

LOT 33 HOPKINSON ROAD CARDUP STRUCTURE PLAN

Part One - Implementation Report

MAY 2024

CLE Town Planning + Design



Title:	Lot 33 Hopkinson Road, Cardup Structure Plan Part One - Implementation Report
Prepared for:	Cardup Investments Pty Ltd
CLE Reference:	2269Rep145D
Date:	29 May 2024
Status:	Final
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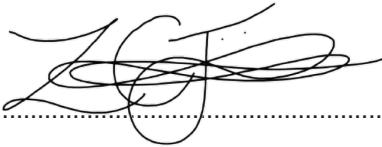
ENDORSEMENT PAGE

This structure plan is prepared under the provisions of the Shire of Serpentine Jarrahdale Local Planning Scheme No. 3

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


12 June 2024

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



.....

an officer of the Commission duly authorised by the Commission pursuant to section 24 of the *Planning and Development Act 2005* for that purpose, in the presence of:

Witness: 

Date: 17 June 2024

Date of Expiry: 17 June 2034

Table of Amendments

Amendment No.	Summary of the Amendment	Date approved by WAPC
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EXECUTIVE SUMMARY

The Lot 33 Hopkinson Road, Cardup Structure Plan ('the Structure Plan') comprises approximately 118 hectares of land and is generally bound by the Tonkin Highway extension reservation to the west, Cardup Siding Road to the north, Cardup Nature Reserve to the east and several private (rural-lifestyle) lots to the south.

The Structure Plan area is zoned 'Urban' in the Metropolitan Region Scheme (MRS) and 'Urban Development' in the Shire of Serpentine-Jarrahdale Local Planning Scheme No. 3 (LPS3). The Structure Plan is lodged in accordance with LPS3 provisions, which require a structure plan prior to development or subdivision. The purpose of the Structure Plan is to provide a planning framework to guide future subdivision and development across the site.

The Structure Plan allows for the creation of a residential community that responds to the surrounding land use context, as well as drawing on key elements of the Byford District Structure Plan, which provides a high-level framework for future land use and development in the area. The Structure Plan is also consistent with the strategic planning for the area with Perth and Peel @ 3.5million, the South Metropolitan Peel Sub-regional Framework and the Shire's draft Local Planning Strategy, all identifying the Structure Plan area for future residential development.

Through the inclusion of a permeable and legible road local road network, the Structure Plan establishes an interconnected interface for the existing development on the surrounding land with residential densities of R10 to R40. The Structure Plan can deliver a residential target of 23.5 dwellings per residential site hectare, net of the R10 lots, thereby achieving State government density targets whilst still appropriately interfacing with the lower-density lifestyle communities to the north and south of the Structure Plan.

The Structure Plan provides a network of public open space areas which, in addition to the adjacent Cardup Nature Reserve, will provide residents with a combination of passive and active spaces whilst also accommodating local and regional drainage which passes through the site.

The Structure Plan also sees the delivery of a Primary School, co-located with an area of active open space, and a High School. The recreational space co-located with the primary school will accommodate a shared-use oval for organised sports and provide an informal recreation space when not used by the school or sports clubs. A small neighbourhood centre is similarly located at the main entrance of the site, creating an additional point of community focus and amenity.

The westernmost edge of the Structure Plan includes a portion of land zoned as 'Urban Development'; this land (approximately 7.0ha), with the exception that the Water Corporation will acquire this land for future infrastructure purposes.

The Structure Plan has access to the essential service infrastructure, which is located within proximity and easily extended to the site.

The Structure Plan is supported by several technical reports, which are provided as appendices and summarised in Part 2:

- Environmental Assessment and Management Strategy;
- Bushfire Management Plan;
- Landscape Masterplan;
- Local Water Management Strategy;
- Transport Impact Assessment;
- Road Traffic Noise Assessment; and
- Engineering Report.

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

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

Table 1: Land Use Summary

Item	Data	Section Number
Total area of Lot 33	126.8 hectares	Section 1.2
Total area covered by the structure plan	118.4 hectares	
Area of each land use proposed Zones (as per the Scheme)		Section 3.2
<i>Residential</i>	49.8 hectares	
<i>Residential (R10 interface)</i>	8.1 hectares	
<i>Neighbourhood Centre</i>	0.9 hectares	
<i>Urban Development</i>	6.9 hectares	
Reserves (as per the Scheme)		
<i>Parks & Recreation</i>	10.7 hectares	
<i>Public Purpose (Primary School)</i>	3.5 hectares	
<i>Public Purpose (High School)</i>	10 hectares	
<i>Road Reserves</i>	28.5 hectares	
Total estimated lots yield	1,100 - 1,300 lots	Section 3.2.1
Estimated number of dwellings	1,100 - 1,300 dwellings	
Estimated residential site density	24 dwellings	
<i>Dwellings per residential site hectare as per Liveable Neighbourhoods¹</i>		
Estimated population	3,360 people @ 2.8 people per household	Section 3.9
Number of Primary Schools	One	
Number of Secondary Schools	One	
Amount of Public Open Space	9.95 hectares (gross creditable) 9.65 hectares (unrestricted) 0.35 hectares (restricted)	Section 3.3

Note: Residential site density calculation excludes R10 residential interface land.

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1.0 STRUCTURE PLAN AREA

This Structure Plan shall apply to Lot 33 Hopkinson Road, Cardup being the land contained within the inner edge of the line denoting the structure plan boundary on the Structure Plan Map.

The Structure Plan is the Lot 33 Hopkinson Road, Cardup Structure Plan.

2.0 STRUCTURE PLAN CONTENT

This Structure Plan comprises:

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

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

3.0 OPERATION

The Structure Plan comes into effect on the date it is endorsed by the Western Australian Planning Commission.

4.0 INTERPRETATION AND RELATIONSHIP WITH STATUTORY PLANNING FRAMEWORK

The Structure Plan constitutes a Local Structure Plan pursuant to Part 5A and Schedule 4 of the City of Serpentine-Jarrahdale Town Planning Scheme 2 and the *Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 - Deemed provisions for local planning schemes*.

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

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

5.0 STAGING

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

6.0 LAND USE

6.1 Land Use and Zones

The subdivision and development of land is to generally be in accordance with the Structure Plan.

Land use permissibility within the Structure Plan area shall be in accordance with the corresponding zone or reserve under the Scheme or as otherwise outlined in this Structure Plan.

6.2 Residential

6.2.1 Dwelling Target

In accordance with the requirements of *Liveable Neighbourhoods*, subdivisions are to achieve an average residential density of 24 dwellings per site hectare across the Structure Plan area.

6.2.2 Density

- a. The Structure Plan map defines the broad residential density ranges that apply to specific areas within the Structure Plan. Lot-specific residential densities within the defined residential ranges are to be subsequently assigned in accordance with a Density Plan approved by the WAPC at the subdivision stage.
- b. A Density Plan is to be submitted at the time of subdivision to the WAPC. It shall be consistent with the Structure Plan and the Residential Density Ranges identified in Plan A and the locational criteria contained in Clause 6.2.3.
- c. The Density Plan is to include a summary of the proposed dwelling yield of the proposed and previously granted subdivision approvals within the entire structure plan area and is to be accompanied with a consolidated density code plan showing the proposed and previously granted R Code plans.
- d. Approval of the Density Plan shall be undertaken at the time of determination of the subdivision application by the WAPC. The approved Residential Density Code Plan shall then form part of the Structure Plan and be used to determine future development applications.
- e. Variations to the Density Plan will require further approval from the WAPC, with a revised Density Plan generally submitted consistent with the approved subdivision plan issued by the WAPC. The revised Density Plan shall be consistent with Residential Density ranges identified on the Structure Plan map and the locational criteria contained in Clause 6.2.3.
- f. A revised Density Plan, consistent with Clause 6.2.2 (e), will replace, wholly or partially, the previously approved Density Plan and shall then form part of the Structure Plan as outlined in Clause 6.2.2 (d).
- g. Density Plans are not required if the WAPC considers that the subdivision is for one or more of the following:
 - (i) The amalgamation of lots;
 - (ii) Consolidation of land for 'super lot' purposes to facilitate land assembly for future development;
 - (iii) The purposes of facilitating the provision of access, services or infrastructure; or
 - (iv) Land which, by virtue of its zoning or reservation under the Structure Plan, cannot be developed for residential purposes.

6.2.3 Locational Criteria

The allocation of residential densities shall be in accordance with the following locational criteria:

- a. The R30 density code shall apply as the base code to all 'Residential' zoned lots, except for those lots coded R10, R25 and R40 as set out in (b), (c) and (d) below.
- b. The R10 density code shall apply to lots as shown on the Structure Plan map.
- c. The R25 density code shall apply to any single residential lot that measures 600m² or greater
- d. The R40 density code may apply to all 'Residential' zoned lots where one or more of the following applies:
 - (i) Lots adjacent to public open space, including all lots with a clear view of the open space;
 - (ii) The lot is within a 400m walkable catchment of the neighbourhood centre; and
 - (iii) Lots fronting neighbourhood connector roads.

R40 development is encouraged within 400m of the neighbourhood centre.

6.3 Public Open Space

The provision of public open space is generally provided in accordance with the Structure Plan map.

7.0 SUBDIVISION AND DEVELOPMENT

7.1 Local Development Plans

The preparation of a Local Development Plan be required by the Western Australian Planning Commission (WAPC), on the advice of the Shire of Serpentine-Jarrahdale, as a condition of subdivision approval where deemed necessary for land comprising, but not limited to:

- (i) Lots with rear-loaded vehicle access; and/or
- (ii) Lots with direct boundary frontage (primary or secondary) to an area of Public Open Space; and/or
- (iii) Lots with a Residential Density Code of R10; and/or
- (iv) Lots subject to 'Quiet House Design' requirements as identified in the Road Traffic Acoustic Assessment; and/or
- (v) The neighbourhood centre to address interface with public open space, bicycle parking and protection of verge trees within Cardup Siding Road; and/or
- (vi) Lots fronting Cardup Siding Road to ensure driveway access minimises impact on verge trees; and/or
- (vii) Lots fronting Doley Road to ensure vehicular access is provided in a forward gear or otherwise provided via the secondary street.

7.2 Movement Network

Cardup Siding Road

- a. Cardup Siding Road is to be designed to protect existing verge trees.
- b. Lots adjacent to Cardup Siding Road are to be designed to ensure that lot levels and frontage access do not impact on verge trees within Cardup Siding Road.
- c. Cycle path connection through Cardup Siding Road to be designed to avoid impacting verge trees.
- d. Cardup Siding Road is subject to detailed design and may require minor widening to achieve a-c above.

Doley Road Extension

- e. Lots fronting Doley Road must provide for vehicular access to Doley Road in a forward gear. Where a secondary street is available, access should be gained from the secondary street.

Pedestrian Orientated Street

- f. Road design and built form is to provide an attractive, high amenity pedestrian connection between the central oval and the neighbourhood centre.

7.3 Bushfire Management

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

Subdivision within the structure plan area must be accompanied by a Staging Plan which demonstrates the ability to achieve two vehicle access and egress points in different directions in accordance with the WAPC Guidelines for Planning in Bushfire Prone Areas.

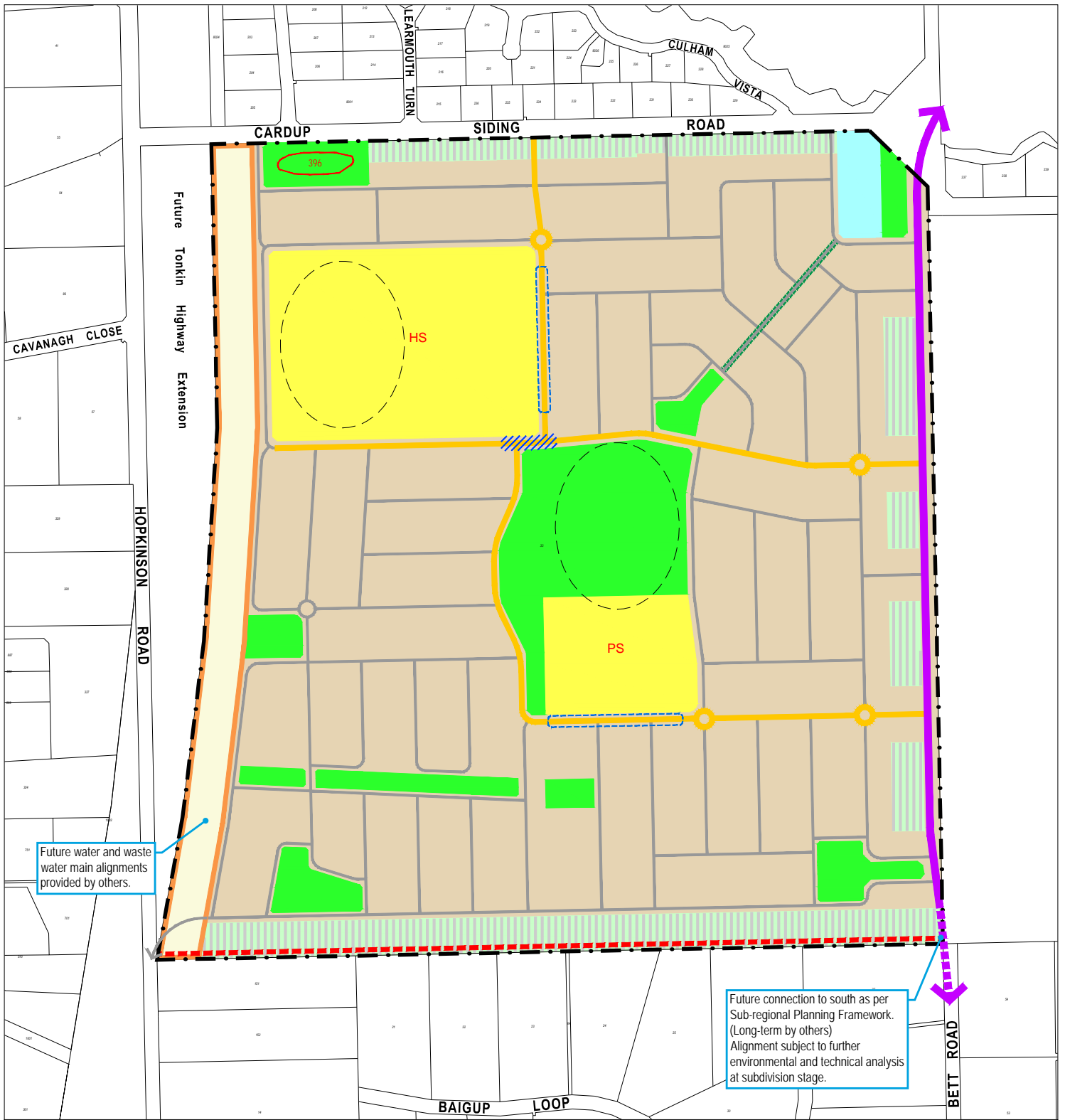
7.4 Notifications on Certificates of Title

Regarding subdivision applications, the Council can recommend to the Western Australian Planning Commission that a condition is imposed for a notification to be placed on the Certificate(s) of Title(s) for lots assessed as being affected by road traffic noise as identified in the Noise Management Plan (Appendix 3).

8.0 OTHER REQUIREMENTS

8.1 Subdivision Requirements

-
- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. The following additional technical reports/plans upon lodgement of subdivision where relevant:</p> | <ul style="list-style-type: none"> • Bushfire Management Plan which demonstrates: <ul style="list-style-type: none"> - The ability to achieve two vehicle access and egress points in different directions in accordance with the WAPC Guidelines for Planning in Bushfire Prone Areas. This is to include subdivision staging plans to demonstrate two access directions at all times; and - Updated vegetation classification mapping. Landscape concept plans providing sufficient detail to assess bushfire impacts are to be submitted with any application containing or adjacent to public open space areas. • Road cross sections for Cardup Siding Road and the Pedestrian Oriented Street. • A Transport Impact Statement addressing the intersection of Hopkinson Road and Cardup Siding Road in accordance with the WAPC Transport Impact Assessment Guidelines Volume 3 (Subdivision) where subdivision is proposed in advance of the Tonkin Highway Extension. • Public open space areas containing Aboriginal heritage or waste water pump station to be provided with landscape concepts identifying all deductions and restricted use open space and an updated public open space schedule if required. |
| <p>2. The following technical reports/strategies are to be prepared and submitted as a condition of subdivision approval (where applicable):</p> | <ul style="list-style-type: none"> • Urban Water Management Plan. • Bushfire Management Plan. • Acid Sulphate Soils and Dewatering Management Plan. • Construction Environmental Management Plan. • Identification and protection of significant vegetation, tree lines and fauna. |
| <p>3. The following additional technical reports/strategies prior to lodgement of development application for the high school:</p> | <ul style="list-style-type: none"> • Specialist Acoustic Advice; and • Bushfire Management Plan. |
-



LEGEND

LOCAL RESERVES

- Public Open Space
- Public Purpose: High School
- Public Purpose: Primary School

ZONES

- Residential (R10)
- Residential (R25-40)
- Urban Development
- Neighbourhood Centre

OTHER

- Structure Plan Boundary
- Integrator Connector
- Neighbourhood Connector
- Fire Service Access Route
6m wide measured from the southern boundary.
- Access Road
The access road layout is indicative only and subject to refinement as part of the detailed subdivision design process.
- Pedestrian Oriented Street
- Heritage Site
- Indicative Bus Embayment
Final location of bus embayment subject to detailed design and agency consultation.
- Final intersection design subject to further investigation and will be determined at subdivision stage, and is to be provided as a full-movement roundabout or shall otherwise provide bus priority north-south.



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LOT 33 HOPKINSON ROAD CARDUP STRUCTURE PLAN

Part Two - Explanatory Report

MAY 2024

CLE Town Planning + Design



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Appendix 2	Bushfire Management Plan (Lushfire and Planning)
Appendix 3	Landscape Report (Emerge Associates)
Appendix 4	Transport Impact Assessment (Transcore)
Appendix 5	Road Traffic Noise Assessment (Herring Storer)
Appendix 6	Local Water Management Strategy (Hyd2o Hydrology)
Appendix 7	Retail Needs Assessment (Shrapnel Urban Planning)
Appendix 8	Engineering Report (The Civil Group)

1.0 PLANNING BACKGROUND

1.1 Introduction and Purpose

The Lot 33 Hopkinson Road, Cardup Structure Plan (Structure Plan) has been prepared on behalf of Cardup Investments Pty Ltd (CIP), a wholly owned subsidiary of Gold Estates Holdings Pty Ltd. No.681 (Lot 33) Hopkinson Road, Cardup (Lot 33) is approximately 127 hectares (ha) of land and is bound by Hopkinson Road to the west, Cardup Siding Road to the north, Cardup Nature Reserve - Bush Forever Site No.352 (Site No.352) to the east and several private rural-lifestyle lots to the south.

The purpose of the Structure Plan is to provide a planning framework to guide the future subdivision and development of Lot 33. It realises the intent of Perth and Peel @ 3.5million and the South Metropolitan Peel Sub-regional Framework (Framework). It represents the next planning stage following Lot 33's zoning (May 2020) of the site for urban development in the Metropolitan Region Scheme (MRS) and the Shire of Serpentine-Jarrahdale Town Planning Scheme No.2 (LPS3).

This Structure Plan is lodged in accordance with the LPS3, which requires a structure plan for land zoned 'Urban Development'.

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

Part 1 - Implementation Section: Part 1 contains the Structure Plan map and outlines the requirements that will be applied when assessing subdivision and development applications.

Part 2 - Explanatory Section: Part 2 discusses the key outcomes and planning implications of the background and technical reports and describes the broad vision and more detailed planning framework. Part 2 is supported by a detailed site-specific analysis of opportunities and constraints and the following Technical Reports and strategies:

- Environmental Assessment and Management Strategy (Emerge Associates).
- Bushfire Management Plan (LushFire and Planning).
- Landscape Report (Emerge Associates).
- Transport Impact Assessment (Transcore).
- Local Water Management Strategy (Hyd2o Hydrology).
- Retail Needs Assessment (Shrapnel Urban Planning).
- Engineering Report (The Civil Group).

Part 3 - Technical Appendices: Part 3 includes the technical reports and supporting plans.

1.2 Land Description

The following section summarises the Structure Plan location, land use and ownership of the Structure Plan area.

1.2.1 Location

The Structure Plan is in the Shire of Serpentine-Jarrahdale (Shire), approximately 10km south-west of the Armadale Strategic Metropolitan Centre and three kilometres (km) south-west of the Byford Town Centre at the intersection of Hopkinson and Cardup Siding Roads, Cardup (Figure 1: Location Plan).

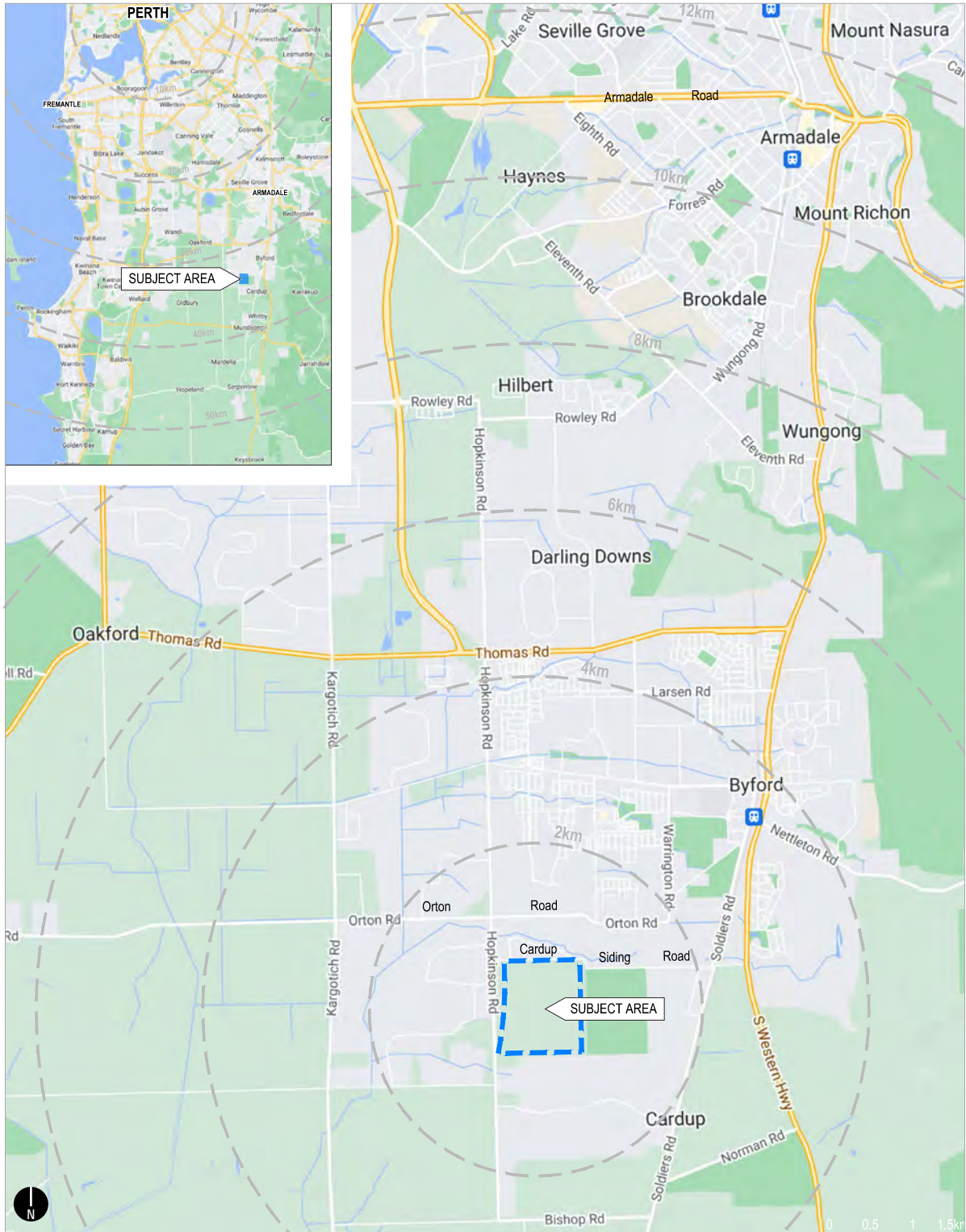


Figure 1 - Location Plan

Source: Google Maps

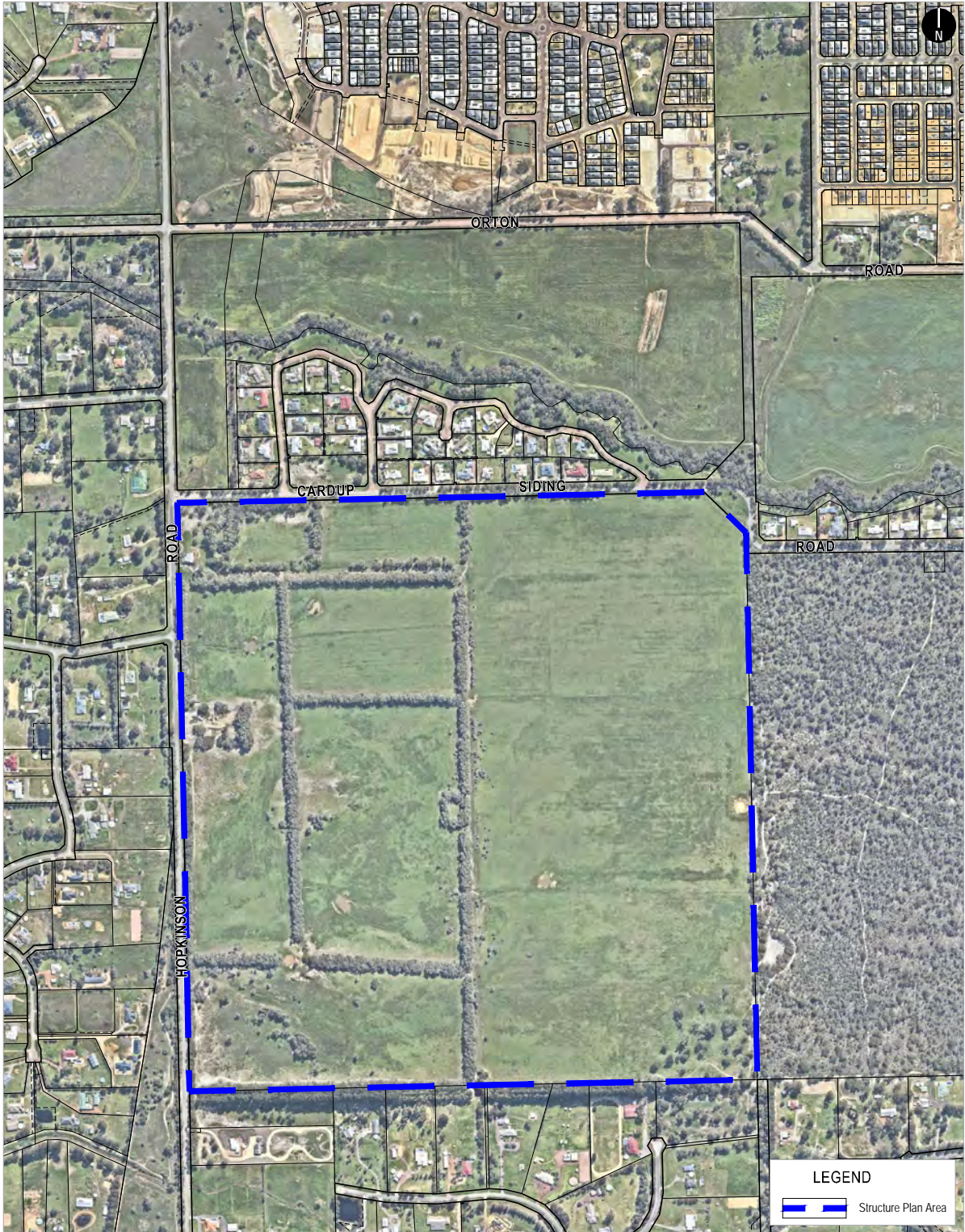


Figure 2 - Site Plan

Source: Nearmap

The Structure Plan area is bound by Hopkinson Road to the west, Cardup Siding Road to the north, Cardup Nature Reserve to the east and several private rural-lifestyle lots to the south.

With ready access to the future Tonkin Highway extension and the planned Byford Metronet Station, the Structure Plan area will have excellent access to regional transport infrastructure.

The Byford Urban Cell, a rapidly developing residential front, is situated immediately north of the Structure Plan area; the Structure Plan represents a logical expansion of these existing residential areas within Byford.

[1.2.2 Area and Land Use](#)

The Structure Plan comprises a single Certificate of Title, identified as No,681 (Lot 33) Hopkinson Road, Cardup, of approximately 126.7ha.

Lot 33 is an undeveloped (vacant) land parcel that has been historically used for agricultural (dairy farming) purposes and is currently being used for cattle grazing (Figure 2: Site Plan).

The past and present agricultural uses have considerably impacted Lot 33 natural environment, resulting in it being primarily cleared of native vegetation. Lot 33 is defined by several windrows of introduced eucalypts delineating various paddock boundaries.

[1.2.3 Ownership and Title Details](#)

The Registered Proprietors of Lot 33 are CIP, and the site is legally defined as Lot 33 on Deposited Plan 226005; Volume 872, Folio 78.

[1.2.4 Surrounding Land Use and Context](#)

The Structure Plan represents the next phase in the planned delivery of a future community at Cardup, with the following being a summary of the local context:

- Land on the northern side of Cardup Siding Road and immediately to the south of the Structure Plan area generally consists of larger private rural-lifestyle lots.
- Site 352 abuts the eastern edge of the Structure Plan area, being reserved 'Parks and Recreation' in the MRS.
- Tonkin Highway (extension) runs along part of the western edge of the Structure Plan, reserved as 'Primary Regional Roads' in the MRS.
- The Byford Urban Cell is situated immediately north, comprising several substantial (mature) residential estates, including The Glades (LWP), Beenyup Grove (Parcel Property and DevelopmentWA) and Redgum Brook Estate (Satterley Property Group).
- The Byford townsite is located 3km north-east along the South Western Highway, including the Byford Station, which forms part of Stage 1 of the Stage Government's key Metronet project.
- The Mundijong-Whitby Urban Cell, another emerging urban precinct, is located 2km south.
- The Forrestdale West Business Park Estate, a 190ha business and service commercial estate and major employment node, is located 11km north, supporting the corridor's future population and employment growth.
- The proposed 440ha West Mundijong Industrial Precinct will also generate significant employment opportunities for the district.

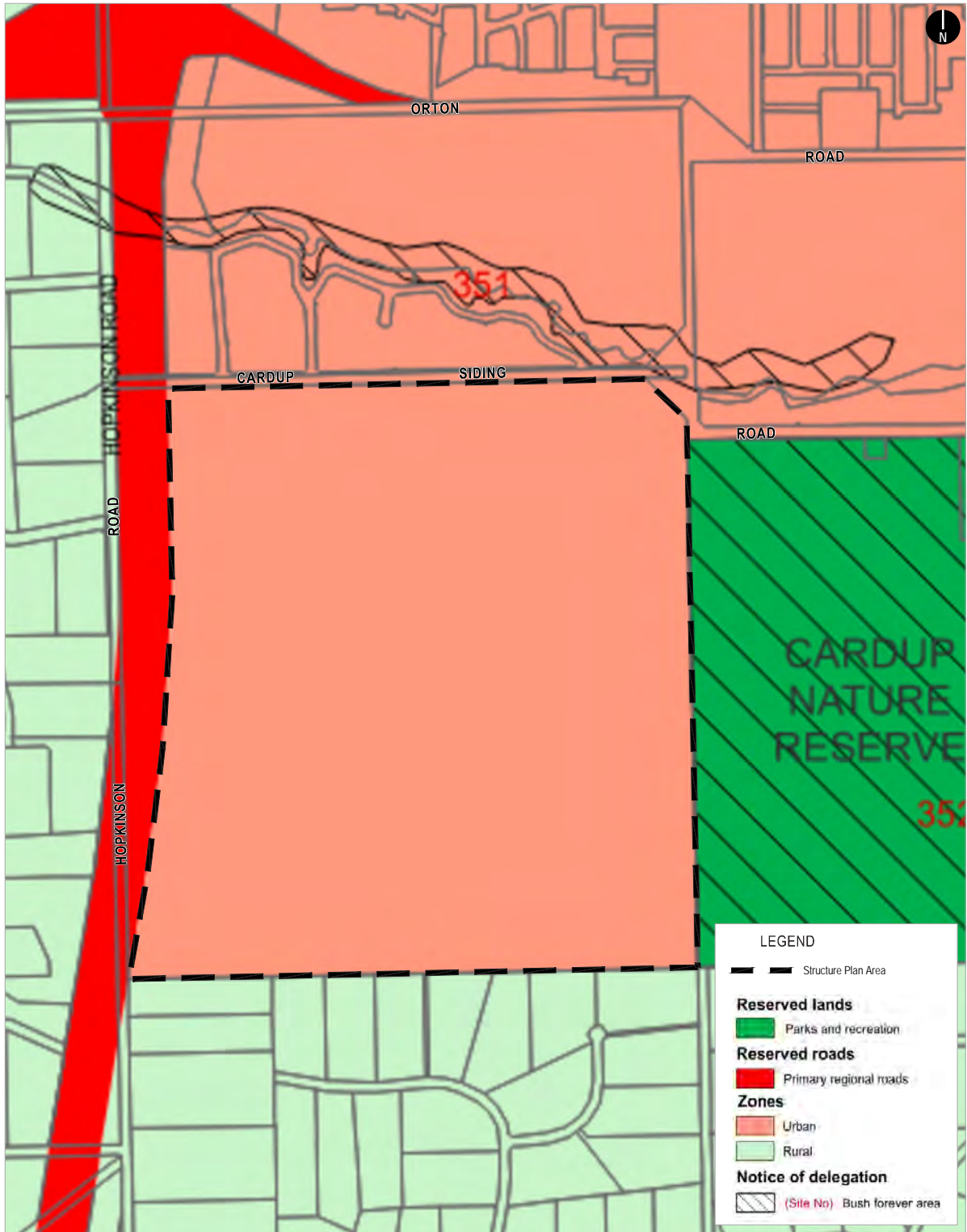


Figure 3 - MRS Zoning

Source: DPLH

1.3 Planning Framework

1.3.1 Metropolitan Region Scheme

The Structure Plan area is primarily zoned 'Urban' in the MRS, with approximately 8ha of the western edge reserved 'Primary Regional Road' for the upcoming extension of Tonkin Highway (Figure 3: MRS Zoning). The Structure Plan is not applicable for this 'Primary Regional Road' reserve.

At the time of determining MRS Amendment 1353/57 (gazettal date 22 May 2020) the Minister for Planning advised that the following should apply at the time of subsequent structure planning:

1. *The proposed residential density of the site and associated lot mix/configuration is to have particular regard to the existing amenity of the locality, including the provision of appropriate community, education and public open space facilities; and*
2. *Appropriate transition arrangements to be considered to the abutting Urban zone to the north, Special-Rural area to the south and Bush Forever site 352 to the east (e.g. public open space, appropriate lot sizes, interface roads etc).*

The Structure Plan responds to this direction and includes a transitional (low-density) residential development to the rural-lifestyle lots located north and south in the Structure Plan area. The Structure Plan also provides a higher-order road interface to Site 352. Further, the Structure Plan provides for both primary and high schools, offering a significant opportunity to advance an education focus within the locality.

These Structure Plan aspects are discussed further in Section 3 of this report.

1.3.2 Shire of Serpentine-Jarrahdale Local Planning Scheme No. 3

The Structure Plan area is zoned 'Urban Development' in LPS3. Under an 'Urban Development' zone, a structure plan is required before development and subdivision (Figure 4: LPS3 Zoning).

1.3.3 The Glades, Byford Local Structure Plan (2011)

The Glades, Byford Local Structure Plan was adopted by the WAPC on 27 April 2011 (last amended on 5 March 2019) and provided further detail to guide the development and subdivision of land within the Byford Urban Cell to the north. This structure plan includes land use, residential densities, community and commercial centres, and a comprehensive road network (Figure 5: The Glades, Byford Local Structure Plan, including proposed Amendment 11).

Importantly, The Glades, Byford Local Structure Plan provides for the crossing of the Cardup Brook via an extension to Doley Road, directly connecting the Structure Plan with Orton Road, the Tonkin Highway and the broader Byford Urban Cell. Doley Road continues along the eastern edge of the Structure Plan, providing needed separation from Site 352. The Doley Road extension reflects the Framework (March 2018) and is discussed in further detail in Section 3.5 of this report.

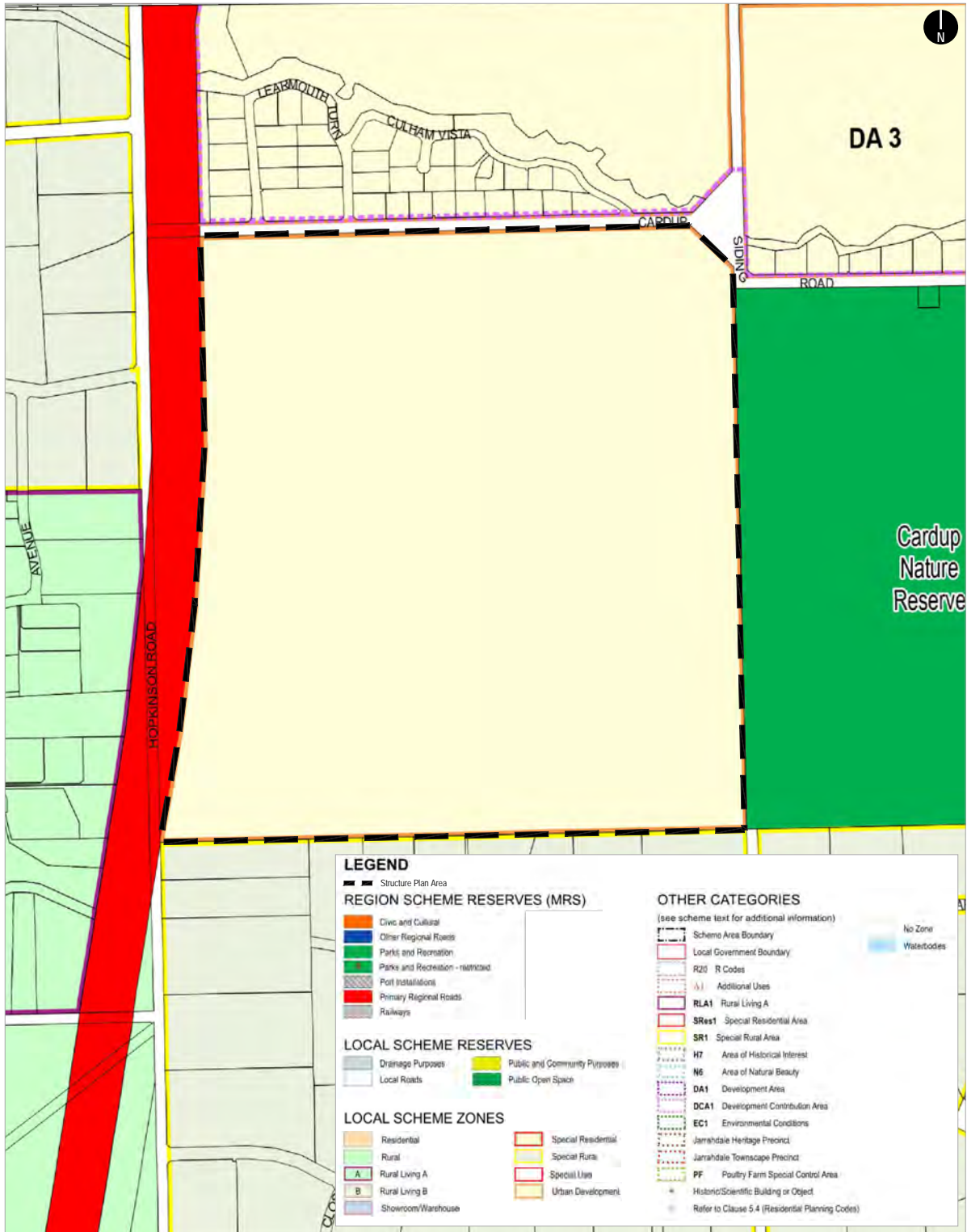
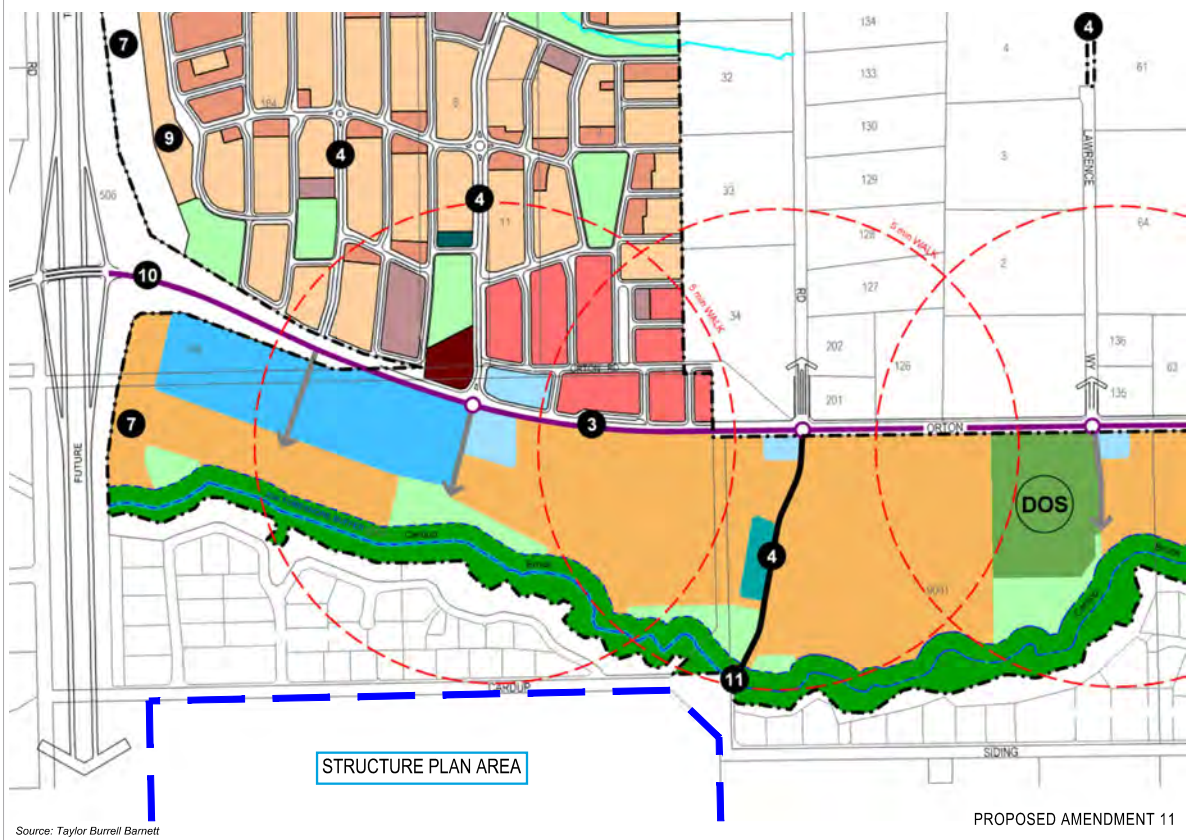


Figure 4 - LPS3 Zoning

Source: DPLH



Source: Taylor Burrell Barnett

PROPOSED AMENDMENT 11

Figure 5 - The Glades, Byford Local Structure Plan (incl Amendment 11)

Source: Taylor Burrell Barnett

Amendment 11

Amendment 11 to The Glades, Byford Local Structure Plan was submitted to the Shire, with a public submission period closing on 25 August 2022.

Amendment 11 proposes several changes to the southern part of this Structure Plan, including but not limited to:

- A revised road layout with a crossing over Cardup Brook via an extension to Doley Road.
- Reconfiguration of public open space (POS), including the provisions of a District Open Space (DOS) area measuring 4ha, located along Orton Road to provide predominantly an active recreation space. The delivery of infrastructure associated with this DOS is funded under the Shire's Development Contributions Scheme.
- General rationalisation of non-residential land uses and the introduction of a residential density range to support the delivery of various dwelling types.

1.3.4 Strategic Planning Framework

Perth and Peel @ 3.5million (March 2018)

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

Perth and Peel @ 3.5million includes the Structure Plan area within the spatial framework, forecasting this sub-region to experience considerable economic and population growth, more than double from 523,400 people in 2011 to 1.26 million by 2050. This population growth is discussed in more detail later in this report.

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

The Framework implements *Perth and Peel @ 3.5million* by providing an additional level of detail at the sub-regional level, including more information about the expected population growth, servicing and infrastructure, housing demand, and importantly it highlights development opportunities throughout the sub-region.

The Structure Plan is shown in the Framework as 'Urban Expansion', that the development of Lot 33 would consolidate and 'round off' existing urban areas given the context of the Byford and Mundijong Whitby Urban Cells. Informed by the Framework, the Minister for Planning has since rezoned the land 'Urban' in the MRS (Minor Amendment 1353/57) and 'Urban Development' in the LPS3, recognising the growth rates and infrastructure availability in the locality. Thus, confirming the suitability of the site for residential development.

The Structure Plan also facilitates a significant piece of road transport infrastructure set out in the Framework, the extension of Doley Road from Byford to the north, crossing over the Cardup Brook and passing along the eastern edge of the Structure Plan and Site 352. This road is planned (long term) to extend further southwards, connecting Byford to Mundijong as identified in the Framework (Figure 6: Regional Road - South Metropolitan Peel Sub-regional Planning Framework).

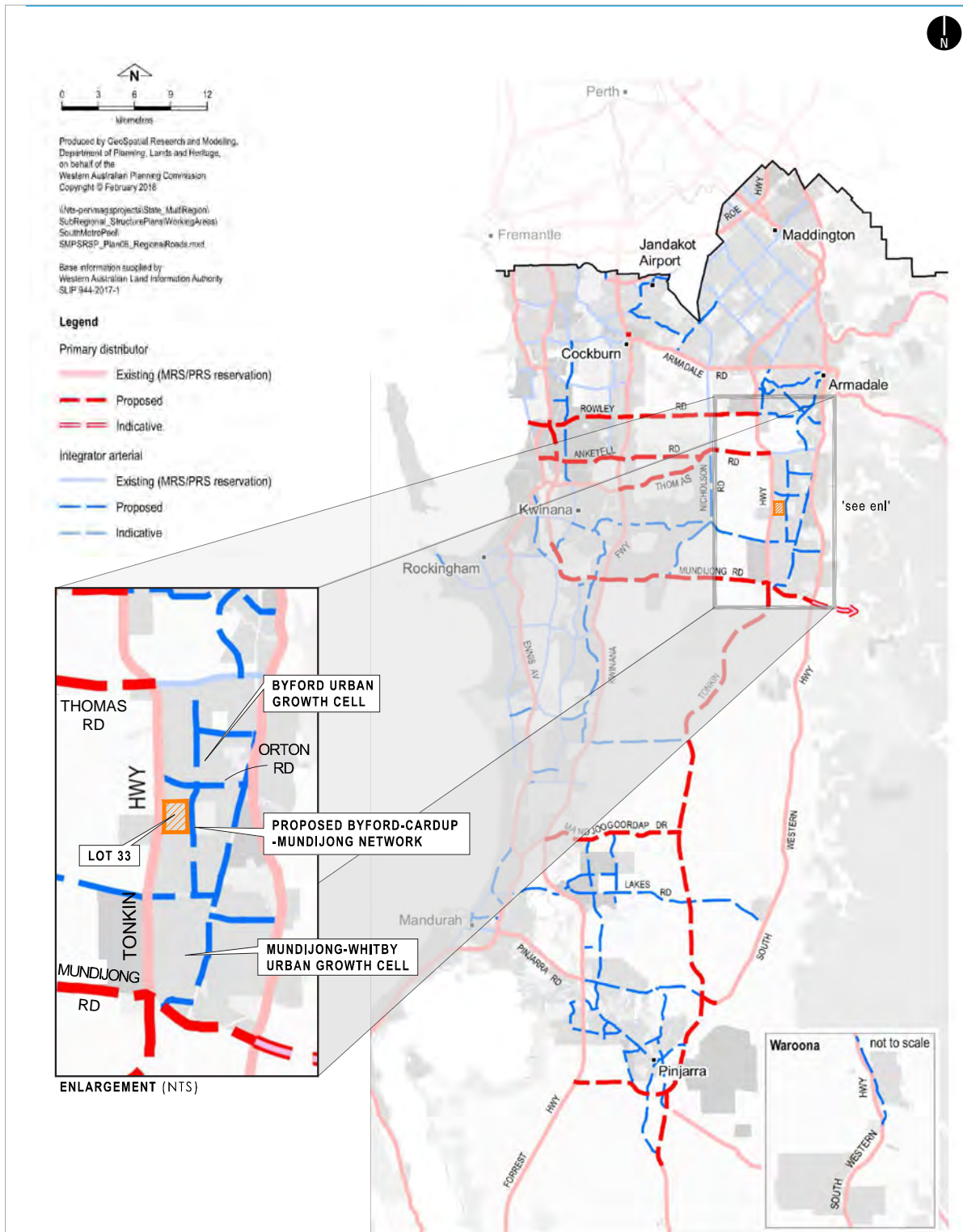


Figure 6 - Regional Road - South Metropolitan Peel Sub-regional Planning Framework

Source: DPLH

Shire of Serpentine-Jarrahdale Draft Local Planning Strategy (2019)

On 29 June 2021, the Statutory Planning Committee (SPC) endorsed the Shire *draft Local Planning Strategy* (LPS) subject to modifications, authorising the Department of Planning, Lands and Heritage (DPLH) officers to execute the LPS once the modifications have been undertaken to their satisfaction.

The Strategy aims to set out the long-term strategic direction for planning in the Shire and to inform the new Shire local planning scheme.

When the LPS was advertised, it identified the Structure Plan area as a 'Development Investigation Area', reflecting the then 'Rural' zoning in the MRS. The SPC subsequently endorsed the LPS with a modification identifying Lot 33 as 'Urban Settlement', reflecting its rezoning in the MRS as 'Urban'.

This modification reinforces the strategic acknowledgment that the Structure Plan area is suitable for urban development.

Byford District Structure Plan (2021)

The Structure Plan adjoins the southern edge of the Byford District Structure Plan (DSP) (adopted in August 2005, last amended in 2021), a district-level structure plan which includes the Byford Urban Cell. The DSP is generally bound by Thomas Road to the north, Hopkinson Road and the future Tonkin Highway extension to the west, Cardup Siding Road to the south, the Byford town centre and the Darling Range foothills to the east.

The DSP sets out the broad framework for major land use and infrastructure, including major roads, commercial centres, residential land, and POS. It also includes the future crossing over Cardup Brook, which links the LSP directly to Orton Road and the future Tonkin Highway (Figure 7: Byford District Structure Plan).

The DSP identifies the location of the Structure Plan area in 'Area U', confirming Lot 33 will be subject to structure planning, suggesting suburban densities with low-density transitional development to interface with the existing rural-lifestyle development and the provision of a primary and high school. The DSP also reinforces the need to provide for the planned extension of Doley Road as a 'secondary distributor' along the eastern edge of the Structure Plan for future connection to Mundijong to the south. The Minister for Planning confirmed the need for this road as part of advice provided with the MRS Amendment (Amendment 1353/57).

The DSP was adopted by the Shire Council on 16 November 2020 and approved the WAPC on a 9 September 2023.

1.3.5 State Planning Policies

WAPC SPP 2.8 Bushland Policy for the Perth Metropolitan Region

State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region (SPP 2.8) guides bushland protection and management in the Perth metropolitan region. SPP 2.8 ensures bushland is appropriately considered in the broader land-use planning and decision-making process, ensuring the long-term conservation of biodiversity and environmental values.

The Structure Plan contains no regionally significant Bush Forever vegetation but borders Site 352, a 'Parks and Recreation' reservation in the MRS.

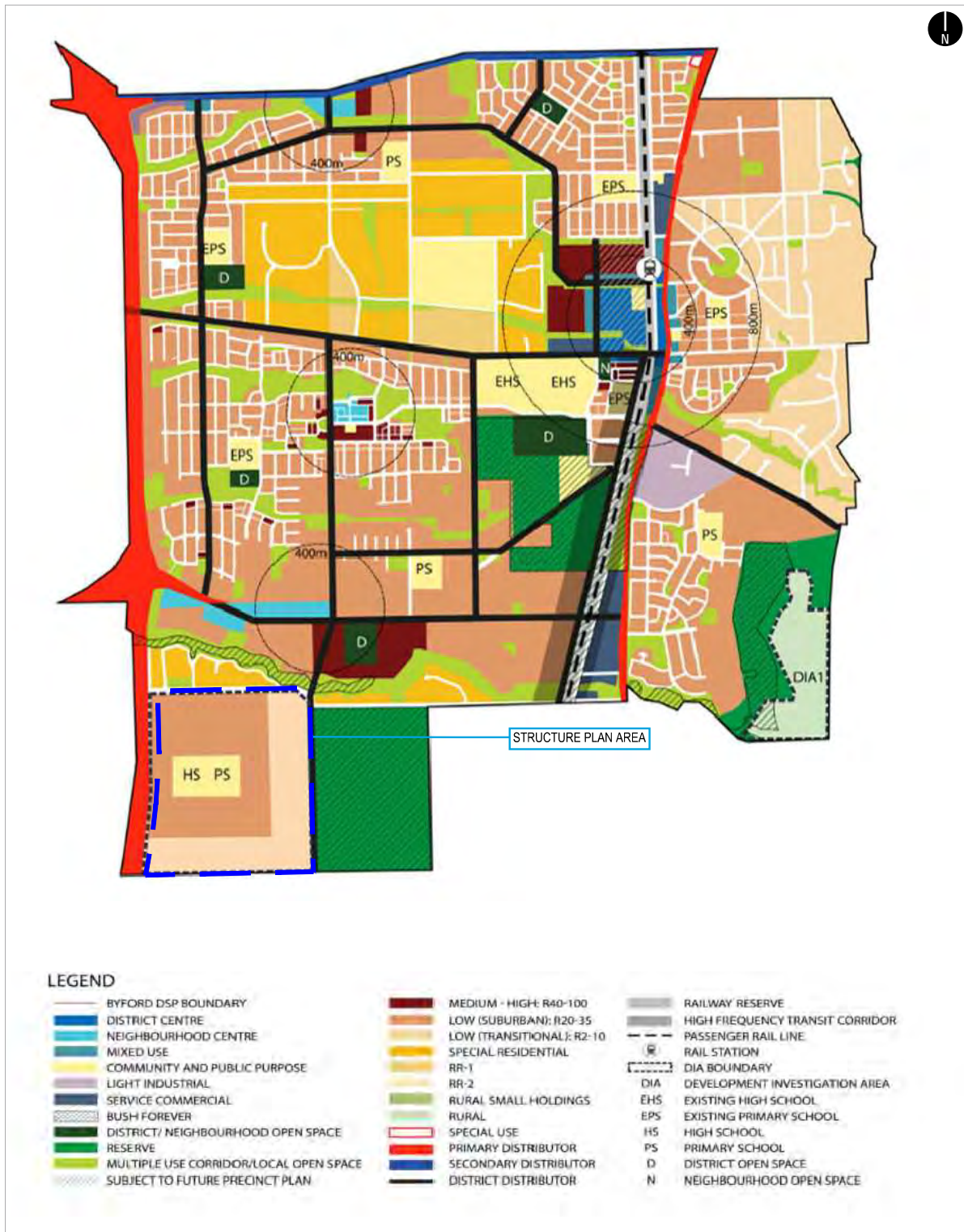


Figure 7 - Byford District Structure Plan

Source: Hames Sharley

In response to this significant environmental asset, the Structure Plan provides for a higher-order road that separates Site 352 from the future urban development to the west. This road interface has similarly been set out in the planning framework via The Glades Local Structure Plan, Framework, and the DSP, as well as being identified by the Minister for Planning as an appropriate transition in advice on MRS Amendment 1353/57.

WAPC State Planning Policy 3.0: Urban Growth and Settlement

State Planning Policy 3.0: Urban Growth and Settlement (SPP 3.0) sets out the principles and considerations that guide the location of new urban growth and settlements. It focuses on the contiguous expansion of urban areas, consolidation in areas with good access to employment, services and transportation, minimised environmental impact and efficient use of suitable land and infrastructure.

The Structure Plan is consistent with SPP 3.0 as it realises the planned urban expansion of the Byford/Cardup locality, confirmed by the land being zoned 'Urban' in the MRS. The Structure Plan will have excellent access to regional transport infrastructure, educational facilities, employment nodes and activity centres, and is not constrained environmentally. The Structure Plan can readily and efficiently connect all essential service infrastructure from immediate surrounding areas.

WAPC State Planning Policy 3.7: Planning in Bushfire Prone Areas

State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7) and Guidelines outline matters that need to be addressed through the planning process to provide an appropriate level of protection of life and property from bushfires.

The Structure Plan is in a designated bushfire-prone area. In accordance with SPP 3.7, Lushfire and Planning have prepared a Bushfire Management Plan (BMP) to support the Structure Plan. The BMP confirms that bushfire risk can be managed and does not impede the development of the Structure Plan area.

Section 3.4 of this report discusses the policy framework in detail, and the BMP is attached in Appendix 2.

WAPC State Planning Policy 4.2: Activity Centres for Perth and Peel

State Planning Policy 4.2: Activity Centres for Perth and Peel (SPP 4.2) sets out the broad planning requirements for the planning and development of new activity centres throughout Perth and Peel.

The Structure Plan provides a small neighbourhood centre situated at the north-eastern corner to facilitate maximum exposure, aiding viability. The centre provides for retail floor space of between 2,800m² and 3,500m² of net lettable area (NLA). While acknowledging the important role that neighbourhood centres play in providing for the day-to-day needs of a local community, SPP 4.2 does not require a Retail Needs Assessment (RNA) when an endorsed (local) structure plan includes an indicative amount of shop-retail floorspace. Nonetheless, the Structure Plan is supported by the RNA (Shrapnel Urban Planning) to ensure the planned centre is robust and feasible while not undermining any other centres within the Shire. The centre will ultimately support the local shopping needs of approximately 2,500 to 3,000 people.

Sections 3.8 of this report discusses the RNA in detail and is attached in Appendix 7.

WAPC State Planning Policy 5.4: Noise and Rail Noise

SPP 5.4: Noise and Rail Noise (SPP 5.4) requires the consideration of transport noise for sensitive land uses abutting major transport and strategic freight routes to avoid or mitigate land-use conflict.

The Structure Plan area is 60 metres from the Tonkin Highway reserve, an identified strategic freight and major traffic route.

In accordance with SPP 5.4, a Road Traffic Noise Assessment (RTA) has been prepared by Herring Storer Acoustics to consider the Tonkin Highway extension works, assessing potential impacts upon future development within the Structure Plan. The RTA will determine the effect of traffic noise on future residential areas within the Structure Plan and identify options to mitigate the noise adequately. A final assessment will be required once the Tonkin Highway design is completed.

Sections 2.7 and 3.6 of this report discuss the RTA in detail and is attached in Appendix 5.

WAPC State Planning Policy 7.3: Residential Design Codes

State Planning Policy 7.3: Residential Design Codes (R-Codes) form the basis for assessing all single, grouped and multiple-dwelling developments in Western Australia. They apply to the Structure Plan under the proposed 'Residential' zone.

The R-Codes can be varied using (relevantly) Local Planning Policies (LPP) and Local Development Plans (LDP).

Standard variations to the R-Codes will be available to the Structure Plan through the reference to the Shire Local Planning Policy 2.2: Residential Development Standards (LPP 2.2) (see Section 3.2 of this report). Other variations may become active in future through LDPs.

Liveable Neighbourhoods

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

The Structure Plan has been prepared in accordance with LN and best practice urban design principles, creating a walkable neighbourhood supported by an interconnected network of local roads and pathways, and adopting an integrated approach to the design of POS and urban water management.

Section 3.0 of this report discusses these aspects in detail.

[1.3.6 Shire of Serpentine-Jarrahdale Local Planning Policies](#)

Local Planning Policy 2.2: Residential Development Standards

Local Planning Policy 2.2: Residential Development Standards (LPP 2.2) sets out acceptable variations to the deemed-to-comply provisions of the R-Codes for the lots coded R25 to R60 in areas zoned 'Urban Development' in the LPS3 and designated 'Residential' in an operational structure plan.

The variations in Table 1 of LPP 2.2 will apply to the Structure Plan and constitute Acceptable Development. Using this LPP will avoid the need for LDPs over most lots, improving efficiencies and minimising costs to the end-user and the Shire.

Shire of Serpentine-Jarrahdale Local Planning Policy 2.4: Water Sensitive Urban Design

Local Planning Policy Water Sensitive Urban Design (LPP 2.4) seeks to ensure water-sensitive design best management practices are implemented in all proposals to improve water quality in the Shire.

Of particular relevance to the Structure Plan is the LPP 2.4 encouragement to adopt a catchment approach, identifying stormwater flows entering and exiting the Structure Plan area (pre- and post-development). Plus, implementing a water management system based on the best Water Sensitive Design management practices will retain current water quality and improve it post-development.

Section 3.7 of this report discusses the Local Water Management Strategy (LWMS) in detail and is attached in Appendix 6.

Shire of Serpentine-Jarrahdale Local Planning Policy 2.8: Public Open Space

A comprehensive landscape strategy has been prepared in the context of *Local Planning Policy 2.8: Public Open Space* (LPP 2.8).

The Structure Plan is supported by a Landscape Report that looks to deliver a readily useable, aesthetic, and liveable environment for residents at the beginning of development by creating several distinct areas of POS.

A key objective of this strategy is to retain mature trees within these open space areas and deliver a shared active open space with the planned primary school. While not strictly within areas of POS, the Lot 33 Hopkinson Road, Cardup Concept Plan (Concept Plan) is also looking to retain several former windrows within public streets to improve streetscapes and capture the historical use of Lot 33.

Section 3.3 of this report discusses the Landscape Report in detail and is attached in Appendix 3.

Shire of Serpentine-Jarrahdale Local Planning Policy 24: Designing Out Crime

Development outcomes will implement LLP Designing Out Crime (LPP 24) to assist in reducing the likelihood of crime and anti-social behaviour in the Shire, adopting the principles of Crime Prevention Through Environmental Design (CPTED).

The Structure Plan will satisfy the fundamental CPTED principles of Surveillance, Access control, Territorial reinforcement and Management and maintenance. The design encourages surveillance of the street and public realm, landscaping that encourages the use and activation of POS areas and the implementation of a safe and legible pedestrian movement network.

The remaining CPTED principle of Target hardening (security measures) is not considered appropriate at this stage, being more relevant for subsequent detailed planning stages.

The final assessment of future development will be undertaken at the time of subdivision and individual dwelling design, ensuring that CPTED principles are implemented within the Structure Plan area.

Shire of Serpentine-Jarrahdale Local Planning Policy 4.18: Street Trees Policy

Local Planning Policy 4.18: Street Trees Policy (LPP 4.18) requires the provision of street trees as part of the land development process in accordance with *Liveable Neighbourhoods*.

The Landscape Report prepared by Emerge Associates includes a Streetscape Planting Strategy that will see a high standard of landscaping delivered within the streetscapes, providing a sense of place and a distinct theme to the Structure Plan area.

Section 3.3 of this report discusses the Streetscape Planting Strategy in detail and is attached as part of the Landscape Report in Appendix 3.

2.0 SITE CONDITIONS AND CONSTRAINTS

The Structure Plan area has a history of agricultural use (dairy farming), having been largely cleared circa 1953.

Emerge Associates has prepared a comprehensive Environmental Assessment and Management Strategy (EAMS), which sets out the site conditions and constraints of the Structure Plan area. The EAMS demonstrates that the site's environmental factors can be addressed adequately through the planning approval process, appropriate land use responses, and management practices.

This section summarises the key findings of the EAMS with a complete copy provided in Appendix 1.

2.1 Landform and Soils

Lot 33 is relatively flat, ranging in height from approximately 26m Australian Height Datum (AHD) in the western portion of the site and gently sloping upwards in a westerly direction to 36m AHD.

Geological mapping identifies the Structure Plan area typically comprises sandy clay of the Guildford Formation, with portions of the west side of the site as sand over Guildford Clay and portions of the eastern side as sand and gravelly sand.

The geotechnical investigation was undertaken by Douglas Partners (October 2014), which confirmed that the soil conditions are generally consistent with that shown on the geological mapping, with sand overlying the Guildford Formation (clay) at depths of between 0.3m and 2.1m below ground level.

2.1.1 Acid Sulphate Soils

The Department of Water and Environmental Regulation (DWER) acid sulphate soil (ASS) mapping identifies the Structure Plan area as 'moderate to low' risk of ASS occurring within 3m of the natural soil surface, except for an eastern portion of the site mapped as having no risk of ASS occurring.

An Acid Sulphate Soil and Dewatering Management Plan will be prepared prior to earthworks to inform the management of ASS.

2.1.2 Potential Contamination

Lot 33 is not registered as contaminated on the DWER Contaminated Sites Database.

Emerge Associates has identified a potential (minor) risk for localised soil impacts associated with areas of historical dairy and manure bagging operations. There is also potential for asbestos contamination in areas around intact buildings. However, standard mitigation measures such as landfill disposal or strategic re-burial can address any contamination (if required). Further site investigations and remedial works are proposed at subsequent stages of the development in accordance with DWER's *Contaminated Sites Act* and guidelines.

2.2 Flora & Vegetation

The Structure Plan area is largely cleared of native vegetation. The site primarily comprises grazing paddocks, a consequence of the long agricultural activities (dairy farming) undertaken on the land. Only scattered remnant trees remain in the south-eastern corner, and windrow planting (exotic species) along some paddock edges introduced during the 1990s.

A Flora and Vegetation Field Survey was undertaken by Emerge Associates (August 2020), with the key findings of the survey as follows:

- Past agricultural pursuits have resulted in most of the Structure Plan area being dominated by non-native species, typically a mixture of planted species over weed and paddock grass species, including two species declared as pests under the *Biosecurity and Agriculture Management Act 2007*.
- The vegetation within the Structure Plan area has been identified as 'Degraded to Completely Degraded' or 'Completely Degraded', with these plant communities having been severely altered, resulting in low native species with a high level of weed cover.
- No Threatened Ecological Communities or Priority Ecological Communities were found within the Structure Plan area.
- No threatened or priority flora species or locally or regionally significant flora species were recorded within the Structure Plan area due to the historic disturbance and use of the site for cattle grazing.

2.3 Fauna

A Fauna and Black Cockatoo Assessment was undertaken by Emerge Associates (August 2020), which involved an ecologist undertaking a comprehensive field survey to identify the characteristics of fauna habitat and the presence of fauna species. The field survey found that the fauna habitat values within the Structure Plan are very limited due to past agricultural activities, with the site habitat predominantly comprising grassland.

An inspection of black cockatoo breeding trees within the Structure Plan area with a diameter at breast height greater than 50cm found only one suitable hollow and one potential suitable hollow. However, one of these trees is located outside the Structure Plan (near Cardup Brook), whilst the other is to be retained within POS, ensuring its protection.

The assessment found limited evidence of foraging habitat for the Forest Red-tailed Black Cockatoo and the Black Cockatoos, albeit with this habitat predominately of 'low' value comprising the planted (non-native) windrows. However, much of this will be retained within future road reserves or POS. Further, any impact from development is not considered significant, given the amount of suitable habitat found within Site 352.

The south-western corner of the Structure Plan contains a patch of vegetation that may provide potential habitat for Quenda, but only occasionally and for short periods.

Overall, the Structure Plan area is highly disturbed with minimal fauna habitat values due to the past clearing of native vegetation and the degraded nature of remaining remnant vegetation. Development of the site will not have a significant impact on any fauna species of conservation significance.

2.4 Hydrology

Ground and surface water management is comprehensively addressed within the LWMS prepared by Hyd2o Hydrologists in support of the Structure Plan.

The LWMS demonstrates that hydrology is not a constraint to urban development. The existing hydrological conditions of the Structure Plan area are summarised below, and the key principles of the LWMS are discussed further in Section 3.7.

Surface Water

Surface water typically flows westerly with groundwater via two non-perennial watercourses, which flow to several culverts under Hopkinson Road, before continuing towards the Water Corporation's main Sub Q Drain, located approximately 200m south. Several constructed soaks and excavations are generally located along these watercourses, a legacy of the previous grazing activity used for stock watering.

Field observations (2014, 2021 and 2022) found no evidence of these flows occurring from Cardup Nature Reserve. Anecdotal evidence from a nearby long-term (upstream) landowner indicated that July 2021 was the only occasion that surface water flows into Site 352 were observed, suggesting that current DWER estimates for flood storage are likely to be considerably less.

The Structure Plan falls outside the catchment of Cardup Brook, which is located to the north. However, DWER's flood mapping does suggest that a breakout flow from the Cardup Brook may enter the Structure Plan area during a major flood event. The existing built form will likely restrict this flow.

Ground Water

A significant amount of knowledge on the local hydrological conditions has been obtained through previous work undertaken as part of the associated District Water Management Strategy (DWMS) related to the MRS amendment.

A pre-development groundwater level and quality monitoring program was undertaken by Hy2do utilising nine monitoring bores installed within the Structure Plan area. The program found that the groundwater levels range from approximately 25m AHD at the south-eastern corner to 32.5m AHD along the central northern boundary. These levels correspond to approximately 5.5m below the existing natural ground level. The groundwater typically flows in a westerly direction.

Groundwater modelling has been undertaken which determined there is an adequate supply of water to support the irrigation of public open space. An amendment to the groundwater license will be required to access the additional groundwater held in reserve, which is required to be submitted to, and approved by the Department of Water and Environmental Regulation.

Wetlands

The Department of Biodiversity, Conservation and Attractions geomorphic wetlands database shows that the majority of the Structure Plan area is classified as a Multiple Use category wetland (UFI 15797 and UFI 16021), which is the lowest order management category for wetlands with few remaining important attributes and functions, making it suitable for development. However, their hydrological features should be maintained through considered water management.

The Cardup Brook is located north and northeast of the site and is classified as a Resource Enhancement category wetland (UFI 14540). One Conservation category wetland (CCW) (UFI 14504) is located within Site 352, which abuts the eastern edge of the Structure Plan.

There are no Environmental Protection Policy lakes or wetlands of international significance within or in proximity to the Structure Plan area.

2.5 Heritage

Aboriginal Heritage

The DPLH Aboriginal Heritage Enquiry System identifies two Registered Heritage Sites within Lot 33:

- Aboriginal Site ID 396 (Site 396) (no restricted access) in the northeast portion of the site, along Cardup Siding Road, associated with artefacts and scatter; and
- Aboriginal Site ID 448 (Site 448) (no restricted access) is located on the western edge of the Structure Plan area, also associated with artefacts and scatter. Site ID 448 is located outside the Structure Plan area, within the Tonkin High extension.

A further six Other Heritage Places and one Registered Site are in proximity to the Structure Plan but will remain unaffected by future development.

An aboriginal heritage review was undertaken by Yates Heritage Consultants, which included a field inspection of Site ID 396 and Site ID 448, along with a desktop review of databases and previous surveys, which found that the Aboriginal Cultural Material Committee assessed both sites in 1995 and that Main Roads Western Australia (MRWA) was granted approved under Section 18 of the *Aboriginal Heritage Act* (for Site ID 448) to use the land for the Tonkin Highway construction.

In 2022 Yates Heritage Consultants undertook a subsequent aboriginal heritage review of the Structure Plan area, including a recent desktop review of databases and previous surveys and an audit of the southern part of Site ID 396 (July 2022). Following this research, a formal onsite engagement process was completed with indigenous elders in accordance with the South West Aboriginal Land and Sea Council Heritage Agreement.

European Heritage

No listed European sites of heritage significance are located within the Structure Plan area.

It is noted that Lot 33 contains the former Fremnells (Kargotich) Dairy, which is listed on the Shire's Local Heritage List (Municipal Inventory) as a Category 4. The former dairy is cited as '*a relatively intact example of an operational dairy farm established in the Serpentine Agricultural area and has historic value in its association with the Orton and Kargotich families*'. The former dairy is located outside the Structure Plan area and within the Tonkin Highway extension land; however, the proponent has completed a photographic record.

2.6 Bushfire Management

The Structure Plan area is designated as bushfire prone, so consequently, Bushfire and Planning have prepared a Bushfire Management Plan (BMP) to support the Structure Plan. This BMP has been prepared following the WAPC's *State Planning Policy 3.7: Planning in Bushfire Prone Areas* and its Guidelines.

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

Section 3.4 of this report discusses the BMP in detail and is attached in Appendix 2.

2.7 Road Transport Noise

Herring Storer Acoustics has undertaken a RTA, assessing the impacts of future traffic movements along the Tonkin Highway extension, which abuts the western boundary of the Structure Plan. This Assessment has been prepared in accordance with SPP 5.4.

The Assessment considers noise impacts regarding the future Tonkin Highway. The Assessment identifies a small number of dwellings that exceed the 'noise target'. The Assessment outlines the appropriate Quiet House Design criteria to satisfy SPP 5.4. Notifications would also be placed on titles of affected properties to inform future owners of potential impacts and required treatments. This Assessment is subject to the final design, level and road pavement composition of Tonkin Highway.

Section 3.6 of this report discusses the RTA in detail and is attached in Appendix 5.

2.8 Interface to 'Urban Development' Zoned Land

Adjoining the Tonkin Highway reservation is 'Urban Development' zoned land (6.9ha) which has the potential to be utilised by Water Corporation for future infrastructure. The land remains under the tenure of the proponent. Should the Water Corporation acquire the land, the proponent will seek a collaborative approach with the Shire and Water Corporation to activate the area and ensure that it is managed to the benefit of the adjoining residential development.

Should the Water Corporation determine that this land is redundant to their needs, the proponent will initiate an amendment to the Structure Plan.

3.0 LAND USE AND SUBDIVISION REQUIREMENTS

3.1 Land Use

The Structure Plan provides the planning framework for the development and delivery of a future community at Cardup.

A concept plan has been prepared for the site to demonstrate how development could occur based on the principles and requirements of the Structure Plan (Figure 8: Concept Plan). The Concept Plan represents the current understanding of the market and site, and the concept will be refined to respond to site and market conditions when subdivision occurs.

The key principles of the Concept Plan are as follows:

- Provide an urban form that responds to the location and context of the site within the Cardup - Byford locality.
- Supports the delivery of a diverse range of housing choice that will cater to a wide purchaser segment while being able to respond to future changes in market demand.
- Deliver high-quality open space areas that serve both an amenity and local and district drainage function.
- Deliver a permeable, interconnected road and path network.
- Support the provision of significant and much-needed community facilities such as the open space supporting 'district level' playing fields co-located with a primary school site and a high school site to meet the current and future needs of the local community.
- Ensure an appropriate interface to existing low-density 'lifestyle' enclaves to the north and south of the Structure Plan area, ensuring the amenity of these residents is maintained.
- Extend the necessary services and infrastructure in a timely and coordinated manner to support future development.

Based on these principles, the Structure Plan provides for the following:

- A yield of approximately 1,100-1,300 dwellings across the Structure Plan area with residential densities between R10 to R60. The low-density R10 ensures a transitional interface with existing low-density 'lifestyle' enclaves to the north and south, while medium-density (R40) will be focused on main access roads and areas of high local amenity.
- Approximately 9.95ha of (gross) POS is distributed throughout the Structure Plan area, ensuring opportunities for passive recreation and delivering local and regional drainage objectives.
- Construction of a permeable local road network that connects to the existing road network, providing for pedestrian and cycling infrastructure, and future public transport services, meeting short and long-term road transport planning objectives.
- Excellent access to the regional road network via a connection to Orton Road, which in turn directly connects to the Tonkin Highway extension.
- Creation of a primary school site co-located within an active open space area, recognising that the Structure Plan forms one school catchment.

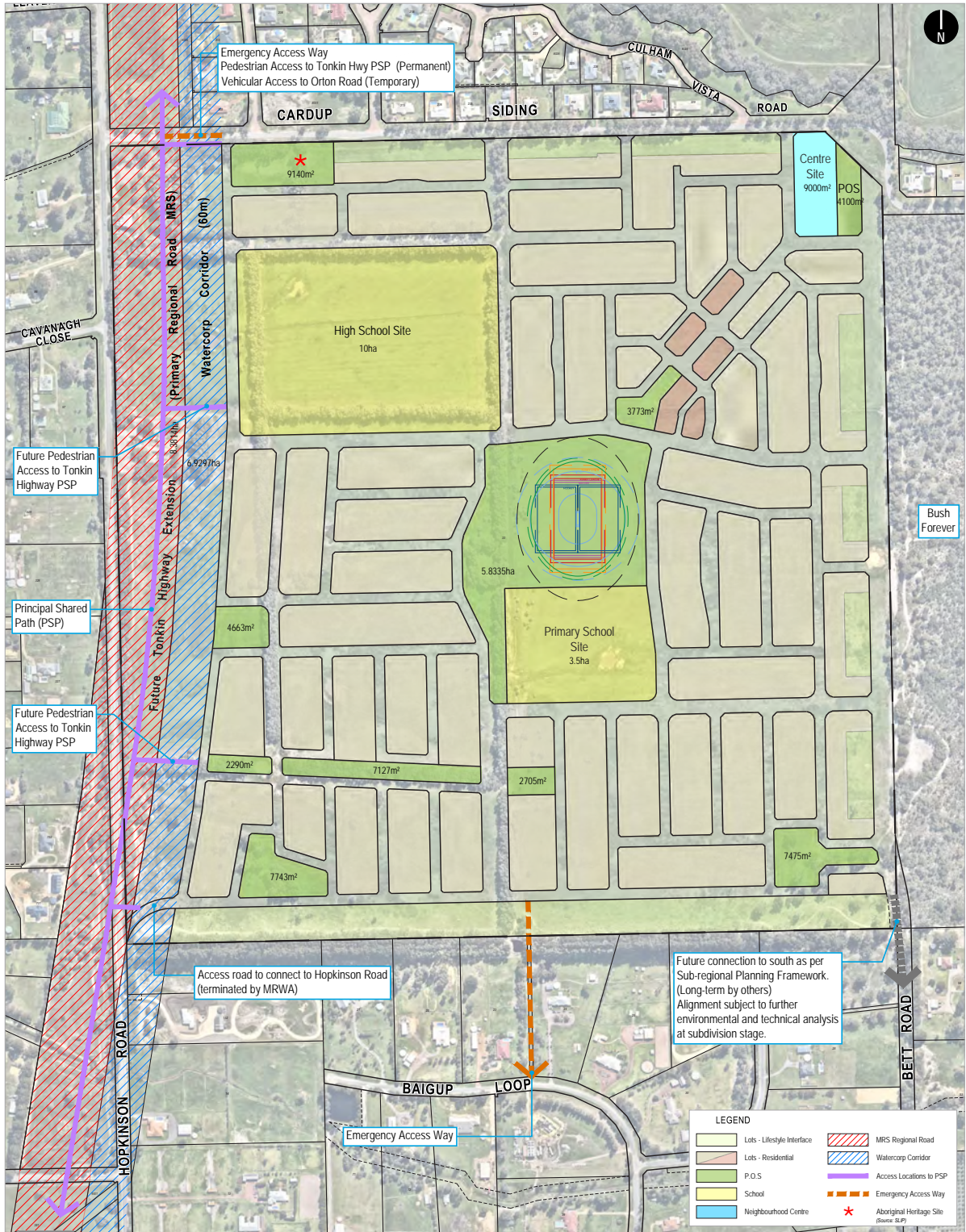


Figure 8 - Concept Plan

Source: Nearmaps

- A high school site is provided in addition to the primary school site at the request of the Department of Education (DoE), as existing secondary schools in the Byford area exceed their design capacity.
- The provision of a commercial centre at the 'gateway' of the Structure Plan area provides residents with convenient access to a commercial centre and amenities.
- The required separation from identified bushfire hazards along the Structure Plan's eastern, northern, and southern edges has been provided.

A Land Use Schedule (Table 1) supports the Concept Plan (Figure 8) and the Public Open Space Schedule (Table 2).

3.2 Residential

The Structure Plan provides a framework to support the delivery of various housing options.

A planned and natural extension to the Byford urban front situated north, the density and style of housing within the Structure Plan area will be responsive to the site's characteristics, to be delivered to create affordable built form and high-quality streetscapes.

3.2.1 Dwelling Yields and Density Targets

The Structure Plan has the potential to create approximately 1,100-1,200 residential lots, set in a density range from R10 to R40, based on the following planning principles:

- A base coding of R30 applies, creating opportunities to deliver a range of traditional (front-loaded) lots typically ranging in size from 300m² to 550m².
- R25 provides for large traditional lots to appeal to purchasers seeking a more generous property size, applied to any single residential lot with an area of 600m² or greater to avoid the circumstance of these lots being 'over-developed' or subsequently subdivided through using the R30 provisions.
- Low-density R10 'lifestyle' lots are located on Cardup Siding Road and the southern boundary of the Structure Plan area. These lots provide an appropriate transition between existing 'lifestyle' properties found north and south of the Structure Plan and the traditional development planned for within the Structure Plan area; as directed by the Minister of Planning.
- Medium density R40 coded lots will typically front POS (where a higher level of amenity exists) and on street corners or at the end of street blocks where good opportunities for integration exist. The R40 coding provides the opportunity to deliver contemporary 'compact' lots that typically 'book-end' street blocks to create a traditional streetscape towards the secondary street.

LN recommends a housing density target of 22 dwellings per site hectare with the aim of this target to encourage more efficient use of infrastructure and housing. The Structure Plan has the potential to achieve 24 dwellings per site hectare, exceeding the target set by LN.

[3.2.2 Local Development Plans](#)

LDPs will be required where specific variations to the R-Codes are needed to deliver a contemporary built-form response. These LDPs will be required as a condition of subdivision approval and be approved by the Shire.

LPP 2.2 sets out acceptable variations to the deemed-to-comply provisions of the R-Codes for lots coded R25 to R60 in areas zoned 'Urban Development' in the LPS3 and designated 'Residential' in an operational structure plan.

The variations in LPP 2.2 will apply to the Structure Plan area and constitute Acceptable Development. The variations in LPP 2.2 will apply to the Structure Plan area and constitute Acceptable Development avoiding the need for LDPs over most lots, improving efficiencies and minimising costs to the end user and the local government.

LDPs will only be confined to the following specific considerations that may require detailed design responses:

- R10 'lifestyle' lots;
- Lots abutting areas of POS;
- Lots affected by road traffic noise that will require 'Quiet House Design' façade treatment; and
- Lots with rear-loaded vehicle access.
- The Neighbourhood Centre to address interface with public open space, bicycle parking and protection of verge trees within Cardup Siding Road.
- Lots fronting Cardup Siding Road to ensure driveway access minimises impact on verge trees.
- Lots fronting Doley Road to ensure vehicular access is provided in a forward gear or otherwise provided via the secondary street.

The following outlines the key provisions to be addressed in LDPs and a brief explanation of their application:

R10 'Lifestyle' Lots

The R10 lots provide a transitional interface with the lifestyle enclaves to the north and south of the Structure Plan, as directed by the Minister of Planning.

To ensure a successful transition to the adjoining low-density rural development. The R10 lifestyle lots will be developed with dwellings that capture the 'rural' character, including open rural-style fencing along the front boundaries, verandahs, and complementary materials.

Lots abutting areas of Public Open Space

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

LN supports residential lots directly abutting POS where the functionality of the space is not compromised and where the dwelling provides adequate visual surveillance.

To ensure the POS is not compromised, subsequent subdivision design and engineering detail will ensure that the adjacent residential lots are elevated a minimum of 500mm from the ground level within the POS to create a visible separation between the private and public realms.

LDPs will be prepared to control the built form where lots interface with open space. These LDPs will address the following:

- Appropriate setbacks to the POS.
- Major openings (other than bedrooms) to address the open space.
- Permeable fencing to promote surveillance.

Lots affected by Road Noise

LDPs will be prepared for lots deemed to be affected by road traffic noise from the Tonkin Highway extension, as identified in the Herring Storer Acoustics RTA. The Structure Plan will mandate appropriate treatment 'Packages' and applicable construction standards where appropriate.

Section 3.6 of this report discusses the RTA in detail and is attached in Appendix 5.

3.3 Public Open Space

The Structure Plan establishes the framework for several POS areas that will serve various functions, balancing active and passive recreational pursuits and delivering key drainage and vegetation retention objectives.

The Structure Plan provides for approximately 9.95ha of local POS, which (once LN credits are applied) represents around 11.7%, as shown in Table 1 (Land Use Schedule), Table 2 (Public Open Space and Drainage Schedule) and Figure 9: Landscape Strategy.

The following is a summary of the key aspects of the POS provision based on LN requirements:

- 10.7ha (gross) of POS is distributed throughout the Structure Plan area, accommodating both active and passive uses and performing a drainage function.
- Approximately 0.8ha of the open space will receive drainage from the first 15mm storm events. For calculation purposes, this is treated as the 1-year storm event and taken as a deduction from the Net Site Area, as set out in *Liveable Neighbourhoods*. This stormwater will be infiltrated within bio-filtration areas.
- The majority of drainage from flows over and above the first 15mm event from the wider Structure Plan area will be directed via a piped drainage system to bio-retention basins and flood storage areas within POS for infiltration.
- Only 0.35ha (approx.) of the POS is restricted use open space due to receiving stormwater flows from the 20% Annual Exceedance Probability (AEP) event, in accordance with LN. For this calculation, the 20% AEP event is treated as a 5-year storm event.

The Structure Plan provides 11.7% POS provision in accordance with LN, exceeding the minimum requirement of 10%.

A more detailed description of the POS is detailed below with the Landscape Report prepared by Emerge Associates, as attached in Appendix 3.

Table 1: Land Use Schedule (all areas in hectares)

LSP Site Area	126.8160	
Existing Deductions		
Tonkin Highway extension (P. R. R. Reserve)	8.4458	
Urban Development Land (see Note 4)	6.9289	
R10 Lots	8.0662	
Commercial Site	0.9015	
Primary School	3.5026	
High School	10.0026	
Future Arterial Road (see Note 3)	3.0910	
Drainage 1:1yr event (as per Hyd20 LWMS)	0.7816	
Total existing deductions	41.7202	
Net Site Area		85.0958
Structure Plan Deductions		
Restricted POS over 2%	0.0000	
Total Structure Plan Deductions	0.0000	
Gross Subdivisible Area		85.0958
POS @ 10%		8.5096
Public Open Space Requirement		
May Comprise:		
Min 8%	6.8077	
Max 2%	1.7019	
TOTAL POS REQUIREMENT		8.5096
Public Open Space Provided	Unrestricted POS Area	Restricted POS Area
POS 4 - Northwest	0.8334	0.0124
POS 1 - Northwest (Adjacent to Commercial)	0.4100	0.0000
POS 2 - Southern Pedestrian Oriented Street	0.3773	0.0000
POS 5 - Central West	0.1811	0.1392
POS 3 - Central (Adjacent to Primary School)	5.4851	0.0682
POS 6, 7, 8 - Southern Linear	0.8821	0.0784
POS 9 - Southwest	0.7385	0.0003
POS 10 - Southeast	0.7475	0.0000
TOTAL (ha)	9.6550	0.2985
Additional Deductions		
Restricted Open Space Surplus		0.0000
Revised Public Open Space Contribution		
Unrestricted POS provided	9.6550	11.35%
Restricted POS provided	0.2985	0.35%
Total Creditable POS Provided	9.9535	11.70%

Notes:

- In accordance with Liveable Neighbourhoods: the area subject to inundation more frequently than a one year average recurrence interval rainfall event is not included as restricted or unrestricted open space and is a deduction from the net site area (LN R33); areas for the detention of stormwater for a greater than one year average recurrence interval up to the five year recurrence interval is restricted open space up to 20%, the area greater than 20% is a deduction (LN R26 & Table 11); areas for the detention of stormwater for a greater than five year average recurrence interval is within unrestricted open space (LN R25).
- This Schedule is for plan CLE Ref. 2269-197A-01 and uses the drainage calculations prepared by Hyd2o dated 4 September 2023 ref: H20050Av3.
- Future arterial road is taken as a deduction on the premise that this road is planned to serve a regional function and will be the subject of a future MRS reservation.
- Urban Development land taken as a deduction, pending finalisation of future land use by Water Corporation

Table 2: Public Open Space Drainage Area Schedule (all areas in ha)

Local Open Space Area	Deductions		Restricted Use Open Space				Total Unrestricted Open Space
	Gross Area	1:1 yr Drainage Area	1:5 yr Drainage Area	1:5 - 1:1 Drainage Area	Other Restricted Use Open Space	Total Restricted Use Open Space	
POS 4 - Northwest	0.9140	0.0682	0.0806	0.0124	0.0000	0.0124	0.8334
POS 1 - Northwest (Adjacent to Commercial)	0.4100	0.0000	0.0000	0.0000	0.0000	0.0000	0.4100
POS 2 - Southern Pedestrian Oriented Street	0.3773	0.0000	0.0000	0.0000	0.0000	0.0000	0.3773
POS 5 - Central West	0.4663	0.1460	0.2852	0.1392	0.0000	0.1392	0.1811
POS 3 - Central (Adjacent to Primary School)	5.8335	0.2802	0.3484	0.0682	0.0000	0.0682	5.4851
POS 6, 7, 8 - Southern Linear	1.2122	0.2517	0.3301	0.0784	0.0000	0.0784	0.8821
POS 9 - Southwest	0.7743	0.0355	0.0358	0.0003	0.0000	0.0003	0.7385
POS 10 - Southeast	0.7475	0.0000	0.0000	0.0000	0.0000	0.0000	0.7475
TOTAL	10.7351	0.7816	1.0801	0.2985	0.0000	0.2985	9.6550

Notes:

1. The one year average recurrence interval areas shown in the table are based on the management of the first 15mm runoff in accordance with Department of Water and Environmental Regulations policy.
2. Areas subject to inundation more frequently than a one year average recurrence interval rainfall event are not included as restricted or unrestricted open space and are a deduction.
3. Areas for the detention of stormwater for a greater than one year average recurrence interval up to the five year recurrence interval are treated as restricted open space.
4. Areas for the detention of stormwater for a greater than five year average recurrence interval are within unrestricted open space and receive a full open space credit.

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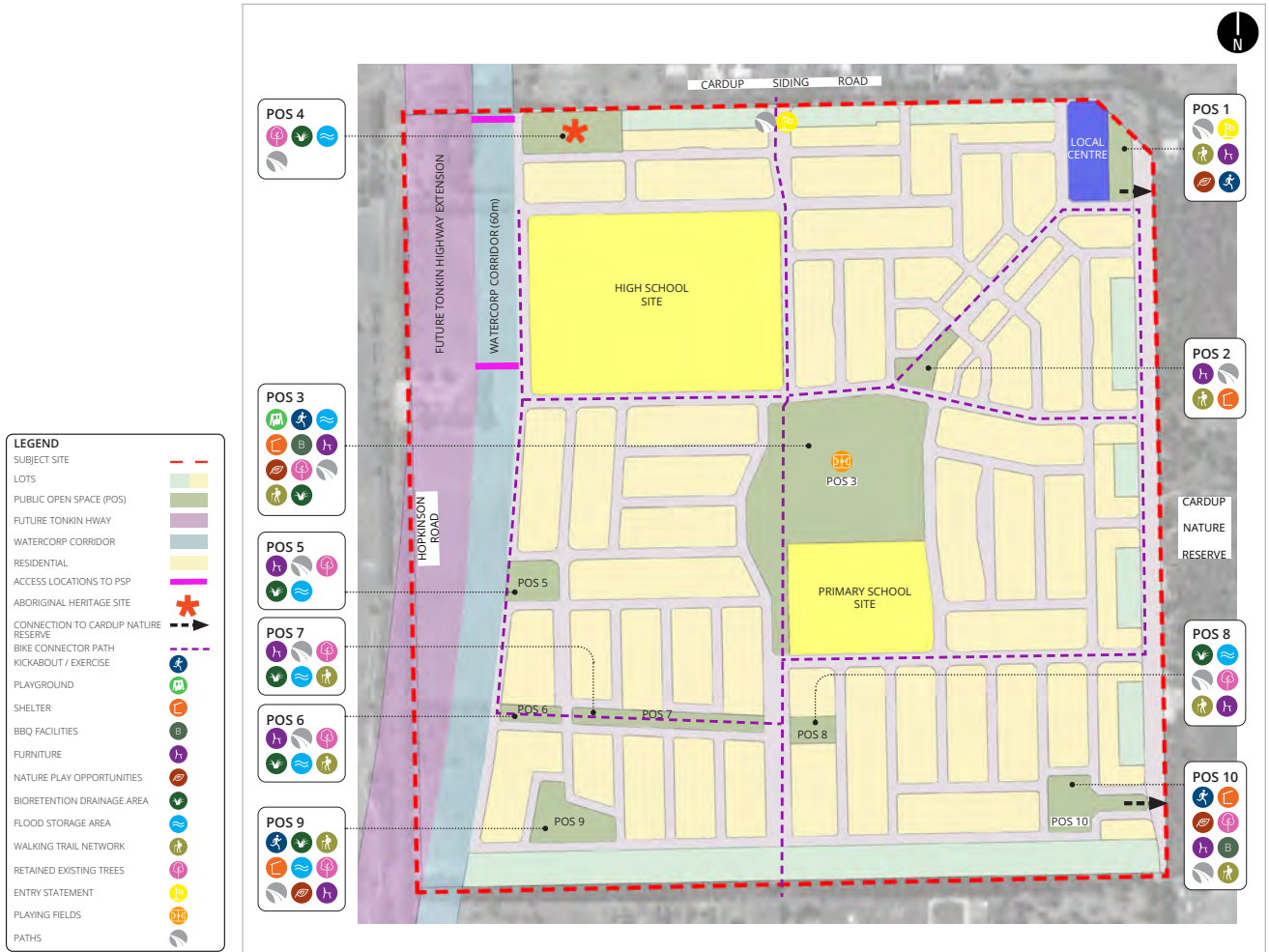


Figure 9 - Landscape Strategy

Source: Emerge Associates

3.3.1 Description of Public Open Space

The Landscape Report by Emerge Associates includes a Landscape Strategy which describes the intended function and design principles of the POS areas (Figure 9: Landscape Strategy). It has ensured that the POS areas can serve various functions throughout the Structure Plan area, balancing active and passive recreational pursuits, tree retention, and local and regional drainage requirements.

The north-western POS (POS 4) is an area of POS that has been positioned to retain and protect an aboriginal heritage site and is subject to ongoing engagement with indigenous groups for design and interpretation opportunities.

It is important to note the landscaping designs shown are conceptual and will be refined as part of the subsequent phases in consultation with the Shire.

Entry POS (POS 1)

- POS 1 serves as the primary entry statement, located adjacent to the commercial zoned land, which creates an arrival experience for residents and visitors alike.
- POS 1 provides an opportunity for a small play space area with a shade structure and seating.
- Landscaping species for this space will be chosen to reflect and complement the nearby Cardup Nature Reserve.
- No drainage is proposed within this space.
- The total area is approximately 6,000m².

Central POS (POS 3)

- POS 3 is a district-level open space that can accommodate a senior AFL oval, two rectangle pitches and a cricket pitch.
- This open space is co-located with the primary school to enable shared-use facilities for the community.
- POS 3 includes the retention of a large number of mature trees and includes the 'bull ring', a delineated space surrounded by trees on all sides. The 'bull ring' is to be presented as a central community node for multi-purpose functions with potential joint use with the primary school.
- Bike and pedestrian pathways through the POS connect to the surrounding network, other POS areas and the broader project.
- POS 3 allows for the provision of shelters and picnic facilities, along with a play space conveniently accessible from pedestrian connections.
- POS 3 importantly accommodates drainage for all storm events.
- The total area is approximately 5.8ha.

Linear POS (POS 6, 7 & 8)

- This POS creates key east-west pedestrian connections within the estate via three distinct spaces.
- They are designed and positioned to retain a row of existing trees (a former windrow) with a heavy focus on native planted species underneath.
- This POS serves both a local and regional drainage function.
- Bike and pedestrian pathways connect to the surrounding network with bridge crossings over a vegetated swale designed to convey regional stormwater flows.
- The total area is approximately 1.2ha.

Pocket Parks (POS 2, 5, 9 & 10)

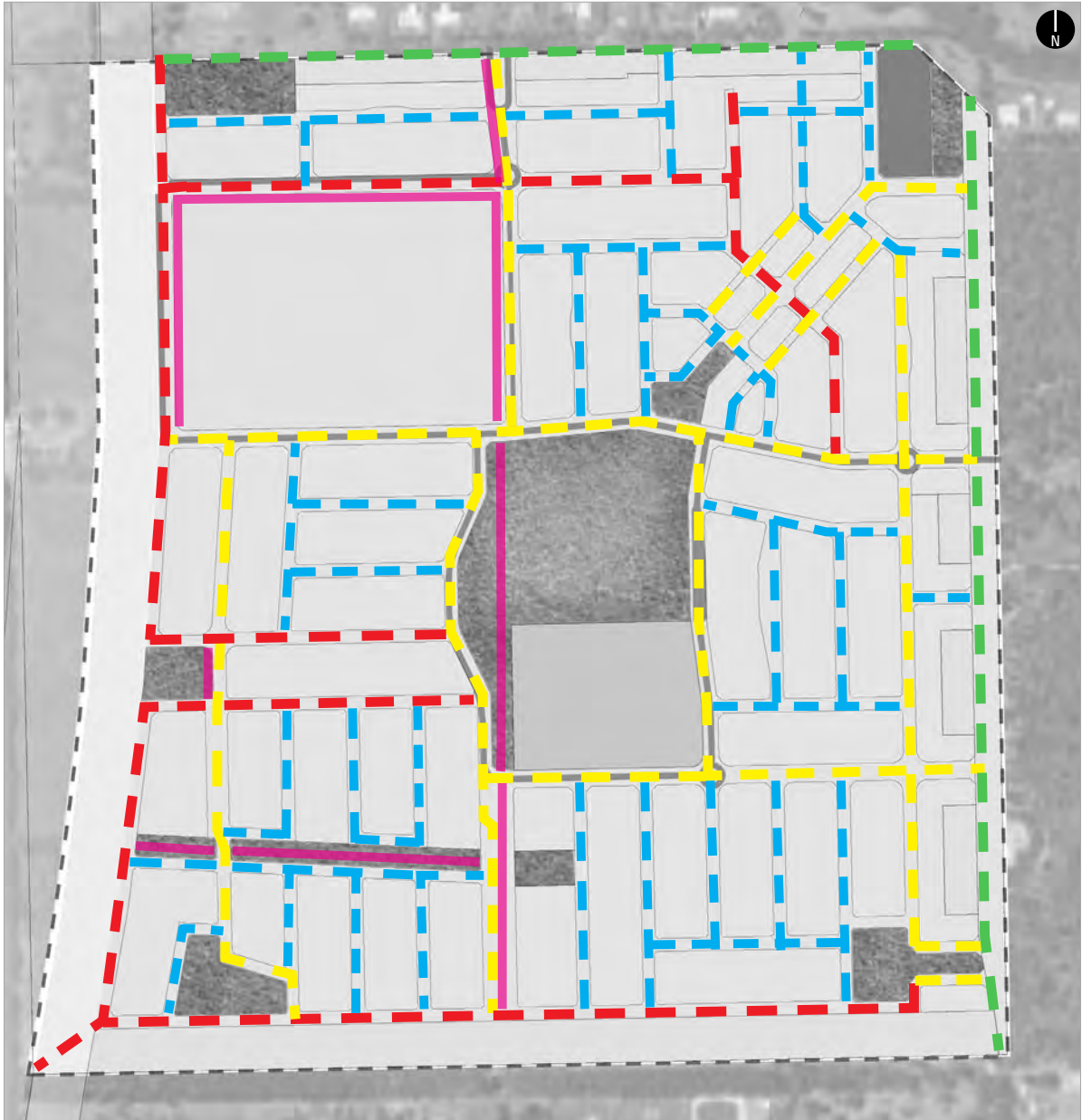
- Consisting of four individual pocket parks, this POS will provide residents with spaces for local amenities.
- All these spaces will be landscaped using predominately native species with limited turfed spaces for passive recreation.
- The POS provides opportunities for small gathering nodes with basic picnic facilities and shade structures.
- POS 5 and POS 9 accommodate drainage from all storm events.
- No drainage is proposed within POS 2 and 10.
- The total area is approximately 2.6ha.

Streetscape Planting

Quality streetscape planting is essential in promoting access and the design character of the Structure Plan.

A Streetscape Planting Strategy has been prepared as part of the Landscape Report to deliver a higher standard of landscaping within the streetscape, along with a considerable increase in the number of onsite trees over and above those being retained (Figure 10: Streetscape Planting Strategy).

Street trees have been carefully selected to deliver quality streetscapes that will provide a sense of place and a distinct theme to this new residential area, incorporating a variety of treatments in response to the road hierarchy system. Street trees have been selected regarding the width of reserves and the role particular roads will serve. Road reserves have also been widened to assist retention of the windrows trees in select locations.



LEGEND	
---	Corymbia ficifolia - Red Flowering Gum Agonis flexuosa - WA Peppermint
---	Liquidambar styraciflua - Sweetgum Jacaranda mimosifolia - Jacaranda Delonix regia - Royal Poinciana
---	Selective retention of windrows in streetscape
---	Eucalyptus wandoo - White Gum Corymbia calophylla - Marri
---	Corymbia ficifolia - Red Flowering Paraserianthes lophantha - Plume Albizia Ulmus parvifolia

Figure 10 - Streetscape Planting Strategy

Source: Emerge Associates

3.4 Bushfire Management

A BMP has been prepared by Lushfire and Planning as part of the Structure Plan, following SPP 3.7. The BMP confirms that the Structure Plan provides a design response and framework that satisfactorily addresses the bushfire risk.

The BMP includes a detailed Bushfire Hazard Level Assessment, which shows that most of the Structure Plan area will have a Low Bushfire Hazard Level, with bushfire-prone vegetation (post-development) generally restricted to:

- Forest classified vegetation, comprising mostly Jarrah, Marri and Banksia, within the Cardup Nature Reserve that abuts the eastern edge of the Structure Plan.
- Woodland, Forest and Grassland (unmanaged) classified vegetation within the rural lifestyle (equine) lots south of the Structure Plan.
- Forest and Grassland (unmanaged) classified vegetation located to the north-eastern side of the Structure Plan area, running along Cardup Brook.
- Remnant pockets of Forest classified vegetation are located along the western edge of the Structure Plan area; however, most of this vegetation will be cleared as part of the upcoming Tonkin Highway extension works.

The BMP requires an Asset Protect Zone (APZ) to be established between the identified bushfire-prone vegetation and any future dwellings to achieve a BAL of 29 or less, in accordance with AS3959 'Construction of buildings within bushfire-prone areas.' The Structure Plan creates these APZs by locating streets and managed POS areas between the identified bushfire risk and any future dwellings, and in rare circumstances, mandating future dwelling setbacks.

Portions of the transitional rural-lifestyle residential lots located along the southern edge of the Structure Plan are partially impacted by a BAL Flame Zone or BAL 40 classification caused by vegetation abutting their southern and eastern boundaries. However, these rural-lifestyle lots are of ample size to ensure that all habitable structures can be located within areas of BAL-29 or less.

All APZs will be confirmed at the time of subdivision.

The Structure Plan also creates a legible road network that will offer multiple egress opportunities for future residents in the unlikely event of a bushfire. These comprise access:

- Northwards by way of the Doley Road extension (over the Cardup Brook);
- Eastwards via Cardup Siding Road; and
- Southwards by way of a connection to Hopkinson Road (south).

In addition Main Roads has confirmed the following commitments regarding bushfire management and emergency egress:

- Extending Doley Road south from Orton Road across Cardup Brook to the North-eastern corner of the site.
- Providing a Principle Shared Path (PSP) along the eastern side of Tonkin Highway extending from Cardup Siding Road to Orton Road.
- Providing a gated emergency connection between Cardup Siding Road and the Tonkin Highway PSP; and

- Providing a cul-de-sac off Hopkinson Road at the south-western corner of Lot 33. The local road connection into this cul-de-sac from the subject land will be the responsibility of the developer.

This demonstrates that bushfire risk can be satisfactorily managed and is not an obstacle to the development of the site.

The BMP is attached in Appendix 2.

3.5 Movement Network

Transcore traffic engineers have prepared a comprehensive Transport Impact Assessment (TIA), which forecasts traffic volumes and sets out a recommended road network hierarchy for the Structure Plan to accommodate expected traffic flows.

The following section discusses the key elements of the TIA, including the existing and planned movement network, road hierarchy classification and an overview of the cyclist and pedestrian network.

The TTIA prepared by Transcore can be found in its entirety as Appendix 4.

3.5.1 Existing Transport Network

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

- **Hopkinson Road** abuts the western edge of the Structure Plan and is reserved as a Primary Regional Road in the MRS, currently constructed as a 7.2m wide single carriageway two-lane rural road with a posted speed limit of 80kph. As a major connection between Rowley Road (north) and Bishop Road (south), Hopkinson Road is classified in the network as a Regional Distributor.
- **Cardup Siding Road** is the primary east-west connection between Hopkinson Road (west) and Soldiers Road and South Western Highway (east), constructed as a 6.2m wide single carriageway rural road with a posted speed limit of 60kph. Cardup Siding Road is classified in the network as an Access Road.
- **Soldiers Road** is a two-way undivided road classified as a Local Road, with a posted speed limit of 60kph. Pedestrian paths are provided on the western side of the road reservation. Bus routes 252 and 253 operate on this road.
- **Doley Road** currently terminates approximately 500m north of the Structure Plan area. From that point it is currently a two-way undivided road classified as an Access Road with a 20m wide road reserve. With a posted speed limit of 50kph, pedestrian pathways are provided on the western side of the road reservation.
- **Orton Road** is currently a two-way undivided road with a posted speed limit of 70kph, located approximately 500m from the Structure Plan area, connecting Hopkinson Road (west) with Warrington Road (east).

Hopkinson Road is currently part of the Restricted Access Vehicles Network 4, accommodating heavy vehicle combinations up to 20m in length.

Public bus services 252 and 253 operate along Soldiers Road, connecting Armadale Station with Jarrahdale town site, passing through the Byford town centre and Mundijong town site.

[3.5.2 Proposed Transport Network](#)

The TIA prepared by Transcore comprehensively addresses traffic movement considerations within the Structure Plan area.

Tonkin Highway Extension

The Tonkin Highway Extension project will provide the Structure Plan area with outstanding access to local, district and regional destinations.

This project will see Tonkin Highway extend from Thomas Road to the north, passing directly by the western edge of the Structure Plan area to the South-Western Highway, southeast of Mundijong. This project has committed funding and is in direct response to the Government acknowledging that the locality has undergone significant growth, which is only expected to continue.

The project comprises:

- Approximately 14km of four-lane dual carriageway, passing along the western side of the Structure Plan;
- Intersection upgrade at Thomas Road;
- New intersections at Orton Road, Mundijong Road and South Western Highway;
- New grade-separated interchange at Bishop Road; and
- Shared pathway along the eastern side of Tonkin Highway, with planned connections to local path networks.

Most critically for the Structure Plan, this project will see a new intersection at Orton Road situated approximately 500m north, connecting to the Doley Road extension, providing direct access for future residents to and from Tonkin Highway.

Three pedestrian pathways will also be provided from the Structure Plan area, connecting to the shared path, which will be constructed along the eastern edge of the Tonkin Highway.

The Tonkin Highway Extension Project is shown as Figure 11.

Road Network

The planned road network shown in the Concept Plan (Figure 8) provides a robust and permeable layout throughout the Structure Plan area, connecting to the surrounding network (both current and planned), facilitating excellent connections to the Tonkin Highway extension and north and south; noting that the extension of Doley Road beyond the southern boundary of the Structure Plan is a long-term prospect and that this will be delivered by others.

The Road Hierarchy Plan shows the road network hierarchy planned for the Structure Plan and the external connections to the existing and future network (Figure 12: Road Hierarchy Plan) and reflects the principles and standards of LN.



Figure 11 - Tonkin Highway Extension Project

Source: Mainroads Western Australia

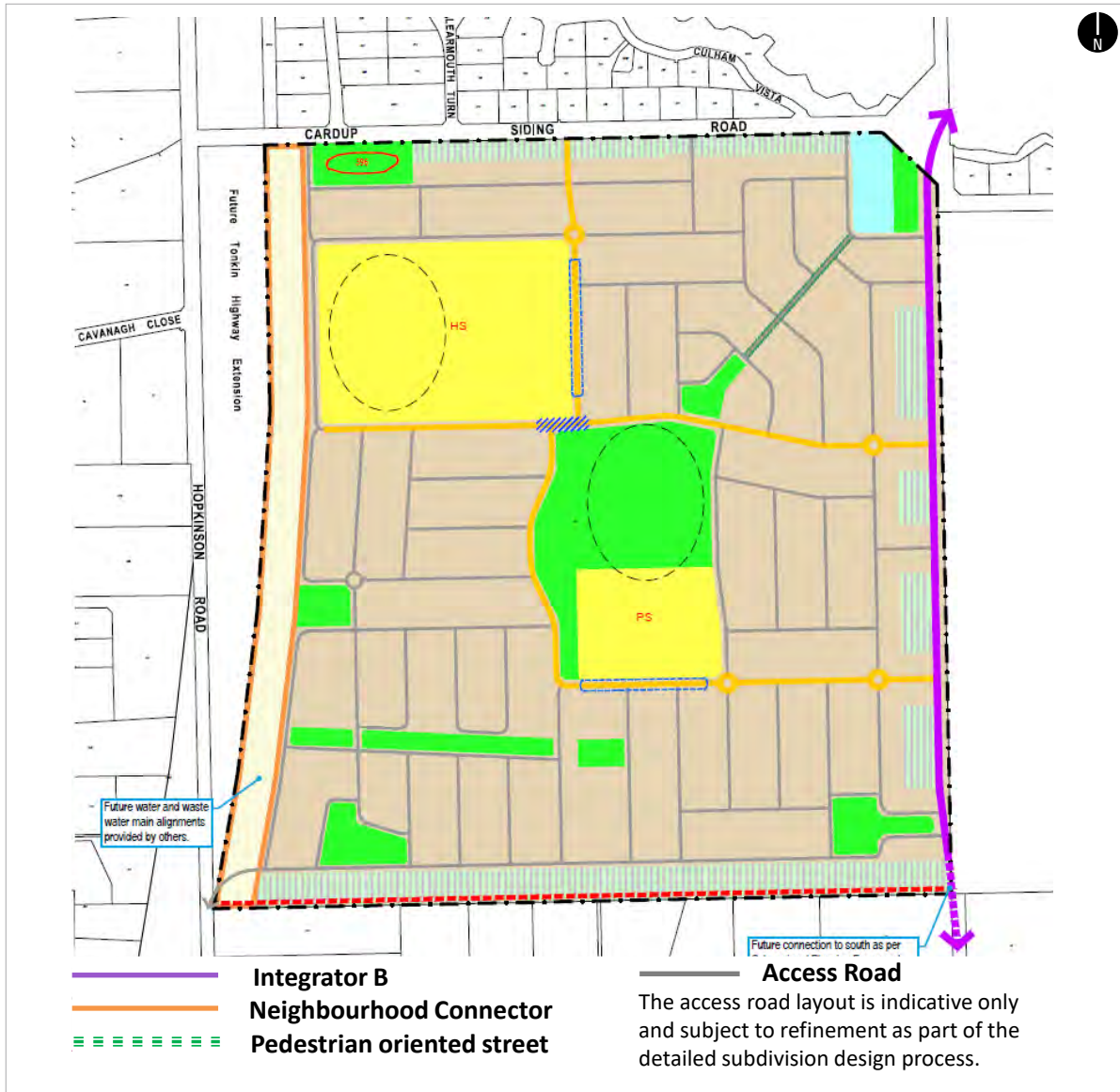


Figure 12 - Road Hierarchy Plan

Source: Tanscore

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

- **Doley Road** is classified as an Integrator Arterial B. Doley Road is to extend southwards from where it currently terminated, north within 'The Glades' in Byford, crossing over Cardup Brook and terminating at the southern end of the Structure Plan area. Long-term planning has Doley Road extending further southwards, ultimately connecting Byford with Mundijong and experiencing traffic volumes ranging between 9,470vpd (south) through to 11,360vpd (north), meaning that direct access from individual lots will be prevented.
- **Neighbourhood Connector** is the key east-west entry road that comes off Doley Road (extension) and then runs between the co-located DOS and the high school site. This road reserve will vary in width from approximately 29m to 18m, responding to forecast traffic volumes.
- **Access Street B** roads generally run along the perimeters of the high school, primary school, and the co-located DOS. These roads have a typical reserve width of 18m to accommodate embayed parking associated with the schools, to be reduced when adjacent to POS.
- **Access Street C** roads generally comprise the remainder of the key entry roads into the Structure Plan area and those abutting the Centre site. These roads typically have a reserve width of 15m, reduced when adjacent to POS.
- **Access Street D** roads make up the remainder of the network, which are forecast to have traffic volumes of less than 1000 vehicles per day (vpd), allowing for a typical reserve width of 14.2m.
- **Laneways** shall be a minimum width of 6m to accommodate two-way movements and rubbish collection. Laneways will increase to a width of 9m, where they provide the only public road frontage.

Pedestrian & Cyclist Facilities

The Structure Plan will deliver a safe, legible, and interconnected pedestrian and cycle movement network, within the Structure Plan area and by facilitating connections to the upcoming Tonkin Highway extension, providing excellent connections to surrounding areas (Figure 13: Pedestrian and Cyclist Facilities).

The two key principles for determining the planned pedestrian and cycling facilities are as follows:

- A pedestrian path on one side with a shared path on the other side for all Integrator Arterials and Neighbourhood Connectors.
- Footpaths on at least one side of all Access Roads, except where they abut either of the school sites or the central POS, in which case one side has a shared path.

These key principles and the final location of footpaths and shared paths will be determined in consultation with the Shire as part of the detailed engineering stage following subdivision approval.

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Figure 13 - Pedestrian and Cyclist Facilities

Source: Transcore

Public Transport

The Structure Plan provides a critical mass that will support the development of a robust public transport service.

One of the most critical public transport investments highly relevant to the Structure Plan is the impending construction of the Byford (Metronet) Train Station, located just north of Abernethy Road in the Byford town centre. This station will combine six bus stands and two train platforms, with associated car parking, making the most of development opportunities within the surrounding localities, including Cardup.

It is anticipated that this station will become a transit hub for local feeder bus services providing local communities outstanding access to the Perth greater railway network.

Presently public bus services 252 and 253 operate along Soldiers Road, connecting Armadale Station with Jarrahdale town site, passing through the Byford town centre and Mundijong town site. It is anticipated that either or both bus routes can service the Structure Plan, providing an important service for (in particular) the student patronage of the two planned schools.

3.5.3 Analysis of the Transport Network

Transcore has undertaken comprehensive traffic modelling for the movement network proposed by the Structure Plan. Transcore demonstrates that the proposed network and associated reserve widths can accommodate expected traffic volumes.

Traffic modelling has incorporated forecast volumes post-2031, the year that full development of the Structure Plan area is assumed to be complete, ensuring a transparent and robust model. In accordance with the WAPC's Transport Impact Assessment Guidelines Volume 2 (August 2016), eight vehicle trips per day per dwelling have been used for the model, whilst two trips per student per day have been used for the school sites. On the advice of the DoE, the primary school is modelled with 540 enrolled students and the high school with 1,450 enrolled students. The model has also assumed the future development of 1,250 dwellings, a small retail centre and a primary school in the land south of the Structure Plan area, north of Bishops Road and between Hopkinson Roads (west) and Soldiers Road).

This modelling has found that the Structure Plan generates approximately 16,470 vpd, of which about 12,540 trips will be external onto the surrounding road network. All vehicle movements fall within the acceptable limits outlined by LN for the respective road categories proposed by the Structure Plan and the TIA.

Internal Intersections

The traffic modelling assessed the internal road network and road hierarchy has sufficient capacity for the forecasted traffic volumes, with none of the internal T-intersections (within the Structure Plan area) requiring any specific traffic management measures due to the low traffic volumes and speeds. All these intersections will be designed as priority-controlled intersections.

The Structure Plan proposes three 4-way intersections that will be constructed as single-lane roundabouts, with two of these roundabouts at corners of the respective school sites, to ensure maximum efficiency for traffic circulation, improve speed management and assist with student drop-off and pick-up operations. The remaining two roundabouts are situated along two entry roads into the Structure Plan area (off the Doley Road extension), where higher traffic volumes are anticipated.

In addition to these roundabouts, five lower order 4-way intersections, given very low forecast traffic volumes, will be constructed with threshold treatments and splitter islands on the side road approaches to slow traffic and enhance road safety, as per LN.

The precise spacing and function of all internal intersections will be determined once the location and alignment of streets are finalised as part of the subdivision approval. All intersection spacing and treatments will be designed in accordance with LN and relevant Austroads standards.

External Intersections

A capability assessment (SIDRA software) was undertaken by Transcore on four of the key proposed Doley Road extension intersections, these being:

- Doley Road extension / Cardup Siding Road intersection;
- Doley Road extension / Neighbourhood Centre intersection;
- Doley Road extension / Neighbourhood Connector intersection; and
- Doley Road extension / Primary School Access Street intersection.

The above four intersections were assessed as priority-controlled, T-intersections, with Doley Road (extension) having a four-lane profile with left- and right-turn facilities on the approach to the respective intersections. Internally within the Structure Plan area, the street approach is modelled with separate (short) left- and right-turn lanes.

This analysis found that all four of these intersections will operate satisfactorily during both AM and PM peak hour periods at ultimate development (post-2031), with each intersection having significant spare capacity (saturation) and an excellent level of service with minimal queues and delays.

3.6 Road Traffic Noise Management Plan

Herring Storer Acoustics have prepared a RTA supporting the Structure Plan, in accordance with SPP 5.4.

The RTA modelled potential noise impacts upon the Structure Plan, resulting from vehicles travelling along the future Tonkin Highway extension, which is approximately 60m west of the Structure Plan area. Tonkin Highway is identified as a strategic freight and major traffic route.

The RTA found that only a limited number of future dwellings along the westernmost edge of the Structure Plan area will exceed the acceptable noise limit targets set out in SPP 5.4. The impact of traffic noise was primarily helped by the 60m separation between these dwellings and the Tonkin Highway extension. Traffic noise is required to be alleviated by constructing a 2.2m noise wall (by others) running along the eastern edge of the Tonkin Highway reservation and facade protection treatments (Quiet House Design packages) for the affected dwellings. These lots will also need notifications on the Certificate of Title to inform landowners of the necessary construction standards.

The RTA is attached in Appendix 5.

3.7 Water Management

The Structure Plan has been designed to accommodate the principles of best practice urban water management by integrating stormwater detention and infiltration within areas of POS.

Hyd2o Hydrology has prepared a LWMS to support the Structure Plan. This LWMS follows the principles and objectives of the approved DWMS that was approved as part of the rezoning of the land in the MRS, as well as the adjacent Byford Townsite District Water Management Plan (2008) and the more recent Byford DWMS (2018). The LWMS is consistent with the WAPC's Better Urban Water Management Guidelines.

Establishing key principles for the management of stormwater runoff and groundwater quality and implementation of the LWMS will be through the development of subsequent Urban Water Management Plans (UWMP), which will be prepared at the time of subdivision.

The LWMS is attached in Appendix 6.

3.7.1 Stormwater Management

Stormwater management will be based on current water-sensitive design principles and best management practices to manage water quality and quantity effectively and refines the stormwater strategy set out in the approved DWMS, which was prepared as part of rezoning the land in the MRS.

The key elements of the drainage system are:

- Use the well-distributed areas of POS for the detention, retention, conveyance, and treatment of stormwater.
- Use residential development in lieu of the land's current agricultural use to reduce nutrient input.
- Provide suitable flow paths for the external contributing catchments (regional flows).
- Use the 'Urban Development' zoned land to maintain its current role in balancing regional flood storage requirements.

The LWMS refines the stormwater strategy as follows:

- Stormwater from within individual lots from the first 15mm event will be infiltrated on site, using soak wells within these lots.
- The remaining stormwater from the first 15mm event will be infiltrated as close to the source as possible by using a piped drainage system to direct this stormwater to biofiltration areas within POS providing water quality treatment.
- Stormwater from the less frequent 20% AEP event will also be directed to retention areas within POS through the piped drainage system.
- Once the capacity of this piped drainage system is reached during a major storm event (1% AEP), stormwater will be conveyed overland using road reserves and designated flow paths to stormwater storage areas located within areas of POS. These areas include using the high school oval and the shared primary school oval to minimise flood storage requirements.
- Habitable building floor areas will be at least 0.5m above the 1% AEP flood level.

Regional Watercourses

Regional flood storage and flow paths provided by the Structure Plan are consistent with the Byford Townsite District Water Management Plan, the Byford DWMS, and on the advice of the DWER.

DWER's current flood mapping has a breakout flow from the Cardup Brook entering the Structure Plan area during a major flood event (1% AEP); however, based on revised modelling carried out by Hyd2o Hydrology and Urbaqua Hydrology (on behalf of DWER), this breakout into the Structure Plan area is now considered unnecessary given revised forecast flows. Cardup Siding Road still provides a failsafe flow path in the highly unlikely event; this is required.

Pre-development regional flows from land beyond the Structure Plan area will be maintained, particularly those from Site 352 that pass through the side towards a Water Corporation drain located approximately 200m south-west. Regarding these flows from Site 352, the current flood mapping of DWER is acknowledged as being conservative, with the design response of providing for these overland flows by way of road reserves an appropriate response to manage and convey these regional flows, which may only occasionally occur.

3.7.2 Groundwater Management

The minimum separation between building floor levels and groundwater will be achieved using clean imported fill and subsoil drainage to protect against any post-development groundwater rise.

A bulk earthworks strategy has been prepared for the Structure Plan area by The Civil Group (engineers). The strategy identifies adequate separation to groundwater of approximately 0.9m to 1.5m over existing levels will achieve a 'Class A' site classification whilst existing levels can achieve a 'Class S' site classification with minimal importation of fill. Fill levels will be subject to further refinement during the UWMP stage.

Subsoil drainage is likely to be needed close to the existing natural (pre-development) surface, with all subsoil flows to be treated for water quality within bioretention systems within areas of open space prior to discharge from the Structure Plan area.

Finished levels, fill requirements and subsoil drainage design, as a detailed civil engineering design issue, will be addressed as part of the UWMP stage.

3.7.3 Monitoring and Implementation

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

The LWMS also establishes a post-development monitoring program that will assess hydrological impacts post-development of the Structure Plan. Post-development monitoring of groundwater (levels and quality) and surface water (quality) will be conducted over three years, with the commencement of the monitoring program (for each subdivision area) to be negotiated with DWER and the Shire at the time of UWMP.

A National Association of Testing Authorities approved laboratory will undertake all water quality testing.

3.8 Activity Centres

The Structure Plan is in proximity to several existing and planned activity centres, ensuring immediate and excellent access to employment opportunities, retail, commercial and community services.

The Armadale Strategic Metropolitan Centre is located 10km north of the Structure Plan; while the Byford Town Centre (District) is located only 3km north-east, both are identified as significant centres in SPP 4.2, providing for a broader range of commercial, community and employment opportunities.

Several smaller (local and neighbourhood) centres are strategically located within Byford, offering those residents excellent access to the more frequent (day-to-day) needs. Neighbourhood and local centres are essential community focal points that help to provide for the main daily household shopping needs of local communities and have the prospect of other amenity opportunities such as café or restaurant uses. These small centres also play a critical role in providing walkable access to community services and facilities.

SPP 4.2 indicates that these smaller centres need not be supported by a RNA but should be recognised in local planning strategies or structure plans for new urban areas.

Nevertheless, Shrapnel Urban Planning has prepared a RNA to review the retail planning for the Structure Plan area, ensuring that the commercial centre is robust, economically feasible and does not disrupt the existing or proposed commercial uses.

The key findings of the RNA are:

- The neighbourhood and local centres accounted for to the north within The Glades are entirely in accordance with the aim of serving the local retail requirements of those future populations and not of Lot 33;
- The nature and locations of these proposed centres are in no way suitable or convenient enough to adequately serve the local retail needs of residents of the Structure Plan area;
- Significant population growth indicates that additional retail will be necessary over the following two decades to accommodate the needs of the existing and future population;
- The commercial site will provide future residents with a conveniently located centre for their day-to-day shopping needs;
- This commercial site would complement, rather than compete with, the larger centres located northward; and
- A commercial site containing approximately 3,500m² of retail floor space can be supported at the 'entry' of the Structure Plan area, providing the initial opportunity for a local convenience store, a restaurant or a cafe.

This commercial centre's final extent and configuration will depend on market demand and subsequent assessment, which will be limited to 3,500m². A subsequent RNA will be required as part of a future development application(s) that proposes any increase to this floor area limit to allow the Shire to appropriately assess the need and appropriateness of any increase given its context.

The RNA is attached in Appendix 7.

3.9 Education

The Structure Plan will be exceptionally well serviced by educational facilities, with the Structure Plan providing both a primary and high school at the request of the DoE.

The Structure Plan provides one 3.5ha primary school site, co-located with a large 5.8ha (shared) active recreational space abutting the primary school. This recreational space will accommodate a shared-use oval for organised sports and provide an informal recreation space when not used by the school or sports clubs. In accordance with LN and based on the estimated yield of 1,100-1,300 lots, the Structure Plan forms a considerable portion of a complete school catchment.

The high school provision is a result of a request from the DoE during the initial MRS amendment phase, advising that secondary student numbers currently experienced within the Byford-Cardup locality are at a critical point and that a secondary college was required to alleviate this issue. CIP, as the landowner, provided the DoE with a written commitment that land would be identified and set aside at the time of structure planning to accommodate a future high school site. The Structure Plan supports this commitment.

The high school is a 10ha site, allowing for a 'standalone' school. The location near the active recreational space allows for the use of this space if desirable to DoE.

Consistent with the principles of LN, all roads abutting the two school sites will be designated as Neighbourhood Connectors, having a minimum width of 18m to help provide these future schools with excellent access, circulation, and parking.

Further to these two schools, the Structure Plan is also near several existing educational facilities, including the Beenyup Primary School, approximately 1km north-east, Woodland Grove Primary School, approximately 1.5km north-west and Byford Secondary College, located approximately 3km north-east.

The Court Grammar School is an independent, co-education Anglican facility located on Soldiers Road, approximately 3km south, offering Kindergarten to Year 12. Salvado Catholic College is situated 2km north on Abernethy Road, currently offering places for Pre-Kindergarten to Year 8 (as of 2022), providing non-government school options for future residents.

3.10 Servicing and Staging

The Structure Plan has access to all essential services, which typically involve extending the infrastructure network from adjacent developed areas.

[3.10.1 Earthworks Strategy](#)

The Structure Plan area is physically capable of development to acceptable urban standards with a geotechnical investigation showing that existing levels can achieve a 'Class S' site classification with minimal importation of fill. Alternatively, a 'Class A' site classification may be achieved by importing sand fill to increase ground levels between 0.9m and 1.5m over existing levels.

Regardless, the Structure Plan area will need to be shaped to form low points grading from east to west to provide for stormwater drainage throughout the site, ensuring subsoil water can discharge into proposed drainage basins. This shaping of the site will then determine the amount of sand required to achieve either 'A' or 'S' class.

[3.10.2 Wastewater](#)

The Structure Plan is located within the Byford Wastewater Scheme, with wastewater gravitating towards a planned long-term Wastewater Pump Station (WWPS) situated to the south; however, this infrastructure is not expected to be delivered before 2040.

Consequently, a temporary Type 40 WWPS will be constructed within the Structure Plan area, along with a temporary main (both at the cost of the developer) that will cross the Cardup Brook via the Doley Road extension, connecting to an existing DN300/DN375. This temporary Type 40 WWPS will be graded out when the long termed WWPS is delivered. A DN300 gravity sewer main will be constructed as part of future development within the Structure Plan area in anticipation of this ultimate wastewater strategy.

[3.10.3 Power Supply](#)

CIP will extend the existing Western Power infrastructure within the vicinity to provide a power supply to the Structure Plan.

A 22kV high voltage (HV) overhead line is situated along the eastern side of Hopkinson Road (originating from the Byford Zone substation) along with a 22kV HV Fuse cable installed along the northern side of Cardup Siding Road, which has the capacity to service future development of the Structure Plan area.

It is expected that a second HV feeder will be required as part of later stages to provide additional capacity, with this anticipated to be extended to the Structure Plan along the Doley Road reserve extension from the north.

[3.10.4 Gas Supply](#)

ACTO gas has confirmed a medium-pressure gas pipe in the Cardup Side Road reserve that runs along the northern edge of the Structure Plan area, which can service approximately 400 lots. At that time, ACTO would review the area's supply and rate of development. An ultimate gas connection is planned to be brought southwards within the Doley Road reserve extension and across the Cardup Brook with ACTO gas; as part of its Capital Contribution Policy, assess the timing and cost of this future extension.

[3.10.5 Telecommunications](#)

The proposed scale of development indicates that the National Broadband Network Company (NBN Co) is likely to become the telecommunications provider. The design and installation of a standard pit and pipe network, along with possible backhaul costs, will be undertaken as the development of the site progresses, with the broadband supplier's installation of fibre optic infrastructure.

[3.10.5 Staging and Timing](#)

The Structure Plan will be constructed in a manner that meets market demand.

The delivery of the Structure Plan is likely to be over 10 to 15 years. The construction will likely commence in the northeast corner of the site. Construction will commence in this location due to the access that will be created by MRWA over Cardup Brook and linking to Orton Road. The staging will move west along Cardup Siding Brook Road and then in a southerly direction. The last stages of Lot 33 to be delivered will be in the south-west corner of the site.

3.11 Development Contributions

The Structure Plan is not contained within any Development Contribution Area prepared under the provisions of Schedule 10 of LPS3.

The Shire has requested for the Structure Plan to be included in the following:

- Byford Traditional Infrastructure Development Contribution Plan; and
- Community Infrastructure Development Contribution Plan.

Inclusion requires amending the current Byford Development Contributions Area. The Shire is progressing with amendments to LPS3 to amend the plans, which need to be completed before initiating any amendment to include the Structure Plan area.

CIP has confirmed its commitment to the Community Infrastructure Development Contribution Plan.

CIP will provide an equitable contribution to the Byford Traditional Infrastructure Development Contribution Plan, noting that a Developer Agreement may be a more appropriate and efficient mechanism for these infrastructure provisions due to the Structure Plan area being in sole ownership. Key considerations influencing the negotiations of the Byford Traditional Infrastructure Development Contribution Plan are:

- Funding of the Doley Road extension by MRWA;
- The gazettal of the Shire's new town planning scheme;
- The influence of State Government grant funding on infrastructure items; and
- The provision of community and regional infrastructure by the proponent.

The Engineering Report is attached in Appendix 8.

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