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OUTLINE DEVELOPMENT PLAN - TUCKEY COVE - LAKE VISTA
PORTION OF LOT 9508 WANJEEP STREET, DUDLEY PARK

ENDORSEMENT PAGE

This structure plan is prepared under the provisions of the City of Mandurah Town Planning Scheme No. 3.

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

14 MARCH 2012

In accordance with Schedule 2, Part 4, Clause 28 (2) and refer to Part 1, 2. (b) of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

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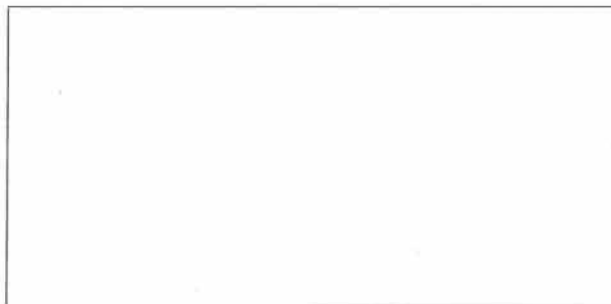
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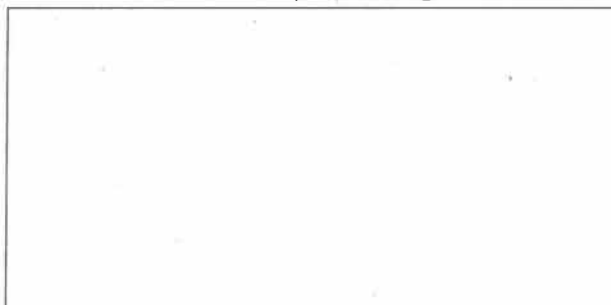
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2. Aboriginal Heritage Report
3. Traffic Volumes - Summary Criteria
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CHAPTER I INTRODUCTION

This report has been prepared in support of an Outline Development Plan (ODP) for portion of Lot 9508 Wanjeep Street, Dudley Park (the subject land) to facilitate future low and medium density subdivision and later residential development.

The land included within the ODP is approximately 23.75 hectares in area which comprises the un-subdivided eastern portion of the Tuckey Cove estate adjacent to and to the west of Wanjeep Street.

Earlier stages of the Tuckey Cove estate (643 lots) have been subdivided and developed at a very low density with a limited lot size range of 700-900m², which offers little or no lifestyle choice to the market. The landowner wishes to offer a range of lot sizes consistent with contemporary market demands and the range of lifestyles.

In order to achieve this, the landowner sought and gained the support of the City of Mandurah, to rezone the land from Residential R17.5 to Urban Development zone through Town Planning Scheme No.3 Amendment No. III. This was recommended for Final Approval by the City of Mandurah on 23rd February 2010. The Amendment is currently awaiting Final Approval by the Minister for Planning.

Within the Urban Development zone under the Local Town Planning Scheme, an Outline Development Plan (ODP) is required to be prepared in accordance with the Town Planning Scheme and approved by Council and the Western Australian Planning Commission. As such the ODP has been prepared in accordance with Clauses 4.9.1 and 4.9.4 and 7.11.

This report addresses the requirements of the City of Mandurah TPS3 and includes a description of the following matters:

- » Location of the subject land;
- » Examination of local, regional and state planning considerations;
- » Examination of environmental and cultural issues;
- » Examination of servicing and access requirements for the ODP area, and
- » ODP area issues and design objectives in the context of Liveable Neighbourhoods.



CHAPTER 2 DESCRIPTION OF SITE

2.1	Regional Location
2.2	Local Location
2.3	Cadastral Information
2.4	Existing Site Conditions
2.5	Acid Sulphate Soils
2.6	Contaminated Sites
2.7	Wetlands
2.8	Cultural

2.1 Regional Location

The subject land is located in the municipality of the City of Mandurah, 72 kilometres south of the Perth central area.

Figure 1 depicts the subject site in a regional context.

2.2 Local Location

The subject land is 2.3 kilometres from the Mandurah CBD and is located 380 metres (and east) of the Peel Harvey Estuary and 900 metres from the Serpentine River.

Figure 2 depicts the subject site in its local context.

2.3 Cadastral Information

Lot 9508 is legally described on 'Certificate of Title on Deposited Plan 54308 and on Certificate of Title Volume 2680, Folio 3'.

The subject portion of Lot 9508 is approximately 22.75 hectares in area, with a 1.067 metre frontage to Wanjeep Street to the east and a 55 metre frontage to Newport Drive to the west.

The subject land has a common boundary of 270 metres on the western side with Mariners Cove estate which has a residential base density coding of R25.

Refer to Figure 3 for a copy of the aerial photograph.

2.4 Existing Site Conditions

2.4.1 Current Use of Site and Surrounding Land Use

The subject site is currently a vacant land parcel located between the existing development (earlier stages of Tuckey Cove estate - fronting Sharperton Mr, Hokita Dve, Coquette Wy and Eglinton St) and Wanjeep Street.

A large proportion of the site has been previously cleared, preparatory to subdivisional works, based on a current approved, very low density (R17.5) subdivisional design.

There are a number of areas of remnant vegetation, through which sections have been cleared for future road reserves under the previously approved subdivisional designs.

Limited drainage and sewer infrastructure is also insitu in a number of areas of the subject land.

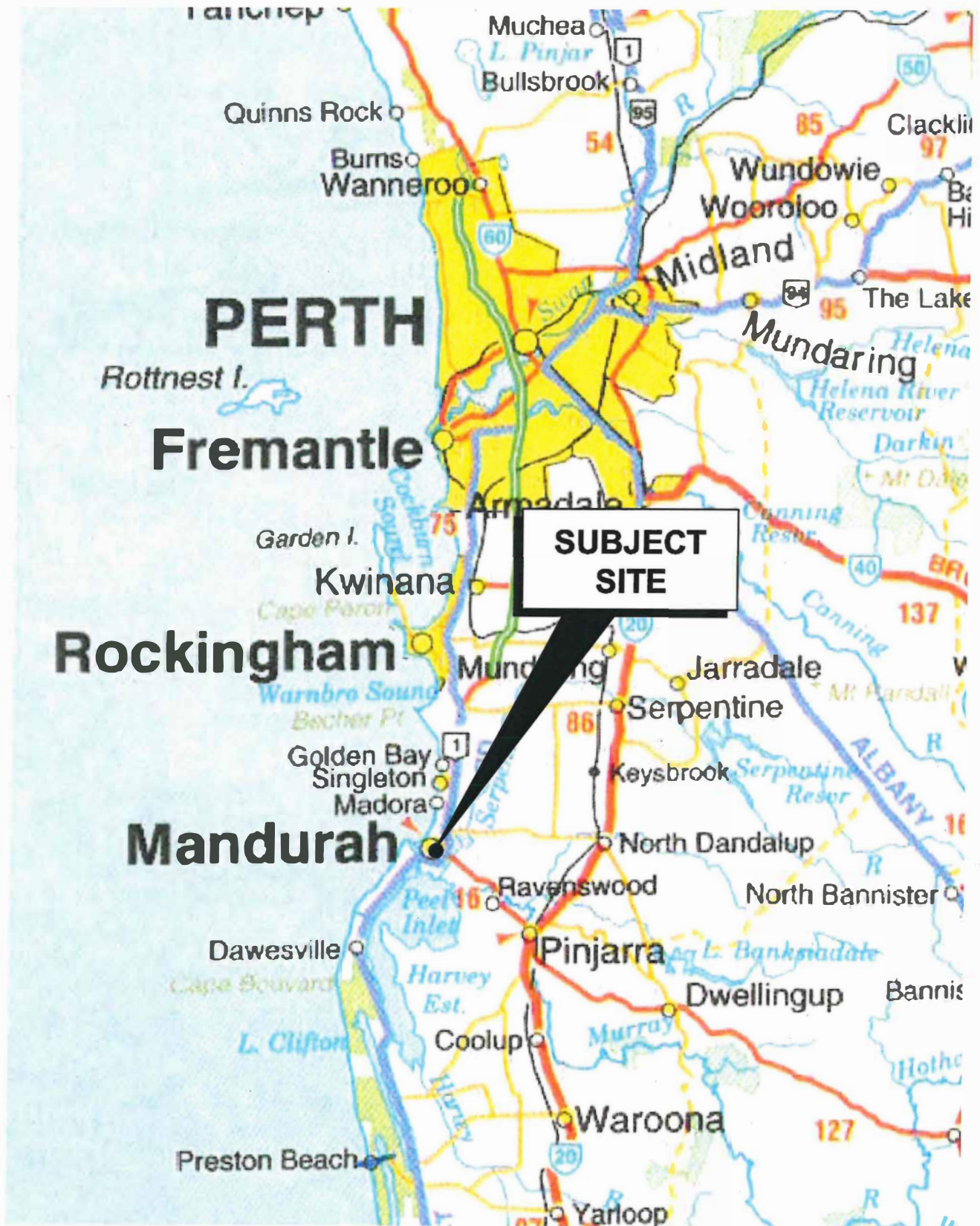


FIGURE 1 » REGIONAL LOCATION

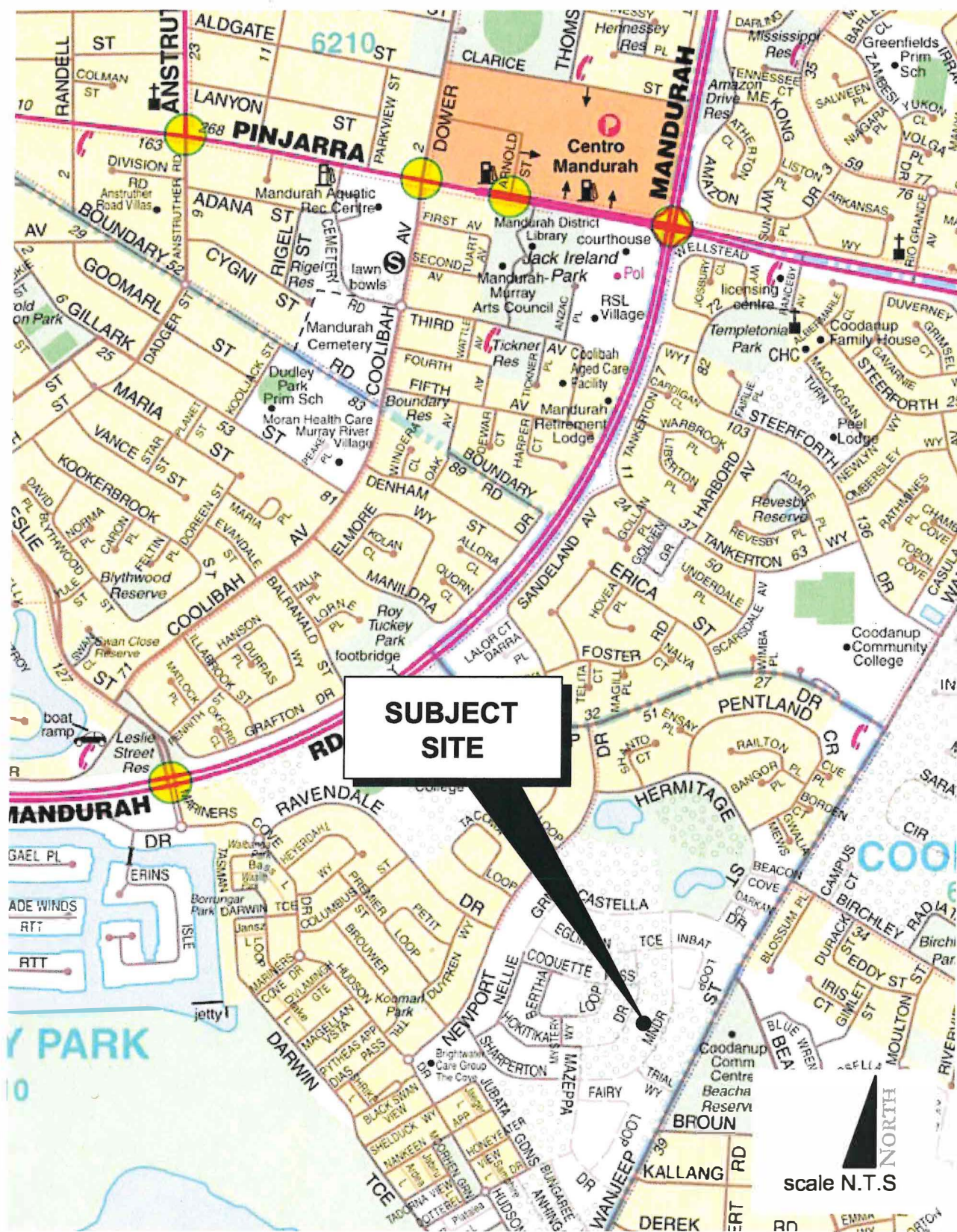


FIGURE 2 LOCAL LOCATION



FIGURE 3 » AERIAL PHOTOGRAPH

2.4.2 Topography

The subject land has a slight high point, comprising an east to west ridge running through the centre of the site at an elevation of 6m AHD. It then gently grades from the ridge between 1 and 2 metres to the northern (5m AHD) and southern (4m AHD) extents (respectively) of the ODP area.

Refer to Figure 4. Slope Analysis.

2.4.3 Flora

2.4.3.1 Vegetation Generally

Environmental consultants "Ecoscape" undertook a Spring Survey of vegetation and flora of the subject land forming part of a wider survey of all un-subdivided Tuckey Cove Estate land (Appendix I).

The assessment of vegetation on the site was consistent with a Level I Survey defined under the EPA's Guidance Statement No. 51 (2004). A site survey was conducted by Ecoscape on 21st October 2008.

Ecoscape concluded in respect of the subject land:

"Site_3(BaBmKgLOW) Banksia attenuata, B.menziesii Low Open Woodland over Kunzea glabrescens, Acacia pulchella Open Shrubland over Conostylis aculeatus Herbland (Plate_3). This site was made up of remnant vegetation patches interspersed between large cleared areas, the vegetation was in good condition with only minor weed invasion recorded. In total 52 vascular plant species were recorded on the site, including 14 introduced (weed) species. The floristics quadrat had 32 species recorded."

Ecoscape assessed vegetation condition in the context of the "Bush Forever Scale (Keighery 1994) on a sliding scale of:

1. Pristine
2. Excellent
3. Very Good
4. Good
5. Degraded
6. Completely Degraded

Ecoscape assessed the vegetation condition of the subject land as follows:

"At Site 3 the remaining vegetation ranged from very good to completely degraded with intact understorey and relatively low levels of weed invasion to cleared areas."

It should be noted that a significant proportion of vegetation classed as "Very Good", coincides with land at the western extremity of the subject land, already given up for Public Open Space purposes.

2.4.3.2 Threatened Ecological Communities

The Ecoscape analysis of the site was based on a desktop evaluation supplemented by a Level I Flora Survey and did not identify the existence on site of any Threatened Ecological Communities,

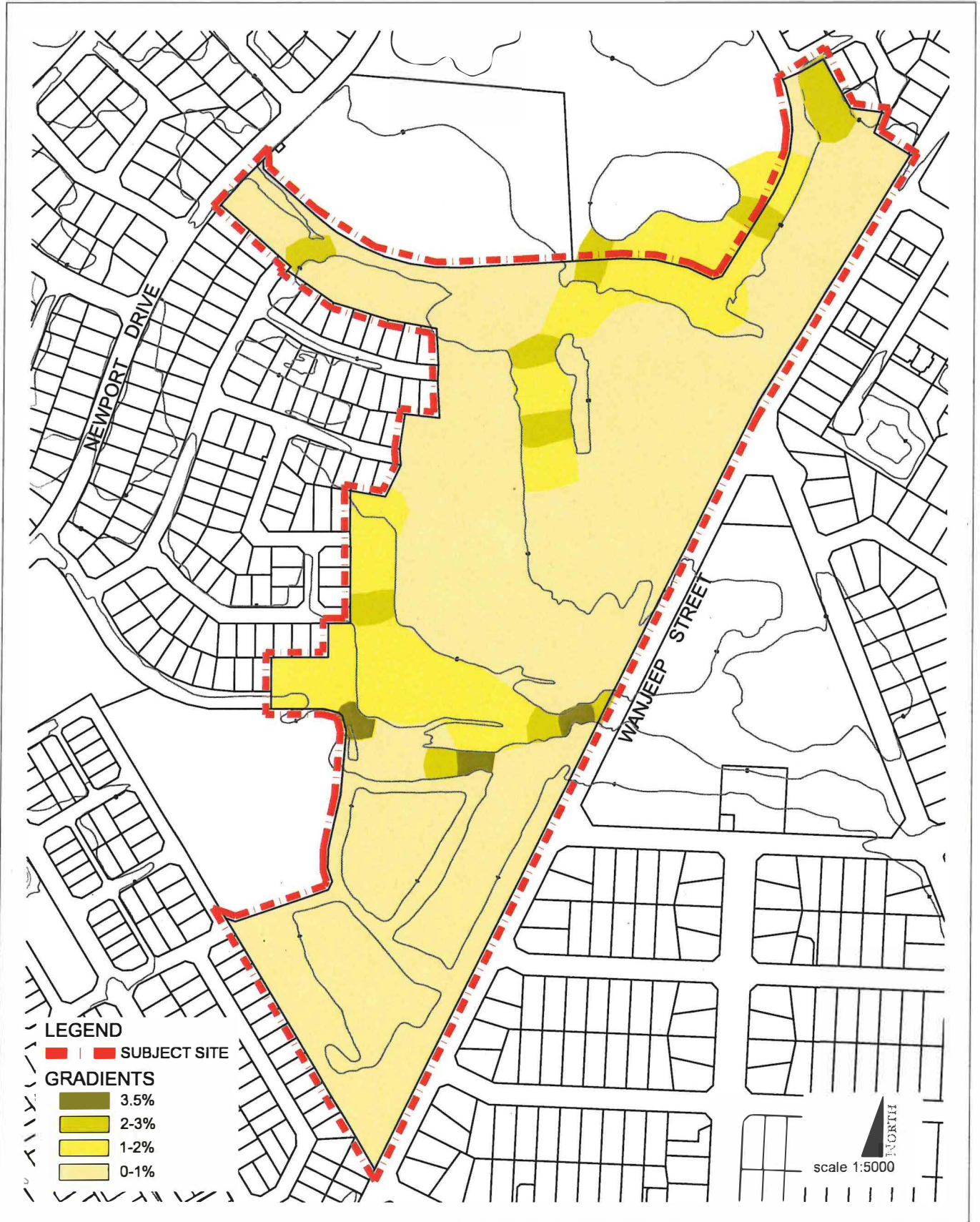


FIGURE 4 » SLOPE ANALYSIS

2.4.3.3 Declared Rare and Priority Flora

Ecoscape's desktop assessment was also supplemented by a Level I Spring Survey of the site and did not identify any Declared Rare or Priority Flora on the subject land.

2.4.3.4 Priority or Threatened Fauna

Ecoscape undertook a desktop assessment of the site through the DEC's Threatened Fauna Data Base and the Commonwealth Government's "Environment Protection and Biodiversity Conservation Act 1999", search tool.

The Ecoscape analysis of the site based on an desktop evaluation was further supplemented by a Level I Fauna consistent with the EPA's Guidance Statement No. 56. The Survey did not identify the existence on site of any Threatened Ecological Communities on the site.

2.5 Acid Sulphate Soils

The northern half of subject site is classified as "No known Risk" of Acid Sulphate Soils. The Southern half of the subject land is classified as "moderate to low risk" of Acid Sulphate Soils, occurring within 3 m of natural soil surface (or deeper)" on the WA Atlas Mapping system.

Revised Acid Sulphate Soils Planning Bulletin 64 (2009), focuses on Acid Sulphate Soils assessment and management as conditions of approval in areas designated as having "high to moderate risk". As a result of the site's classification no further testing of the site is warranted.

This is confirmed by previous Acid Sulphate Soils testing of the earlier stage of Tuckey Cove estate land (as conditions of subdivision approval). This did not detect levels of Acid Sulphate Soils, which warrant further investigation or management. To this extent, the Department of Environment did not recommend the imposition of Acid Sulphate Soils management conditions on the current subdivision approval, over the subject land.

As such Acid Sulphate Soils are not a constraint to subdivision or development of the land.

2.6 Contaminated Sites

A search of the Department of Environment and Conservation's Contaminated Sites Database does not indicate the presence of site contamination. The subject land is not therefore constrained in this regard.

2.7 Wetlands

The subject land does not contain any Wetlands reflected in the Department of Environment's "Geomorphic Wetlands of the Swan Coastal Plain" mapping system and is therefore not constrained in this regard.

2.8 Cultural

2.8.1 Aboriginal Heritage

During 1995, as a result of concerns relating to possible sites of Aboriginal Heritage for the Tuckey Cove area generally, a detailed and thorough Archaeological Survey and Ethnographic Survey was undertaken of the wider Tuckey Cove area. This was undertaken by qualified consultants MacDonald Hales and Associates (K Edwards & M Hammond) and included interviews and negotiations conducted with Aboriginal representatives nominated by the community.

The survey of the wider Tuckey Cove area (including the subject land), was conducted using a "series of parallel linear foot traverses, spaced at intervals of between 10 and 20 metres" (Edwards & Hammond 1995).

Further to this an Ethnographic Survey was undertaken which involved archival research, site inspections and interviews with Aboriginal Consultants (Winjan Aboriginal Corporation).

The survey and investigation concluded that there was one artefact cluster and one isolated artefact, recorded on now developed land in the vicinity of Heyerdahl Way approximately 850 metre west north west of and beyond the subject land.

A second 'small cluster' of three artefacts scattered over an area measuring approximately 6 metres by 4 metres, was located in the northern portion of the subject land. This is in the area abutting the future Primary School Site generally in the route of the Castella Drive Road Reserve, at the northern end of Nellie Green.

An extract of the Aboriginal Heritage Report is reflected in Appendix 2.

The Aboriginal Heritage Report notes that in relation to the second cluster:

"the three artefacts recorded at this location consisted of quartz, waste flakes (debitage) measuring less than 16mm in maximum dimension."

The Aboriginal Heritage Survey consultants note in their report that the:

"newly recorded artefact cluster (DPA-AC No 1) has been fully recorded with respect to its visible artefact component and environmental context. This artefact cluster is of a type well represented in the wider area (in terms of environmental context, assemblage, size and composition), and offers little further research potential."

Edwards and Hammond (1995 page 1) further concluded:

"Whilst the newly recorded artefact cluster and isolated finds are important in terms of addressing substantive research questions, on a regional scale this material must be accorded a low levels of archaeological significance for reasons of representativeness, research potential and site integrity."

It should be noted that based on the report and recommendations, the Western Australian Planning Commission has granted a number of preliminary subdivision approvals over the subject land, on the condition that the landowner consults with representatives of the indigenous community in relation to the site.

In 1995, the Department of Aboriginal Affairs, recommended that the landowner enter into dialogue with the Winjan Aboriginal Corporation as representative of the indigenous community in relation to Aboriginal Heritage issues.

The landowners, following consultation with the representatives of the Aboriginal Community, agreed to provide a plaque recognising and acknowledging that Aboriginal people had occupied the general area prior to European colonisation. Further to this the landowner agreed to provide funds to assist the Winjan Aboriginal Corporation in the construction of a "Billabong" at the corner of Wanjeep Street and Pinjarra Road.

At the completion of the process, the Winjan Aboriginal Corporation confirmed that the organisation had no objection to the continuation of subdivision of the wider Tuckey Cove site, subject to the provision of a plaque to be erected in the open space area to the east of the estate.

As such matters of Aboriginal Heritage for the sites, have been thoroughly investigated, with all appropriate consultations undertaken and as a result no impediment to the development of the subject land exists. Notwithstanding this, the identified artefact site (DP-AC No 1) is subject to Section 18 ("Consent to Certain Uses") of the Aboriginal Heritage Act 1972.

2.8.2 European Heritage

A desktop search of the Heritage Council of WA and Australian Heritage databases, indicates that the subject site is not identified as a place of European, National or State Heritage significance. The nearby Peel-Harvey Estuarine System is however listed on the Register of the National Estate.



CHAPTER 3. TOWN PLANNING CONSIDERATIONS

3.1	Statutory
3.2	Policy
3.3	Strategic

3.1 Statutory

3.1.1 Zoning

3.1.1.1 Peel Region Scheme

The subject land is zoned "Urban" under the Peel Region Scheme.

Refer to Figure 5.

3.1.1.2 City of Mandurah Town Planning Scheme No. 3

The subject land is currently zoned Residential Zone R17.5, however is the subject of proposed City of Mandurah Town Planning Scheme No.3, Amendment No III, which proposes to rezone the land from Residential R17.5 zone to Urban Development zone.

The City of Mandurah recommended Amendment III for Final Approval by on 23rd February 2010. The amendment is now with the Western Australian Planning Commission and the Honourable Minister for Planning for Final Approval.

The amendment was intended to *"facilitate residential density mixes compatible and consistent with those in adjacent Outline Development Plan areas specifically Frasers Mandurah and Mariner's Cove Outline Development Plan."*

Within the Urban Development Zone of Town Planning Scheme No.3, preparation of an ODP is required. Specifically, Clause 4.9.1 of the Scheme specifies the intent of the Urban Development Zone as follows:

"4.9.1 Purpose and Intent of Zone"

"The intent of the Urban Development Zone is to provide for future residential and urban related development after comprehensive planning of the relevant areas has been carried out resulting in an approved Outline Development Plan. The Outline Development Plan shall conform with any Structure Plans or Guide Plans, any Planning Policies and Retail Structure Plan adopted by Council and the Western Australian Planning Commission. Where no Outline Development Plan exists the following Use and development standards shall apply. Land uses that are likely to adversely affect the potential for urban development shall not be permitted (e.g. uses that require the intensive use of pesticide or other chemical)."

Amendment III is therefore intended to facilitate the preparation and adoption of the Outline Development Plan by the City of Mandurah.

Town Planning Scheme No. 3 Clause 7.11, in addition to defining requirements for preparation and the contents of Outline Development Plans, also defines the requirements for Technical Guidelines. The Technical Guidelines provide servicing, land use and development requirements for the land, the subject of the Outline Development Plan.

Earlier stages of Tuckey Cove estate to the north are coded R17.5. Land in the adjacent Mariners Cove Outline Development Plan area (to the west) has a base residential density code of R25.

Land in Coodanup east of Wanjeep Street is zoned Residential with density codes ranging from R12.5/20 to R25. Land in adjacent Frasers ODP includes densities from R20 to R60.

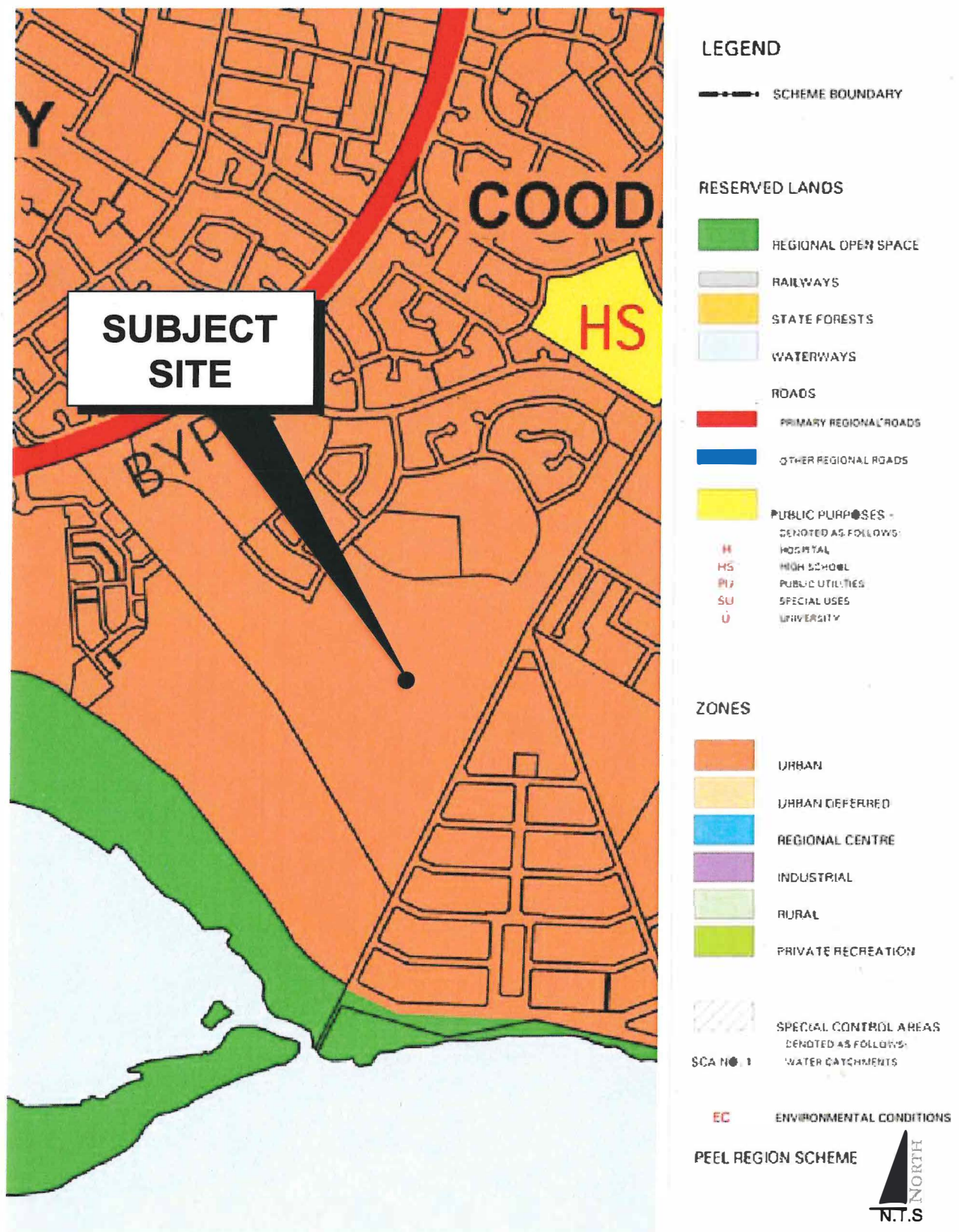


FIGURE 5 » PEEL REGION SCHEME

3.2 Policy

3.2.1 Statement of Planning Policies

3.2.1.1 Statement of Planning Policy Peel Harvey Coastal Plain Catchment SPP 1

The general policy objectives as outlined under the Peel Harvey Coastal Plain Catchment Policy are focused on improving and balancing the social, economic, ecological, aesthetic and recreational management and potential of the Peel-Harvey Coastal Plain Catchment.

The Policy seeks to minimise the export the export of nutrient (primarily phosphorous) from land use and development within the catchment, to the district drainage network. It deals in particular with phosphorous discharge arising from subdivision and development of land and requires that this should not exceed pre-development levels.

The Policy includes onsite detention of storm water for prescribed periods and onsite infiltration. The management and treatment of storm water within the ODP, will be generally consistent with that employed under previous subdivision designs. This is because there is existing drainage infrastructure in place in the vicinity and is dealt with in greater detail in the servicing component of the ODP Report by VDM Consulting (Section 4.2).

3.2.1.2 Urban Growth and Settlement – SPP 3.0

The intention of Statement of Planning Policy No. 3 – Urban Growth and Settlement, is to set out principles and considerations which apply to the planning and management of urban growth and settlement.

Key objectives of the policy are based on the development of sustainable communities, in which land is developed based on a number of considerations, including, environmental capability, employment opportunity, provision of adequately serviced land and accessibility to community services.

As discussed in Sections 4.1.1 to 4.1.7, the ODP area can be serviced with all essential infrastructure through simple extension of existing infrastructure available on adjacent land and there is existing capacity within the existing infrastructure.

Future residents of the subject land will have access to community infrastructure available at the local, district and regional levels. That is neighbourhood activity centre facilities will be available either at a Neighbourhood Centre (or an alternative location) at the intersection of Coodanup Drive and Mandurah Road. This Centre is reflected in an ODP currently being considered by Council. District level services are provided at Halls Head Centre located 3.6km to the west and Regional facilities are available 2km to the north.

Potential employment local sources for the subject land are the future Primary School site abutting the subject land, the proposed future Neighbourhood Centre at the corner of Coodanup Drive and Mandurah Bypass. In addition (based on national levels) it is likely that 12% of dwellings will accommodate home base business of some description. At the wider district level employment opportunities will exist at the Mandurah Strategic Centre, Gordon Road Light Industrial Area and Mixed Business area and various educational and administrative institutions within the Mandurah and Pinjarra Urban areas.

Furthermore future employment opportunities will also be generated in the growth of commerce in the City Centre and the Nambeelup Industrial Estate.

Employment opportunities are further quantified in Section 5.8 (to follow).

3.2.1.3 Liveable Neighbourhoods (2007)

"Liveable Neighbourhoods" (LN) is a State Government's operational policy guideline for the design and assessment of structure plans and urban subdivisions. The philosophy of the LN, is based on increasing residential densities within walkable catchments of both Neighbourhood and District centres, and to increase the connectivity between centres by situating them in areas of high accessibility and along key transport routes. *Liveable Neighbourhoods* essentially supersedes the Development Control Policies of the Western Australian Planning Commission.

Elements of LN are required to be addressed by Structure Plans, Outline Development Plans and Subdivision designs. The proposed ODP as discussed in Chapter 5 is consistent with the objectives principles and specific design requirements of LN.

3.3 Strategic Planning

3.3.1 Regional

3.3.1.1 Inner Peel Region Structure Plan (Final Report 1997)

The subject site is identified as 'Urban' within the Inner Peel Region Structure Plan and the ODP proposal is therefore consistent with the current strategic classification, under the Structure Plan.

Refer to Figure 6 –Inner Peel Region Structure Plan Map.

3.3.1.2 Southern Metropolitan Sub-Regional Structure Plan and Urban Growth Management Strategy

The subject land is reflected as "Undeveloped Urban or Urban Deferred" under the Southern Metropolitan Sub-Regional Structure Plan.

It is reflected as an "Area under Detailed Investigation for Development and/or Protection" under the "Urban Growth Management Strategy". The ODP is therefore consistent with this Strategy.

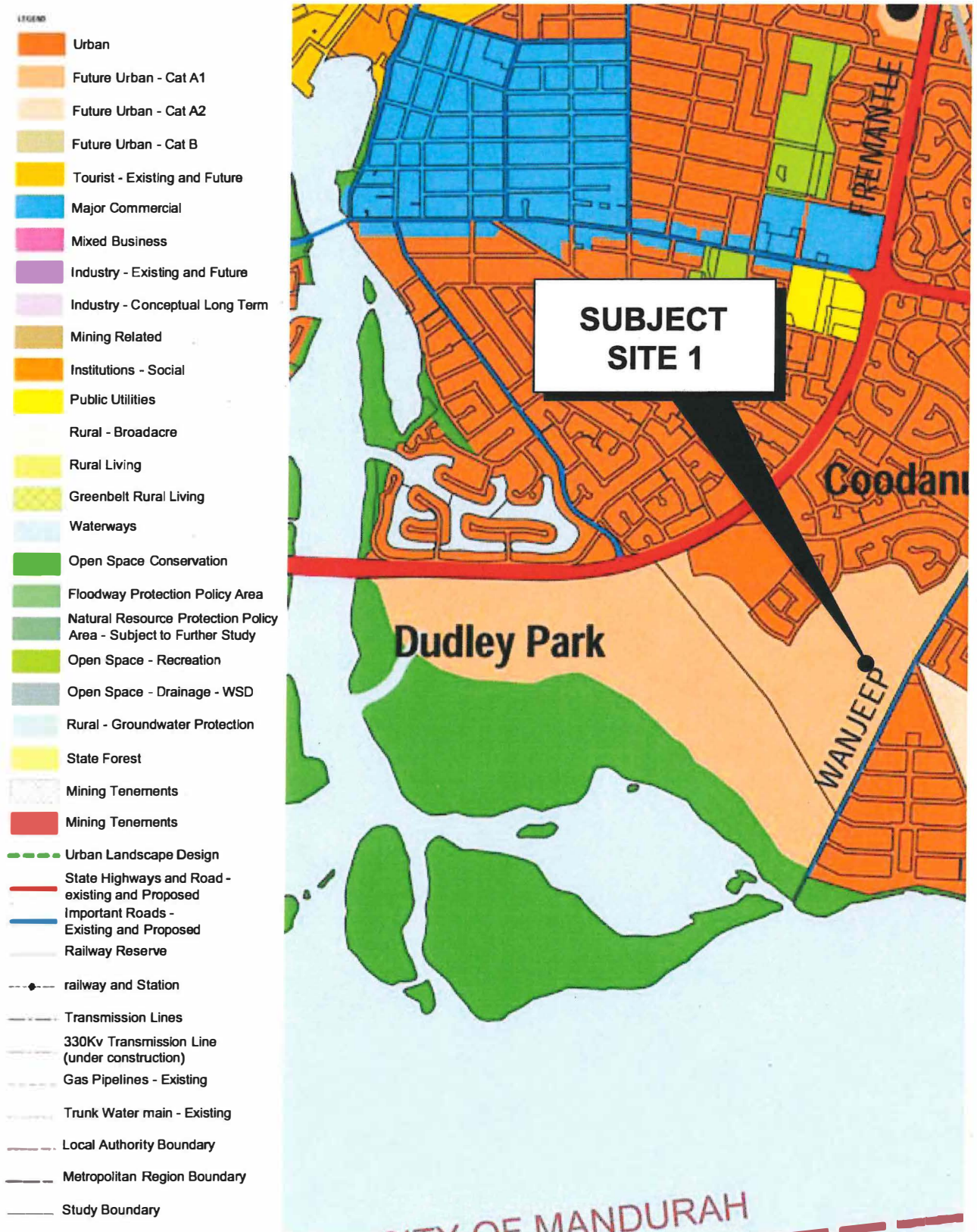


FIGURE 6 - INNER PEEL REGION STRUCTURE PLAN



CHAPTER 4 ENGINEERING AND SERVICING CONSIDERATIONS

- 4.1 Traffic and Access Considerations
- 4.2 Existing Public Utilities and Infrastructure

4.1 Traffic & Access Considerations

The subject land's most convenient road access to the wider district and regional networks is via Wanjeep Street located along the south eastern edge of the ODP area. Alternatively a similar level of access to the wider road network to the north west, would be via Newport Drive and Coodanup.

Wanjeep Street carries 4610 vehicles per day (MRWA 1998/99) further north of the subject land. While this would be expected to increase over time, the traffic volume at the southern end (adjacent to the subject land) would be expected to be reasonably low as other than the estuary there are no other key trip generators or attractors to the south.

Existing Bus route 597 focused on Mandurah Centro and Mandurah Railway station is routed along Wanjeep Street.

Expected traffic volumes within the ODP area are discussed in Section 5.6.

4.2 Existing Public Utilities and Infrastructure

Engineering Consultants VDM, advise that existing public utilities are available to the site as discussed as follows:

4.2.1 Sewer

The subject land is able to be serviced by extending existing sewer connections to the north and south (refer Appendix 4 Servicing Report).

4.2.2 Water

The subject land is able to be serviced by extending existing water connections (refer Appendix 4 Servicing Report).

4.2.3 Gas

Natural gas is able to be provided to the site (refer Appendix 4 Servicing Report).

4.2.4 Telecommunications

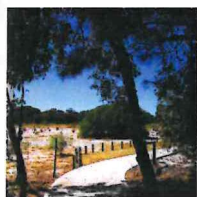
Telecommunication services area able to be provided to the site (refer Appendix 4 Servicing Report).

4.2.5 Power

Western Power infrastructure is able to be extended into the ODP area (refer Appendix 4 Servicing Report).

4.2.6 Drainage

The ODP site can be serviced by drainage following changes to existing institu infrastructure.



CHAPTER 5 PROPOSED OUTLINE DEVELOPMENT PLAN

5.1	Context
5.2	Design Objectives
5.3	Key Vistas and View Corridors
5.4	Density Targets
5.5	Land Use
5.6	Movement Network
5.7	Activity Centres
5.8	Employment
5.9	Lot Layout
5.10	Climate Responsive Design
5.11	Vegetation Retention
5.12	Public Parkland
5.13	Education

5.1 Context

The proposed ODP area comprises the un-subdivided balance of the Tuckey Cove Estate abutting Wanjeep Street in Dudley Park, over which there is a current subdivision approval based on a previous design, which predates the principles of “Liveable Neighbourhoods”. The ODP site abuts established earlier stages of the Tuckey Cove estate on the north western side.

Refer to Figure 7 - Outline Development Plan

The ODP area on the southern side abuts the existing R25 coded Mariners Cove ODP area, which provides a transition to the Peel Harvey Estuary from the subject land. The ODP site is also adjacent to existing older residential areas to the east of Wanjeep Street.

5.2 Design Objectives

The ODP design is intended to achieve strong visual connections between the future residential areas and established open space areas given up as part of earlier subdivision approvals of the Tuckey Cove Estate, or open space areas on adjacent estates.

In order to achieve this, where possible, road alignments terminate at established open space areas or have vistas which terminate at open space areas.

The ODP is based on an urban design principle which includes central avenue spine, midway along which is a significant roundabout, within which, will be constructed a landmark urban arts or similar feature. This will provide a strong landmark feature and identity to the estate and will also provide view corridors along the avenue to 2 open space areas at the northern and south western ends of the ODP area. The avenue treatment will include street trees of a consistent species, at a consistent spacing, planted in the verge to “frame” the view corridors and verge parking embayments (variegated) provided at a rate of 1 per 2 lots.

It is proposed under the ODP, to preserve significant verge vegetation along Wanjeep Street and respond to the different circumstances along the 1 kilometre ODP frontage to Wanjeep Street. This includes sections backing onto Wanjeep Street (mirroring the layout opposite), conventional frontage opposite existing open space area and Controlled Access Place (CAP) roads, opposite existing older style development.

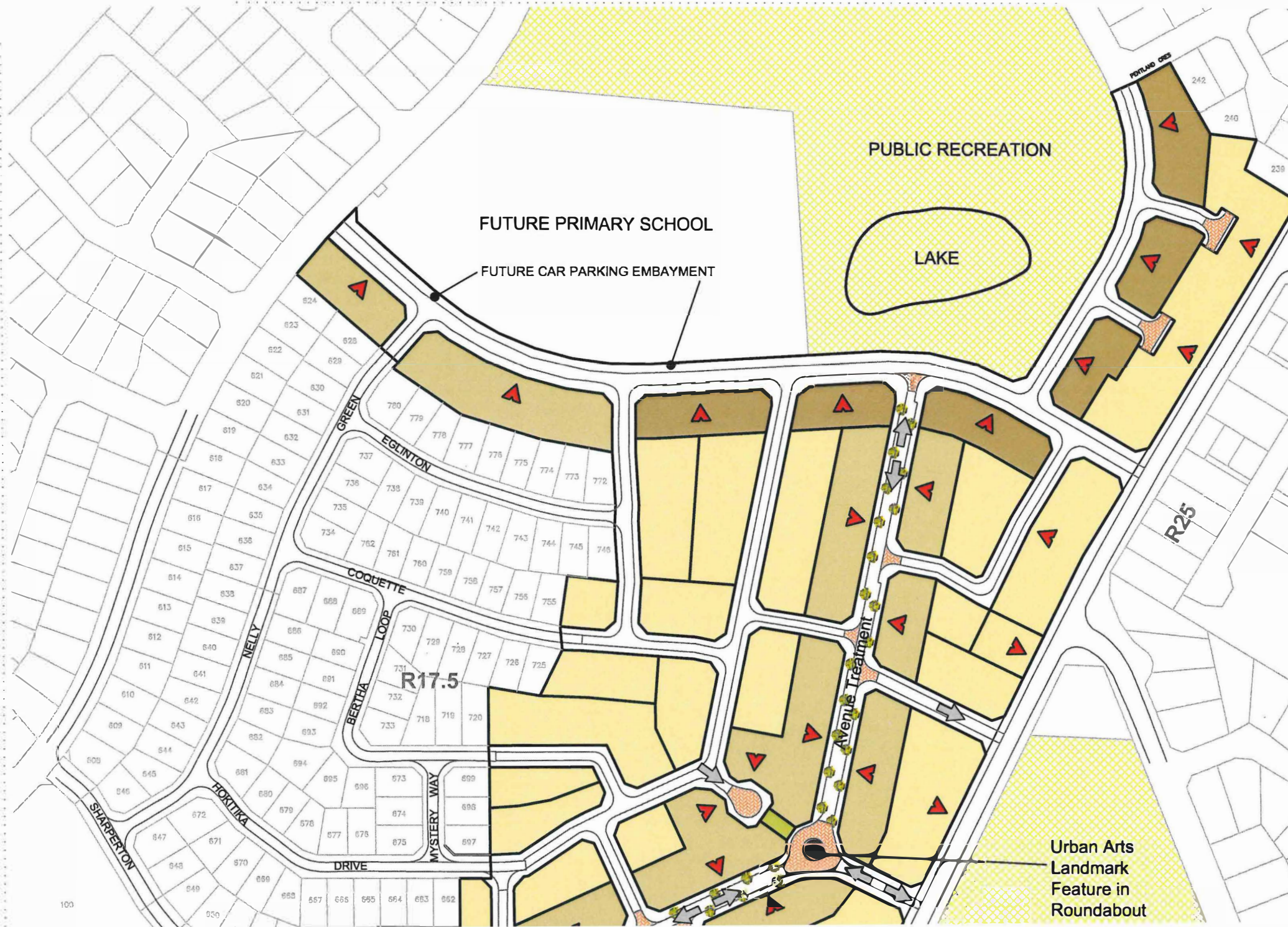
The design is also intended to preserve significant individual trees retained in earlier subdivision designs in addition to the Wanjeep Street frontage/verge where possible.

5.3 Key Vistas and View Corridors

There are 3 key open space areas abutting the ODP site which provide a strong landscape focus for the ODP area. These include:

- » Hermitage St Reserve (including artificial lake)
- » Sharperton St Reserve
- » Beacham Reserve

Refer Figure 9 – Key Vistas and View Corridors



FUTURE PRIMARY SCHOOL

FUTURE CAR PARKING EMBAYMENT

PUBLIC RECREATION

LAKE

R17.5

R25

Urban Arts
Landmark
Feature in
Roundabout



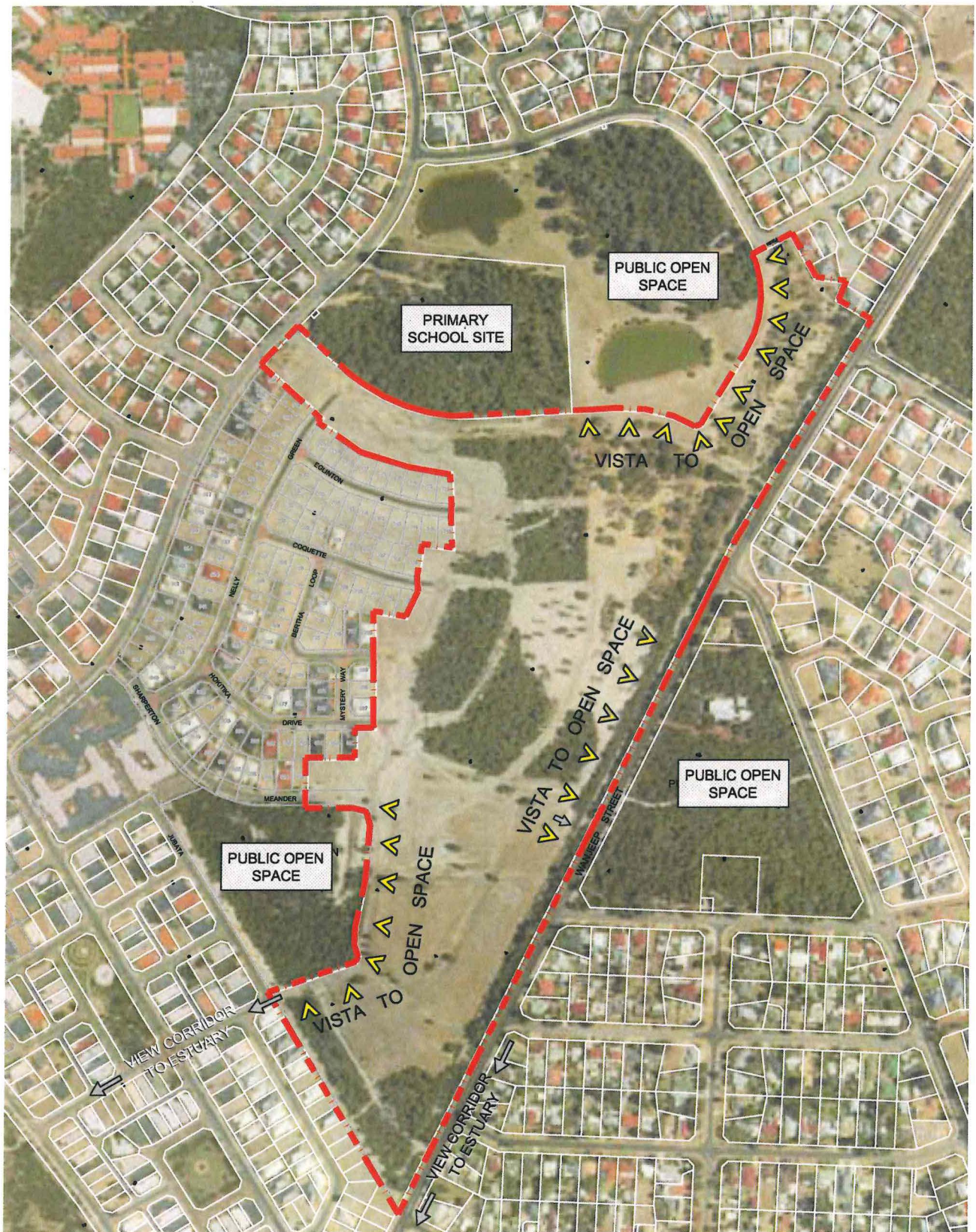


FIGURE 9 » KEY VISTAS AND VIEW CORRIDORS

The ODP Layout is intended to maximise access and vistas towards these key features.

5.4 Density Targets

Liveable Neighbourhoods requires a urban area density of "15 dwellings per urban hectare and an average of 22 dwellings per site hectare". This is reinforced under the Southern Metropolitan Peel Subregional Structure Plan. It is expected that at the densities proposed the dwelling yield for the ODP area would be 13.5 per urban ha and 20.1 dwellings per site ha.

The Outline Development Plan, proposes that the subject land be classified a combination of R20, in general terms with R25 development flanking a avenue which has a strong visual linkage to two existing significant open space areas at either end of the avenue.

R30 development will be focussed on the 2 existing significant areas of public open space to provide a vista from the medium density development.

The intention is to provide a range of housing and lifestyle choices within the wider Tuckey Cove area.

5.5 Land Use

Land Use within the proposed ODP area is summarised in Table 1 below:

TABLE 1 LAND USE BREAK DOWN

Use	Area (ha)	Total (% of area)
Residential		
R20	10.208	44.89
R25	3.9269	17.27
R30	1.9683	8.66
Sub Total	16.1032	70.81
POS	0.0208	0.09
Road	6.6159	29.09
Total	22.73	100.00

The mix of residential densities within the ODP area proposed (% of area) is as follows:

- » R20 64%
- » R25 24%
- » R30 12%

10% of the wider Tuckey Cove area has already been given up as Public Open Space and as such the Open Space area proposed to be given up as part of the ODP is for landscape rather than recreational purposes in order to provide the necessary view corridor and pedestrian connectivity.

5.6 Movement Network

Expected Traffic volumes identified for the ODP area (generate by the ODP area) are reflected in Figure 11 and are based on summary criteria contained in Appendix 3.

It is expected that development from within the ODP area will generate approximately 2550 vpd on future Castella Drive, which provides access to the future Primary School. Previous designs for Castella Drive proposed a road reserve width of 20 metres and this is similarly reflected in the ODP. This would be classifiable as Neighbourhood Connector B under LN.

Development of the ODP area is expected to add approximately 1400 vpd and 720 vpd to the northern and southern sections respectively of Wanjeep Street. As discussed earlier, Wanjeep Street, further to the north, carries approximately 4600 vpd

The central spine avenue is expected to carry close to 1000 vehicles per day (vpd) at its northern end close to the Primary School. In order to accommodate parking embayments and footpaths and avenue planting in the verge, a road reserve width of 18 metres is proposed (consistent with Access Street B under Element 2 of LN).

A road cross section of the central avenue road is reflected below in Figure 8.

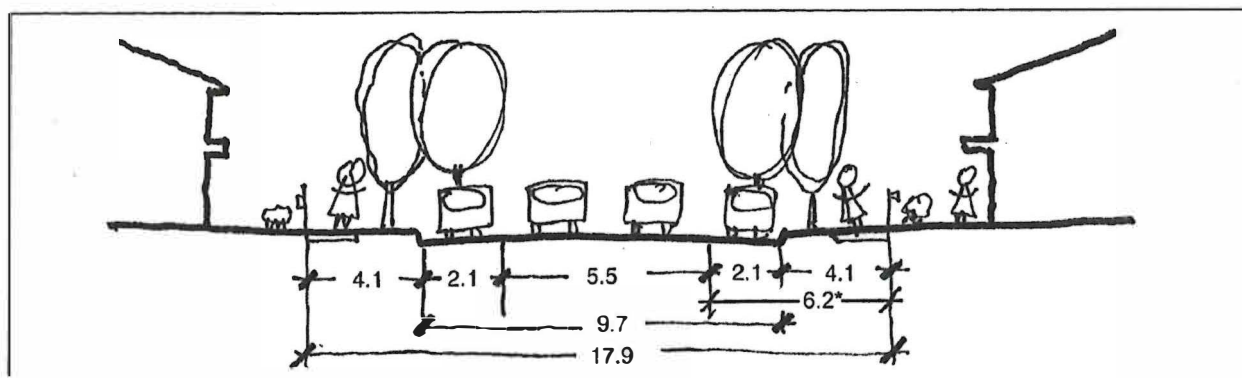


Figure 20: Access street B – wider access street Target speed 40 km/hr (< 3000 vehicles per day).

Wider access street suited to higher density residential areas (typically R30–R40+, or where dwelling density is greater than around 1 per 250 m²) with higher parking demand. Extensive parking, no bike lane, no buses, trees in verge, with additional trees in parking lane if required.

FIGURE 10 » CENTRAL AVENUE ROAD CROSS SECTION

Other streets carrying less than 1000 vpd are proposed at reserve widths of 15 and 14 metres respectively, consistent with Access Streets C & D under Element 2 of LN.

All Left/Right and Right/Left staggered intersections have spacing of at least 20 metres consistent with Element 2 R19 of LN.

Street Block lengths range from 210 metres in the central section on the western side of the central avenue and others are generally in the vicinity of 110 metres to 160 metres. Some shorter street block length have been established adjacent to existing development on the western side of the ODP area to account for existing connections. This is also to provide staggered intersections which provide east to west connectivity to Wanjeep Street as the principal public transport bus route in the area.



Lot access to Wanjeep Street is via a combination of direct lot access directly opposite Beacham Reserve to take advantage of the natural outlook and controlled access places south of Beacham Reserve to preserve verge vegetation opposite older style housing. North of Beacham Street, no direct lot access to Wanjeep Street is proposed as development on the opposing side backs onto Wanjeep Street.

No bus routes are proposed through the area (other than those which will serve the future primary school), however existing bus services are provided along Wanjeep Street, which is within 400 metres of the majority of the ODP area.

Footpaths will be provided in accordance with Council Policy and it is likely that this will include a path along Castella Drive and the proposed central spine avenue road. Pedestrian and cyclist access is promoted north to south and east to west, through a highly connected street network.

The road design of the road networks within the ODP focused on maximising views and access to Open Space areas at the perimeter of the ODP area (provided as part of earlier stages). The street alignment and network is intended to focus on the future Primary School to the north of proposed Castella Drive. Secondary education services are provided by Coodanup Community College approximately 500 metres further to the north of the subject land.

5.7 Activity Centres

The subject site, while not including a proposal for an Activity Centre, is within a reasonable distance of a small retail node at the intersection of Coodanup Drive and Wanjeep Street, and a proposed Neighbourhood Centre at the intersection of the Mandurah Road and Coodanup Drive. This is reflected in a proposed Outline Development Plan under consideration by Council.

Further to this, a commercial node is reflected in the in the Fraser's Outline Development area directly opposite the intersection of Coodanup Drive and Wanjeep Street. The ODP site is also located within 1.5 km of Mandurah Forum and 2.3 km of the Mandurah City Centre and 3.5 from Halls Head District Centre. The ODP site therefore has a high degree of accessibility to local, district and regional activity centres.

The relationship of the ODP site to existing and proposed activity centres in the vicinity is reflected in Figure 12.

5.8 Employment

The ODP site is expected to generate an additional population of 960 persons (330 lots x 2.9 persons/dwelling) and a Labour Force of 414 persons (43.3% based on SMSSP).

Based on a Employment Self Sufficiency target of 75% under the SMSSP, a total of 310 jobs would have to be generated locally to meet the target.

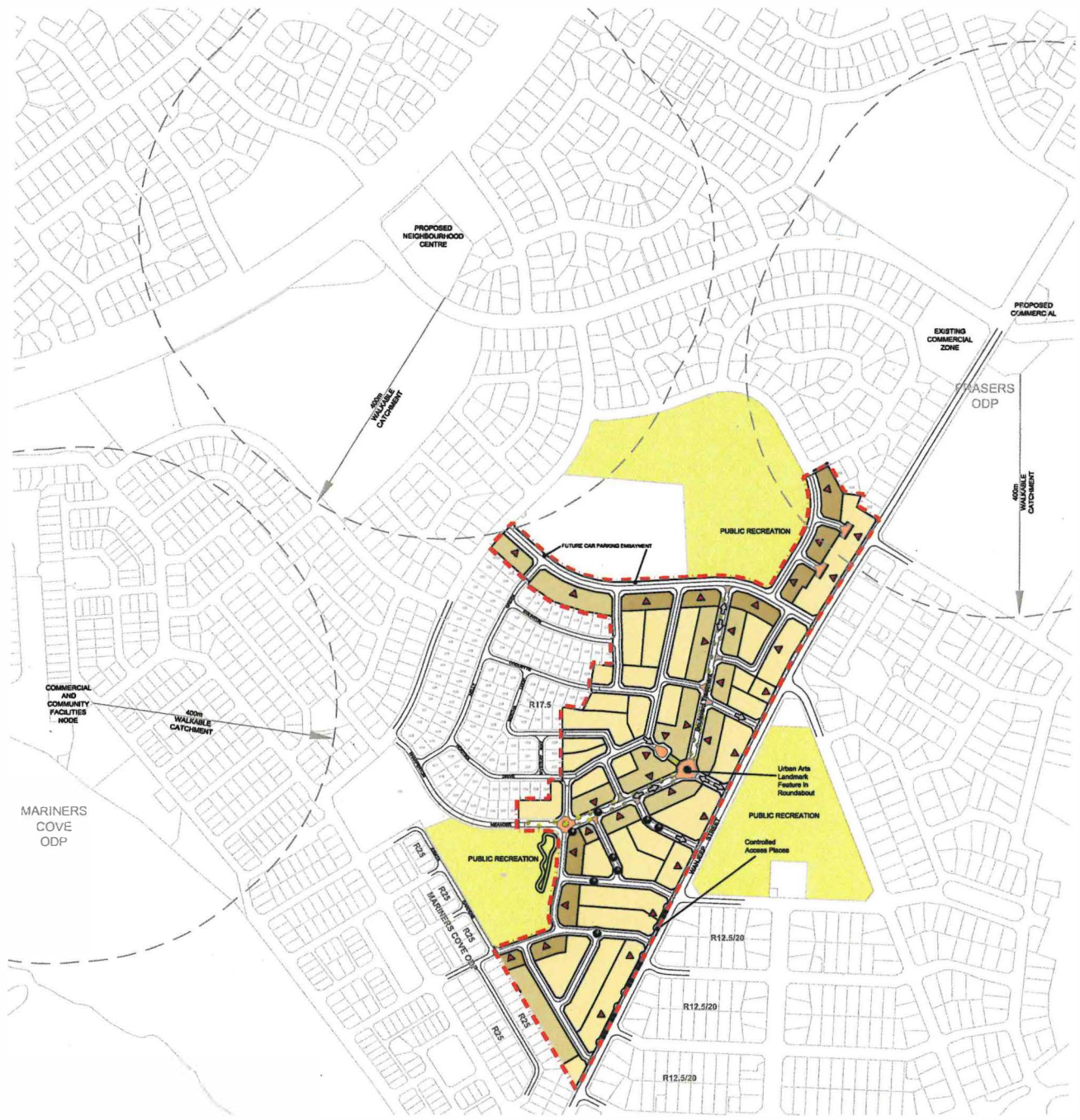


FIGURE 12 » SITE RELATIONSHIP TO ACTIVITY CENTRES

It is expected that the following jobs would be created within the immediate vicinity of the ODP area in the short to midterm:

Local Additional Employment Sources	Employment Rates	# Job
Primary School		
Teaching Staff*	26/School	26
Non Teaching Staff **	38% of teaching Staff	10
Proposed Neighbourhood Centre (Coodanup Drive)		
Retail ***	1 job/31.53m ² nla	79
Commercial ***	1 Job/49.65m ² nla	40
Home Based Business within ODP Area ****	12% of households	40
		195

*Commercial Land Use Survey (WAPC 1997)

**Australian Bureau of Statistics 2008

***National Report on Schooling in Australia 2008

****Extrapolated from ABS Statistic 2004 (i .e Nationally Home Based Businesses =865,000 & Dwellings = 7,402,000)

Therefore the number of additional local jobs to be created within the wider Tuckey Cove estate equates to approximately 47% of the expected labour force, or 63% (immediate area) self sufficiency.

Added to this are existing local employers (Coodanup College and Mandurah Catholic College) which could provide employment for future residents.

The City of Mandurah as part of it's "Southern City Strategy and Action Plan", includes the provision of employment generating land uses to achieve a target of approximately 75% self sufficiency which include considerable employment opportunities in the City Centre Precinct Area and surrounds only 2 km to the north.

5.9 Lot Layout

The mix of residential densities within the ODP area proposed (% of area) is as follows:

- » R20 64%
- » R25 24%
- » R30 12%

In general terms the R20 lots will range in depth from 32 to 38 metres with frontages from 13.5 to 17 metres.

The ODP R25 lots will range in lot depth from 28-30 metres with widths of 11.5 to 13 metres.

The ODP R30 lots will range in lot depth from 25-28 metres and widths of 10.5-11.5 metres.

5.10 Climate Responsive Design

The extent to which optimum orientation is able to be achieved to maximise passive solar design is determined to a large degree by the relatively narrow width of the balance of unsubdivided land comprising the ODP area and the alignment of Wanjeep Street at a bearing of 26 degrees.

LN no longer provides detailed guidance to optimum road and lot solar orientation although earlier versions provided optimum lot bearings. Liveable neighbourhoods instead refers to the desirability of achieving north south and east west road alignment in order to optimise the opportunity for passive solar design. The Australian Model Code for Residential Development (AMCORD), still however provides guidance for road and lot orientation. Specifically it recommends that in temperate areas, lot orientation should be provided in the range of bearings of 340 - 30 degrees or 70 - 120 degrees in order to create the potential for passive solar design.

The majority of lots are just within the outer edge of the optimum solar orientation range. Approximately 234 (71%) of lots are within the acceptable lot long axis orientation range specified under AMCORD for temperate regions.

Further to this, LN recommends for areas above the 26th parallel that the orientation of lots facilitate access by cooling breezes to provide cross ventilation of dwellings. While the subject land is not in the subtropical zone, channelling of summer sea breezes through the neighbourhood via the street network can be achieved particularly on road with a southerly or south westerly alignment. Various publications (Leung (2009) and Townsville City Council (2007) refer to the ability of roads to channel cooling breezes within + of - 30 degrees of the direction of the wind.

Where streets are perpendicular to the prevailing winds, cross ventilation of dwellings can be achieved through staggering the lots and dwellings (Chalermwat Tantasavasdi et al (2001) and Australia Department for Planning and Environment (2004) for Darwin (Northern Territory of Australia).

There is a strong emphasis within the ODP area on aligning the majority of roads in the vicinity of the direction of south westerly summer cooling breezes.

Refer Figure 13 for Climate Responsive Design.

5.11 Vegetation Retention

Much of the site has been cleared of vegetation to accommodate infrastructure as part of and consistent with previous subdivision approvals. Where clearing has occurred, individual trees have been preserved for inclusion within road reserves consistent with the previous conditions of subdivision approval. The ODP design seeks to preserve the majority of these individual trees, albeit within different design layouts.

As discussed in Appendix I there are also some portions of the ODP area site where areas of remnant vegetation remain.

Ecoscope concluded that in relation the ODP area (Site 3) that:

"at Site 3 the remaining vegetation ranged from very good to completely degraded with intact understorey and relatively low levels of weed invasion to cleared areas."

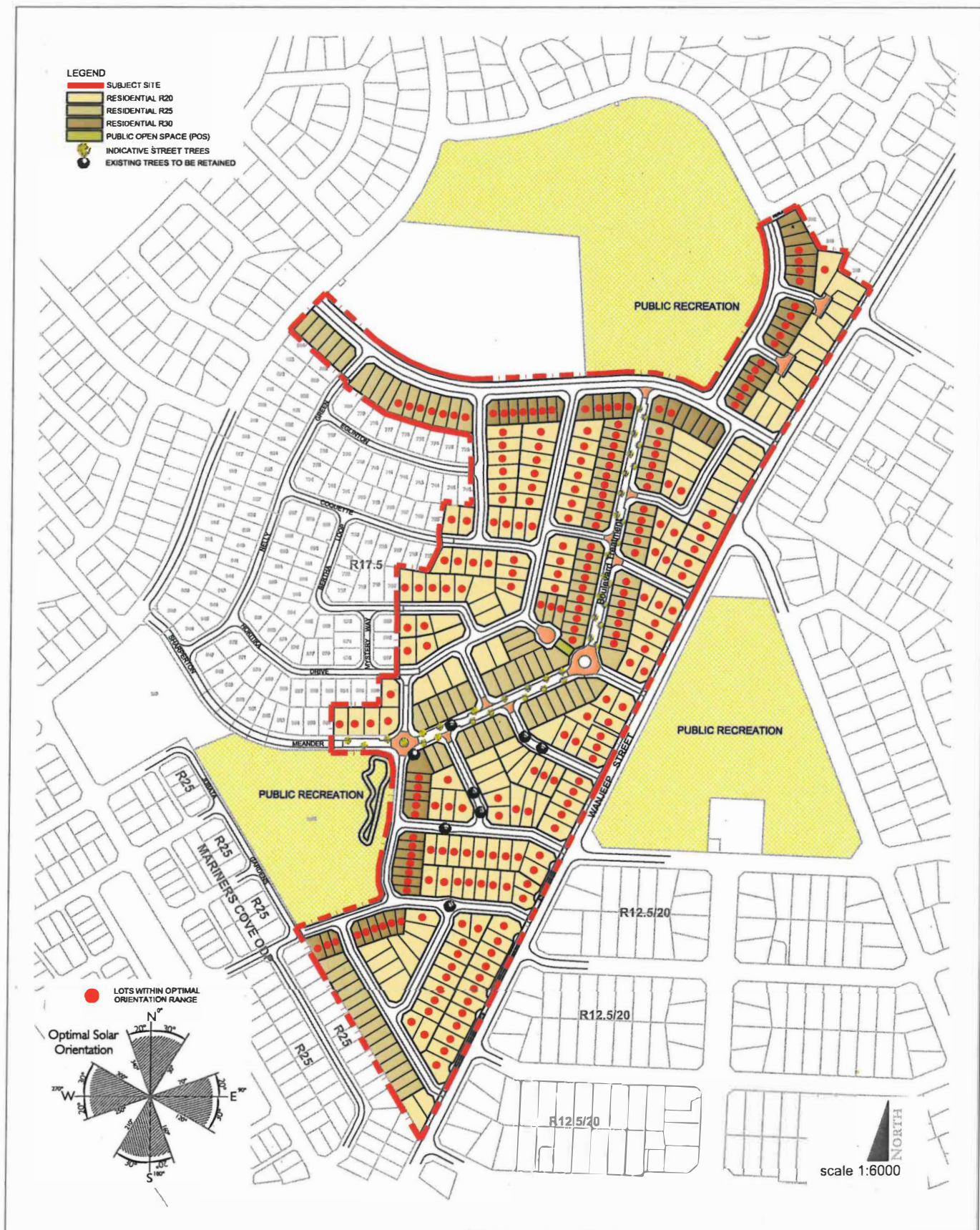


FIGURE 13 » CLIMATE RESPONSIVE DESIGN

It should be noted that Ecoscape in their flora assessment included an assessment of vegetation already given up a reserve for conservation purposes as part of previous subdivision approval for the site.

Ecoscape in their report concluded (following the field survey), that:

"No threatened flora species or Threatened Ecological Communities were located during the Field survey. The inferred Floristic Community Type (SCP 21a Central Banksia attenuate – Eucalyptus marginata woodland) is Well Reserved and Low Risk with 52 vascular flora Species identified on the remnant vegetation portions of the sites."

Ecoscape also further noted that in relation to the dominant vegetation community onsite:

"This community is Well Reserved and known from two or more A Class National Parks or Nature Reserves and a Conservation Status of Low Risk is one that does not qualify as Susceptible, Vulnerable, Endangered, Critical or Completely destroyed (Gibson et al. 1994)".

As such in those areas where there a group of remnant vegetation, individual trees will be preserved (where possible) in the subdivision process within road reserves. The subdivision design (if necessary) will be adjusted from the ODP layout in order to preserve individual trees.

In addition, it is appropriate to treat the Wanjeep Street frontage in such a manner, as to preserve verge vegetation, including the use of Controlled Access Places.

5.12 Pubic Parkland

Public Open Space has already been provided for the subject site at the rate of 10% of the residential subdivisible area, as part of earlier subdivision approvals.

This includes Reserve No. 49425 (3.0724 ha) fronting Sharperton Meander and Reserve No. 45575 (7.3473 ha), fronting Hermitage Drive and abutting the proposed Primary School site located on Newport Drive.

As 10% of the subdivisible are has already been ceded free of cost to the crown for the purposes of Public Open Space, there is no statutory requirement for further Open Space to be give up from the site. The ODP however reflects a minor area of additional Public Open Space to be given up as Public Open Space linking a short cul de sac to the central spine avenue. This is intended to provide a vista and a pedestrian connection from a road parallel and to the west of the proposed avenue towards the central "urban arts" roundabout and through to the Beacham Reserve on the eastern side of Wanjeep Street.

5.13 Education

The ODP area will be well serviced by educational facilities being within 300 metres (from the closest points within the ODP area) of the future Dudley Park Primary School, the existing Coodanup Community College and the Mandurah Catholic College (years K-12). The Department of Education have no short term plans to construct the primary school as existing schools are operating within capacity.

Tertiary Education opportunities are available locally from the Murdoch University Peel Campus, or via the Mandurah to Perth passenger railway to tertiary education institutions within the Perth Metropolitan Region.



CHAPTER 6 CONCLUSION

The Outline Development Plan represents a review of the densities and layout of the un-subdivided (easternmost) balance of land of the Tuckey Cove Estate.

It proposes a base density of R20 and an introduction of R30 coding to discrete areas overlooking internal Public Open Space areas provided as part of earlier subdivision approvals. R25 Density coding is focused along a avenue linking 2 major open space areas. This is to ensure that all areas of increased density have an outlook to area of open space to counter-balance the tighter built form streetscape of increase densities.

The street and street block layout is intended to provide the majority of streets within the ODP with a view corridor along the street, to one or more areas of open space in order to promote a natural outlook.

The ODP also proposes a strong landmark focus along a central avenue "spine" which includes a built form vertical landscape/landmark link between the open space areas to the north and the south of the ODP area. It also provides a visual link to the Beacham Open Space area to the east of the ODP area abutting Wanjeep Street.

The proposed street layout is intended to provide a permeable road network consistent with *Liveable Neighbourhoods*. It also includes a strong north to south road focus, to provide connection with the future Primary School and existing open space areas located to the north and south of the ODP area.

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