

Appendix 1a: Executive Summary for Bushfire Management Plan

1. Introduction

1.1 Proposal Details

Acumen Development Solutions, on behalf of Carabooda Landowners Pty Ltd, are seeking to progress a District Structure Plan (DSP) across 959.16 ha of land in Carabooda (hereafter referred to as the subject site (Figure 1). The proposed Carabooda Urban Precinct DSP will provide broad level guidance for future land use and development through subsequent planning stages, including scheme amendments, local structure plans, subdivision and development of land within the subject site. The Carabooda Urban Precinct seeks to create a master planned community with an estimated 9,221 dwellings, multiple activity centres, schools and amenities to support an estimated population of 21,000 residents (Figure 2).

The subject site is within a designated bushfire prone area as per the *Western Australia State Map of Bush Fire Prone Areas* (DFES 2024; Figure 3), which triggers bushfire planning requirements under *State Planning Policy 3.7 Bushfire* (SPP 3.7; WAPC, 2024a) and the associated *Planning for Bushfire Guidelines* (the Guidelines; WAPC, 2024b).

Western Environmental Approvals Pty Ltd (WEPL) was commissioned to prepare a Bushfire Management Plan (BMP) to support the DSP. This BMP has been prepared by Associate Bushfire Consultant Dylan Wray (FPAA BPAD Level 2 Certified Practitioner No. BPAD44656) and Senior Principal Bushfire Consultant Daniel Panickar (FPAA BPAD Level 3 Certified Practitioner No. BPAD37802).

1.1.1 Site context

The subject site is located within the City of Wanneroo and is predominantly zoned Rural Resource under District Planning Scheme No. 2 (DPS2) and Rural under the Metropolitan Region Scheme (MRS). The subject site comprises of unmanaged, classifiable vegetation, as well as market gardens, turf farms, limestone quarries and rural residential properties.

The subject site is bound by a Bush Forever Site to the east, Wesco Road to the south, Karaborup Road and Gibbs Road to the west and Carabooda Road to the north (Figure 1).

1.2 Purpose and Application of the BMP

This BMP has been prepared in accordance with SPP 3.7 and the Guidelines to support the assessment of the DSP for the subject site submitted to the Western Australian Planning Commission (WAPC).

In addition, this BMP provides strategies and guidance to reduce the level of bushfire risk exposure for the subject site through implementation of a range of bushfire management measures in accordance with the Guidelines.

1.2.1 Subsequent Planning Stages

The Guidelines acknowledge that specific details may not be known at the strategic level and that certain requirements may need to be considered at subsequent planning stages. This BMP provides a high-level assessment of the bushfire requirements relevant to the DSP and demonstrates how compliance with the bushfire protection criteria will be achieved at subsequent planning stages.

1.2.2 Limitations and Future BMPs

The subject site and surrounding land comprise of multiple private properties under different ownership. Permission to access to each private property was unable to be obtained, and the existing public road network only provides visibility over some of the properties within the assessment area. Consequently, the vegetation classification assessment in this BMP has been undertaken through a combination of desktop analysis and visual inspection from within the subject site, surrounding public road network and drone footage. This is discussed further in Section 3.

Given these limitations, a conservative approach was adopted for vegetation classification which likely overestimates bushfire risk. Future BMPs supporting subsequent planning stages will refine the vegetation classifications in this BMP and may result in reduced setbacks in response to bushfire risk and/or lower Bushfire Attack Levels (BALs).

Despite the limitations described above, the level of assessment undertaken is considered suitable for this strategic planning proposal and provides a platform for future planning stages and supporting BMPs to build on. The limitations are outside of the control of the developer, and we ask the decision-making authorities and referral agencies reviewing this BMP to exercise discretion in this regard.

Appendix 1b: Executive Summary for Economic and Employment Analysis

1 EXECUTIVE SUMMARY

This economic and social assessment has been prepared for Acumen to provide a rationale to support the ultimate objective of rezoning of the Carabooda site to Urban under the Metropolitan Region Scheme (MRS) and Urban within the City of Wanneroo Local Planning Scheme.

1.1 Proposed Development

Preliminary concept plans for the Carabooda Site (the Site) have identified primary and high schools, a District Activity Centre, a Neighbourhood Activity Centre, two Local Activity Centres and a significant amount of public social infrastructure and public open space, whilst preserving the vibrant natural landscape of the Site.

The plans have also identified the potential to develop approximately 9,221 residential lots and dwellings. Ratios from the City of Wanneroo have been applied to total dwellings to identify the potential population of Carabooda (Figure 1).

Figure 1. Estimated Lots, Dwellings and Population

Components	Quantum
Total Lots	9,221
Total Dwellings	9,221
Total Population	25,358

Source: Acumen 2023, ABS 2022, Pracsys 2023

The 25,358 residents at the Carabooda Site will generate a labour force of 13,453 people. Approximately 58% of the future labour force will work in population-driven industries (Figure 2). The remaining 42% of the labour force is assumed to demand strategic job opportunities.

Figure 2. Population-Driven and Strategic Job Demand

Indicator	Labour Force	Proportion (%)
Workers in Population-Driven Industries	7,861	58%
Workers in Strategic Industries	5,592	42%
Total	13,453	100%

Source: ABS Census 2022, Pracsys 2023

Pracsys' analysis has indicated this development will create population-driven employment opportunities at the Site and for the City of Wanneroo. The development would also provide the

workforce of nearby existing and potential future strategic employment zones a vibrant and well provided place of residence.

1.2 Local Employment Targets

The North-West Sub-Region has an employment self-sufficiency (ESS)¹ target of 59.5% for 2050, above the level estimated in 2011 of 49.2%². To increase the level of ESS in the area, the North-West Sub-Region needs to accurately plan the distribution of future population in proximity to strategic employment centres, such as the existing Yanchep Strategic Centre, Joondalup Strategic Centre and any potential future strategic zones.

The City of Wanneroo's Economic Development Strategy 2022 – 2032 sets out an ESS target of 60% by 2031. This target applies to the combined Cities of Wanneroo and Joondalup, and not to the City of Wanneroo alone. This is marginally greater than the 59.5% ESS target established by the North-West Sub-regional Planning Framework. For the purpose of this analysis, an ESS target of 60% has been assumed for the proposed Carabooda Site development (Figure 3).

Figure 3. Carabooda Local Employment Targets (60% ESS)

Indicator	Labour Force	ESS Target (%)	Local Job Target
Population-Driven	7,861	60%	4,717
Strategic	5,592		3,427
Total	13,453		8,144

Source: City of Wanneroo 2022, Pracsys 2023

This target can be considered ambitious for Carabooda as the Site's capacity to deliver 8,144 local employment opportunities is limited by a range of factors including the extent of infrastructure provision, private investment, comparative advantage and more.

It is common for residential greenfield developments to lack the infrastructure and strategic industry required to employ its local labour force. The outcome is a higher proportion of residents that travel outside the local area to secure high productivity jobs. The State planning framework accounts for this by establishing strategic employment nodes in the Sub-Region such as Yanchep and Joondalup. These centres provide more job opportunities than those required by the local labour force and support the population of less-strategic areas such as Carabooda.

¹ ESS represents the ratio of local jobs to residents and an increase demonstrates that employment growth is outpacing labour force growth in the area

² Department of Planning, Lands and Heritage, 2018, [https://www.wa.gov.au/system/files/2021-05/FUT-PP-Perth and Peel Sub Region March2018 v2.pdf](https://www.wa.gov.au/system/files/2021-05/FUT-PP-Perth%20and%20Peel%20Sub%20Region%20March2018%20v2.pdf)

1.3 Population-Driven Employment Summary

A reasonably level of community and commercial provision has been estimated at a high-level to estimate the extent of population-driven employment opportunities available to local residents. Across the identified sources, Carabooda is estimated to generate 4,037 local job opportunities (Figure 4).

Figure 4. Local Population-Driven Employment Summary

Employment Source	Local Population-Driven Opportunities
Activity Centres	2,099
Aged Care	199
Libraries	34
Schools	788
Medical Centres	22
Recreation Facilities	172
Home-Based Businesses	314
Small Commercial	284
Child Care	124
Total	4,037
Target (60% ESS)	4,717
Shortfall	680

Source: Department of Planning, Lands and Heritage 2018, ABS 2022, Pracsys 2023

This estimation generates a shortfall of 680 jobs relative to the 60% ESS target for population-driven jobs at the Site. Given that the analysis conducted utilised conservative benchmarks and forecasts, the number of local jobs will likely grow over time.

1.4 Strategic Employment Summary

A high-level benchmarking analysis identifies that Carabooda is not expected to generate significant strategic employment opportunities within the Site itself (Figure 5). This generates a shortfall of 3,427 jobs relative to the 60% ESS target for strategic jobs at the Site. As outlined in Section 3.1, ESS and Strategic Employment, Carabooda's capacity to deliver strategic employment opportunities is limited by the planning framework and provision of infrastructure.

Figure 5. Strategic Employment Target / Shortfall

Measure	Strategic Jobs
Target (60% ESS)	3,427
Shortfall	3,427

Source: Pracsys 2023

Yanchep and Joondalup are identified as key strategic centres in the North West Sub-Region, together with the Wangara and Neerabup Industrial Areas, and account for less strategic developments such as Carabooda and other new developments. The analysis estimated that residents of Carabooda will have access to 2,210 strategic opportunities in the Sub-Region (Figure 6).

Figure 6. Strategic Employment Summary

Source	Strategic Job Opportunities
Yanchep	330
Alkimos	220
Neerabup	570
Future Inter-modal Hub	280
Other Nodes	810
Total	2,210

Source: Pracsys 2023

There is a shortfall to the local strategic job target when accounting for sub-regional sources. The shortfall will likely dissipate as existing strategic sources expand, and further strategic opportunities arise in the North West Sub-Region.

The employment estimates above should also account for the loss of existing rural and agricultural employment within the DSP area as land transitions to urban development (refer Section 3.4, Rural and Agricultural Employment Impacts).

1.5 Additional Economic and Social Benefits

Rezoning and developing the Site is associated with a number of desirable liveability and economic outcomes. Social and Economic benefits that are associated with the rezoning of the Site to Urban include:

- Proximity and access to existing and future strategic employment zones for future residents reducing vehicle travel time and vehicle operating costs
- Improved housing accessibility and affordability resulting from the supply of land in the North-West Sub-Region
- Proximity and access to future transport and rail access links
- Increased retail expenditure in the City of Wanneroo supporting the existing Activity Centre Hierarchy
- Improved access to TAFE and other vocational education due to the Site's proximity to both Yanchep and Joondalup

1.6 Landowner Infrastructure Agreement

The scale of land development proposed in the Carabooda Urban Precinct, covered in this District Structure Plan for residential housing (approx. 9,200 lots) requires a strategic plan for provision of services infrastructure and social infrastructure to support the new community.

Service infrastructure, both new and upgrades to existing, will potentially include:

- Widening and upgrade of Karaborup Road between Wanneroo Road and Gibbs Road, to connect to new McLennan Drive
- Construction of McLennan Drive between Karaborup Road and Godel Road
- New major connector roads running north south in the DSP area
- Extensions and upgrades to Kiln Road.
- Upgrades to existing pavements and configuration of Gibbs Road and Karaborup Road (north of McLennan Drive) to urban standard
- Wesco Road and Nowergup Road upgrades to urban standards.
- Provision of upgraded power infrastructure, including provision of land for a future sub-station
- Provision of water services upgrades including pressure relief valves and connections with existing major water tank
- Negotiations with Water Corporation for provision of pre-funded sewer pump stations and pressure mains to return to existing sewer outfalls

- Other trunk main extensions and upgrades as provided for in detailed engineering planning phase of the project.

These services costs will be allocated within subsequent Local Structure Plan areas, but there will need to be a level of co-ordination of service infrastructure upgrades and sharing of major roads that will be allocated on a whole of DSP basis.

It is anticipated that sharing of costs will be allocated on an equitable sharing of costs basis by allocation of cost sharing based on net zoned urban land per owner divided by overall urban zoned land area.

Community and Social Infrastructure planning will also be included in the overall Carabooda DSP and will potentially include opportunities for Local Government lead outcomes including:

- Local Health clinics
- Civic spaces for local recreation and performing arts
- Library and community meeting rooms

In provisioning these social and community assets within Carabooda DSP, consideration needs to be given to the level of Regional and District level facilities that are being planned in nearby locations such as Alkimos, to avoid duplication of assets. The costs will be allocated on an equitable cost share basis, per hectare of urban zoned land per owner, divided into the total urban zoned land for the DSP.

There are two methods by which infrastructure cost sharing can be managed and administered, by a private landowner's agreement, or a Development Contribution Plan administered by the City of Wanneroo. As the DSP progresses with phases of planning approvals, a decision as to which scheme of administration will be made, or potentially a hybrid of the two processes. Please carefully note, no landowner will be liable for any contributions until such time as they decide to develop their landholding. Otherwise, no commitment is made upon individual landowners unless they decide to proceed with development at some future stage.

1 INTRODUCTION

Acumen is progressing a Needs Assessment to support a District Structure Plan (DSP) for Carabooda. Pracsys has been engaged to undertake the Needs Assessment to address State Planning Policy guidelines, providing background socioeconomic analysis, demand analysis, floorspace provision projections and recommendations for the development area and the district centre. The analysis also addresses the requirements of an Economic, Retail and Employment (ERE) Strategy¹.

The report details the following components:

- An analysis of demographic and economic context reflective of Carabooda
- An analysis of demand for goods and services
- An analysis of local and regional industry drivers
- A strategic review of relevant local and state policies and frameworks
- A review of retail trends
- A Needs Assessment to determine supportable retail and non-retail activity centre floorspace
- Employment generated by activity centre floorspace
- Implementation recommendations to ensure that activity centres are high performing and activated

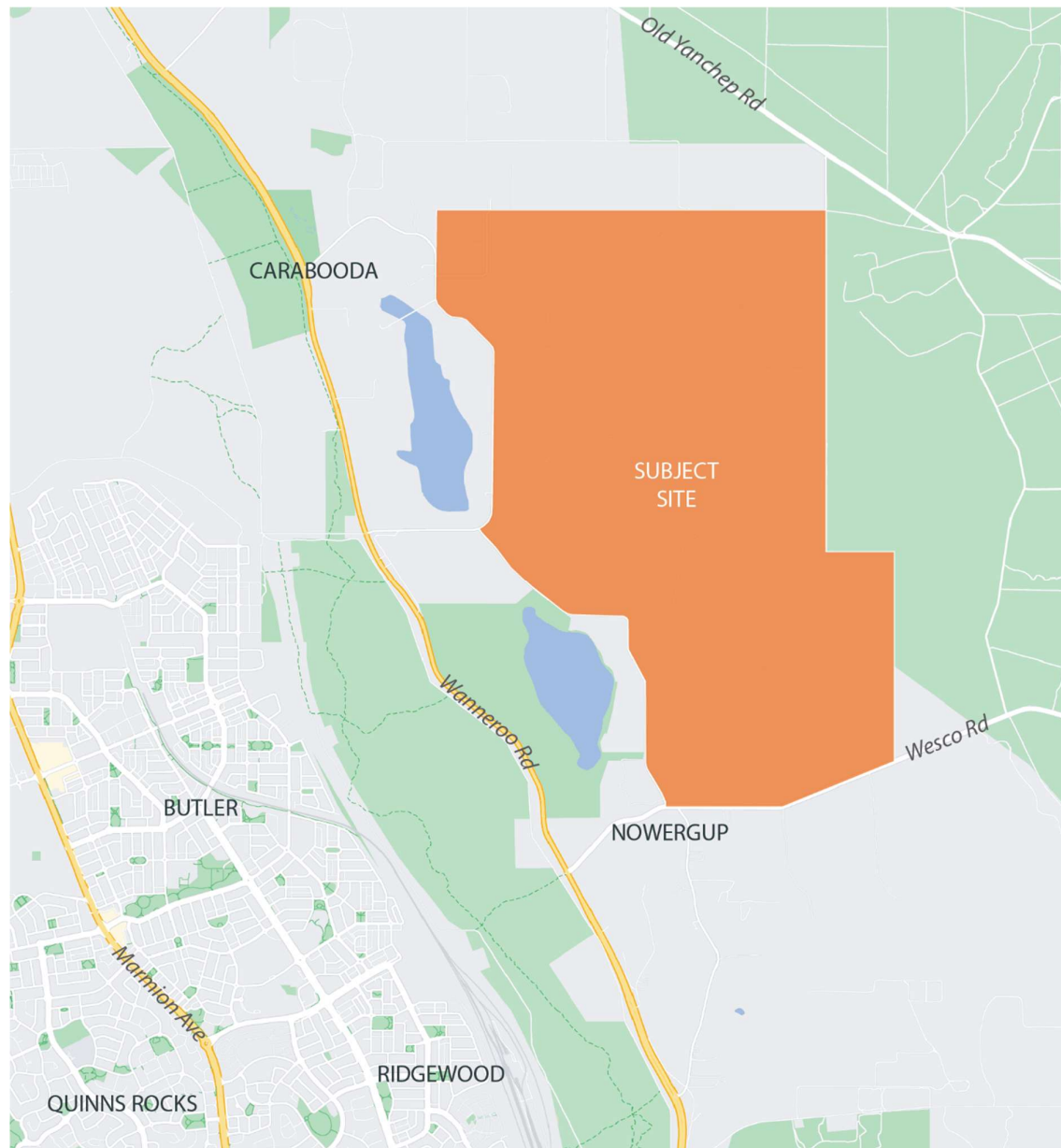
This report contains variations to the typical methodology undertaken to complete a Needs Assessment and ERE Strategy as Carabooda is a greenfield development. A substitute population has been used in certain parts of the analysis to reflect the future population of the urban development. Some common analysis components were deemed inapplicable, such as a property market profile, and were excluded.

¹ While an ERE Strategy is only required for a PSP under SPP7.2, key areas of analysis for an ERE Strategy were completed in previous work for Carabooda and are informative. These additions form a comprehensive retail assessment.

1.1 Background

Carabooda is situated east of Wanneroo Road, bounded by Carabooda Lake and Lake Nowergup to the west, Wesco Road to the south, and Bailey Road to the north (Figure 1).

Figure 1. Site Location – Indicative Urban



Source: CLE Town Planning + Design 2023, Pracsys 2023

Most of the subject site's land is currently zoned Rural. Established residential areas in Alkimos and Butler are located just west of the subject site, separated by Wanneroo Road. Eglinton and Yanchep are north-west of the subject site.

1.2 Retail Needs Assessment Purpose and Objectives

State Planning Policy 4.2 Activity Centre 2023 (SPP4.2) states: *The need for activity centre uses refers to the scale and mix of residential and non-residential uses likely to be needed within a catchment area over the plan period (10 years for Precinct Structure Plans).*²

Needs Assessments measure demand in an identified trade area and identify the scale of supply necessary to appropriately accommodate this demand in square metres Net Lettable Area (NLA) of the Department of Planning, Land Use and Heritage's (DPLH) Planning Land Use Category (PLUC), Shop/Retail (SHP)².

This Needs Assessment follows the requirements of SPP4.2 Implementation Guidelines to consider and assess demand for activity centres uses. The assessment should be based on facts and unbiased evidence³. The key objectives of a Needs Assessment are to:

- Define the catchment area of the proposed development application request
- Review drivers of floorspace, including forecast population growth and socio-economic characteristics, employment and changing demand patterns
- Consider the competitive environment and the surrounding activity centre hierarchy
- Develop a net demand assessment
- Assess the level of Shop/Retail floorspace supportable at the site

² Please see Appendix 1: LUES Glossary for more detail regarding DPLH Land Use and Employment Survey Categories

³ WAPC, 2023, *State Planning Policy 4.2 Activity Centre Implementation Guidelines*, Government of Western Australia

Appendix 1c: Executive Summary for Engineering Servicing (Infrastructure) Report

1. EXECUTIVE SUMMARY

This report has been prepared by Cossill & Webley Pty Ltd (CW) for the Carabooda Urban Precinct. It summarises the results of a review of the civil engineering aspects which have informed and support the delivery of the structure plan and are related to the future servicing of the developed land.

This report provides details on each major infrastructure type and a servicing strategy for the implementation required for the development of the District Structure Plan (DSP) area.

The engineering review covers siteworks, earthworks, roadworks, stormwater drainage, sewerage, water supply and utility services.

The site is frontal to major strategic infrastructure which lends itself to a development of this scale leveraging on state government and private assets that have already been funded and either constructed or under construction.

The Mitchell Freeway extension to Romeo Road provides a direct road connection to the site and links to the Alkimos Regional Centre and public transport with the Yanchep rail line and Alkimos Station now operational.

The Alkimos Wastewater Treatment plant is within 5km of the site. The 1500mm diameter Alkimos Main Sewer has been extended under the rail corridor to facilitate sewerage flows from land east of the rail where the site is located. The existing Water Corporation Carabooda Water Tank is located within the DSP area and will provide potable water to the development through the extension DN400 distribution main connected to reticulation mains.

The Alkimos Seawater Desalination Plant (ASDP) was announced in May 2022 with enabling works underway and expected to be operational by 2028. A 1600mm diameter watermain from the ASDP will connect to the Carabooda Tank and then south east to the Wanneroo Reservoir with approximately 6,300m of watermain traversing the site. These works are currently underway.

The Western Power Yanchep zone substation is located adjacent to the site at the corner of Wanneroo Road and Romeo Road and will provide for the early stages of the development. Existing 132kVA and a series of 22kVA transmission and distribution lines traverse the site providing good connectivity to the electricity network. When required, the extension of a 132kV transmission line from the existing Pinjar-Neerabup line will be required and new zone substation located at the eastern boundary of the DSP area.

Major gas and telecommunication's infrastructure exist in Wanneroo Road and are at the doorstep of the site.

The site has favourable geotechnical conditions suitable for development consisting of sand and limestone with significant depth to groundwater providing good infiltration. The site topography lends itself to efficient cut to fill earthworks thereby minimising importation and exportation of fill creating affordable land development and reduced carbon emissions.

A staged approach to earthworks and development in areas of the site mapped as Basic Raw Materials (sand and limestone) and that have mining tenements is to be adopted to allow sequential land use and the appropriate extraction and rehabilitation to be undertaken.

The investigation has found the land is well suited to urban development, with the logical progressive extension of infrastructure and base capacity.

Appendix 1d: Executive Summary for Environmental Assessment Report

Executive Summary

Western Environmental Approvals Pty Ltd (WEPL) present this Environmental Assessment Report (EAR) to inform the development of a District Structure Plan (DSP) for the Carabooda Urban Precinct, on behalf of Carabooda Landowners Pty Ltd. This EAR is intended to not only accompany the lodgement of the DSP, but to also support the referral of the subsequent Metropolitan Region Scheme (MRS) Amendment request to the Environmental Protection Authority under s38 of the *Planning and Development Act 2005*.

The Site, covering approximately 979 ha across 65 lots within the City of Wanneroo, is located 35 km north of Perth Central Business District (CBD). The proposed DSP for the Site encompasses a range of land uses, including urban residential areas, centres, schools, a transport network, conservation areas, and public open space (POS). It also identifies areas for Basic Raw Material (BRM) extraction within Lots 104, and 102.

The identification and conservation of significant areas of established bushland with identified trees and ecological communities worthy of retention is a key outcome of the Carabooda DSP proposal. The DSP will provide for approximately 241.60 ha of conservation zoned land and an additional 11.0 ha for Local Open Space for Conservation wherein environmental values will be retained. Ongoing funding will be established through an innovative Conservation Management Fund (CMF), managed by the City of Wanneroo or an identified authority or agency. This will result in:

- Establishing seed funding of \$8,500,000 over the development of the Carabooda DSP through the contribution of \$1,000 per lot into a CMF.
- Ensuring the management of the significant conservation areas are permanently funded and protected in the future by establishing a Specific Area Rating system (SAR) that provides an ongoing annual contribution to the CMF through the annual collection of SAR from every residential lot created in the DSP, contributing \$2.76M annually into the CMF.
- Protecting and enhancing that the significant regional ecological linkage which runs from east to west across the centre of the Site through the establishment and management of the significant conservation areas in the DSP.

The Site covers a total of 979 ha and is situated 35 km north of Perth Central Business District (CBD). The majority of the Site is currently zoned Rural under the MRS and Rural Resource under the City of Wanneroo Local Planning Scheme No. 2 (LPS 2).

The proposed DSP comprises the following land uses:

- Urban (Residential).
- Centre.
- Primary School.

-
- High School.
 - Private College.
 - Transport network.
 - Conservation Areas.
 - Local Open Space (LOS) for Conservation.

The DSP identifies areas of Conservation and LOS for Conservation which require further review at the MRS Amendment, Local Structure Plan, or individual property level. The DSP aims to provide a strategic framework for the proposed land uses, with additional investigations to confirm the suitability of specific areas for development or conservation prior to any changes in zoning. The retention of the ecological linkage will protect environmental values, maintain connectivity with regionally significant bushland, and mitigate cumulative development impacts in line with the DSP. The project emphasises minimising environmental impacts and enhancing conservation long-term through innovative funding and management strategies.

The EAR identified the environmental constraints/considerations below:

- Flora and vegetation.
- Terrestrial fauna habitat.
- Contamination.
- Conservation areas (Bush Forever).
- Heritage.

There are no watercourses, wetlands or Public Drinking Water Source Areas within the Site.

The current DSP design provides for the retention of concentrated, high-value environmental features within Conservation Areas and LOS for Conservation . These include significant species-rich communities and degraded zones. Further environmental investigation is required to confirm the suitability of proposed urban land use or Conservation and LOS for Conservation in some areas, as indicated in the proposed DSP. For the purpose of this EAR, areas identified as proposed Conservation and LOS for Conservation or proposed residential (subject to further environmental investigation) are assumed to be used for the relevant land use.

A summary of the potential impacts and WEPLs recommendations to management have been included in Table E1.

Table E1. Summary of Potential Impacts and Recommended Management

Environmental Feature	Description of Potential Impact	Recommended Management
Remnant Native Vegetation	Approximately 333.78 ha of remnant native vegetation exists within the Site, with 13 distinct vegetation types identified. These areas include species-rich communities and degraded zones. The vegetation includes significant species such as Banksia, Eucalyptus, and Xanthorrhoea, with potential impacts from development, including clearing of habitat.	Native vegetation has been prioritised for retention to the fullest degree possible within designated conservation areas, prioritising the conservation of species-rich communities and degraded zones with high ecological value. In total, 222.23 ha of remnant native vegetation will be retained within Conservation Areas, and an additional 10.94 ha will be retained within LOS for Conservation. As such, 70% of remnant native vegetation within the DSP area will be retained. In total, over 80% of remnant native vegetation which is in Good or better condition will be retained within Conservation Areas and LOS for Conservation. A detailed vegetation management plan will be developed to guide retention, protection, and rehabilitation efforts.
Banksia Woodlands of the Swan Coastal Plain	The Site contains vegetation considered to be the Banksia Woodlands of the Swan Coastal Plain ecological community, which is a Priority 3 Ecological Community at State level and an Endangered Threatened Ecological Community at Commonwealth level.	In total, 39.26 ha (87%) of Banksia Woodlands within the DSP area will be retained and protected within conservation areas. A conservation management plan will be developed to support future stages of planning to protect and rehabilitate these areas during development.
Tuart Woodland TEC	The Site contains vegetation that is considered to be the Tuart Woodlands and Forests of the Swan Coastal Plain ecological community, which is a Priority 3 Ecological Community at State level and a Critically Endangered Threatened Ecological Community at Commonwealth level.	In total, 84.35 ha (75%) of Tuart Woodlands within the DSP area will be retained and protected within conservation areas. A conservation management plan will be developed to support future stages of planning to protect and rehabilitate these areas during development.
Honey Myrtle TEC	The Site contains vegetation that is considered to be the Honeymyrtle Shrubland on Limestone Ridges of the Swan Coastal Plain Bioregion ecological community, which is a Critically Endangered Threatened Ecological Community at both State and Commonwealth levels. No impact to this TEC is proposed.	No impacts to the Honeymyrtle Shrubland TEC are anticipated. Retention of 12.09 ¹ ha of Honeymyrtle Shrubland within conservation areas has been prioritised. A conservation management plan will be developed to support future stages of planning to protect and rehabilitate these areas during development.
Black Cockatoo Foraging Habitat	Foraging habitat for Carnaby's black cockatoo is present throughout the Site with varying quality, ranging from 1/10 to 7/10, with the weighted Site average	Foraging habitat for black cockatoo species is retained within areas proposed for Conservation. The DSP will retain and conserve 241.46 ha of foraging habitat for Carnaby's

¹ 0.25 ha of this TEC occurs within the Water Corporation owned land, outside of conservation areas. This is the result of inaccurate mapping, and the entirety of this TEC will be included within conservation areas.

Environmental Feature	Description of Potential Impact	Recommended Management
	quality being 3/10. High-quality areas are associated with dense Banksia spp. stands. Foraging habitat for Forest red-tailed black cockatoo is also present, ranging from 1/10 to 5/10 in quality, with the weighted Site average quality being 2/10.	black cockatoo with a weighted average quality of 5/10, and 241.46 ha of foraging habitat for Forest red-tailed black cockatoo with a weighted average quality of 3/10. Given the majority of remnant native vegetation throughout the Site is dominated by Banksia spp., retained habitat is primarily for Carnaby's cockatoo. Baudin's black cockatoo is considered a vagrant to the Site only. In addition, 11.0 ha of foraging habitat for Carnaby's black cockatoo and Forest red-tailed black cockatoo within LOS for Conservation. Of that, 5.58 ha is of higher quality for Carnaby's black cockatoo.
Black Cockatoo Roosting Habitat	Black cockatoo species utilise tall eucalypt trees (> 10 m tall) for night roosting and typically select the tallest trees in the landscape (DAWE, 2022). Roosting sites are often within 2 km of natural or artificial water sources. BCE (2024) found no signs of night roosting activity during field investigations, but tall trees suitable for roosting are abundant. Black cockatoos have been observed drinking from artificial water sources (horse troughs) within the Site.	Tall eucalypt trees suitable for roosting, particularly near water sources outside of the conservation areas will be investigated for retention in future stages of planning. Management plans will also be developed to minimise and avoid disturbances that could impact roosting activities during development.
Black Cockatoo Breeding Habitat	Within the Site, BCE (2024) recorded 1,598 trees with a DBH $\geq$ 50 cm that may be considered potential nesting trees. The majority of these are tuart (1,113 trees), jarrah (300 trees), and marri (65 trees). BCE (2024) categorised these trees based on the presence and suitability of hollows. However, no confirmed nesting hollows were recorded (Class 1). The majority of potential nesting trees are Class 5, showing no hollow development, however 14 trees (Class 2) have suitable hollows with chew marks indicating previous use.	Mature eucalypt trees, particularly tuart (743), jarrah (180), and marri (47) species have been prioritised for retention within Conservation areas, with 999 mature eucalyptus trees to be retained. An additional 13 will be retained within LOS for Conservation. Further, 81 trees containing suitable hollows (Class 2 and 3) will be retained, which is 72% of those within the DSP area. Retention of additional Class 2 and Class 3 trees outside the conservation areas will be investigated for retention in future stages of planning. Management plans will also be developed to minimise and avoid disturbances that could impact breeding activities during development.
Geomorphic Wetlands	No geomorphic wetlands intersect the Site. The nearest wetland is Nowergup Lake, a Conservation Category Wetland (CCW) located 200 m west. Other wetlands, including Resource Enhancement Wetlands (REW) and Multiple Use Wetlands (MUW), are mapped within 2 km of the Site.	The Site does not contain watercourses or wetlands. The Site's development will be planned to ensure that no disturbance occurs to the hydrological and ecological functions of adjacent wetlands. Future stages of planning will include appropriate setbacks and management strategies to protect the values of nearby wetlands, particularly Nowergup Lake (CCW).

Environmental Feature	Description of Potential Impact	Recommended Management
Bush Forever Site 389	BF Site 290 (Hopkins Road Bushland) is east of the Site, and BF 383 (Neerabup National Park, Lake Gnowrup Nature Reserve) is 175 m west. Regional ecological linkage (Link ID 8) runs through the Site.	The mapped regional ecological linkage (Link ID 8) to connect BF 290 and BF 383 will be retained and enhanced, preserving ecological values and reducing cumulative development impacts.
Contamination	One contaminated site was identified: the Nowergup Biosolids Facility, which is located 360 m to the southeast of the Site, and is closed and classified as Remediated for Restricted Use. There is potential for asbestos-containing materials due to old structures on the Site, as well as a possibility of contamination from previous agriculture and horticultural land uses.	Preliminary site investigations for contamination will be conducted as part of early works for development as required.
Acid Sulfate Soils	The majority of the Site has a low risk of ASS, with a small pocket (2.15 ha) in the northern portion at moderate to high risk, affecting soils within 3 m of the surface.	Investigation into the presence and extent of ASS within the Site will be undertaken at subsequent stages of planning and development, in accordance with DER (2015a) Identification and investigation of acid sulfate soils and acidic landscapes. Subsequent measures to minimise the risk of ASS disturbance will be identified in accordance with the results of the investigation and DER (2015b) Treatment and management of soil and water in acid sulfate soil landscapes.
Karstic Features	A small portion (4%) of the Site is mapped as having a High risk of karst, and a larger area (~18%) is mapped as having a Moderate risk of karst.	A desktop karst survey will be undertaken for each Local Structure Plan in accordance with City of Wanneroo <i>Local Planning Policy 4.13: Caves and Karstic Features</i> .
Public Drinking Water Source Area (PDWSA)	The Site does not intersect any mapped PDWSAs. A Priority 3 PDWSA is located approximately 670 m to the west, and a Priority 1 PDWSA is located approximately 750 m to the east.	The Site does not intersect a PDWSA. Appropriate measures will be detailed in future stages of planning to prevent contamination of groundwater or surface water, particularly in areas near these PDWSAs.
Heritage	One registered Aboriginal heritage site near Nowergup Lake (Place ID 17450) with mythological significance. Another site near Lake Neerabup (Place ID 3315), containing Orchestra Shell Cave with artifacts. Additionally, the Lime Kilns – Spiers (Place no. 14299) is a Category 2 heritage site under the City's Heritage List, and another Lime Kiln site (Wanneroo, Place no. 18338) is located adjacent to the site boundary but is not listed	Future development will comply with the Aboriginal Heritage Due Diligence Guidelines (DPLH and DPC 2013) to protect heritage sites. The Lime Kilns – Spiers site listed under the City's Heritage List will be retained and management of the Wanneroo Lime Kiln site will be detailed in future stages of planning.

Appendix 1e: Executive Summary for District Water Management Strategy

Executive Summary

Acumen Development Solutions (Acumen) is embarking on a rezoning project of 8,500 to 10,000 lots in the suburb of Carabooda ('the site') located approximately 45 km north of Perth CBD and approximately 15 km north-east of Wanneroo in Western Australia. The site currently consists of numerous lots that are currently mostly used for rural purposes.

This District Water Management Strategy (DWMS) has been prepared to support the District Structure Plan (DSP) through presenting the groundwater and surface water management strategies that will support future development of the Carabooda development area. This has been completed by assessing the current hydrological characteristics of the site. A summary of the key DWMS elements detailed in this report is provided in Table 1.

Table 1: Key DWMS reporting elements

DWMS elements	Design objectives/comments
Current land use (Section 1.1)	The site consists of numerous lots that are currently used for mostly rural purposes, with Carabooda Lawn Turf Farm located in the northern portion of the site.
Planning background (Section 1.2)	The site is currently zoned as 'Rural Resource' under the District Planning Scheme No. 2 for the City of Wanneroo.
Topography (Section 3.2)	Topographic contours indicate the surface elevation of the site ranges from approximately 18 metres Australian Height Datum (m AHD) on the south-western boundary of the site to 78 m AHD on the south-eastern boundary of the site
Geology and soils (Section 3.3)	Regional geological mapping (50 K map sheet) indicates majority of the site is underlain by sand (S7) classified as pale and olive yellow, medium to coarse-grained, sub-angular to sub-rounded quartz, trace of feldspar, moderately sorted, of residual origin. Mapping indicates there are small areas of limestone (LS1) comprised predominantly of light yellowish brown, fine to coarse-grained, sub angular to well-rounded quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of eolian origin and one small area of Limestone (LS2) similar to LS1 but with abundant karstic phenomena, including caves, swallows and dolines located in the south-western portion of the site.
Groundwater (Section 3.10)	The site is located in the Wanneroo Groundwater Management Area and Nowergup Groundwater Management subarea. The aquifers underlying the site include the Perth-Superficial Swan aquifer, Leederville partially confined aquifer and the Perth Yarragadee North confined aquifer. Maximum groundwater contours (DWER 2019) indicate that maximum groundwater levels across the site range from 10 mAHD along the north-western portion boundary of the site to 21.5 mAHD along the south-eastern portion of the site. Elevation and maximum groundwater contour mapping indicate clearance to groundwater across majority of the site is considerable, as deep as 59 m on the eastern boundary of the site to 8 m on the south-west corner of the site. Groundwater flow across the site is largely westward towards the coast. The site is not located with a Public Drinking Water Source Area (PDWSA).
Surface water hydrology and wetlands (Sections 3.7 and 3.12)	The site is located in the Yanchep Coastal Lakes Catchment within the Swan Coastal basin. Geomorphic wetland mapping shows there are no wetlands mapped within the site boundary. There is one Conservation Category Wetland (CCW), four Resource Enhancement Wetlands (REWs) and one Multiple Use Wetland (MUW) located within 2 km of the site. Lake Nowergup, located approximately 200 m southwest of the site, is a Conservation Category Wetland. The lake is also a Ministerial criteria site

	that DWER manages to conserve its ecological values (DoW, 2011). Management has included supplementing with groundwater to maintain lake levels. The lake is home to waterbirds and supports aquatic invertebrates, fish and turtles, and is also a registered site of significance for Aboriginal heritage (DoW, 2011). Lake Nowergup has been categorised as a significant wetland therefore has a mapped sensitive water resource area within 1km of the lake. With the generally high permeability of the Spearwood and Bassendean Sands, the pre-development hydrology of the site is characterised by high rates of infiltration. Surface water run-off is anticipated to occur only during large storm events via overland flow to wetlands, localised low points or off-site areas.
Water source planning (Section 4)	The site is located within the Water Corporation licensed area for provision of a potable water supply. It is understood that Water Corporation has not carried out planning for the provision of water supply to the subject land. The combined volume (over 3,000,000 kL in the Perth Superficial - Swan aquifer) will be more than sufficient for irrigation of public open space (POS), district open space (DOS) or regional playing fields, high school and primary school sites across the development area. The site is located within the Water Corporation licensed area for operating sewerage services. It is understood that the site is outside the northern and eastern extents of the Water Corporation's currently planned sewer catchments as this area has not been identified for urban development in any agreed planning strategy (Cossill and Webley 2024). The site grades at an average 2% from east to west which facilitates servicing by gravity sewers and a series of wastewater pumping stations with the flows to be pumped to the DN1500 Alkimos Main Sewer for ultimate discharge to the Alkimos Wastewater Treatment Plant. Development of the site is contingent upon the construction of a reasonable level of higher-order wastewater infrastructure to convey flows from the site to the plant, and as such application would need to be made to include these works on Water Corporation's Capital Investment Program (CIP).
Stormwater management (Section 6)	Small rainfall events (first 15 mm) will be managed and treated on site via soakwells, swales, standard drainage sumps and bioretention basins. Managing small rainfall events via close-to-source infiltration will effectively mimic the pre-development hydrology regime of the site. During major rainfall events, any lot run-off that exceeds the capacity of on-site disposal systems will overflow towards the road, where excess flow will be conveyed to the swales, standard drainage sumps or bioretention areas via the road drainage system. The road drainage network will be designed to ensure that roads will remain passable in the 20% AEP event. For all rainfall events greater than the 20% AEP event up to and including the 1% AEP event, any run-off that does not infiltrate the sandy soils will be conveyed via overland flow paths to detention basins, which will be used to attenuate flood events post-development.
Groundwater management (Section 7)	There is significant depth to groundwater experienced across the site and therefore, it is expected there will be sufficient groundwater clearance at the finished lots i.e., > 2 metres below ground level (mbgl). Should it be determined that groundwater management is required then shallow groundwater will be managed by the installation of a subsoil drainage and important of fill to provide clearance from the shallow groundwater to roads and building pads.
Monitoring requirements (Section 8)	The proponent will engage with DWER to determine if pre-development groundwater monitoring over two winter peaks will be required to support the preparation of the LWMS.

Appendix 1f: Executive Summary for Transport Impact Assessment



Executive Summary

PJA has been engaged by Acumen Development Solutions (“the Applicant”) on behalf of the land owner groups, to prepare a Transport Impact Assessment (TIA) to assist in the development of a District Structure Plan (DSP) for a portion of land located in Carabooda, Western Australia (“the Site”). The Site is located within 40km radius from the Perth CBD and is less than 5km to both the Alkimos Railway and Bus Station and the Alkimos Secondary Activity Centre, while being around 6km from Alkimos Beach from the western boundary of the Site. The Site currently comprises approximately 980ha of total land area with around 910ha of Brownfield land including existing roads and conservation areas (existing road reserves and Water Corporation owned land). The boundaries of the Site consist of Carabooda Road (north), Cutler Road/Bush Forever Land (east), Wesco Road (south) and Karoborup Road/Gibbs Road (west). Wanneroo Road is located approximately 800m west of the Site with Carabooda Lake and Lake Nowergup providing a natural recreational / open space boundary. The Site sits under the jurisdiction of the City of Wanneroo Local Government Area (LGA).

The District Structure Planning stage within the *WA Planning Framework* is formed on the basis of the overarching Sub-Regional Planning Frameworks/Structure Plans (*Perth and Peel at 3.5million people – North West Sub-Regional Framework 2018*), Local Planning Strategy (*City of Wanneroo Draft Local Planning Strategy 2041, City of Wanneroo Place Strategy 2023-2027, City of Wanneroo Active Transport Plan 2022/23 – 2025/26 and City of Wanneroo Transport Strategy 2019/20*) and Local Planning Scheme (*City of Wanneroo District Planning Scheme No. 2/ City of Wanneroo draft Local Planning Scheme No.3*). The *Perth and Peel at 3.5million people – North West Sub-Regional Framework (2018)* indicates a number of proposals to the external transport network including the Yanchep Rail Extension (YRE) (completed in July 2024), the Mitchell Freeway extension (to Romeo Road completed in July 2023, with the staged extensions to Eglinton and Indian Ocean Drive anticipated between 2031 and 2050) and Whiteman-Yanchep Highway (anticipated to be completed post 2051). The City of Wanneroo draft Local Planning Strategy 2041, Place Strategy 2023-2027, Active Transport Plan 2022/23-2025/26 and Transport Strategy 2019/20 were reviewed and highlight a desire to promote alternative and sustainable transport modes across the LGA.

The major roads comprising of Wanneroo Road, Romeo Road, Mitchell Freeway, Old Yanchep Road and Marmion Avenue are within 5km of the Site. Additionally, Tonkin Highway and Great Northern Highway are around 30-40km east of the Site.

The Site has recently been unlocked with a new bus and train station services recently opened at Alkimos Railway and Bus Station located some 3.5km away.

There are no formal active transport provisions within the Site at present. The nearest existing path networks are on Romeo Road (shared path) and the Mitchell Freeway corridor (principal shared path). Additionally,

Romeo Road connects to the Yaberoo Budjara Heritage Trail which is an unsealed walking/mountain biking trail and ultimately connects to Burns Beach Road, between Mitchell Freeway and Joondalup Drive.

The DSP is proposed as an urban development with 9,221 residential dwellings, around 68,400m² GFA of commercial centres, six primary schools, one government secondary school and one private college, in addition to 61ha of public open space (POS) and 224ha of conservation reserve, with an anticipated full development forecast year of 2048.

The proposed road access locations from the DSP boundary comprise of six connections, two on the north (via Karoborup Road and Cutler Road), one on the west (via Karoborup Road/Carabooda Road and Karoborup Road/McLennan Drive) and three on the south (via Nowergup Road, Gibbs Road and Wesco Road). The DSP comprises a network of existing and development roads including Integrator A, Integrator B and Neighbourhood Connectors running north to south and east to west, and local access roads.

For the purposes of the DSP, the modal share targets identified in the *Perth and Peel Transport Plan for 3.5 Million People and Beyond (Summary) (2016)* have been considered. The proposed transport infrastructure has been planned to support achievement of these targets, to the extent practicable, through the delivery of connected and accessible walking and cycling networks that promote active transport and contribute to the target modal share outcomes.

Ultimately, the DSP is estimated to generate in the order of 89,500vpd of which around 74% are distributed onto the external road network and the remaining 26% are distributed among the internal DSP road network. Of the internal 26%, some 70% are commercial based and 30% are school based vehicle trips.

The 2046 Main Roads WA (MRWA) Regional Operations Model 24 Hours (ROM24) sub-area cordon matrices indicate of the internal generated trips, 31.6% have internal destinations and 68.4% have external destinations. Furthermore, the data indicates 18.9% of trips inside the DSP have internal origins and destinations, 40.8% have internal origins and external destinations, and 40.3% have external origins with internal destinations.

The trips external to the DSP are split accordingly to the MRWA ROM24 data with around 29% via Romeo Road west, 22% via Wanneroo Road south, 19% via Wanneroo Road north, 19% via Whiteman-Yanchep Highway south, 10% via Gibbs Road (south of Wesco Road) and 1% via Whiteman-Yanchep Highway north.

The road hierarchy is proposed to comprise of the following, based on the distributed daily traffic volumes and indicative midblock two-way daily traffic volumes, with the ultimate road reservation widths and typical cross-section profiles to be determined within the subsequent planning stages.

Ultimate (full) development road hierarchies are:



- **Integrator A/B:** Karoborup Road (east of Romeo Road), McLennan Drive, Karoborup Road (between McLennan Drive and Greenlees Way), Gibbs Road, Wesco Road/Nowergup Road and the NS Road (between Wesco Road and the northern road of the high school/commercial area).
- **Neighbourhood Connector A/B:** Kiln Road, Karoborup Road (between Greenlees Way and Carabooda Road), Carabooda Road, Greenlees Way, the NS Road (between the Integrator B portion and Carabooda Road), both of the EW Roads (between Gibbs Road and the NS Road) and the NS Road (south of the private college to Wesco Road), Gibbs Road (between Gibbs Road at Godel Road to Karoborup Road).

Staging considerations:

It is noted that the land east of the Carabooda water tank has few constraints to immediate development, being cleared of native vegetation and predominantly in single ownership (as Lot 121 Carabooda Road). A Staging Plan has been presented in Part 2 of the Town Planning DSP report to reflect this, showing this area as a short- to medium-term priority. The intended Local Structure Plan (LSP) boundaries also reflect this intention.

Ultimately, most traffic from the Lot 121 area will obtain east-west access to external routes via McLennan Drive, however, this is a significant piece of infrastructure for which there is no short-term need. The Lot 121 area is proposed to initially obtain access to external routes via an extension of Kiln Road across the conservation estate, south of the water tank. This interim arrangement ensures that Lot 121 can develop concurrently with, or even ahead of, other land in LSP 2 further west. It also ensures that residential traffic will not interact with truck traffic related to the Godel Road quarry, which will be operating until the early 2030s and uses the eastern section of McLennan Drive for access (connecting into Godel Road and Gibbs Road). If McLennan Drive is constructed through to Romeo Road too soon, truck traffic and residential traffic will interact, and this is not preferred.

In the ultimate (full) development scenario, McLennan Drive and Kiln Road will share the role of servicing the east-west traffic from the Lot 121 area. In the meantime, Kiln Road will perform that role alone until the construction of McLennan Drive to its ultimate standard is necessary due to development reaching completion on land east of the conservation estate and enabled by the conclusion of operations at the Godel Road quarry.

In alignment with the City of Wanneroo Pathways Policy (October 2024), all Integrator and Neighbourhood Connectors require a minimum of a 2-2.5m wide concrete shared path on one side with Neighbourhood Connector A and Integrators also requiring a 1.5-1.8m wide concrete pedestrian path on the other side. Alternatively, if the road is identified within the Department of Transport long-term cycle network (LTCN), a 3m wide red asphalt path with centre line marking and wayfinding signage is required. Parts of Carabooda Road, Karoborup Road, McLennan Drive, Wesco Road and the NS Road have been identified as Secondary and Local routes on the LTCN.

The ultimate form and control of the intersections will be determined at the subsequent planning stages, with indicative controls of the intersections on the Integrator roads consisting of signals/roundabouts at intersecting Integrators and roundabouts/priority-controlled intersections at Integrators intersecting Neighbourhood Connectors.

Leveraging the State Government's extension of the Yanchep Rail Extension from Butler Station to Yanchep Station, which provides a train station at Alkimos approximately 3.5km of the Site. It is envisaged bus services will run from Alkimos Station to the DSP area as the area is occupied by residents and demand justifies the service. The Carabooda Urban Precinct offers an ideal location for a bus depot and investigations into a new depot for electric bus services is discussed to deliver a cleaner and lower-emissions public transport network.

The key school routes onto the higher order roads and crossing locations within the typical 800m catchment radius (approximately 5-minute ride or 10-minute walk) were identified. For secondary schools, the catchment radius could be extended to 1,500m to accommodate longer active travel routes of older children/young adults and the uptake of electric powered or assisted devices. Subsequent development planning stages should identify what additional infrastructure will be required to provide safe and convenient routes/crossings to school and determine the appropriate design for them. Additionally, consideration should be given for the provision of bicycle/scooter parking at schools.

There is potential for further active travel routes and trails through the public open space (POS) areas, connecting residential precincts to other trip generating lands uses such as shops and schools.

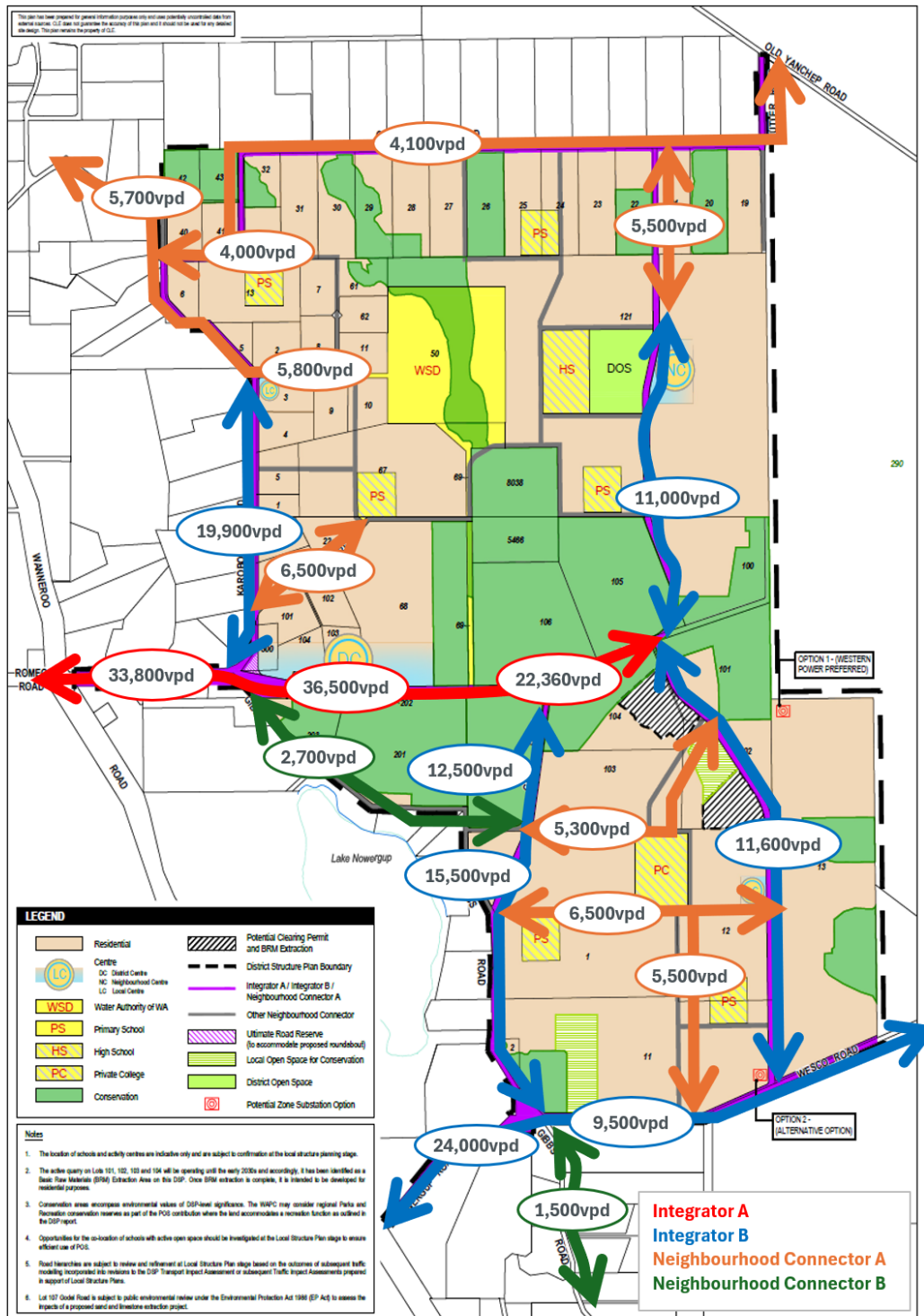
The proposed Road Hierarchy for the DSP area is provided in **Figure E-1**. This will also support bus and electric bus depot investigations.

The high level assessed *indicative* Intersection Controls on Integrator Roads are provide in **Figure E-2**.

The proposed Active Travel Network in consideration of the Department of Transport's Long Term Cycle Network is provided in **Figure E-3**.

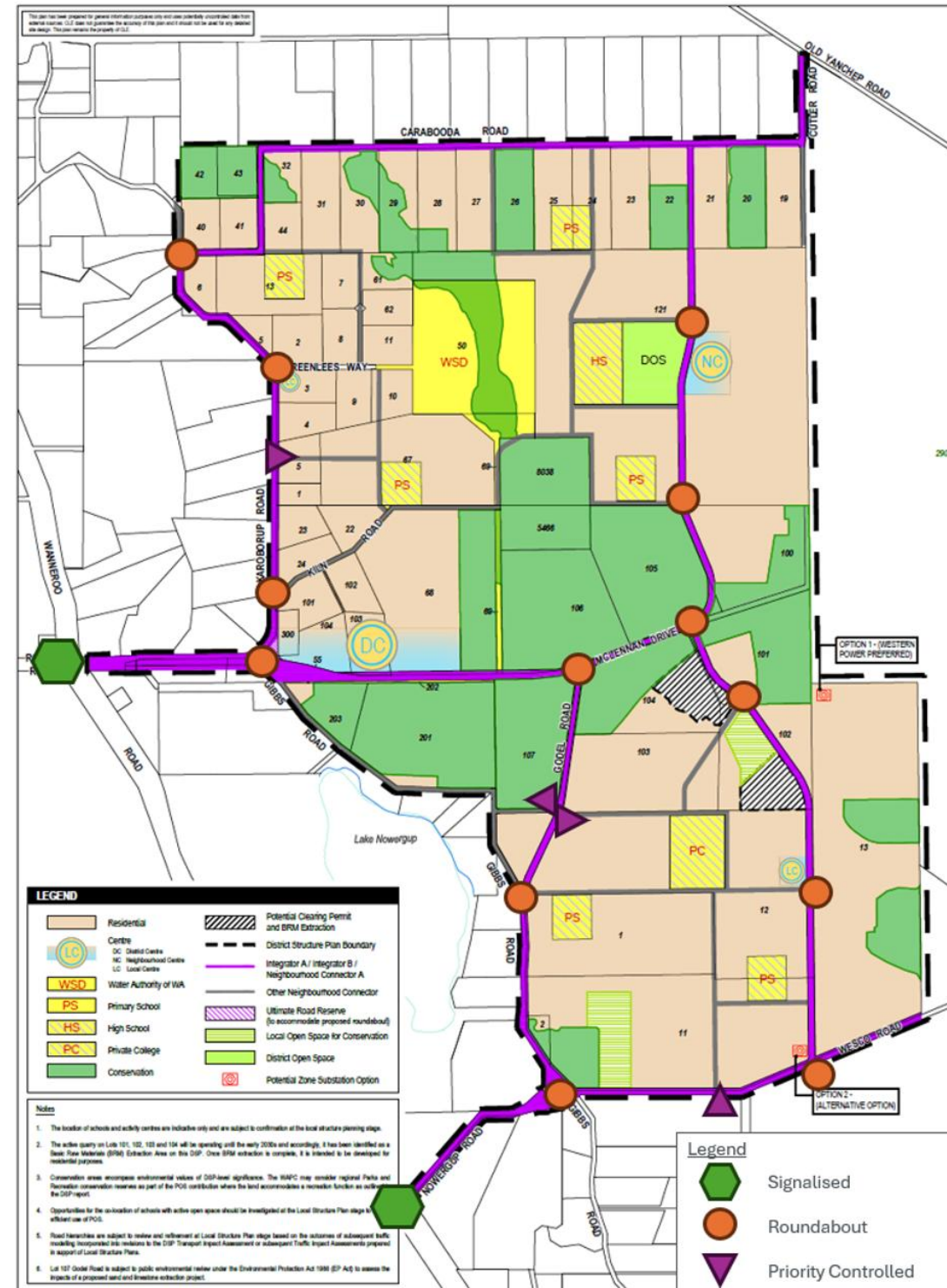
The preliminary proposed Key School Routes and Crossing Locations are provided in **Figure E-4** for future investigations to enhance road safety and support equitable access.

Figure E-1: Proposed Road Hierarchy



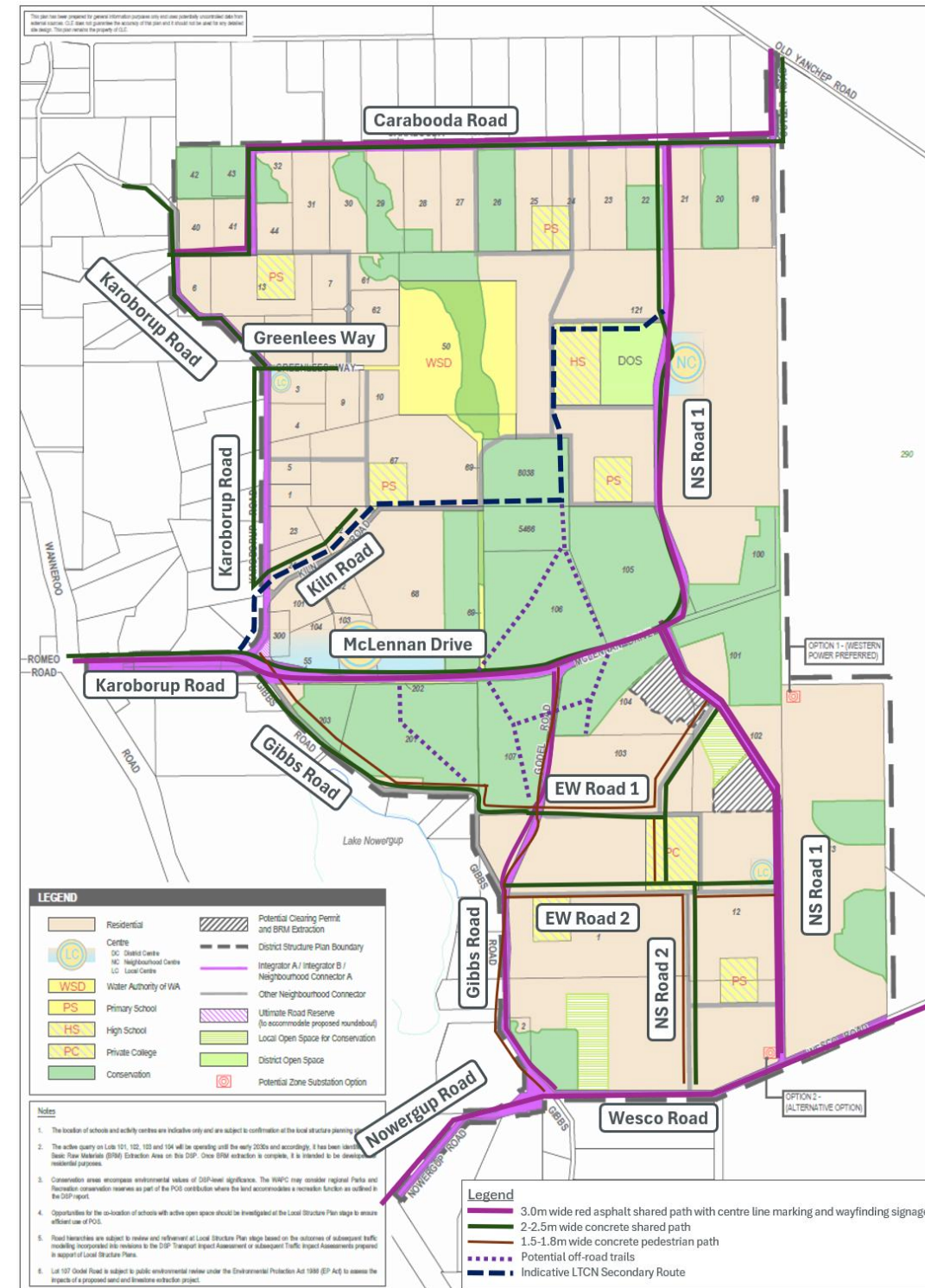
Base Image Source: CLE Town Planning + Design (14 July 2026)

Figure E-2: Indicative Intersection Controls on Integrator Roads



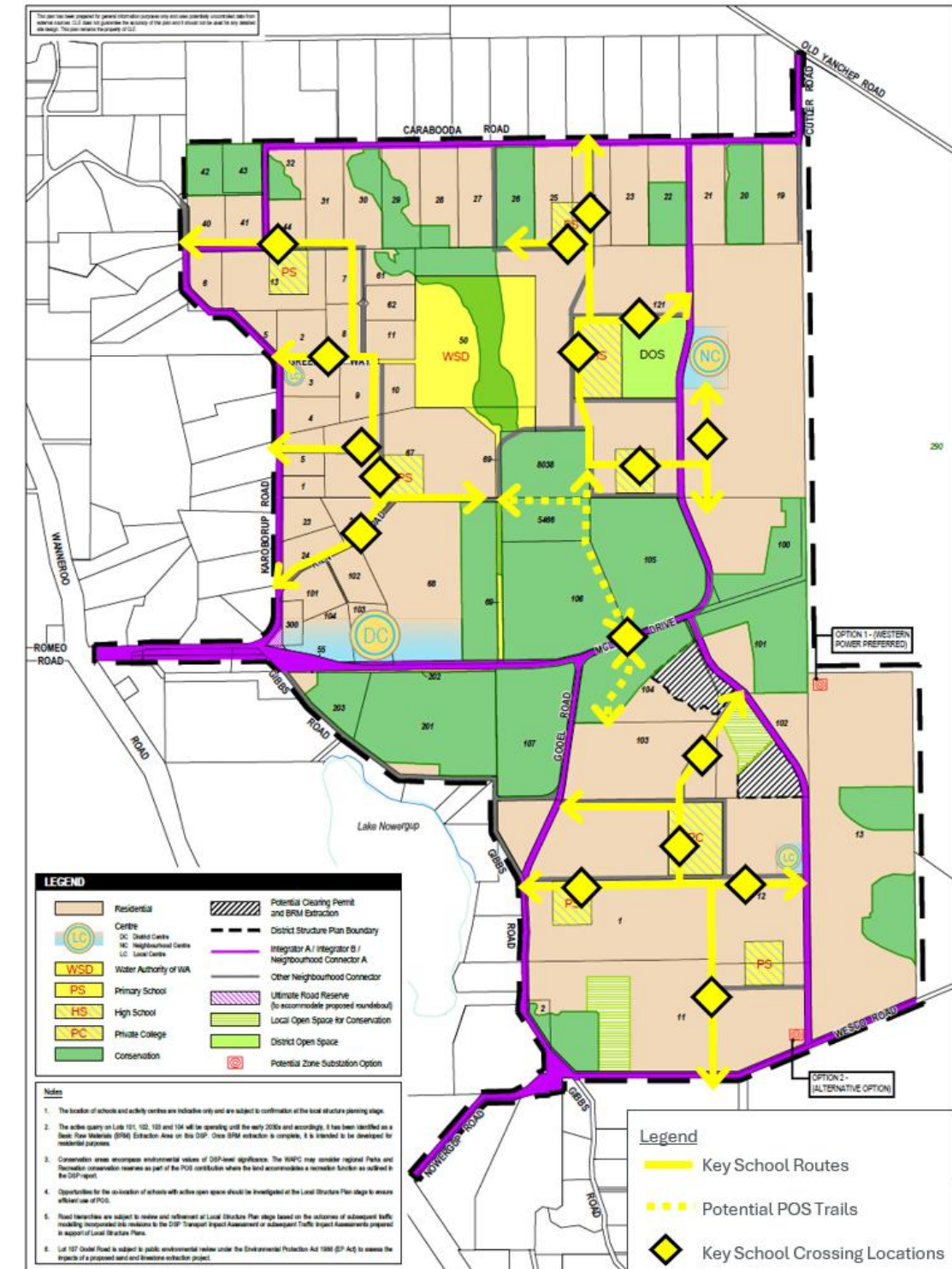
Base Image Source: CLE Town Planning + Design (14 July 2026)

Figure E-3: Proposed Active Travel Network



Base Image Source: CLE Town Planning + Design (14 July 2026)

Figure E-4: Key School Routes and Crossing Locations



Base Image Source: CLE Town Planning + Design (14 July 2026)