drainage areas may be required within these areas of POS. Where drainage is required landscaped basins will be provided to serve a recreational and amenity function. Drainage swales catering for events greater than a 1:5 event will have turf to enable multiple use and ease of maintenance.

Within each POS, the extent of hardscape and 'urbanity' of the space will increase in proximity to the Town Centre.

The POS are proposed to create areas of local amenity within 400m of most dwellings.

5.4.1 Linear Open Space Network

In order to address the requirements of retaining site topography and the principles of protecting existing trees and ecological linkages where possible, the Structure Plan has incorporated a series of linear open spaces.

The design intent of these spaces is to rehabilitate existing vegetation as well as incorporate existing stands of isolated trees and drainage alignments. Through respecting the existing topography in these areas, the linear POS will provide a necessary drainage function as well as provide visual amenity to the public realm.

As surrounding lots and roads required imported fill to ensure suitable structural conditions for housing, these linear parks will sit at a lower grade. This will ensure that drainage will flow towards these areas and discrete biofiltration and detention basins will be incorporated along the length of the linear parks. A system of inlet and overflow structures will ensure designated parkland areas are kept dry and usable.

Linear parks and widened road reserves, as well as serving environmental and drainage function, also provide an efficient means of supporting a legible cycle and pedestrian network. This network will be designed to encourage passive surveillance from overlooking residents in accordance with Liveable Neighbourhoods and best practice in terms of 'Designing out Crime'.

5.4.2 Living Streams

Due to the requirement to convey stormwater reliably away from high use areas; a system of shallow 'living streams' will be created in the larger POS areas, broader sections of linear parkland and widened road reserves. This system will see to mimic pre-development flows and enable upstream bio-filtration and recharge of the groundwater table.

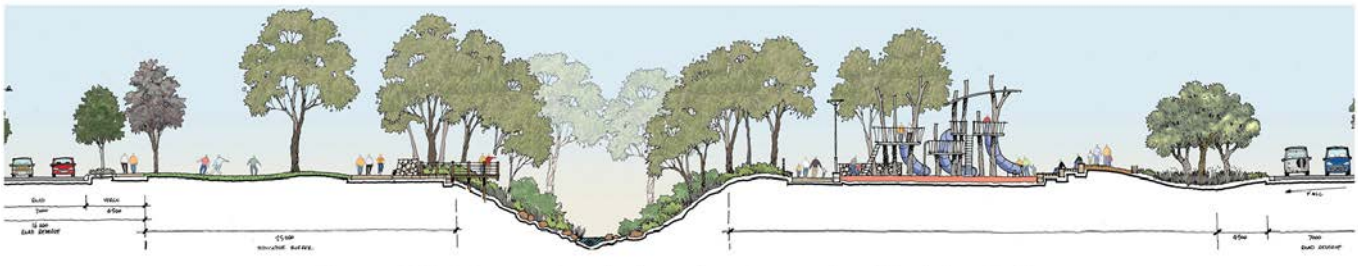
Through the linear parks the living stream may include an interface with a dual use path (DUP). There will be native shrub planting on the banks and nature reed/sedge planting to enhance nutrient uptake. Bank stabilisation is to be incorporated into the design and a variety of tree species will be used to provide a diverse tree canopy. Treatment along the length of the stream will be dependent upon the width of the corridor and the engineering constraints. The living stream will provide not only a viable drainage function but also a variety of ecological zones and restoration opportunities.

5.4.3 Ki-It Monger Brook

The Ki-it Monger Brook provides a valuable natural landscape resource that contains existing remnant vegetation along a natural drainage corridor. Existing remnant vegetation is in a degraded state, however rehabilitation works will be undertaken interlaced with passive recreation opportunities through walking trails and formalised parkland nodes.

The interface area with the Ki-It Monger Brook will consist of rehabilitated endemic planting interlaced with passive recreation opportunities through walking trails and formalised parkland nodes. These nodes will form Neighbourhood POS and provide settings for picnics and informal gatherings as well as opportunities to incorporate nature play areas. Supplemental planting adjacent to the Ki-it Monger Brook will limit direct public access and where possible an informal dual use path system may extend along the length of the interface area to define public use and to discourage turf and weed encroachment. It is not proposed that any drainage be introduced into the interface areas beyond that required to maintain pre-development flows.

FIGURE 11: Ki-it Monger Brook Cross Section



5.4.4 Street Trees

Where possible, the retention of existing stands of scattered and isolated trees may be incorporated into public open space or through the creation of wider road reserves.

Street trees are a desirable design element to increase shade and amenity. The selection and placement of street trees may very dependant of the road hierarchy. It is proposed that along major roads, street trees will form a strong visual avenue, and not impede traffic flow, safety or sightlines.

In residential streets, the roads may vary in character from precinct to precinct; however they are characterised as smaller scale pedestrian friendly environments. Therefore, street trees may be of a smaller scale and take advantage of passive solar principles allowing summary shade and winter sun. As the road reserve widths may vary to allow for the retention of existing vegetation and the interconnection of the linear park network, it may be possible to retain clusters or groupings of trees within road reserve. This will be investigated and reviewed at the detailed design stage.

5.5 Public Open Space Contribution

A POS Schedule has been prepared for the Structure Plan area (refer Table 3) which illustrates compliance with the 10% creditable POS requirement in accordance with Liveable Neighbourhoods. The location of each area of POS is identified on Figure 21.

The areas of POS within the Structure Plan area have been separated into broad categories based on their specific treatments and design. The Structure Plan proposes a total of 15 areas of creditable Public Open Space (POS).

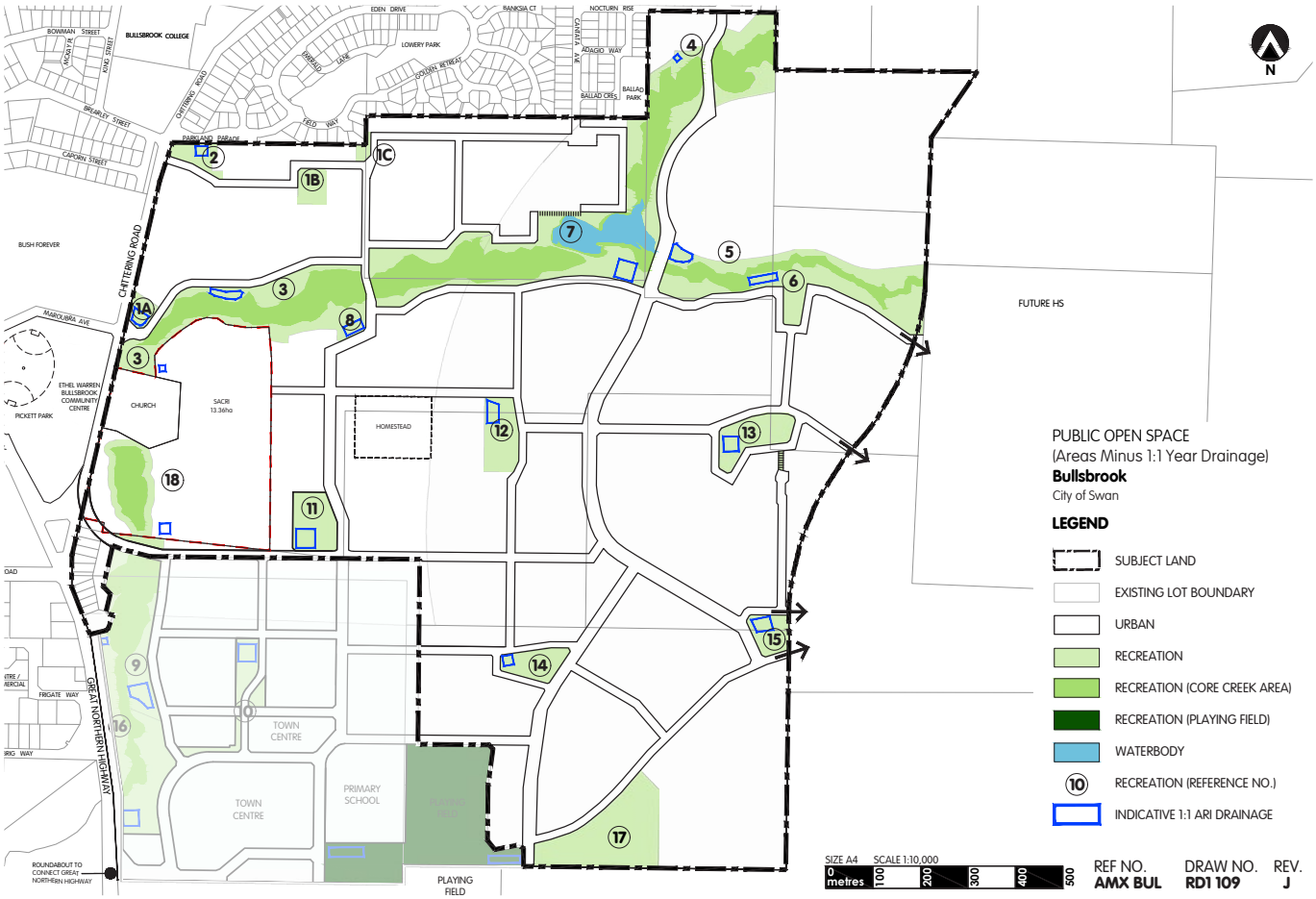
TABLE 2: Public Open Space Schedule

GROSS SITE AREA			207.32 ha
DEDUCTIONS			
Church	2.06 ha		
Recreation (Core Creek Area)	13.20 ha		
1:1 Year Drainage	1.66 ha	16.92ha	
Gross Subdivisible Area			190.4 ha
Public Open Space @ 10%			19.04 ha
PUBLIC OPEN SPACE CONTRIBUTION			
May Comprise:			
Minimum 80% unrestricted public open space		15.23 ha	
Maximum 20% restricted use public open space		3.81 ha	19.04 ha
UNRESTRICTED PUBLIC OPEN SPACE SITES			
Local and Neighbourhood Parks (area minus 1:1 year drainage area)			
1A		0.30 ha	
1B		0.35 ha	
1C		0.16 ha	
1 (Total 1A + 1B + 1C)	total		0.81 ha
2			0.48 ha
3			3.35 ha
4			1.98 ha
5			1.40 ha
6			2.14 ha
7			3.05 ha
8			2.87 ha
9			PP
10			PP
11			1.08 ha
12			0.74 ha
13			1.67 ha
14			0.72 ha
15			0.49 ha
16			PP
17			2.94 ha
18			1.16 ha
TOTAL			24.88 ha
RESTRICTED USE PUBLIC OPEN SPACE SITES			
Drainage filtration area between 1:1 and 1:5 year (forms part of the local and neighbourhood parks)	0.70 ha		
TOTAL			25.58 ha
Public Open Space Provision	0.70 ha	24.88 ha	13.4 %

(PP - included in Precinct Plan)

The POS Schedule will be continually reviewed under the more detailed subdivision and engineering design stages, as drainage provision, earthworks and nett residential development cells are further adjusted.

FIGURE 12: Public Open Space



5.6 Water Management

A Local Water Management Strategy (LWMS) has been prepared for the Structure Plan area developed in accordance with Better Urban Water Management (WAPC 2008), State Planning Policy 2.9 Water Resources (WAPC 2006) and Planning Bulletin 92 Urban Water Management (WAPC 2008) (Appendix 3 refers).

The below information represents a summary of the primary objectives and strategies outlined in the LWMS report:

- Utilise fit for purpose water sources throughout the development by abstracting groundwater from the Perth Superficial Aquifer from the Cockman Bluff Subarea.
- Achieve a consumption target for water of 100 kL/ person/yr, including not more than 40–60 kL/person/year scheme water through the use of water efficient fixtures and fittings within households, as well as encouraging homeowners to install rainwater tanks (amongst other water wise practices in the home).
- Retain and treat stormwater runoff from constructed impervious surfaces from the first 15 mm rainfall event. To achieve this the majority of lots will have onsite soakwells whilst bio-retention basins will be used for retaining, treating and infiltrating the first 15mm rainfall event from road reserves and a small number of connected lots.
- Investigate opportunities to incorporate street-scale infiltration devise (e.g. tree pits and rain gardens) where possible.
- Incorporate a pit and pipe system to ensure roads will remain passable in the 5-year rainfall event.
- Protection of infrastructure and assets from flooding by ensuring habitable floor levels provide a minimum 0.5m vertical clearance from watercourse flood levels and 0.3m clearance from local drainage systems.
- Provide storage and delineate flow paths for the 1% AEP event. This will be achieved by providing flood storage to maintain the pre-development hydrology of the Ki-it Monger Brook and provide flood paths for overland flows within the Structure Plan area along road reserves.
- Maintain clearance between the finished lot levels and groundwater level of at least 1.2m.
- Groundwater quality leaving the site should be the same, or better, than that entering the site. This can be managed through the minimisation of fertilizer and pesticide use in Public Open Space and streetscapes.
- Utilise appropriate structural and non-structural measures to reduce nutrient loads to the Ki-it Monger Brook and downstream waterways.
- The LWMS also provides a comprehensive summary of the existing environmental values of the Structure Plan area, which are based on site-specific studies undertaken and review of publicly available data. The characteristics and environmental values of the Structure Plan area and guidance provided by National and State policies and guidelines relevant to urban water management have guided the design criteria and propose a contemporary best practice approach to achieving the design objectives for water management.

The LWMS demonstrates that the design approach for the Structure Plan area is consistent with a best practice WSUD approach, that the water management objectives can be achieved within the spatial allocation of the Structure Plan, and that the requirements of the relevant State and local government policies and guidelines will be satisfied.

5.7 Services and Infrastructure

A Servicing Report (Appendix 7 refers) has been prepared in support of the Structure Plan and is summarised herein.

5.7.1 Ground Conditions

The following is a summary of the investigative reporting provided by Galt Geotechnical Consultants and is an overview of the likely soil types that will be encountered and proposed remedial measures.

Mapping indicates that the site is underlain by a variety of soil and rock types. The western part comprises mainly soil deposits while the eastern part is underlain by shallow rock and rock outcrop. The following notes are relevant:

- Generally soils over the western portion of the site are sandy overlaying clay/sandy clay.
- Generally soils over the eastern portion of the site are clays/ clayey sand overlaying rock (siltstone/gravel/gneiss).
- The soils are generally moderate to high reactive clay/clays soils with high percentage fines and low permeability.
- The site is predominantly classed as M abd S, with some existing class A in the northern portion of the site.
- The general remediation suggested is:
    - Strip 100mm topsoil and grub, remove deleterious material.
    - All excavated sand shall be reused as inert structural fill. The underlying clayey sand can be used for bulk fill (non-structural) only.
    - Proof roll and lay inert clean structural fill with less than 5% fines at depths relevant to required classifications (>1.8m fill for class A, 1-1.8m fill for class S).
- For areas where subgrade has >0.5m inert structural fill a CBR of 12 can be adopted for pavement design.
- Drainage can be managed via infiltration only where clean sandy fill is present to a depth of 1.2m. Detailed geotechnical investigations are required prior to further development.

It is recommended that an allowance is made to fill the class M areas of the site by either 0.7m or 1.5m respectively to achieve class S or A classifications in accordance AS2870- 2011 “Residential Slabs and Footings”. This is based on the conservative assumption there is an average of 300mm of sandy fill overlaying the site. Ultimately this will have to be confirmed by intrusive geotechnical investigations.

5.7.2 Sewage

The Water Corporation (WC) advised the project engineers (JDSi) that the development is located within the current scheme planning and a connection to gravity sewer has been provisioned for. The current Bullsbrook WWTP only services the Bullsbrook town centre and is near capacity.

The Water Corporation has recently advised that the WWTP will be converted into a major transfer station with the additional flows created by the landholdings being rezoned to be pumped from Bullsbrook to Ellenbrook via a major transfer pipeline. The Water Corporation has advised that this project should be completed by mid 2023.

5.7.3 Water Supply

The Water Corporation (WC) has advised that the Structure Plan area is located within the current scheme planning and a connection to water reticulation has been provisioned for under an upgrade of the existing infrastructure located within Great Northern Highway (GNH).

The WC had completed the planning study for the delivery of additional water services to the Bullsbrook area. This included supply to the residential area on the eastern side of Great Northern Highway and Chittering Road including the proposed development site. WC advised that supply to the Structure Plan area would be via a new DN300 distribution main between Great Northern Hwy and Hurd Road installed to the west of the site along Chittering Road.

5.7.4 Power Supply

The Western Power Network Capacity Mapping Tool indicates that there is enough capacity to feed the estimated ultimate 2500+ lots. JDSi can advise that a feasibility study was recently undertaken that indicates the remaining capacity on the existing 22kV feeder adjacent to the development was approximately 4MVA. Beyond the initial supply, reinforcement of the upstream 22kV feeder line, and voltage regulator may also be required. The development will also require a number of transformers, switchgear units and associated low voltage cable and pillar infrastructure to service the lots.

5.7.5 Telecommunications

NBN will be the primary telecommunication service provider for the Structure Plan area. NBN Co has advised that the development can be serviced from their existing infrastructure in the vicinity of the site.

After NBN connectivity for the development has been established at the boundary of the development, connections of future subdivision lots to the network will thereafter be managed stage by stage.

5.7.6 Gas

The Bullsbrook area currently has no reticulated gas network. Reticulated gas is not considered to be an essential service and as such is not required as a condition of subdivision. It is usual practice to install gas reticulation network for the subdivision within a common civil trench at no cost to the developer. If there is an extension required to connect to the nearest high pressure gas main the developer will be required to pay for the trenching to the gas main as a headworks cost.

Consideration may be given to the option of the developer funding the installation of a "dormant" internal gas network to the subdivision vested with ATCo Gas that could be connected into ATCo mains at some point in the future. ATCo have agreed in principle to assess such a proposal and ensure the design meets with ATCo standards.

5.7.7 Roads

The traffic movement patterns for the Bullsbrook area have changed substantially when the Perth Darwin National Highway was constructed with most heavy vehicle traffic moving to the new road from Great Northern Highway. This change has reduced the movements of heavy vehicles adjacent to the Structure Plan area, promoting improved traffic conditions for local vehicles.

All internal roads will be developed to the standards of the City of Swan.

5.7.8 Stormwater Management & Drainage

The Structure Plan area is subject to a drainage strategy which proposes the management of runoff through a pit and pipe system within road reserves, with outfall into bioretention swales incorporated into POS areas. Lot runoff will generally be managed via onsite infiltration where possible.

5.8 Staging

The development of the Structure Plan area will be implemented in multiple stages and is indicative as the timing, location and composition of the future stages will be dependent on market demand.

The staging has commenced in the north-western portion of the site, with access provided via Chittering Road and developed for Display Village, Sales Office and 'first release' residential purposes.

The staging will move eastwards and southwards with a view to deliver the District Activity Centre /Town Centre.

The provision of engineering infrastructure and primary internal road network will also need to be staged to suit development demand and/or suitable access at an early stage. A detailed programme for this will prepared as part of ongoing detailed planning and design of service infrastructure.

Appendix 1

Bushfire Management Plan

(Strategen JBS&G)

Appendix 2
Acoustic Assessment
(Herring Storer)

Appendix 3
Local Water Management Strategy
(RPS)

Appendix 4
Environmental Summary Report
(RPS)

Appendix 5
Transport Impact Assessment
(Transcore)

Appendix 6
Landscape Strategy
(Emerge)

Appendix 7
Engineering Services Report
(JDSI)

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