

# ANSTEY-KEANE URBAN DEVELOPMENT PRECINCT - NORTHWEST PRECINCT STRUCTURE PLAN

PART ONE IMPLEMENTATION SECTION

January 2020

**ANSTEY-KEANE URBAN DEVELOPMENT PRECINCT  
- NORTHWEST PRECINCT STRUCTURE PLAN  
PART ONE - IMPLEMENTATION SECTION**

Prepared by:

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2340Rep51G  
January 2020

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

17 February 2020 ..... 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

17 February 2020 ..... Date

17 February 2030 ..... Date of Expiry

**TABLE OF AMENDMENTS**

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Amendment No.	Summary of the Amendment	Amendment type	Date approved by WAPC

## EXECUTIVE SUMMARY

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The Anstey - Keane Urban Development Precinct - Northwest Precinct Structure Plan (the Structure Plan) allows for the creation of a residential neighbourhood that embraces and integrates with the surrounding natural environment, whilst accommodating a range of residential dwellings opportunities consistent with State government density targets. It also incorporates planned regional drainage requirements and the Dampier to Bunbury Natural Gas Pipeline (DBNGP) seamlessly into the open space network.

The Structure Plan area covers a total area of approximately 29.5 hectares, comprising lots 91, 101, 200 and 552 Anstey Road, Forrestdale. The subject area is zoned 'Urban' under the Metropolitan Region Scheme (MRS). It is presently zoned 'General Rural' and 'Public Purpose' (Local Reserve) under the City of Armadale Town Planning Scheme No. 4 (TPS4), however an amendment to TPS4 rezoning the land 'Urban Development' is being progressed.

The Structure Plan is lodged in accordance with TPS4, which requires a structure plan prior to development or subdivision for land zoned 'Urban Development'.

The Structure Plan draws on the key land use elements of the Southern River/Forrestdale/Brookdale/ Wungong District Structure Plan which provides a high level framework for future land use and development in the area. The Structure Plan also fulfils strategic planning for the area with Perth and Peel@3.5Million, the South Metropolitan Peel Sub-regional Framework and the City's Local Planning Strategy all identifying the Structure Plan area for future residential development.

With densities allocated ranging from R30 to R60, the Structure Plan can deliver a residential target of around 29.6 dwellings per site hectare, achieving Stage government density targets. Medium density housing will be located around key areas of public open space with more traditional sized lots providing a transition to adjacent bushland to the north and west.

Four areas of public open space will provide residents with a combination of passive and active spaces whilst also accommodating the DBNGP, and regional and local drainage. Key open space also protects wetlands and bushland.

The site can be readily serviced, with essential infrastructure located within proximity and easily extended to the Structure Plan area. In preparation of the Structure Plan the following reports have been prepared, and are summarised in Part 2 of the Structure Plan report, with complete copies included as technical appendices:

- Environmental Assessment Report
- Environmental Management Plan
- Bushfire Management Plan
- Landscape Masterplan
- Local Water Management Strategy
- Transport Report
- Engineering Servicing Review

These reports comprehensively address all of the relevant planning considerations, and demonstrate that the land is suitable for urban development in the form proposed.

Table 1 provides a land use summary of the Structure Plan.

**TABLE 1: LAND USE SUMMARY**

Item	Data	Section number referenced within the Structure Plan Report
Total area covered by the structure plan	29.5 hectares	Section 1.2.2
Area of each land use proposed: Zones (as per the Scheme) - Residential Reserves (as per the Scheme & MRS) - Road Reserves - Parks & Recreation - Public Purpose	12.5 hectares 5.5 hectares 11.2 hectares 0.3 hectares	Section 3.1
Total estimated lots yield	290 – 300 lots	Section 3.2.1
Estimated number of dwellings	360 – 370 dwellings	
Estimated residential site density - Dwellings per gross urban zoned hectare (as per Perth & Peel@3.5 Million) - Dwellings per site hectare (as per Liveable Neighbourhoods)	11.8 dwellings per gross urban zoned hectare 29.6 dwellings per site hectare	Section 3.2.1
Estimated population	1008 – 1036 people @ 2.8 people per household	
Number of Primary Schools	None	Section 3.8
Number of Secondary Schools	None	
Amount of Public Open Space	2.6 hectares (gross) 2.1 hectares (unrestricted) 0.5 hectares (restricted)	Section 3.3

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Plan A: Structure Plan

## 1.0 STRUCTURE PLAN AREA

The Structure Plan Area is shown on Plan A: Structure Plan.

## 2.0 STRUCTURE PLAN CONTENT

This Structure Plan comprises:

- Part One – Implementation Section
- Part Two – Explanatory Report
- Appendices – Technical Reports

Part One of the Structure Plan comprises the structure plan map and planning provisions. Part Two of is the Planning Report component which can be used to interpret and implement the requirements of Part One.

## 3.0 OPERATION

This Structure Plan comes into effect on the date that it is endorsed by the Western Australian Planning Commission (WAPC).

## 4.0 INTERPRETATION AND RELATIONSHIP WITH STATUTORY PLANNING FRAMEWORK

The Anstey – Keane Urban Development Precinct – Northwest Precinct Structure Plan constitutes a Structure Plan pursuant to the City of Armadale Town Planning Scheme 4 and the *Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 - Deemed provisions for local planning schemes*.

The Structure Plan Map (Plan A) outlines future land use, zones and reserves applicable within the structure plan area.

Pursuant to the *Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 - Deemed provisions for local planning schemes*, a decision maker of an application for development approval or subdivision approval is to have due regard to the provisions of this Structure Plan, including the Structure Plan Map, Implementation Report, Explanatory Report and Technical Appendices.

## 5.0 STAGING

Development staging will follow an orderly sequence and shall not exceed the extension of essential service infrastructure or constructed road access.



## **6.0 LAND USE AND SUBDIVISION**

### **6.1 Land Use and Zones**

Land use permissibility within the structure plan area shall be in accordance with the structure plan map (Plan A) and the corresponding zones and reserves set out in the City of Armadale Town Planning Scheme No. 4.

### **6.2 Residential**

#### 6.2.1 Dwelling Target

In accordance with the requirements of Liveable Neighbourhoods, subdivisions are to achieve an average residential density of 22 dwellings per site hectare across the Structure Plan area.

#### 6.2.2 Residential Density

Residential densities applicable to the Structure Plan shall be those residential densities shown on the Structure Plan Map.

### **6.3 Public Open Space**

The provision of public open space being provided generally in accordance with Plan A.

### **6.4 Utilities Planning**

#### 6.4.1 Gas Pipeline Corridor

The land comprising the existing DBNGP easement as shown on the structure plan map (Plan A) shall be ceded free of cost to the Crown as a local scheme reserve for 'Parks and Recreation' at time of subdivision and vested in the City of Armadale, unless otherwise determined by the Western Australian Planning Commission.

The WAPC, on advice of the City of Armadale and/or relevant utilities service provider(s), may require as a condition of subdivision approval:

- i) the implementation as part of subdivisional works, any endorsed AS2885 Safety Management Study (Qualitative Risk Assessment) to the specification of the WAPC and/or relevant utilities service provider(s) (DBP Transmission).
- ii) a notification pursuant to Section 70A of the Transfer of Land Act 1893 to be placed on the certificate(s) of title of lot(s) created within the setback distances outlined in Planning Bulletin 87. The notification is to advise that the lot is in close proximity to the pipeline corridor.

## 7.0 DEVELOPMENT

### 7.1 Local Development Plans (Detailed Area Plans)

The preparation of a Local Development Plan in accordance with Clause 6A.5 of the Scheme may be required by the WAPC, on the advice of the City of Armadale, as a condition of subdivision approval where deemed necessary for land comprising, but not limited to:

- i) Lots abutting areas of Public Open Space.

### 7.2 Bushfire Management

This Structure Plan is supported by Bushfire Management Plan (Appendix 2). Regardless of whether the land has been formally designated as bushfire prone, any building to be erected on land identified as falling within 100 metres of a bushfire hazard is designated as bushfire prone land and shall comply with the requirements of Australian Standard 3959 under the Building Code of Australia.

## 8.0 OTHER REQUIREMENTS

### 8.1 Conditions of Subdivision Approval

The following technical reports / strategies are to be prepared and submitted as a condition of subdivision approval (where applicable):

- Urban Water Management Plan
- Bushfire Management Plan
- Acid Sulphate Soils Management Plan
- Detailed Buffer Management Plan
- Detailed Wetland and Buffer Management Plan

### 8.2 Development Contributions

The Structure Plan is subject to contribution to the costs of common infrastructure in accordance with a Development Contribution Plan and Cost Apportionment Schedule prepared pursuant to Town Planning Scheme 4.



**LEGEND**

Local Structure Plan Boundary

**ZONES**

- Residential R25
- Residential R30
- Residential R40
- Residential R60

**OTHER**

- Neighbourhood Connector
- Dampier to Bunbury Natural Gas Pipeline Easement
- Access Street
- Private Road / Vehicle Access
- Conservation Category Wetland Boundary

**LOCAL RESERVES**

- Parks & Recreation
- Public Purposes WSD

**Notes**

1. Public Open Space areas are indicative only and subject to further detailed design including drainage considerations at subdivision stage.
2. Road network is indicative only and subject to refinement at subdivision stage.
3. Location of access road crossings to be confirmed at subdivision stage, in consultation with DBNGP operator/owner.
4. The full extent of the Community Facilities Site will be subject to refinement following the completion of conceptual designs by the City of Armadale.



# ANSTEY-KEANE URBAN DEVELOPMENT PRECINCT - NORTHWEST PRECINCT STRUCTURE PLAN

PART TWO EXPLANATORY REPORT

January 2020



**ANSTEY-KEANE URBAN DEVELOPMENT PRECINCT  
- NORTHWEST PRECINCT STRUCTURE PLAN**

**PART TWO - EXPLANATORY REPORT**

Prepared by:

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January 2020

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**DEVELOPER**

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Cedar Woods Properties Ltd.

**PROJECT TEAM**

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Town Planning - CLE Town Planning + Design

Environmental - Coterra Environment

Hydrology - Hyd2o

Civil Engineering - JDSi Consulting Engineers

Landscape Design - Plan E

Bushfire - Natural Area Consulting

Traffic & Transport - Transcore



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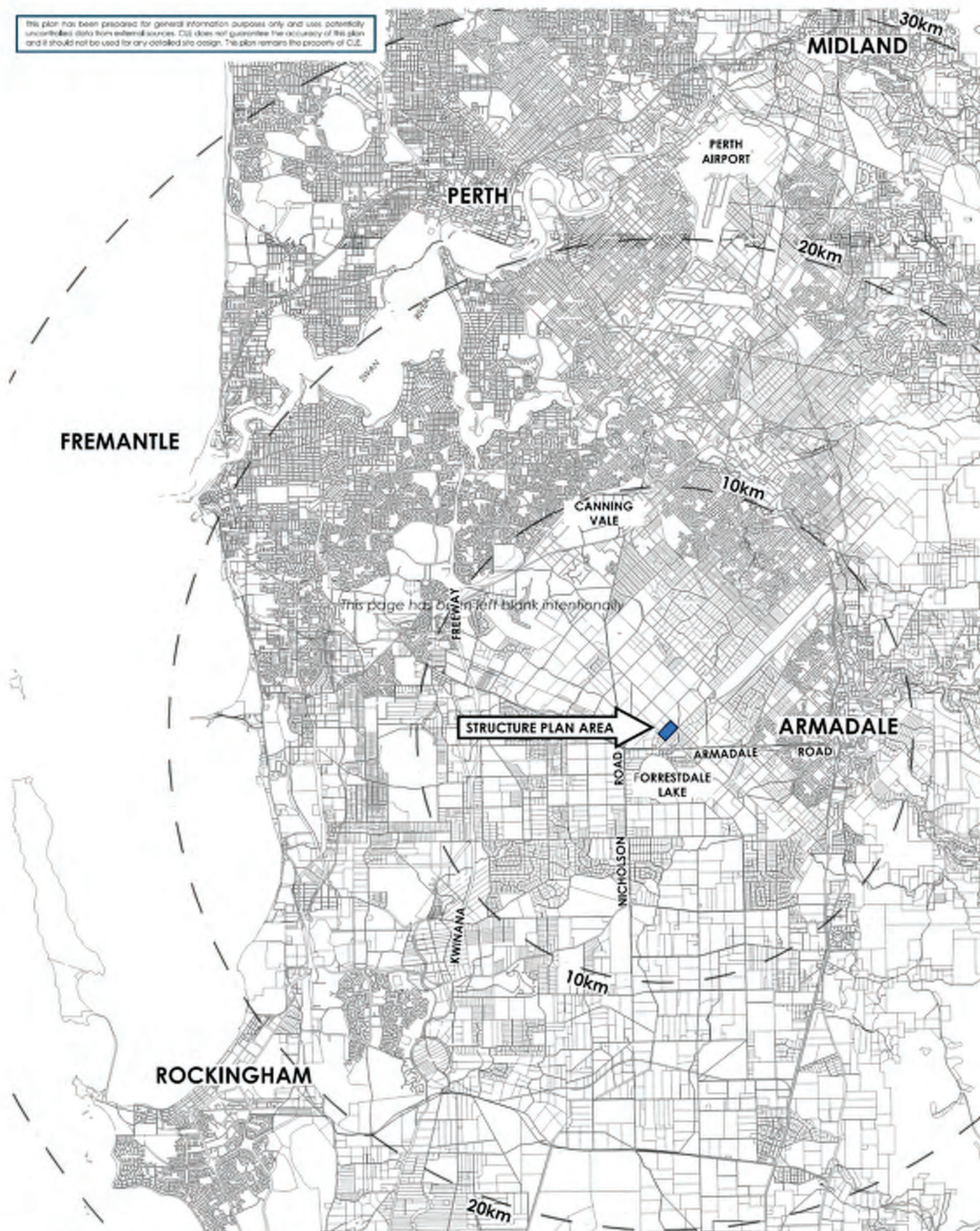


FIGURE 1: LOCATION PLAN

## 1.0 PLANNING BACKGROUND

### 1.1 Introduction and Purpose

The Anstey - Keane Urban Development Precinct - Northwest Precinct Structure Plan (the Structure Plan) has been prepared on behalf of Terra Property Pty Ltd (a wholly owned company of Cedar Woods Properties Ltd) over lots 91, 101, 200 and 552 Anstey Road, Forrestdale. The Structure Plan is lodged in accordance with the City of Armadale Town Planning Scheme No. 4 which requires a structure plan for land zoned 'Urban Development'.

The purpose of the Structure Plan is to provide a planning framework to guide future subdivision and development across the site. It draws on key land use elements of the Southern River/Forrestdale/Brookdale/Wungong District Structure Plan and reflects the recommendations of Perth and Peel@3.5million and the Sub Regional Frameworks.

The format of the Structure Plan follows that set out in the Western Australian Planning Commission's (WAPC) Structure Plan Framework (August 2015), consisting of three parts:

- **Part 1: Implementation Section:** Contains the Structure Plan Map and outlines the requirements that will be applied when assessing subdivision and development applications.
- **Part 2: Explanatory Section:** Discusses the key outcomes and planning implications of the background and technical reports and describes the broad vision and more detailed planning framework being proposed. Part 2 is based on a detailed site specific analysis of opportunities and constraints and the following technical reports and strategies:
  - Environmental Assessment Report (Coterra Environment);
  - Environmental Management Plan (Coterra Environment);
  - Bushfire Management Plan (Natural Area Consulting);
  - Local Water Management Strategy (Hyd2o);
  - Transport & Access Strategy (Transcore);
  - Servicing and Infrastructure Strategy (JDSi Consulting Engineers); and
  - Landscape Master Plan and Descriptions (Plan E).
- **Part 3: Technical Appendices:** Includes the technical reports and supporting plans and maps as prepared by the project team.

### 1.2 Land Description

The following section provides a brief summary of the location, land use and ownership within the Structure Plan area.

#### 1.2.1 Location

The Structure Plan area is located on Anstey Road, Forrestdale, approximately 22km south of Perth CBD, within the City of Armadale (Figure 1: Location Plan).

The site has excellent access to major traffic routes including Armadale Road, the Kwinana Freeway and Tonkin Highway.

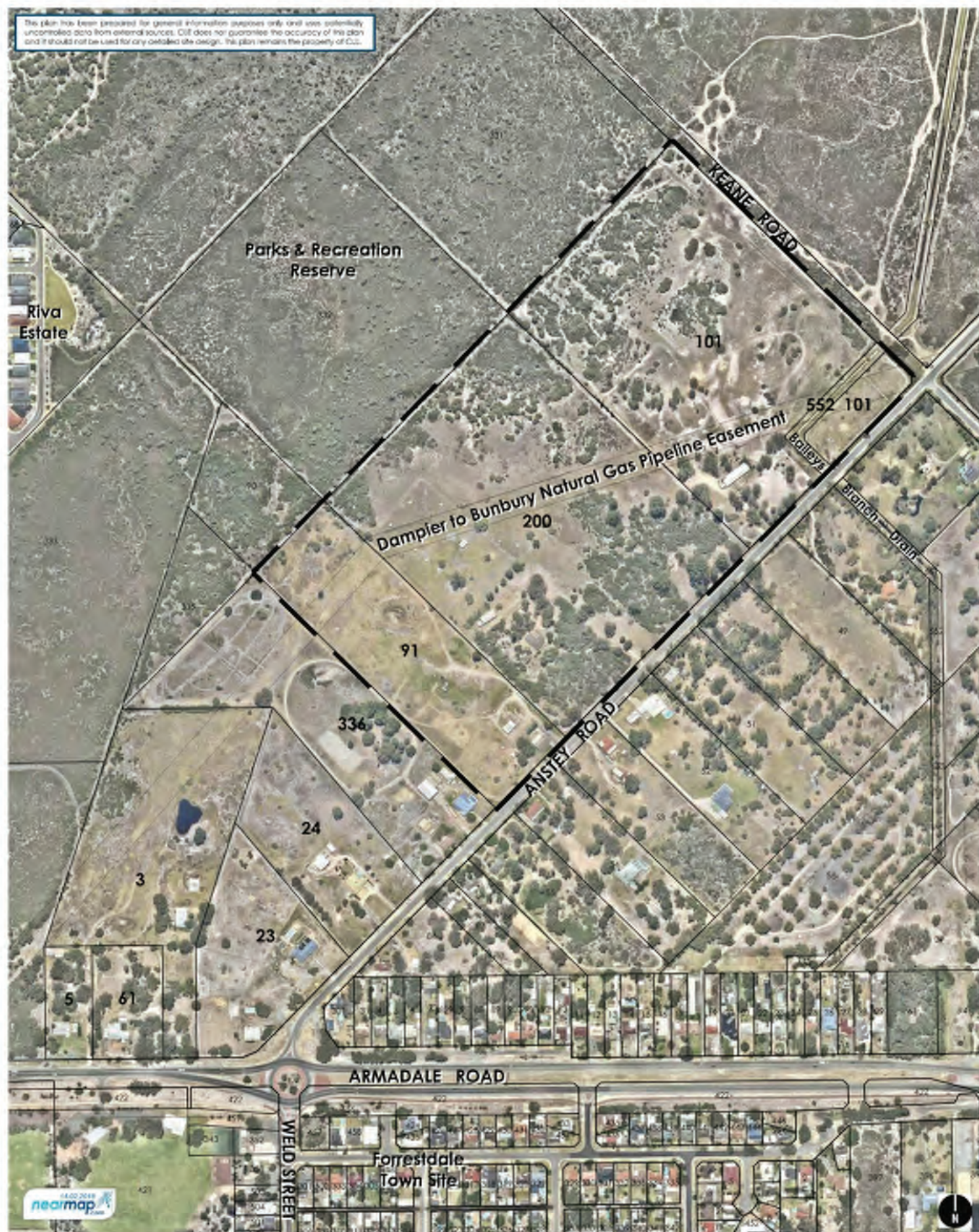


FIGURE 2: SITE PLAN

The Structure Plan area is generally bound by Anstey Road to the south-east, Keane Road (an unconstructed road reserve) to the north-east, Bush Forever Site No. 342 to the north-west and a number of private land holdings to the south west.

### 1.2.2 Area and Land Use

The Structure Plan area is approximately 29.5ha. It is largely cleared, having been used primarily for low intensity grazing and the stabling of horses. One dwelling and a number of sheds and stables relating to past agricultural uses are located within the site.

The Dampier to Bunbury Natural Gas Pipeline (DBNGP) traverses the site in a north-eastern direction, with a 30m easement in favour of the pipeline owner.

The Water Corporation's Baileys Branch Drain crosses the north-eastern corner of the site as a 15m wide drainage corridor at the intersection of Anstey Road and the unconstructed Keane Road.

### 1.2.3 Ownership and Title Details

The Structure Plan area comprises of lots 91, 101, 200 and 552 Anstey Road, Forrestdale (Figure 2: Site Plan).

This land is legally described as follows:

Lot Number	Diagram/Plan	Volume	Folio	Total Area
91	P028768	2524	395	4.89ha
101	D058509	2149	330	11.36ha
200	P045492	2616	287	12.93ha
552	D058509	LR3120	369	0.32ha
				<b>29.5ha</b>

Lots 91, 101 and 200 are owned by Terra Property Pty Ltd, with these properties also encumbered by the 30m easement in favour of the Department of Lands over the DBNGP.

### 1.2.4 Surrounding Land Use and Context

The Structure Plan area is in close proximity to both existing and emerging residential and business estates, and its development would see the strategic consolidation of these urban communities within the Armadale south eastern growth corridor, whilst responding and protecting key environmental features of the locality.

- The adjacent land to the north and west is Bush Forever Site No. 342, comprising a Category Conservation Wetland.
- Land immediately adjoining the Structure Plan area on the eastern side of Anstey Road has been set aside for future urban development via a recent amendment to the Metropolitan Region Scheme.
- The Forrestdale townsite is located immediately south, on the opposite side of Armadale Road.
- Nearby to the north and west are the new residential communities of Harrisdale and Piara Waters.



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FIGURE 3: METROPOLITAN REGION SCHEME

- Located 2 kilometres south-east of the site is the Metropolitan Redevelopment Authority's Wungong Urban Project. This estate comprises 1,580ha of land which is planned to accommodate some 16,000 new dwellings, support a population of 40,000 people, along with a town centre, sporting facilities and recreational areas.
- To the east is the Metropolitan Redevelopment Authority's Forrestdale West Business Park Estate, an emerging 190ha business and service commercial estate, which will support future population growth in the corridor.

### **1.3 Planning Framework**

#### 1.3.1 Metropolitan Region Scheme Zoning

The Structure Plan is zoned 'Urban' under the Metropolitan Region Scheme (Figure 3: MRS Zoning)

#### 1.3.2 City of Armadale Town Planning Scheme No 4

The Structure Plan area is currently zoned 'General Rural' and 'Public Purpose' (Local Reserve) under the City of Armadale Town Planning Scheme No. 4 (TPS4).

On 28th May 2018 the City of Armadale Council initiated Amendment 96 to TPS4 rezoning the land 'Urban Development' on the scheme map, establish a corresponding Development (Structure Planning) Area and inserting a number of applicable development requirements into Schedule 8 of TPS4 which must be undertaken at the time of subdivision and development.

Under an 'Urban Development' zone a structure plan is required prior to development, with this Structure Plan consistent with the proposed amendment.

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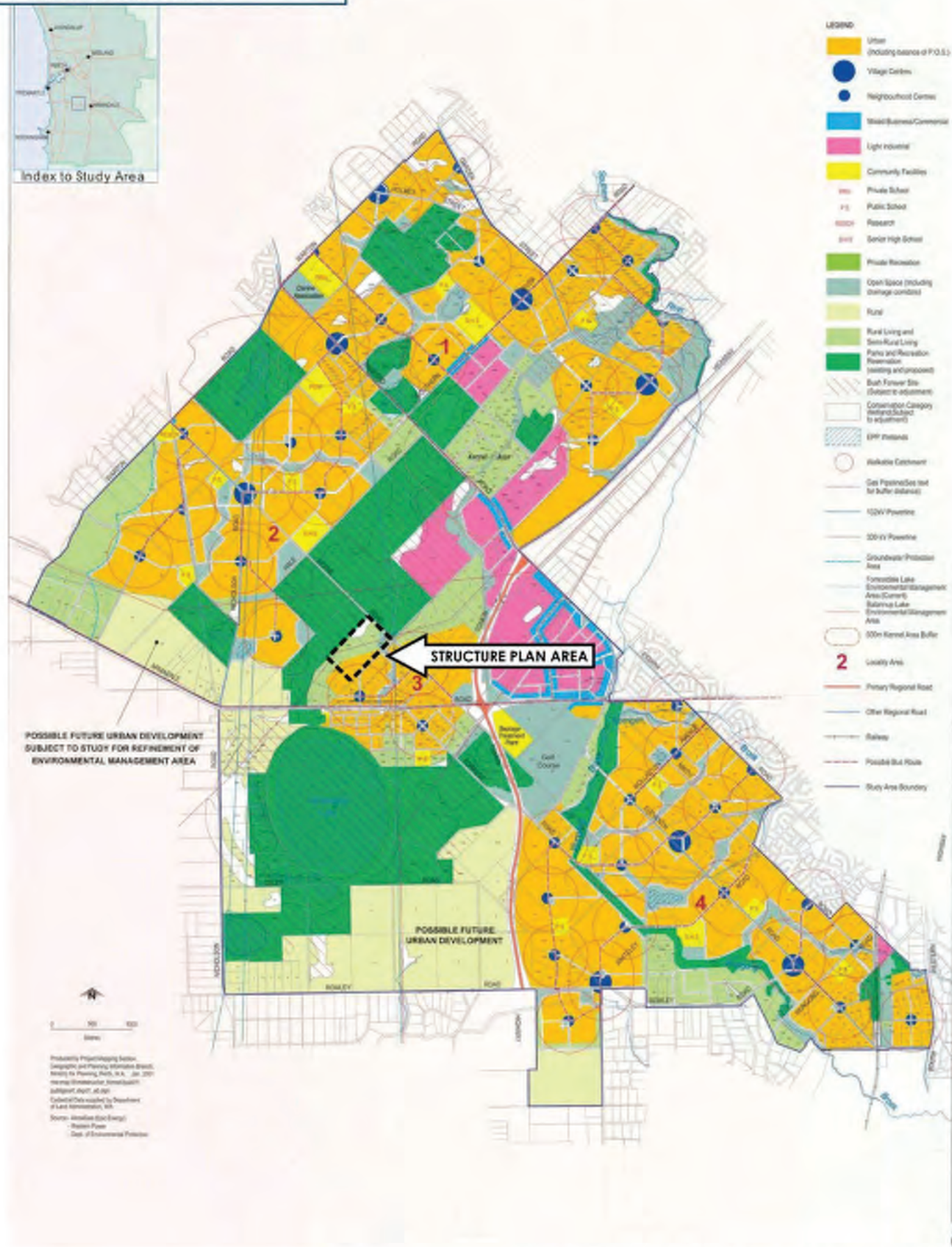


FIGURE 4: SOUTHERN RIVER / FORRESTDALE / BROOKDALE / WUNGONG DSP

### 1.3.3 Southern River/Forrestdale/Brookdale/Wungong District Structure Plan (2001)

This District Structure Plan (DSP) was prepared and adopted by the WAPC in 2001 and provides a broad framework for land use and development of a number of localities within the City of Armadale (including Forrestdale) supporting 56,000 new residents (Figure 4: District Structure Plan).

The DSP has identified the Structure Plan area as suitable for urban development, providing that local structure planning recognises the high pressure natural gas pipeline and the adjacent Bush Forever site.

### 1.3.4 Strategic Planning Framework

#### Perth and Peel@3.5million (March 2018)

Perth and Peel@3.5million is a high level 'spatial framework' and strategic plan that manages the growth of the metropolitan region, and provides a framework to guide the planning and delivery of essential housing, infrastructure and services.

It includes the Structure Plan area within the South Metropolitan Peel Sub-region, forecasting this sub-region to experience considerable economic and population growth, with population increase estimates to more than double from 523,400 people in 2011 to 1.26 million by 2050. It also establishes a residential density target of 26 dwellings per residential site hectare. The need for density targets to encourage more efficient and effective housing is acknowledged, however, it is important that the application of these targets recognises the impact of site specific constraints and market conditions on the ability to deliver density. This is discussed in more detail later in this report.

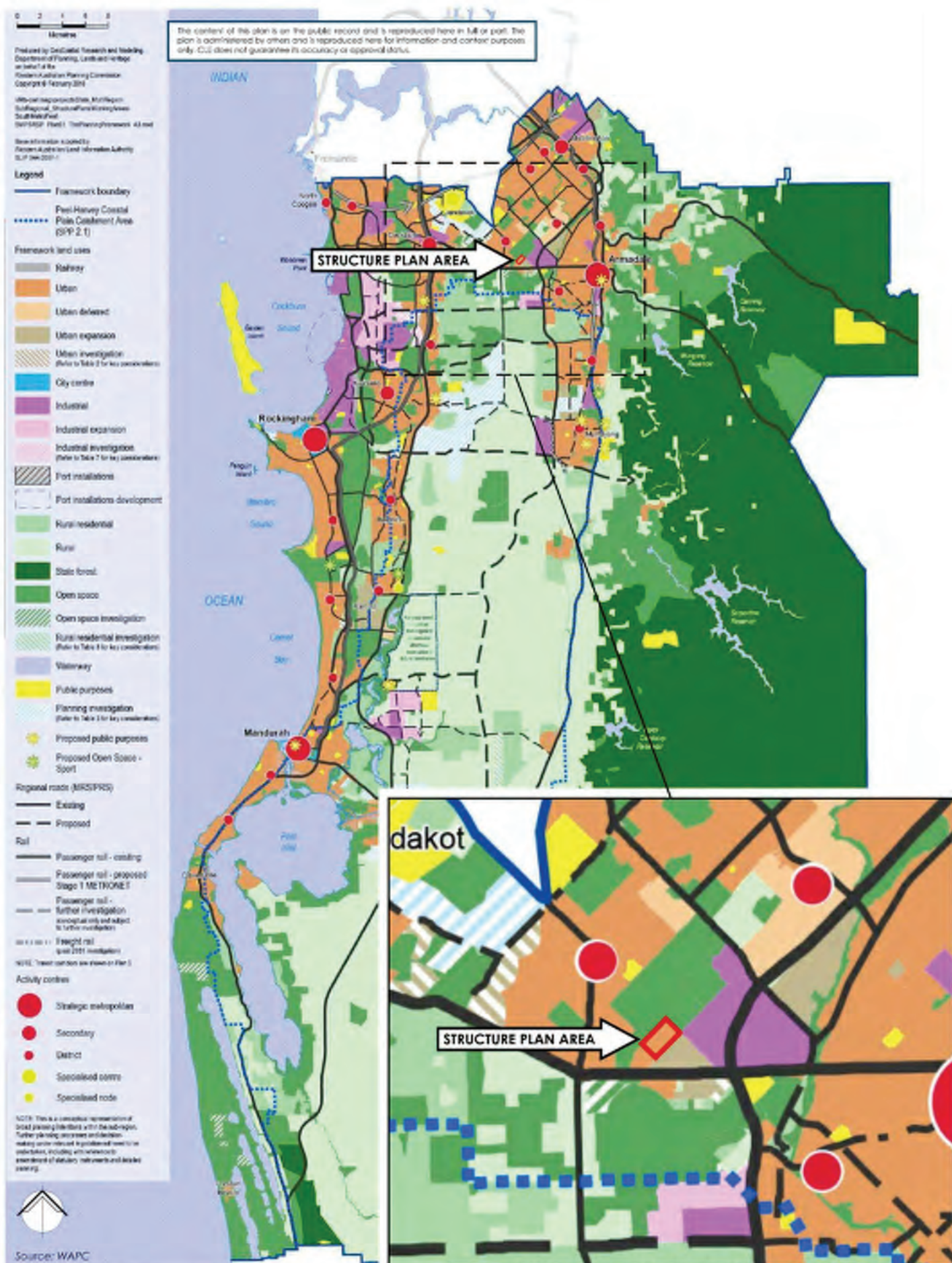


FIGURE 5: SOUTH METROPOLITAN PEEL SUB-REGIONAL PLANNING FRAMEWORK

South Metropolitan Peel Sub-regional Planning Framework (March 2018)

The South Metropolitan Peel Sub-regional Framework (The Framework) provides an additional level of detail concerning the implementation of Perth and Peel@3.5million at the sub regional level including more information about the level of expected population growth, servicing and infrastructure, housing demands, and importantly it highlights development opportunities throughout the sub region.

The Structure Plan area has been identified in the Framework as 'Urban', recognising its current zone under the MRS.

City of Armadale Local Planning Strategy (December 2016)

The City of Armadale Local Planning Strategy was endorsed in December 2016, and Strategy sets out the objectives and recommended actions associated with future development.

The Strategy identifies the Structure Plan area as 'Urban Residential', stating that the site is suitable for urban purposes as identified by the DSP. The Strategy encourages the provision of urban land supply in areas it identifies as 'Urban Residential', to assist in maintaining a level of housing affordability, ensure the cost effective delivery of infrastructure and services, and to support local economic development of the City.

More specifically, the draft Strategy recognises that development within Forrestdale (Harrisdale, Piara Waters) and nearby Wungong localities has accounted for the most significant growth for the City of Armadale in recent times. The Strategy forecasts this growth to continue into the foreseeable future.

The Structure Plan reflects the objects of the draft Local Planning Strategy in providing further urban land supply within this significant (growth) locality.

### 1.3.5 Other Planning Considerations

The following section summarises other government policies relevant to urbanisation and development of the Structure Plan area.

#### Liveable Neighbourhoods

Liveable Neighbourhoods is the WAPC's 'operational policy' for greenfields development in Western Australia. Liveable Neighbourhoods sets out the key considerations for the planning of new communities including subdivision layout and movement networks, the location of open space, community facilities, schools and activity centres.

The Structure Plan has been prepared in accordance with the principles and specific objectives of Liveable Neighbourhoods and best practice urban design principles, creating a walkable neighbourhood supported by an interconnected network of local roads and pathways, and adopting an integrated approach to the design of public open space and urban water management. These aspects of the Structure Plan are described in more detail in Section 3.

#### State Planning Policy 3.7 (SPP3.7) – Planning in Bush Fire Prone Areas

SPP 3.7 – Planning in Bushfire Prone Areas was gazetted in December 2015 and sets out a range of matters that need to be addressed through the planning process to provide an appropriate level of protection of life and property from bushfires.

The Structure Plan is accompanied by a Bushfire Management Plan which includes a Bushfire Hazard Assessment as per the Guidelines. The manner in which the Structure Plan responds to bushfire risk is discussed in further detail in Section 3.4.

#### WAPC Planning Bulletin 87 High Pressure Gas Transmission Pipelines

The Dampier to Bunbury Natural Gas Pipeline (DBNGP) passes through the Structure Plan area in a north-east direction and is protected by a 30m service easement.

The Structure Plan has been prepared in accordance with the WAPC's Planning Bulletin No.87 High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region which provides for residential development to abut the easement, with the pipeline easement integrated in public open space, ensuring that the pipeline is protected whilst also providing a valuable community asset that provides excellent local amenity.

Opportunities relating to the gas pipeline are discussed further in sections 3.3 and 3.11 of this report.

#### Keane Road Strategic Link

The City of Armadale prepared a formal referral of the Keane Road Strategic Link to the Office of the Environmental Protection Authority (OEPA) via a Public Environmental Review (PER). The Keane Road Strategic Link was to connect the new Harrisdale and Piara Waters localities with Forrestdale and Armadale.

Following its assessment of the PER, the OEPA recommended that the Minister for the Environment not support the Keane Road Strategic Link due to likely impacts on a Threatened Ecological Community located on the property immediately north of the Structure Plan area. On 14 November 2014 the Minister for Environment agreed with the recommendation of the EPA and determined that the proposal should not be implemented.

The Structure Plan has been prepared on the basis that the Keane Road Strategic Link will not be constructed, in accordance with the decision of the Minister for Environment.

#### Metropolitan Region Scheme Amendment 1321/57

On 16 February 2018 the Western Australian Planning Commission approved minor Amendment 1321/57, rezoning the land located immediately east of the Structure Plan area (opposite side of Anstey Road) from 'Rural' to 'Urban'.

The result of Amendment 1321/57 is that the planned urban front for Forrestdale has been expanded.



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## 2.0 SITE CONDITIONS & CONSTRAINTS

The Structure Plan area has been cleared and grazed for many years which has a resulting in most of the natural environment being removed, highly disturbed and/or degraded.

Coterra Environment has prepared a comprehensive Environmental Assessment Report (EAR) which describes the site conditions and constraints within the Structure Plan area. The EAR demonstrates that the environmental factors affecting the site, including wetlands, vegetation, groundwater, drainage and bushfire management can all be addressed adequately through the planning approval process and through the application of appropriate land use responses and management practices.

The following section summarises the key findings of this analysis with a complete copy of the EAR provided as Appendix 1.

### 2.1 Biodiversity & Natural Assets

#### 2.1.1 Flora & Vegetation

The land has been subject to long periods of clearing and agricultural activity with limited remaining ecological value and only isolated patches of vegetation remaining.

In accordance with the EPA (2003) Guidance Statement No. 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment, a Level 1 Flora and Vegetation Survey was completed by Bennett Environmental Consulting in May 2013, with a subsequent Level 2 Survey undertaken in October 2013.

The surveys found:

- The clearing of the site for stock grazing has affected the biodiversity rating and ecological viability of areas with remnant vegetation, making the site suitable for future development.
- The majority of the vegetation within the Structure Plan area has been identified as 'Degraded' to 'Completely Degraded' and is not identified as significant due to past grazing activity and spreading weeds.
- Only a small portion of vegetation was considered as 'Excellent' to 'Very Good', which was located in CCW (UF114893) within the Structure Plan area. This wetland will be retained (along with its associated buffer) and incorporated within the natural open space as part of the Structure Plan.
- There were no Threatened Flora or Threatened Ecological Communities found within the Structure Plan area.

The Structure Plan design recognises the small portion of quality remnant vegetation associated with wetland (UF114893), incorporating this vegetation within open space which is discussed further in Section 3.3.

#### Adjacent Threatened Ecological Community

A Level 2 Vegetation and Flora Assessment was undertaken by EnviroWorks Consulting (2012) as part of the Keane Road Strategic Link alignment assessment, immediately north of the Structure Plan area.

This Assessment found a Threatened Ecological Community (TEC) within the proposed Keane Road Strategic Link road reserve and Bush Forever Site 342, however, importantly these are located on the neighbouring property to the north-east and not within the Structure Plan area. The Department of Parks and Wildlife (Threatened Species Scientific Committee) identified the key threat to the TEC as being changes to the natural hydrology of the wetland, with the vegetation type dependant on the wetlands filling and drying at appropriate times of year.

Subsequent investigation into the presence of surface water flow paths has been undertaken by GHD (2015) and Hyd2o Hydrologists (February 2016), which found no evidence that any surface water flows from the Structure Plan area into the TEC. Likewise groundwater flow is not directed towards the TEC, and groundwater levels can be maintained post-development through engineering design and infrastructure, allowing for the health and protection of the TEC.

An Environmental Management Plan has been prepared as part of this Structure Plan which specifically addresses management to ensure that there are no unacceptable impacts to the TEC. A copy of the Environmental Management Plan is provided as Appendix 2.

#### Fauna

A Level 1 Fauna Impact Assessment was undertaken in May 2013 by Bamford Consulting Ecologists to identify fauna values of the site. The Fauna Impact Assessment is included as part of the EAR. It concludes:

- A desktop analysis of available databases found 85 species of conservation significance were recorded as likely to occur within and adjacent to the site, but due to the limited diversity of suitable habitats available on the site, the likelihood of these species occurring within the site is limited.
- The Structure Plan area has no quality foraging habitat for the Carnaby Black Cockatoo and there is no evidence of roosting, with development of the site posing no significant impact to this species.
- Potential impact to any fauna on site from development is considered minor to negligible given the site has been so extensively cleared and remnant vegetation on site exposed to historical degradation processes.

The Fauna Impact Assessment concludes that development of the Structure Plan area will pose negligible impact to fauna, given the lack of any quality habitat onsite.

## 2.2 Topography & Soils

The topography and soils within the Structure Plan area is suitable for urban development.

The Structure Plan area is relatively flat, ranging from approximately 22m Australian Height Datum (AHD) in the north-east corner up to 24m AHD in a number of pockets across the site.

Regional geology mapping indicates that most of Structure Plan area contains sand characterised by a relatively thin veneer over silts and clay. Several isolated pockets of peaty sands are also found across the site. A preliminary geotechnical investigation for lots 101 and 200 was undertaken by Galf Geotechnics in December 2013, which found that the site is underlain by a mix of sand and clayey sand, verifying the regional geological mapping.

### 2.2.1 Acid Sulphate Soils

The Department of Water and Environmental Regulation (DWER) Acid Sulphate Soil (ASS) Risk Map shows the majority of the site as 'low to moderate risk of ASS occurring within 3m of the natural soils surface (or deeper)'. There are only two isolated high risk areas mapped within the eastern corner and along the western boundary of the site.

The Structure Plan area is therefore suitable for urban development with an ASS investigation (if necessary) to be prepared in the usual manner prior to any excavation or dewatering as part of the subdivision.

### 2.2.2 Contamination

The Structure Plan area is not located within any DWER listed contaminated sites.

Given the past use of the land for agricultural purposes a Preliminary Site Assessment (PSA) was undertaken for lots 100 and 200 which found no evidence of any site contamination.

Two dwellings within the Structure Plan area were found to have asbestos. These dwellings have been subsequently demolished using appropriate management practices to ensure the asbestos was removed safely. Asbestos surveys of currently occupied dwellings and other structures will be undertaken prior to their demolition.

## 2.3 Hydrology

The management of ground and surface water is comprehensively addressed within the Local Water Management Strategy (LWMS) prepared by Hyd2o Hydrologists in support of the Structure Plan. These clearly demonstrate that hydrology is not a constraint to urban development. The LWMS was prepared in accordance with a District Water Management Strategy which was prepared for the site as part of Amendment 1290/57 to the MRS which rezoned the land 'Urban'.

The existing hydrological conditions of the Structure Plan area are summarised below, while the key principles of the LWMS are discussed further in Section 3.6 of this report.

### 2.3.1 Ground Water

Regional mapping from the Perth Groundwater Atlas indicates that groundwater occurs at a depth of approximately 23m - 24m AHD across the site, with the separation distance varying between 0m and 3m, typically flowing in a north-eastern direction.

A pre-development groundwater level monitoring programme is being undertaken by Hyd2o for the Structure Plan area, comprising six groundwater bores across the site and includes groundwater quality monitoring. Commenced in May 2013, these results will be available at the later phases of development.

### 2.3.2 Surface Water

The Structure Plan falls within the Southern River catchment of the Canning River System. Minor grades onsite mean surface water typically flows towards the north and north-east of the Structure Plan area.

The Baileys Branch Drain, which is situated in the north-east corner of Structure Plan, is managed by the Water Corporation and connects to the Forrestdale Main Drain upstream of Ranford Road.

The Baileys Branch Drain was constructed to manage regional groundwater and prevent flooding of the Forrestdale town centre. The Baileys Branch Drain contributes to the inundation of the adjacent Bush Forever Site No. 342 (in events greater than 3 year recurrence interval) and several other wetlands in events greater than 10 year recurrence interval.

The Structure Plan provides for the ongoing management of regional groundwater by taking regional stormwater from neighbouring landholdings into open space located within the site and maintaining the (pre-development) peak discharge volumes and flood levels of the Baileys Branch Drain.

### 2.3.3 Wetlands

The Department of Biodiversity, Conservation and Attractions (DBCAs) geomorphic wetlands database indicates that there are three wetlands within the Structure Plan area:

- Multiple Use Wetland (MUW) (UFI 14897);
- Resource Enhancement Wetland (REW) (UFI 15183); and
- Conservation Category Wetland (CCW) (UFI 14893).

The central portion of the site has been mapped as the Dampland MUW (UFI 14897). The REW (UFI 15183) is located in the western corner of the site (Lot 101) while the CCW (UFI 14893) intrudes into the site at the northern end of Lot 200.

In addition to the wetlands found within the Structure Plan area, Conservation Category Wetlands are present to the north and west on adjoining properties.

The majority of the MUW has been largely cleared of native vegetation and, as indicated by its low management category rating, is suitable for urban development.

CCW (UFI 14893) has been cleared since the 1950's, however, during the 1970's showed signs of natural revegetation and consist of a range of plant species. The vegetation condition within this CCW is considered to be 'Very Good' to 'Excellent' and will be retained/protected.

REW (UFI 15183) has the characteristics of a stressed system which has been exposed to a long history of clearing and grazing since the 1950's, with the vegetation within the REW considered 'Degraded' to 'Completely Degraded' and is suitable for development.

Following consultation with the EPA it has been agreed that 65% of the REW dampland will be retained within POS, with the remainder supported for development.

The Structure Plan has recognised the environmental significance of CCW areas within and adjacent to the site (UFI 14893) and those on the adjacent properties (UFI's 15427, 15428, 14876 and 14170), incorporating the onsite CCW within open space with a 50m buffer, providing a buffer of 50m to adjacent wetlands on Lot 101, and a buffer between 30-50m to adjacent wetlands on Lots 90 and 200. The size of this protective buffer has been supported by the OEPA as noted in the agreed scheme provisions. This is shown in further detail in Section 3.3.

#### Environmental Management Plan

An Environmental Management Plan (EMP) has been prepared by Coterra Environment, demonstrating that the development of the site will not have an unacceptable impact upon the adjacent Threatened Ecological Community (TEC) located within Bush Forever Site No. 342. The EMP has been prepared on the advice of the EPA and is a requirement of corresponding (draft) amendment to Town Planning Scheme No. 4.

This EMP identifies a series of actions that are to be implemented at subdivision stage, to ensure the health of the TEC. This includes an ongoing ground and surface water monitoring programme (both pre- and post-development), along with management actions that will prevent direct or indirect impact upon the TEC.

The draft TPS amendment provisions also require the approval of a Detailed Buffer Management Plan(s) at the time of subdivision or development, which will sets out the design and management of the wetland interfaces.

A complete copy of the EMP is provided as Appendix 2.

#### **2.4 Bushfire Management**

Natural Area Consulting has prepared a Bushfire Management Plan (BMP) in accordance with WAPC's Planning for Bushfire Protection Guidelines. A complete copy of the FMP is included as Appendix 3.

The BMP concludes that bushfire risk is not an impediment to the development subject to the implementation of asset protection zones, interface treatments and the construction of dwellings within 100m of bushfire prone vegetation in accordance with AS3959 Construction of buildings in bushfire prone areas.

The manner in which the Structure Plan responds to bushfire hazards is discussed in further detail within Section 3.4 of this report.

#### **2.5 Heritage**

The Department of Aboriginal Affairs Aboriginal Heritage Enquiry Systems list no registered sites within or adjacent to the Structure Plan Area. There are no listed European sites of heritage significance located within the subject site.

## 2.6 Dampier to Bunbury Natural Gas Pipeline

The Dampier to Bunbury Natural Gas Pipeline (DBNGP) runs through the Structure Plan area in a north-east direction and is protected within a service easement and the statutory provisions of the Dampier Bunbury Pipeline Act 1997 (the Act) .

The WAPC's Planning Bulletin 87: High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region allows residential development to abut the Dampier to Bunbury Natural Gas Pipeline (DBNGP) corridor along this section of the pipeline with road reserves, public utilities and other infrastructure able to be located within the pipeline easement subject to consent being granted by the DBNGP Land Access Minister under Section 41 of the Act.

A Pipeline Risk Assessment (or similar) may need to be prepared to gain a thorough understanding of the grade and condition of the pipeline and identify necessary mitigation measures from the proposed development; with this Assessment to be undertaken prior to subdivision works in conjunction with Australia Gas Infrastructure Group. Importantly, the (then) Department of Lands (Infrastructure Corridors) has granted Cedar Woods Property (the proponent) 'in principle' support for development proposed by the Structure Plan, within and abutting the DBNGP corridor. This includes road crossings and drainage infrastructure within the DBNGP corridor. Whilst having obtained 'in principle' support, Cedar Woods Property acknowledges that any works proposed within the pipeline easement is still subject to final approval under Section 41 the Act , which will be obtained prior to construction works being undertaken.

Opportunities relating to the gas pipeline are discussed further in section 3.11 of this report, but with the exception of two planned road crossings and drainage infrastructure (swales), the pipeline corridor is to be integrated in public open space ensuring that the pipeline is protected whilst also providing a valuable asset, with the open space to be vested to the City of Armadale for ongoing management. In the unlikely event that AGIG need to access the DBNGP, AGIG will remediate the land in accordance with current practice.



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FIGURE 6: DEVELOPMENT CONCEPT PLAN

### 3.0 LAND USE AND SUBDIVISION REQUIREMENTS

#### 3.1 Land Use

A Development Concept Plan has been prepared for the site to demonstrate how development could occur based on the Structure Plan principles and requirements (Figure 6: Development Concept Plan). It represents only one way development could occur and the concept will be refined at the time of subdivision.

Reflecting on the Concept Plan and Structure Plan documentation, the key principles are to:

- Enable the creation of a diverse range of high quality housing choices that appeal to a wide market segment.
- Provide a robust urban form that responds to the local context and location within the broader Forrestdale locality.
- Recognise the natural amenity and values of the site through appropriate protection and management of environmentally significant areas.
- Provide accessible and integrated multi-functional public open spaces that can accommodate drainage requirements whilst offering a range of active and passive recreational opportunities.
- Includes part provision of a senior play field, a need identified by the City of Armadale.
- Extend the necessary services and infrastructure in a timely and coordinated manner to support the future development.
- Establish a legible and permeable road network.

Building on these broader key principles, the Structure Plan provides for the following:

- Approximately 290-300 dwellings across the Structure Plan area, with residential densities of R25, R40 and R60. The R40 density is focused on areas of high local amenity, with R60 reserved for identified grouped or multiple development sites exceeding 900m<sup>2</sup> in area.
- A centrally located linear public open space of approximately 2 hectares that also covers the DBNGP easement, accommodating some drainage whilst meeting recreational objectives.
- A second large area of public open space that corresponds with the environmentally significant wetland, allowing for its protection and a transition between this key natural asset and neighboring residential development.
- Providing a portion (1.8ha approx.) of senior playing field, with the remainder to be provided by landowners located to the south.
- A permeable local road network that connects to the existing regional road network, providing a framework for the provision of pedestrian and cycling infrastructure and future public transport services.
- Appropriate separation between identified bushfire hazards along the western and northern edges of the Structure Plan area and all future dwellings. This separation likewise transitions between development within the Structure Plan area and the adjacent Conservation Category Wetland and the identified TEC located to the north and west.

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LEGEND	
	Subject Site
	Residential - Traditional
	Residential - Cottage
	Density Site
	Public Open Space

FIGURE 7: LOCAL CONTEXT PLAN

A Local Context Plan has been prepared showing the Development Context Plan in context with the adjacent (southern) land, west of Anstey Road. This demonstrates how this adjacent land could be developed in a manner that responds to the adjacent Bush Forever site, the DBNGP and provides future road connections to its surrounds, including the Structure Plan area. While provided for context sake, it is important to note the adjacent land south of the Structure Plan area is subject to local structure planning, to be undertaken by others (Figure 7: Local Context Plan).

### 3.2 Residential

The Structure Plan provides a framework for the delivery of a range of lot types, subsequent housing product and lifestyle options in a manner that will also satisfy density targets. The delivery of quality housing and streetscapes that reflects the amenity and environmental values of the area is one of the primary objectives of the Structure Plan.

#### 3.2.1 Dwellings Yields and Density Targets

The Structure Plan has the potential to create approximately 290-300 residential lots utilising density codes of R30 to R60. This response is based around the following planning principles:

- A 'base' density code of R30 applies, providing opportunities to deliver a range of more traditional 'front loaded' lots ranging from 300m<sup>2</sup> to 450m<sup>2</sup>.
- Medium density R40 coded lots are located adjacent to an area of public open space (where a higher level of amenity exists), and on street corners or at the end of street blocks where good opportunities for integration exists. This coding provides the opportunity to deliver 'cottage' style housing (single or double storey) with front or rear laneway access or for the contemporary 'compact' lots, that typically bookend street blocks in order to create a traditional streetscape to the secondary street. Single lots sizes will generally range from 180m<sup>2</sup> to 300m<sup>2</sup>.
- R60 coded lots are allocated to only identified grouped/multiple dwelling lots in appropriate locations and when these exceed 900m<sup>2</sup> in area.

Perth and Peel@3.5million recommends a housing density target of 15 dwellings per gross urban zoned hectare. The aim of this target is to encourage more efficient use of infrastructure and housing. It is also important that this target consider local site constraints and the capacity to deliver. Considerations in this regard include:

- The requirement of the OEPA to provide buffers between the adjacent Conservation Category Wetlands and the identified TEC located to the north and west of the Structure Plan area.
- The need to set aside otherwise developable land affected by the DBNGP easement as restricted public open space.
- The need to provide excessive open space to accommodate district drainage associated with the Baileys Branch Drain.
- The small size of the Structure Plan area and lack of any activity centres, rail stations or employment generators in this general location that might otherwise provide context for higher residential densities.

Against this backdrop however the Structure Plan can still manage to achieve a density target of 11.8 dwellings per gross urban zoned hectare and can also deliver approximately 29.6 dwellings per site hectare. This figure exceeds the Liveable Neighbourhoods requirement for an average of 22 dwellings per site hectare (being the pure residential area, excluding open space, roads and other non-residential uses).

### 3.2.2 Local Development Plans

Local Development Plans (LDPs) will be required for when lots abut areas of public open space.

Typically the interface to public open space at the time of subdivision will be via roads, however, in some instances direct lot frontage is an appropriate design response providing product diversity, amenity and increased surveillance of the public spaces.

Liveable Neighbourhoods supports residential lots directly abutting open space where the functionality of the POS is not compromised, and where the dwelling addresses the open space providing adequate visual surveillance.

To ensure these public open spaces are not compromised subsequent subdivision design and engineering detail will ensure that visitor parking is provided along adjacent streets, and the adjacent residential lots are elevated a minimum of 500mm above the POS ground level to create a visible separation between the private and public realm.

Where lots interface with open space LDPs will need to be prepared to control built form. These Structure Plans will address:

- minimum setbacks to the public open space.
- major openings (other than bedrooms) to address the space.
- permeable fencing to ensure constant surveillance.

These LDPs will be required as a condition of subdivision approval, and be approved by the City of Armadale.

This plan is an indicative land use concept depicting one hypothetical development scenario for the land and is prepared for illustrative purposes only. It has no formal endorsement or approval status. Any lot boundaries, areas, road networks, public open space or any other land use detail depicted should be considered notional and will be subject to change as part of any subsequent formal planning approval processes. This plan remains the property of CLE.



FIGURE 8: PUBLIC OPEN SPACE

### 3.3 Public Open Space

The Structure Plan creates a framework for the delivery of a high amenity, integrated open space network.

It provides for approximately 11.2ha of local parkland which represents around one-third of the Structure Plan area being set aside as open space. This well exceeds the requirement established by Liveable Neighbourhoods, as shown in Table 1 (Public Open Space Schedule), Table 2 (Detailed Open Space Breakdown and Drainage Area Specification) and Figure 8: Public Open Space.

The following is a summary of the key aspects of the open space provision based on Liveable Neighbourhoods requirements. A more detailed description of the public open space is provided in Section 3.3.1.

- 11.2ha (includes the CCW core and pipeline easement) of open space is distributed across the Structure Plan, accommodating both active and passive uses and in part performing a shared multi use drainage function.
- Approximately 0.12ha of the open space will receive drainage from storm events occurring more frequently than the 1 in 1 year (1 hour) event (for calculation purposes this is treated as a deduction from the Net Site Area, as set out in Liveable Neighbourhoods).
- Approximately 0.2ha will take drainage from the 1 in 1 year to the 1 in 5 year drainage events via landscaped infiltration swales and bio-retention area, reflecting water sensitive urban design principles. The 1 in 1 year to the 1 in 5 year drainage event is treated as restricted use open space in accordance with Liveable Neighbourhoods.
- The Category Conservation Wetland core has been taken as a deduction from the Gross Site Area, with the associated buffer being treated as restricted open space, in accordance with Liveable Neighbourhoods.
- Regional flood storage onsite (approx. 1.5ha) associated with the Baileys Branch Drain has been treated as a deduction.
- The DBNGP easement (which measures approximately 1.4ha) has been treated as a deduction.

Liveable Neighbourhoods recommends that no more than 20% of public open space should be made up of 'restricted use' open space, with the aim being to ensure open space areas provide a balance between offering a diversity of recreational options while also incorporating water sensitive design principles and nature spaces that protect areas of environmental significance.

While the Structure Plan is provided with 10.2% creditable public open space, surplus restricted use open space has been taken as a deduction from the from the Gross Subdivisible Area (in accordance with Liveable Neighbourhoods).



**Table 1: Anstey Road Public Open Space Schedule** (all areas are in hectares)

<b>Gross Site Area<sup>1</sup></b>			<b>29.49</b>
<b>Less</b>			
Conservation Category Wetland Core	0.82		
TWL Regional Stormwater Drainage (incl lot 552)	1.51		
Pipeline Easement	1.44		
Anstey Road Reserve Widening	0.07		
<b>Total</b>		<b>3.84</b>	
<b>Net Site Area</b>			<b>25.65</b>
<b>Deductions<sup>2</sup></b>			
Total drainage area up to the 1:1 year event	0.12		
<b>Total</b>		<b>0.12</b>	
<b>Gross Subdivisible Area</b>			<b>25.53</b>
<b>Public Open Space @ 10%</b>			<b>2.55</b>
<b>Public Open Space Contribution</b>			
Minimum 80% unrestricted POS	2.04		
Maximum 20% restricted POS able to be credited	0.51		
<b>Unrestricted Open Space</b>			
Welland Park	Nil		
Linear Park	0.23		
Baileys Park	0.22		
Community Facilities Site	1.58		
<b>Total Unrestricted Use</b>		<b>2.04</b>	
<b>Restricted Open Space</b>			
Drainage area between 1:1 and 1:5 year events <sup>2</sup>	0.22		
Wetland buffers <sup>3</sup>	5.32		
<b>Total Restricted Use Open Space</b>		<b>5.54</b>	
Restricted Open Space Surplus	5.03		
<b>Revised Gross Subdivisible Area</b>			<b>20.50</b>
<b>Revised Public Open Space @ 10%</b>			<b>2.05</b>
<b>Summary of Public Open Space (Revised Gross Subdivisible Area)</b>			
Unrestricted POS Provided	2.04	(80%)	
Restricted Open Space Provided	0.51	(20%)	
<b>Total Unrestricted &amp; Restricted Public Open Space Provision</b>			<b>2.55</b>
<b>Total Public Open Space Provisions as a % of Gross Subdivisible Area</b>			<b>10.0%</b>

Notes:

- The site area is the total area of lots 91, 101, 200 and 552 Anstey Road, Forrestdale.
- In accordance with Liveable Neighbourhoods: the area subject to inundation more frequently than a one year average recurrence interval rainfall event is not included as restricted or unrestricted open space and is a deduction from the net site area (LN R33); areas for the detention of stormwater for a greater than one year average recurrence interval up to the five year recurrence interval is restricted open space; areas for the detention of stormwater for a greater than five year average recurrence interval is within unrestricted open space (LN R25)
- Buffer to Category Conservation Wetland has been taken as farming restricted open space in accordance with Liveable Neighbourhoods (LN R33).

Table 2: Anstey Road Detailed Open Space Breakdown and Drainage Area Specification

Local Open Space Area	Gross Area	Deductions	Restricted Use Open Space			Total Restricted Use Open Space	Unrestricted Open Space <sup>5</sup>
		1:1 year Drainage Area <sup>3</sup>	Gross Area less 1:1 year Drainage Area	1:5 year Drainage Area <sup>4</sup>	Other Restricted Use Open Space		
Wetland Park <sup>6</sup>	5.32ha	Nil <sup>9</sup>	5.32ha	Nil <sup>10</sup>	5.32ha <sup>11</sup>	5.32ha	Nil
Linear Park <sup>7</sup>	0.23ha	Nil <sup>9</sup>	0.26ha	Nil	Nil	Nil	0.26ha
Baileys Park <sup>8</sup>	0.36ha	0.06ha	0.31ha	0.07ha	Nil	0.07ha	0.23ha
Community Facilities Site	1.78ha	0.06ha	1.74ha	0.14ha	Nil	0.14ha	1.60ha
<b>Total</b>	<b>7.69ha</b>	<b>0.12ha</b>	<b>7.57ha</b>	<b>0.22ha</b>	<b>5.32ha</b>	<b>5.54ha</b>	<b>2.04ha</b>

Notes:

1. The 1:1, 1:5 and 1:10 year drainage volumes have been sourced from the Hyd2o modelling.
2. The one year average recurrence interval drainage areas shown in the table are based on management of the first 15mm runoff in accordance with Department of Water and Environmental Regulations policy.
3. Areas subject to inundation more frequently than a one year average recurrence interval rainfall event are not included as restricted or unrestricted open space and are a deduction from the net site area.
4. Areas for the detention of stormwater for a greater than one year average recurrence interval up to the five year recurrence interval are treated as restricted open space.
5. Areas for the detention of stormwater for a greater than five year average recurrence interval are within unrestricted open space and receive a full open space credit.
6. Gross area of Wetland Park excludes the Category Conservation Wetland core.
7. Gross area of Linear Park excludes the Boundary to Dampier Natural Gas Pipeline.
8. Gross area of Baileys Park excludes the TWL of Regional Flood Storage (including lot 552 – Baileys Branch Drain) and the Bunbury to Dampier Natural Gas Pipeline Easement.
9. Areas for the detention of stormwater for the one year average recurrence interval rainfall event are provided for within road reserves and/or the Bunbury to Dampier Natural Gas Pipeline easement.
10. Areas for the detention of stormwater for a greater than one year average recurrence interval are provided for within wetland buffers.
11. Wetland Park Restricted Use Open Space includes CCW Buffer.

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Critically the Structure Plan achieves the over arching objectives and establishes a balance of open space typologies, having regard to the context of the local site and its natural and structural constraints:

- One-third of the Structure Plan area already being set aside as open space, far exceeding the typical 10% provision.
- 2ha of linear open space that provides residents with a 'green link connection' which is suitable for a range of recreational activities, including walking, jogging and other forms of exercise pursuits, notwithstanding that it is also protecting the DBNGP.
- Interface to the adjacent Category Conservation Wetland and TEC which protects these important environmental assets while also being an area that offers outstanding passive recreation pursuits.
- Location of the Forrestdale Sporting Fields (Alfred Skeet Oval) only 400m south of the Structure Plan area, giving residents ready access to active sporting facilities.
- Future delivery of an area of a senior playing field (measuring a total area of approximately 5.2ha) within the Anstey Road Precinct that offers residents another area of open space suitable for formal and informal sporting activities. This Structure Plan provides delivers approximately 1.8ha for this senior playing field.
- Provision of the 'Baileys Park', which other than needing to accommodate district drainage associated with the major storm event, is wholly unimpeded in terms of public access and use.
- The limited size of the Structure Plan area that might otherwise be able to offset these considerable site constraints.
- Structure Plan area being only one part of the overall Anstey Road Precinct in which there will be opportunities to deliver unrestricted areas of open space to meet the full range of recreational needs of the future residents.

A future Development Contribution Plan is understood to include provision for contributions towards the land and facilities for the 5.2ha playing field, with all landowners within the overall Anstey Road Precinct to be provide 8% creditable public open space (as defined under Liveable Neighbourhoods) within their respective landholdings, with the remaining 2% to be satisfied via cash-in-lieu payments. Collectively this will provide for the necessary 10% public open space provision across the entire precinct.

Critically the Structure Plan is robust in that it achieves the primary objective of Liveable Neighbourhoods in providing residents with a variety of excellent and accessible public open space, acknowledging that a Development Contribution Plan is in train to ensure the fair and equitable provision of open space, including recompense for land owners that provide over and above their necessary public open space allotment.

While not formally 'recognised' as unrestricted open space by Liveable Neighbourhoods, the public open space network within the Structure Plan area strikes an appropriate and pragmatic balance between offering spaces for active and passive recreational pursuits while also incorporating water sensitive design principles and nature spaces that protect areas of environmental significance.

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Source: Plan E

### 3.3.1 Description of Public Open Space

The Landscape Masterplan prepared by Plan E shows how the areas of open space will be landscaped (Figure 9: Landscape Masterplan). It is important to note the landscaping designs shown are conceptual and will be confirmed as part of the subdivision process in consultation with the City of Armadale.

The following is a summary of the key characteristics of each open space:

#### The Wetland Park

- 6ha (approx) of open space (includes the wetland core), comprising carefully selected native tree species and revegetation. Functions primarily as a protective buffer to the adjacent Category Conservation Wetland.
- Comprises low and sporadic native tree planting to ensure the park remains a low fuel zone for bushfire protection whilst reinforcing a connection between future residents and the adjacent bushland.
- Opportunities for an integrated pedestrian pathway incorporating environmental educational initiatives to encourage community awareness and appreciation of the natural wetland.
- Drainage will be accommodated within wetland buffers (via a linear swale located within the adjacent road reserve), comprising native dampland planting which will strip nutrients prior to onsite infiltration and into the groundwater.
- Protective dog proof fence (post & wire) proposed along the back of footpath to provide protection to the adjacent wetland.
- The size of the protective buffer surrounding the Category Conservation Wetland, which ranges from 30m to 50m, has been supported by the OEPA.

#### Baileys Park

- 1.8ha (approx) of open space that creates a wide view corridor and green link connection through the Structure Plan area.
- A large turf space provides opportunities for picnic facilities, seating, playground and shade structures.
- Pedestrian pathways surrounding the turf spaces form part of a network, connecting with the Linear Park (South).
- Conveys local and regional drainage from neighbouring landholdings, taking stormwater drainage from events greater than 1 in 1 year in accordance with the Forrestdale Main Drain Arterial Drainage Strategy.
- Aligns with the DBNGP easement, ensuring the protection of this service assets.
- No structural development within the DBNGP easement, with the development of this space to be undertaken in consultation with the DPB Transmission (pipeline owner and operator).



#### Linear Park

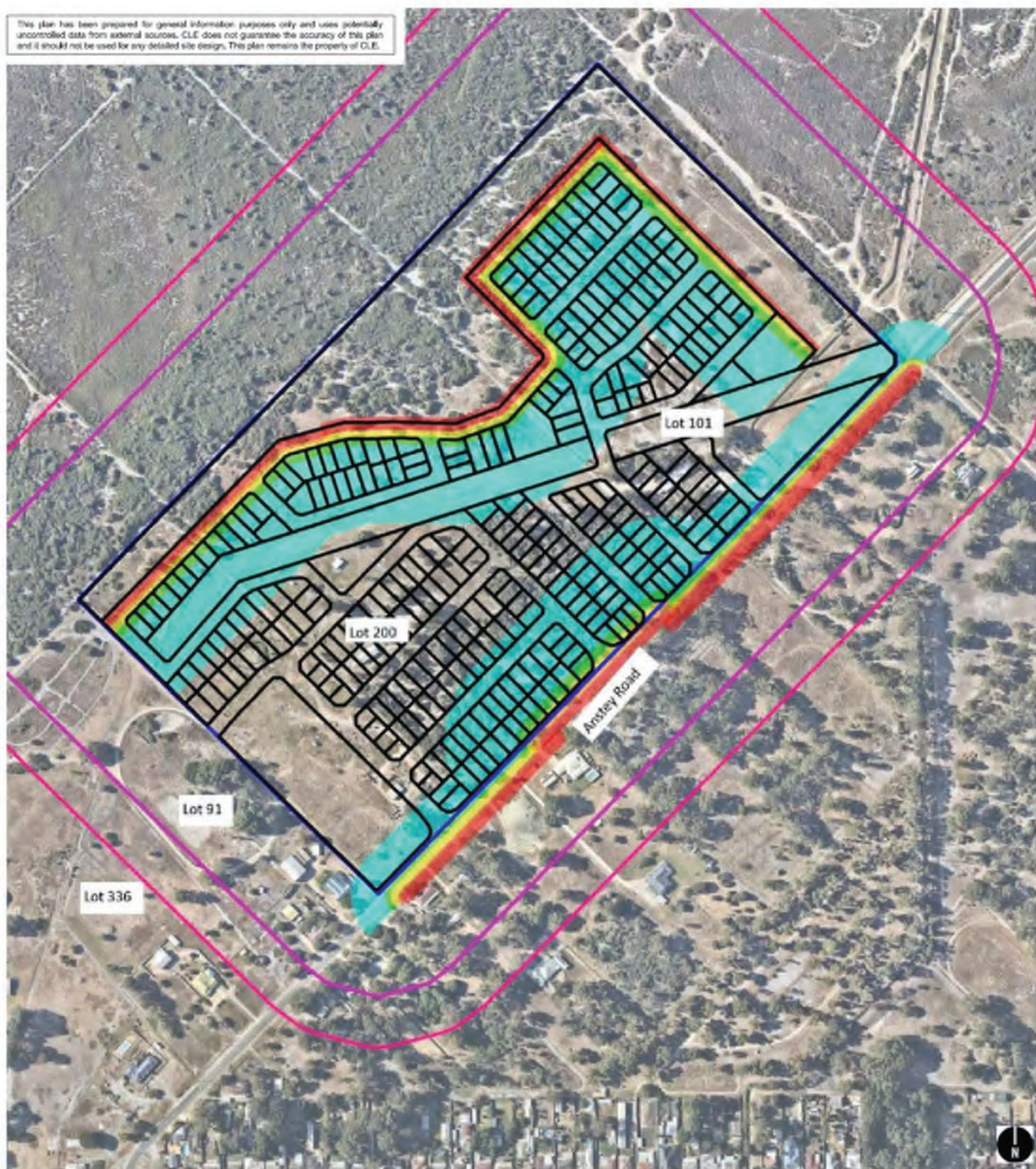
- 1.7ha (approx) of linear open space which forms a southern extension of the Baileys Park, primarily comprising turfed areas with pockets of native planting, extending the green link connection through the Structure Plan area.
- Turfed spaces for informal play and sport.
- Creates an opportunity for pedestrian pathways and seating, connecting the turf space and the landscaped areas within this linear open space.
- Provides for integrated drainage swales and basins, vegetated with native wetland species to add to the overall character and diversity of the development.
- Adventure playground and picnic facilities located within adjacent open space.
- No structural development within the DBNGP easement, with the development of this space to be undertaken in consultation with the DPB Transmission (pipeline owner and operator).

#### Community Facilities Site

- 1.8ha (approx) portion of a planned 5.2ha community facilities site.
- Primarily a turfed senior playing field for formal play and sport
- Additional community facilities to be accommodated within the site, including sports room, public toilets and car parking.
- Remainder of the 5.2ha site to be provided by the landowners located south of the Structure Plan area.
- The full extent of the Community Facilities Site will be subject to refinement following the completion of conceptual designs by the City of Armadale.



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Legend

BAL-12.5 zone		BAL-40 zone		Site boundary	
BAL-19 zone		BAL-FZ zone		100 m from site boundary	
BAL-29 zone		Indicative Lot layout		150 m from sit boundary	

### 3.4 Bushfire Management

The Structure Plan provides a design response and the planning framework that addresses potential bushfire hazards. It demonstrates that the risk from bushfire is not an impediment to development and that this can be managed through a combination of building protection zones, mandatory dwelling setbacks and appropriate construction standards.

In accordance with the WAPC's 'Planning in Bushfire Prone Areas', a Bushfire Management Plan has been prepared by Natural Area Consulting.

This Hazard Assessment shows that bushfire prone vegetation (post-development) is restricted to:

- Retained vegetation within the rural residential lots located to the eastern side of Anstey Road;
- Wetland vegetation associated with the Category Conservation Wetland that encroaches into the western side of the Structure Plan area; and,
- Shrubland associated with the neighbouring Bush Forever sites, abutting the northern and western boundaries of the Structure Plan area.

The Hazard Assessment requires that an Asset Protection Zone (APZ) be established between the identified bushfire prone vegetation and any future dwellings in order to achieve a Bushfire Attack Level (BAL) of 29 or less in accordance with AS3959 'Construction of buildings within bushfire prone areas'.

The Structure Plan creates an APZ through the positioning of local access streets and mandatory building setbacks that ensure the required separation between bushfire prone vegetation and future dwellings is achieved. To the northern and western boundaries and surrounding the Category Conservation Wetland, a 15m wide local access street runs adjacent to the identified bushfire prone vegetation which, in conjunction with mandatory building setbacks on adjacent lots, establishes the minimum APZ. This will ensure BAL-40 and BAL-FZ construction standards are not required.

The FMP also requires any dwelling that falls within 100m of any identified bushfire prone vegetation will need to be constructed to a BAL12.5 standard, with appropriate notifications on titles to inform landowners of the need to construct dwellings to higher (BAL) construction standard (Figure 10: BAL Contour Plan). Any mandatory dwelling setbacks and constructions standards will be implemented via LDPs at the time of subdivision approval.

All areas of POS will be landscaped and maintained to a 'low hazard' standard within the Structure Plan area.

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### 3.5 Movement Network

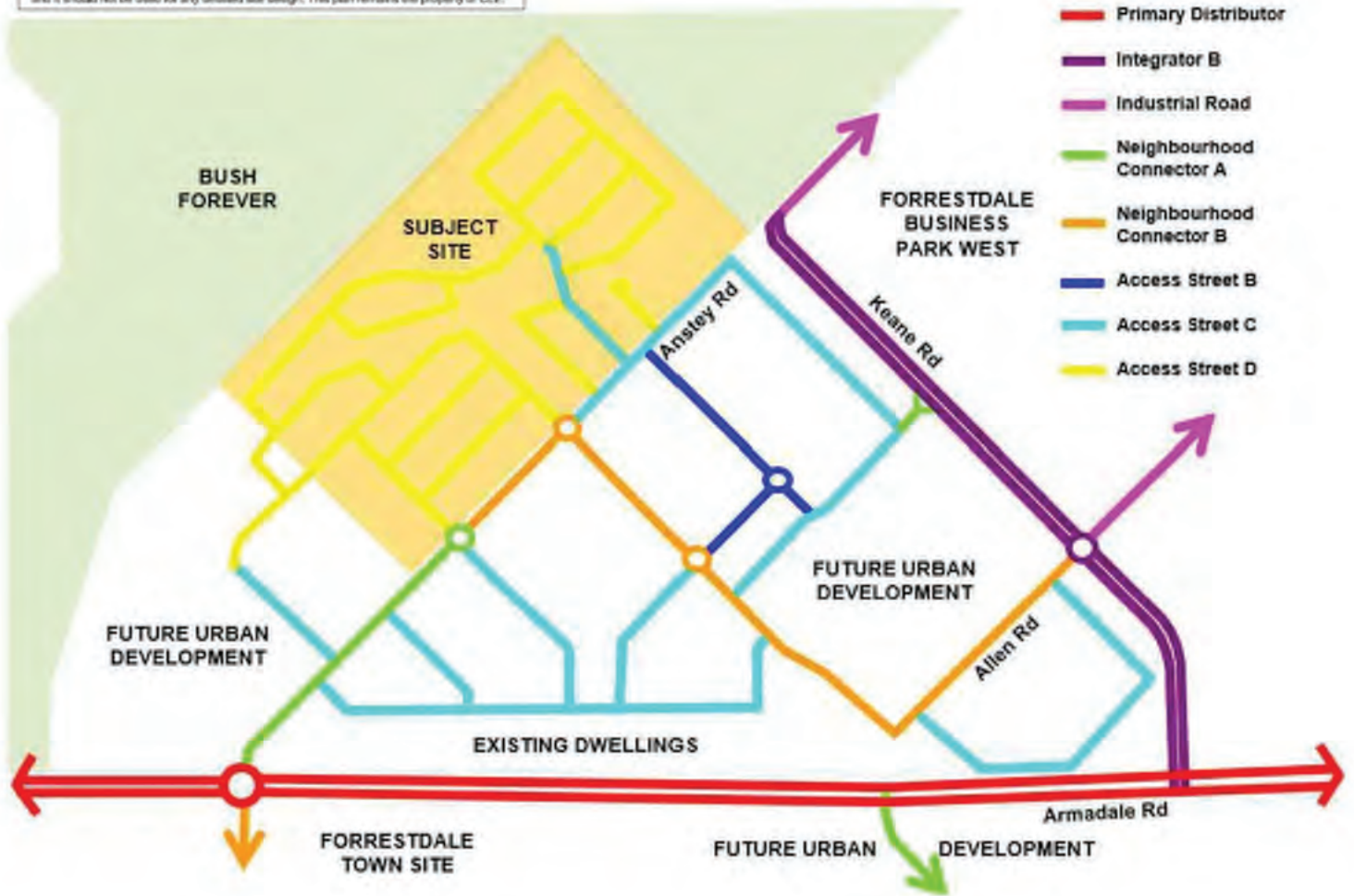
A comprehensive Transport Assessment Report has been prepared by Transcore traffic engineers (Appendix 5). The following section discusses the key elements of the Assessment, including existing and planned movement network, road hierarchy classification and an overview of the cyclist and pedestrian network.

#### 3.5.1 Existing Movement Network

The Structure Plan is supported by a regional road network that allows for good connections to local, district and regional destinations. Key aspects of this existing road network surrounding the Structure Plan area are:

- Armadale Road is reserved as a Primary Regional Road under the MRS and is classified in the network as a Primary Distributor. It is the main district and regional road connection for the site.
- Anstey Road abuts the eastern edge of the Structure Plan and is classified as an Access Street, providing local access to the area linking to Armadale Road to the south and Ranford Road to the north.
- Keane Road is an Access Street linking Anstey and Armadale Roads. This portion of Keane Road is constructed as a single carriageway, two-lane rural road while the section of Keane Road between Anstey and Skeet Roads (abutting the northern boundary of the Structure Plan) is unconstructed.
- A 4-arm roundabout, comprising two through lanes in each direction, is constructed at the Armadale Road/Anstey Road/Weld Street intersection to the south of the Structure Plan.
- Public bus service 519 connects to Murdoch Train Station and runs along Armadale Road, approximately 600m south of the Structure Plan area, providing an hourly service Monday to Friday with more frequent services in the peak AM and PM periods.
- A 1.5m wide footpath is located along the southern side of Armadale Road from Nicholson Road to Weld Street, turning into a 3m wide shared path continuing on the eastern side of Weld Street.
- Anstey Road and Keane Road (between Nicholson and Armadale Roads) are considered a good riding environment in accordance with Perth Bike Map series (Department of Transport; 2009).

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Source: Transcore



### 3.5.2 Proposed Movement Network

#### Road Network

The road network reflects the principles and standards of Liveable Neighbourhoods and has been designed to provide a permeable and legible movement structure. Road alignments also reflect the constraints imposed by surrounding land uses and are influenced by the location of the DBNGP easement through the site.

The Transcore Road Hierarchy Plan shows the hierarchy of the movement network planned for the area and the external connections to the existing network (Figure 11: Road Hierarchy Plan). The road network has been planned and modelled on known and forecast traffic volumes and will be refined further at the time of subdivision to relevant City of Armadale standards.

The traffic modelling incorporates the overall urban growth anticipated for the area, as identified in the Southern River/Forrestdale/Wungong/Brookdale District Structure Plan and Perth and Peel@3.5million, showing an indicative network passing through the land subject to MRS Amendment 1321/57, with connections onto Keane Road.

It is important to note that the planned road network, as shown on the Local Context Plan (Figure 8), includes two local access street connections to the adjacent lot 336. This land falls outside the Structure Plan area and will be developed by others, however, it was considered important to recognise the eventual development of this land to establish a transparent and robust model.

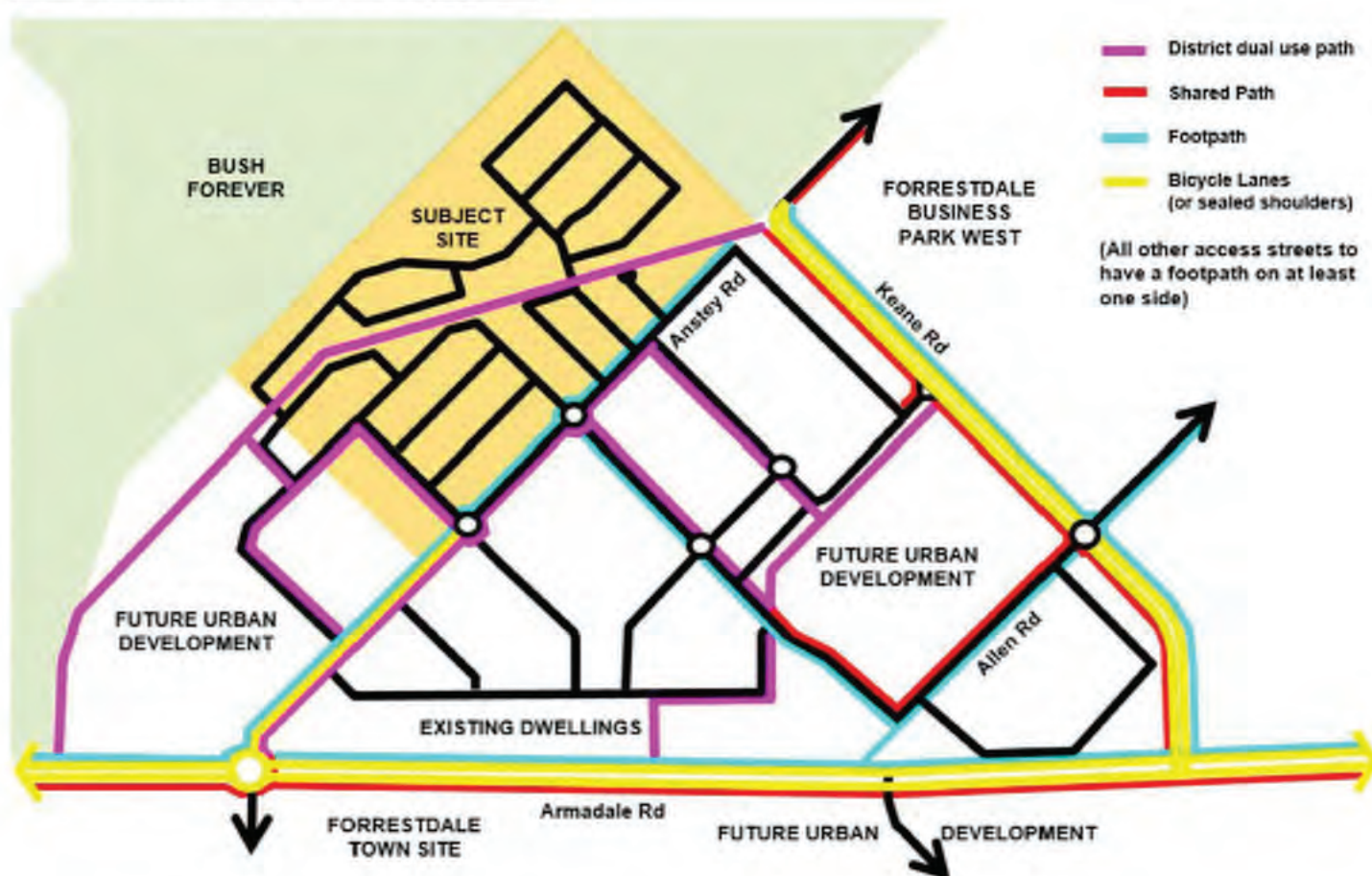
The key aspects of the planned road network are as follows:

- **Anstey Road** - Recommended to be reclassified as a Neighbourhood Connector A for approximately half of its length to the north of Armadale Road, within a reservation width of 23m. The remaining portion of Anstey Road abutting the Structure Plan area is to be reclassified as a Neighbourhood Connector B, and Access Street for the northern most portion.
- **Keane Road** (abutting the Structure Plan area) - To remain unconstructed following the decision of the OEPA to not support the Keane Road Strategic Link.
- **Access Streets** - These will range in width from 14.2 to 20m road reserves with the majority to be constructed as 15m road reserves with a 6m carriageway. Laneways shall be a minimum width of 6m to accommodate two way movements and rubbish collection.

The City has planned for Anstey Road to be terminated as a cul-de-sac at the northern end to prevent industrial traffic from the Metropolitan Redevelopment Authority's Forrestdale West Business Park Estate shortcutting through the residential area, to access Armadale Road.

This proposed local road network will be refined further at the time of subdivision.

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Source: Transcore

FIGURE 12: PEDESTRIAN AND CYCLIST FACILITIES

### Pedestrian and Cyclist Facilities

The Structure Plan provides an excellent level of accessibility and permeability for pedestrians and cyclists, both within the site and through connections to future urban development in the surrounding areas (Figure 12: Pedestrian and Cyclist Facilities).

The precise location and alignment of footpaths and shared paths will be determined in consultation with the City of Armadale as part of the detailed engineering stage following subdivision approval, and in accordance with the following key principles:

- Footpaths on at least one side of all access roads, constructed to a minimum width of 1.5 metres.
- Neighbourhood Connectors will be provided with paths to both sides, comprising a shared path at least 2m wide and a footpath.
- On-street cycle lanes to be included on Anstey Roads, in addition to the existing cycle lanes already along Armadale Road.

### Public Transport

It is common for development to precede public transport services as these are not provided until there is a critical population mass to demand and warrant such services. Presently bus route 519 connects to Murdoch Train Station and runs along Armadale Road. It is anticipated that this bus route will service the Structure Plan area along Anstey Road which is planned to Neighbourhood Connector B standard and will be capable of accommodating a public bus route.

### 3.5.3 Transport Network Analysis

#### Traffic Generation

Transcore have undertaken detailed traffic modelling for the road network proposed by the Structure Plan. It demonstrates that the network and associated reserve widths have the capacity to accommodate the expected traffic volumes right through to the ultimate development scenario by 2031. This is consistent with the long term planning horizon in Perth and Peel@3.5million, the Main Roads regional operation model and strategic transport modelling from the City of Armadale.

All vehicle movements fall within the acceptable limits outlined by Liveable Neighbourhoods for the respective road categories proposed by the Structure Plan.

Anstey Road, which is recommended as a Neighbourhood Connector A, is forecast to experience a maximum of 7,000 vpd for only a short section off Armadale Road (at ultimate development in the year 2031) but then to drop significantly to 2,400 vpd which is well within the acceptable limits set by Liveable Neighbourhoods.

It is important to note that the traffic modelling undertaken incorporates the overall urban growth anticipated for the area, as identified by the Southern River/Forrestdale/Wungong/Brookdale District Structure Plan and Perth and Peel@3.5million. This has ensured a transparent and robust model.



#### Armadale Road / Anstey Road Roundabout

The Structure Plan proposes safe and efficient access to the regional road network via Armadale Road.

A SIDRA intersection capacity analysis was undertaken for the Armadale Road / Anstey Road / Weld Street roundabout to the south of the Structure Plan area, using AM and PM peak hour flows at ultimate development (to the year 2031).

The analysis confirms that the existing roundabout (two-lanes each way) will operate satisfactorily within both peak periods, offering an excellent level of service.

In the longer term when regional traffic growth increases, Main Roads WA is planning to upgrade Armadale Road to three lanes each way which will require minor widening on the Anstey Road northern approach to two lanes. This will ensure a high level of service at this intersection in future years.

#### Internal Intersections

The precise nature and function of all internal intersections will be determined once the location and alignment of access streets has been finalised as part of the subdivision approval. All intersection spacing and treatments will be designed to accord with Liveable Neighbourhoods standards.

The SIDRA capability analysis carried out for the site confirms that uninterrupted traffic flows can be expected at all internal intersections during typical operating conditions.

### 3.6 Water Management

The Structure Plan has been designed based on practice urban water management principles by integrating stormwater detention and infiltration within areas of public open space, and creating spaces that support a range of activities without compromising their amenity or functionality.

In accordance with the WAPC's Better Urban Water Management guidelines, Hyd2o has prepared a Local Water Management Strategy (LWMS) (Appendix 6). It has been prepared in consultation with government agencies including the City of Armadale and reflects the approved District Water Management Strategy (DWMS).

The LWMS establishes key principles for the management of stormwater runoff and groundwater quality, with these principles to be refined and implemented as part of subsequent Urban Water Management Plans (UWMP), which will be prepared at the time of subdivision.

#### 3.6.1 Stormwater Management

The LWMS proposes stormwater management at both lot and estate scales in a manner that is consistent with water sensitive design practices:

- Soakwells on individual lots to manage the first 15mm of lot runoff;
- The first 15 mm runoff from roads to be managed close to source using open bottom soakwells, bio-retention areas, and vegetated infiltration basins within areas of open space;
- Larger events up to the 100 year event to be managed by retention and detention systems located within areas of public open space, including use of the DBNGP easement and wetland buffers for larger event storage and conveyance.
- Outflows from the development to be maintained consistent with the requirements of the Department of Water and Environmental Regulations Forrestdale Main Drain Arterial Drainage Strategy based on the existing flow regime of the site.
- Provision of regional flood storage associated with the Baileys Branch Drain (lot 552) in accordance with the Department of Water and Environmental Regulations Forrestdale Main Drain Arterial Drainage Strategy.
- Establishment and rehabilitation of wetland buffers.

### 3.6.2 Groundwater Management

A preliminary earthworks strategy has been prepared over the Structure Plan area in order to achieve suitable separation to groundwater. Minimum separation between finished lot levels of development and groundwater will be achieved by a combination of fill and subsoil drainage to protect against any post-development groundwater rise.

Local site conditions will determine the finished lot levels and fill requirements which will be established and reported during the UWMP stage, given the detailed engineering design involved.

### 3.6.3 Implementation and Monitoring

The LWMS sets the overall water management strategy for development within the Structure Plan area. It will be the responsibility of the developer to construct and maintain the stormwater drainage system in accordance with UWMP(s) to be prepared at subdivision stage.

Monitoring of groundwater levels and quality will be carried out on a quarterly basis for three year years, with samples being analysed for physical parameters, nutrients and heavy metals at a NATA accredited laboratory.

### 3.7 Activity Centres and Employment

The Structure Plan is located in close proximity to a number of existing and proposed activity centres and employment nodes, ensuring excellent accessibility to commercial services, and providing good opportunities to meet employment self-sufficiency targets.

The Armadale, Fremantle and Rockingham Strategic Metropolitan Centres are all easily accessible from the Structure Plan area, and offer employment opportunities and access to retail, commercial and community services. The Forrestdale town site, located immediately south of the Structure Plan area on Armadale Road provides future residents within the Structure Plan area with further community facilities.

In addition to these existing centres, the Structure Plan area is located to the south-west of the Metropolitan Redevelopment Authority's fast growing Forrestdale Business Park, a key employment generator for the area.

The Southern River/Forrestdale/Brookdale/Wungong District Structure Plan (DSP) identifies a Neighbourhood Centre east of the Structure Plan, while the City's Local Planning Strategy (2005) identifies two Local Centres in lieu of a single Neighbourhood Centre. The two Local Centres are forecast to accommodate up to 250m<sup>2</sup> and 600m<sup>2</sup> of retail floor space respectively and are likewise located to the east of the Structure Plan area to ensure centrality to their catchments.

The Structure Plan responds to these planned centres in providing a future residential population and ensuring vehicle and pedestrian access to these centres. This improves the retail catchment and commercial viability for these centres, increasing the likelihood of their early delivery as the area to the east develops.

### 3.8 Education

The Structure Plan is well serviced by existing and planned educational facilities. There are no educational facilities planned or required within the Structure Plan area.

The DSP has identified a public high school located approximately 2km north of the Structure Plan area within Harrisdale, with the existing Forrestdale Primary School located approximately 1km south both which will serve the Structure Plan area. St John Bosco College is a Kindergarten to Year 12 Catholic School located on Armadale Road, approximately 1km west from the Structure Plan area, providing a non-government school option for future residents.

In accordance with Liveable Neighbourhoods and based on the estimated yield of 320-340 lots, the Structure Plan does not constitute a complete school catchment. As the locality develops it is envisaged that any additional school that may be required to be located within the broader Anstey Road Precinct.

### 3.9 Infrastructure Coordination, Servicing and Staging

The following section summarises the engineering considerations in the Engineering Servicing Report prepared by JDSi Consulting Engineers (Appendix 7).

#### 3.9.1 Earthworks Strategy

Key aspects of the earthworks strategy are:

- Import at least 1m of clean sand fill over the reactive clay materials to achieve a Class S classification and to provide adequate drainage for the site, or alternatively 1.8m of clean sand fill to achieve a Class A classification.
- Ensure a minimum separation distance of 1.2m between the Annual Average Maximum Groundwater Level and finished lot levels.
- Match into the ground levels found within the adjoining landholdings, including the Bush Forever site located to the north and west of the Structure Plan area.
- Provide allowance for the DBNGP which crosses the Structure Plan area, to maintain existing cover levels to the pipeline.
- Create finished levels within the Structure Plan area that accommodate gravity-reliant infrastructure to facilitate appropriate servicing (sewer and drainage).

#### 3.9.2 Waste Water

The Structure Plan area is included within the Water Corporation's existing catchment for the Balannup Sewer District in which sewerage will flow via a proposed DN150 gravity sewer network from the site to a planned Type 90 pump station located approximately 470m east, along Allen Road. The pump station will then discharge to the existing Westfield Waste Water Treatment Plant.

#### 3.9.3 Water Supply

The Structure Plan will be provided with reticulated water via the existing DN1400 Trunk main and a P250-12 reticulation main located within the Anstey Road reserve (which forms part of the Serpentine Canning Link Main), in addition to an existing DN500 steel distribution ring main which provides reticulated water network for the surrounding area and connects the system to Amadale Road.

#### 3.9.4 Power Supply

An existing 22kV overhead power line running along the northern side of Anstey Road will provide the electricity supply to the structure plan area. Power supply will be provided by the Southern River Substation, located approximately 4.5km from the site.

#### 3.9.5 Gas Supply

The Structure Plan area will be serviced via a DN300 high pressure main and a DN80 medium pressure main which are within the Anstey Road reserve. Atco Gas has confirmed that these gas mains have capacity to service the Structure Plan area once fully developed.

### 3.9.6 Telecommunications

The current Federal Government telecommunication policy identifies the National Broadband Network Company (NBN Co) as becoming the wholesale telecommunications provider for greenfield developments that exceed 100 lots.

The design and installation of 'fibre-ready' pit and pipe infrastructure will be undertaken at the cost of the developer with the installation of optic fibre to be provided by the NBN Co as development within the southern eastern corridor expands the fibre optic footprint, which is currently expected within 3 years. In the interim, access to the internet will be available through existing wireless broadband services.

### 3.9.7 Staging & Timing

The Structure Plan is relatively small and subdivision will be staged generally to ensure the efficient supply of infrastructure and to meet market demand. The first stage of development is proposed at this time around the Anstey Road entry, with sales expected to begin in early 2017. This is subject to subdivision design and approvals being in place.

The remainder of the area will be staged as demand grows, with the final lot release expected in 2019. This should be taken as indicative only and may be subject to change depending on market and other variables.

### **3.10 Development Contributions**

The Structure Plan is subject to contribution to the costs of common infrastructure in accordance with a Development Contribution Plan and Cost Apportionment Schedule prepared pursuant to Part 6B and Schedule 13B Development Contribution Plans.

### **3.11 Pipeline Corridor**

As discussed in Section 1.3.5, the Dampier to Bunbury Natural Gas Pipeline (DBNGP) runs north-east through the Structure Plan area protected within a 30m service easement.

The WAPC's Planning Bulletin 87: High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region (PB87) allows residential development to abut the service easement along this section of the pipeline without the need for a Qualitative Risk Assessment (QRA). Recent communications with DBP Transmission (the pipeline owner and operator) has confirmed that a QRA is not required as part of the Structure Plan.

Road reserves, public utilities and other infrastructure may be located within the pipeline easement. This will require the preparation and implementation of a QRA, however, this can occur at the time of subdivision. The Department of Lands (the pipeline easement owner) and DBP Transmission have both formally supported the Structure Plan under the premise that any works proposed within the pipeline easement (such as road crossings) will be subject to subsequent approval from the Department of Lands under the Dampier to Bunbury Pipeline Act 1997. This approval will be sought as a separate approval post-subdivision approval once the road network has been refined and defined. Supporting correspondence from the Department of Lands and DBP Transmission can be found in the JDSi Engineering Services Report.